RRB NTPC Graduate Level CBT-II Official Paper (Held On: 13 Oct, 2025 Shift 1) (Previous Year Paper)

RRB NTPC • 2025 • 120 questions • 90 minutes • Answer key and solutions

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FULL TEST

Q1. In the following triads, each group of letters is related to the subsequent one following a certain logic.

Select from the given options, the one which follows the same logic.

WASH - HSWA - WSAH

NEST - TSNE - NSET

(a) TRAY - RATY - RAYT
(b) FOGS - SGFO - OGFS
(c) PACE - PCAE - ECAP
(d) OILS - SLOI - OLIS

Q2. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

32 − 15 ÷ 5 + 10 × 2 = ?

(a) 100
(b) 103
(c) 101
(d) 102

Q3. A machine depreciates at a rate of 10% per annum. If the current value of the machine is Rs. 1,00,000, what will be its value after 2 years?

(a) Rs. 79,000
(b) Rs. 78,000
(c) Rs. 81,000
(d) Rs. 80,000

Q4. On 3 June 2025, India secured the presidency of which international organisation, defeating Austria with 87 out of 141 votes?

(a) Commonwealth Association for Public Administration (CAPA)
(b) United Nations Public Administration Network (UNPAN)
(c) Global Institute of Governance and Public Administration (GIGPA)
(d) International Institute of Administrative Sciences (IIAS)

Q5. India's North Central Railway Zone's Headquarter is located in _____.

(a) Prayagraj
(b) Jaipur
(c) Jabalpur
(d) Bilaspur

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Q6. Which keyboard shortcut allows you to quickly delete the word to the left of the cursor in MS Word 2019?

(a) Alt + Backspace
(b) Ctrl + Delete
(c) Shift + Backspace
(d) Ctrl + Backspace

Q7. If the ratio of the quadrilateral's four angles is angle w: angle x: angle y: angle z = 2 : 3 : 3 : 4, then what is the value of angle x.

(a) 90°
(b) 80°
(c) 60°
(d) 70°

Q8. In a certain code, ‘food is tasty’ is coded as ‘gm rt pj’, ‘snack is good’ is coded as ‘xl rt bn’, and ‘tasty good meal’ is coded as ‘pj bn dv’. What is the code for ‘meal’ in that code? (All codes are two-letter codes.)

(a) rt
(b) pj
(c) bn
(d) dv

Q9. In 1878, dissatisfied followers of Keshab Chandra Sen established the Sadharan Brahmo Samaj. Who among the following were its founders?

(a) Raja Ram Mohan Roy, Debendranath Tagore and Keshab Chandra Sen
(b) Ishwar Chandra Vidyasagar, Ananda Mohan Bose and Bankim Chandra Chatterjee
(c) Ananda Mohan Bose, Sib Chandra Deb and Umesh Chandra Dutta
(d) Sib Chandra Deb, Rabindranath Tagore and Surendranath Banerjee

Q10. Which of the following is the characteristic of Montane Forest?

(a) Teak is the most dominant species of this forest.
(b) Royal Bengal Tiger is the famous animal in these forests.
(c) Evergreen broad-leaf trees, such as oaks and chestnuts predominate here.
(d) Some of the important trees of this forest are ebony, mahogany etc.

Q11. Which of the following Articles deals with the composition of the panchayats?

(a) Article 243B
(b) Article 243D
(c) Article 243A
(d) Article 243C

Q12. The Brundtland Report, 'Our Common Future' (1987), formally introduced which key concept, defined as meeting present needs without compromising the ability of future generations to meet their own?

(a) Sustainable Development
(b) Ecological Modernisation
(c) Green Economy
(d) Inclusive Growth

Q13. The price of 4 pens and 5 notebooks is Rs. 130. If the price of a pen is increases by 25% and the price of the notebook decreases by 20%, then the price of 2 pens and 4 notebooks becomes Rs. 82. What is the original price of 1 pen and 2 notebooks?

(a) Rs. 40
(b) Rs. 25
(c) Rs. 20
(d) Rs. 30

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Q14. In this question, a question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and select the most appropriate answer.

Question:

Among 5 students, F, A, K, E and D each having a different height, which student is the shortest?

Statements:

(I) A is shorter than E. K is shorter than F.

(II) K is taller than A.

(a) Data in statements I and II together are NOT sufficient to answer the question

(b) Data in statement I alone is sufficient to answer the question while data in statement II is not

(c) Data in statement II alone is sufficient to answer the question while data in statement I is not

(d) Data in statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question

Q15. 6 is related to 34 following a certain logic. Following the same logic, 8 is related to 46. To which of the given options is 10 related, following the same logic?

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(a) 57

(b) 58

(c) 56

(d) 55

Q16. The Champaran Satyagraha of 1917, Gandhi's first major involvement in India's freedom struggle, was launched in support of which group?

(a) Peasant tenants in Awadh

(b) Tea plantation workers in Assam

(c) Cotton mill workers in Bombay

(d) Indigo farmers in Bihar

Q17. The marked price of a shirt is Rs. 1,200. A shopkeeper offers two successive discounts of 5% and 15% on the marked price. By how many rupees is the selling price less than the marked price?

(a) Rs. 131

(b) Rs. 231

(c) Rs. 141

(d) Rs. 241

Q18. What was the ranking of India in the Sustainable Development Goals (SDG) Index according to the 2025 edition of the Sustainable Development Report released in June 2025?

(a) 106

(b) 99

(c) 121

(d) 114

Q19. Which of the following is NOT a direct tax?

(a) Tax on capital gains

(b) Value Added Tax (VAT)

(c) Corporate tax

(d) Income tax

Q20. The price of a product is increased by 15% and then a discount of 8% is applied. Find the net percentage increase in the price.

(a) 6.2%

(b) 7%

(c) 5%

(d) 5.8%

Q21. Simplify: 0.848 ÷ 0.8 × 1/2 + 0.125 ÷ 5/2 × 0.4

(a) 0.55
(b) 0.73
(c) 0.53
(d) 0.75

Q22. The ratio of the salaries of two employees is 3 : 4. If the first employee's salary is increased by 10% and the second employee's salary is increased by 20%, what will be the new ratio of their salaries?

(a) 11 : 16
(b) 33 : 47
(c) 33 : 56
(d) 3 : 4

Q23. Which of the following are aspects of the Centre-State legislative relation?

1. Territorial extent of Central and state legislation
2. Distribution of legislative subjects
3. Parliamentary legislation in the state field
4. Centre's control over state legislation

(a) Only 2 and 3
(b) All 1, 2, 3 and 4
(c) Only 1 and 2
(d) Only 1, 2 and 3

Q24. On 3 March 2025, the world observed World Wildlife Day with which theme?

(a) Wildlife Conservation Finance: Investing in People and Planet
(b) Partnerships for Wildlife Conservation
(c) Recovering Key Species for Ecosystem Restoration
(d) Forests and Livelihoods: Sustaining People and Planet

Q25. In August 2025, which facility was inaugurated by the Chief of the Army Staff (COAS), General Upendra Dwivedi, at IIT Madras to bridge academic research and military needs?

(a) Project SAMBHAV Secure Army Mobile Lab
(b) Bharat Military Technology Incubation Hub
(c) Agnishodh, the Indian Army Research Cell (IARC)
(d) Defence Innovation and Technology Research Centre

Q26. A group of 30 students has secured the average marks of 70 and another group of 20 students has secured the average marks of 80. What is the average marks secured by students of both the groups taken together?

(a) 78
(b) 74
(c) 72
(d) 76

Q27. Which country is known for its unique 'Dragon King' monarchy?

(a) Sri Lanka
(b) China
(c) Bhutan
(d) Bangladesh

Q28. What happens to the speed of sound in a medium when its temperature increases?

(a) It increases.
(b) It is not affected by the temperature.
(c) It decreases.

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(d) It remains the same.

Q29. Why does evaporation cause cooling?

(a) Because particles absorb latent heat from the surroundings during evaporation
(b) Because evaporation reduces air pressure
(c) Because particles lose heat to the surroundings during evaporation
(d) Because evaporation increases particle size

Q30. The name given by Wegener to a huge water body that surrounded Pangaea is:

(a) Water hemisphere
(b) Panthalassa
(c) Laurasia
(d) Tethys

Q31. In MS Excel 2019, what is the maximum column width that can be set, and what does it represent?

(a) 409 – Represents the number of visible characters possible in a zoomed-out view
(b) 255 – Represents the number of characters in the default font that fit in a cell
(c) 255 – Represents pixels based on the monitor resolution
(d) 32767 – Represents the maximum number of characters storable in a cell

Q32. The simple interest (in Rs.) on Rs. 5,000 at 5% per annum for 2 years is:

(a) 600
(b) 500
(c) 580
(d) 530

Q33. In the following number-pairs, the second number is obtained by applying certain mathematical operation(s) to the first number. Select the number-pair in which the numbers are related in the same way as are the numbers of the following pairs.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

11, 68

14, 86

(a) 17, 104
(b) 18, 104
(c) 18, 103
(d) 17, 103

Q34. The primary force responsible for pulling water upward in tall plants is _____.

(a) osmosis
(b) guttation
(c) root pressure
(d) transpiration

Q35. Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week. Q has an exam on Thursday. Exactly four people have their exam between U and P, neither of whom has an exam on Sunday. R has an exam immediately before S. V does not have an exam on Friday. U does not have an exam after S. How many people have exams after P?

(a) 4
(b) 1
(c) 3
(d) 2

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Q36. What should come in place of the question mark (?) in the given series?

2 12 60 240 ? 1440

(a) 780
(b) 660
(c) 720
(d) 760

Q37. A trader gives 10% discount on the marked price of an article and gives 4 articles free for buying 15 articles and gains 35% in the entire transaction. Assuming a customer pays for 15 articles, the marked price of an article is what percentage more than its cost price?

(a) 95%
(b) 89%
(c) 90%
(d) 94%

Q38. A, B, C, D, X and Y each scored different marks. Only two people have scored more than A. Only B has scored less than D. X has scored more than Y but less than C. How many people have scored more than X?

(a) One
(b) Two
(c) Three
(d) Four

Q39. The value of $6^2+\sqrt{(2^2)}-5\sqrt{25}-11$ is

(a) -5
(b) -2
(c) 2
(d) 3

Q40. The reservation of seats for women in Panchayati Raj institutions is provided by which of the following Constitutional amendments?

(a) 75th Amendment
(b) 74th Amendment
(c) 70th Amendment
(d) 73rd Amendment

Q41. As part of an initiative of the Union government, the NCCF started selling onions through mobile vans in Mumbai during September 2025 at subsidized rates. What does NCCF stand for?

(a) National Cooperative Confederation for Food supplies
(b) National Cooperative Consumers' Federation of India
(c) National Consumer Cooperative for Food distribution
(d) National Consumer Confederation for Food

Q42. Which keyboard shortcut allows you to open the Open dialog box in MS PowerPoint 2019 for selecting a file to open?

(a) Alt + O
(b) Shift + O
(c) Ctrl + Shift + O
(d) Ctrl + O

Q43. Which of the following Articles of the Indian Constitution automatically suspends the Fundamental Rights during emergencies?

(a) 356
(b) 352
(c) 359
(d) 358

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Q44. Three bells ring at intervals of 12, 15 and 18 minutes. If they rang together at 10:00 am, when will they ring together again?

(a) 1:00 p.m.
(b) 2:00 p.m.
(c) 4:00 p.m.
(d) 12: 00 p.m.

Q45. The downstream speed is 125 km/hr and the upstream speed is 25 km/hr. It takes a total of 25 hours to go to a place and come back. What is the total distance (in km) travelled by boat?

(a) 5201/6
(b) 5205/6
(c) 10411/3
(d) 10412/3

Q46. In the context of operating systems, what does PCB stand for?

(a) Process Control Block
(b) Permanent Code Buffer
(c) Printed Circuit Board
(d) Program Control Board

Q47. If the ratio of two numbers is 5 : 4 and their HCF is 5, find their LCM.

(a) 90
(b) 100
(c) 128
(d) 124

Q48. A question is followed by two statements numbered (I) and (II). You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and decide the appropriate answer.

What is Rahul's age(in years)?

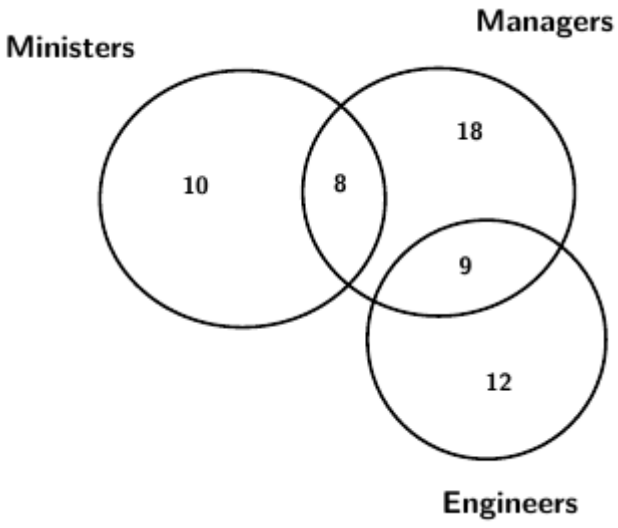
Statements:

I. Rahul was born when his father was 33 years old.

II. Rahul is 29 years younger than his mother.

(a) Both statements I and II together are NOT sufficient to answer the question
(b) Both statements I and II together (and not statement I alone or statement II alone) are sufficient to answer the question.
(c) Data in Statement II alone is sufficient to answer the question while data in statement I is not
(d) Data in statement I alone is sufficient to answer the question while data in statement II is not

Q49. Study the given Venn diagram carefully and answer the question that follows. The numbers in different sections indicate the number of persons.



How many Ministers are there who are Managers but NOT Engineers?

(a) 18
(b) 10
(c) 8
(d) 9

Q50. In the following series, only one letter-cluster is incorrect. Select the INCORRECT letter-cluster.

FHK IKN LNQ OQT RSW

(a) RSW
(b) LNQ
(c) FHK
(d) OQT

Q51. Ramesh invested Rs. 25,000 each in two different schemes for 2 years. The rate of interest in the first scheme is 8% per annum, compounded annually, and in the second scheme it is 6% per annum, compounded annually. What is the difference in the compound interest earned from both the schemes?

(a) Rs. 1,050
(b) Rs. 1,040
(c) Rs. 1,060
(d) Rs. 1,070

Q52. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) IO – DJ
(b) RX – MS
(c) NR – GL
(d) MF – HA

Q53. Find the simplified value of 7^(-8) × 11^(-8) × 13^(-8).

(a) 1/(1001^8)
(b) 1/(995^8)
(c) 1/(1025^8)
(d) 1/(962^8)

Q54. During a sale 50% of the goods are sold at 45% profit, 30% of the remaining goods are sold at 27% profit and the still remaining goods are sold at a loss of 43%. If there is an overall profit of x%, then what is the value of x?

(a) 12
(b) 13
(c) 10
(d) 11.5

Q55. Namesh starts from point A and drives 4 km towards west. He then takes a left turn and drives 5 km. He takes a final left turn and drives 6 km and stops at point B. Rimit starts from point P, which is 16 km east of Point A, and drives 3 km towards east. He then takes a right turn and drives 5 km. He takes a final left turn and drives 3 km and stops at Point Q. What is the shortest distance between Point Q and Point B? (All turns are 90 degree turns only.)

(a) 21 km
(b) 20 km
(c) 22 km
(d) 19 km

Q56. The sides of a triangle are 70 cm, 56 cm and 42 cm. What is its area? (in cm^2)

(a) 1186
(b) 1176
(c) 1171

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(d) 1211

Q57. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the letter-cluster pair that DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) MQ−PT
(b) KO−NR
(c) AE−DH
(d) GK−IP

Q58. Which of the following numbers is divisible by 39?

(a) 625649
(b) 622710
(c) 625092
(d) 622776

Q59. The average of three numbers is 49. The first number is twice the second, and the second is twice the third. What is the largest number?

(a) 63
(b) 42
(c) 21
(d) 84

Q60. Eight people are sitting in two parallel rows containing 4 people each in such a way that there is equal distance between adjacent persons.

In row 1 – A, D, O and P are seated and all of them are facing south.

In row 2 – U,W, Y and F are seated and all of them are facing north.

Thus each person faces another person from the other row.

U sits third to the left of Y. The one facing P is an immediate neighbour of Y. A sits at some place to the right of P and is not facing W. D sits third to the right of O. Who amongst the following faces F?

(a) U
(b) A
(c) W
(d) D

Q61. Gharana Parampara is found in which of the following?

(a) Hindustani Classical Music
(b) Karnataka Classical Music
(c) Hindustani Lok Music
(d) Karnataka Folk Music

Q62. If ‘A’ stands for ‘+’, ‘B’ stands for ‘−’, ‘C’ stands for ‘×’ and ‘D’ stands for ‘÷‘, what will come in place of the question mark (?) in the following equation?

25 C 3 B 12 D 4 A 10 = ?

(a) 83
(b) 82
(c) 81
(d) 80

Q63. Which of the following ratios is the greatest?

(a) 20 : 38
(b) 19 : 43
(c) 23 : 45
(d) 13 : 40

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Q64. If i is the angle of incidence and r is the angle of refraction, which relation is correct according to Snell's law?

(a) sin i ÷ sin r = constant
(b) sin i × sin r = constant
(c) sin i + sin r = constant
(d) sin i – sin r = constant

Q65. Which Governor-General of India (1848-1856) was mainly associated with enforcing the Doctrine of Lapse to annex Indian states without a male heir?

(a) Lord Cornwallis
(b) Lord Wellesley
(c) Lord Dalhousie
(d) Lord Hastings

Q66. In a certain code language,

A + B means 'A is the mother of B',

A – B means 'A is the brother of B',

A x B means 'A is the wife of B', and

A ÷ B means 'A is the father of B'.

Which of the following means that R is the mother's brother of T ?

(a) P ÷ Q x R ÷ S + T
(b) P ÷ Q x R – S + T
(c) P x Q ÷ R – S x T
(d) P ÷ Q – R x S – T

Q67. Mahatma Gandhi labelled which repressive British legislation as the 'Black Act' and called for an All-India mass protest against it in 1919?

(a) Arms Act
(b) Vernacular Press Act
(c) Indian Councils Act
(d) Rowlatt Act

Q68. The simplified value of 72÷ [12/6× [3+9-(5+5-(2+5))]]

(a) 4
(b) 8
(c) 6
(d) 3

Q69. The 'Chennai Port' is located along which of the following water bodies?

(a) Arabian Sea
(b) Andaman Sea
(c) Bay of Bengal
(d) Gulf of Mannar

Q70. MOST is related to EFKK in a certain way based on the English alphabetical order. In the same way, GEMJ is related to YVEA. To which of the given options is IDOI related, following the same logic?

(a) AUZG
(b) AUGZ
(c) AGUZ
(d) AGZU

Q71. Which of the following statements, in the context of Indian citizenship provisions, is correct?

I) Citizenship is listed in the State list. I

I) Articles 5 to 11 of the Constitution of India deal with various categories of persons who are entitled to citizenship.

III) There are only three ways to get Indian citizenship.

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(a) Only I and III
(b) Only II
(c) Only III
(d) I, II and III

Q72. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

26 + 8 × 4 − 10 ÷ 5 = ?

(a) 77
(b) 75
(c) 74
(d) 73

Q73. Find the number of bricks, each measuring 72 cm × 50 cm × 25 cm, required to construct a wall 81 m long, 29 m high and 0.8 m thick, while the sand and cement mixture occupies 40% of the total volume of wall.

(a) 12687
(b) 12727
(c) 12496
(d) 12528

Q74. Evaluate the following:

5/2+(1/(1+5/7))-3/2

(a) 11/8
(b) 19/12
(c) 28/3
(d) 18/19

Q75. A, B, C, D, E, F, G and H are sitting around a square table facing the centre of the table. Some of them are sitting at the corners while some are sitting at the exact centre of the sides. F sits second to the right of G. F sits at one of the corners. Only three people sit between G and E when counted from the left of G. H sits third to the left of E. Only three people sit between H and B when counted from the left of H. C sits second to the right of B. D is not an immediate neighbour of E. How many people sit between E and D, when counted from the left of D?

(a) One
(b) Two
(c) None
(d) More than two

Q76. Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week. S has an exam on Tuesday. Exactly two people have an exam between S and P. T has an exam immediately before U and R has an exam immediately after Q. Only 1 person has an exam between U and Q. How many people have exams after Q?

(a) 2
(b) 1
(c) 4
(d) 3

Q77. Who among the following is credited with the composition of a text called 'Gatha Saptasati' or 'Saptasati'?

(a) Srimukha
(b) Gautamiputra
(c) Hala
(d) Satakarni I

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Q78. When a plain text email is sent, which Content-Type value is typically specified in the message header, according to MIME standards?

(a) text/plain; charset=UTF-8
(b) text/html; charset=ASCII
(c) multipart/mixed
(d) application/octet-stream

Q79. Refer to the following letter, number, symbol series and answer the question

(Left) $ T 1 & 9 Z 7 * A M S 1 * D % 7 * (Right)

If all the symbols are dropped from the series, which of the following will be seventh from the right?

(a) 9
(b) T
(c) 7
(d) 1

Q80. In the following series, only one letter-cluster is incorrect. Select the INCORRECT letter-cluster.

JFB RNJ ZVR HDZ PLK XTP

(a) RNJ
(b) ZVR
(c) HDZ
(d) PLK

Q81. A man covers equal distances at the speed of 19 km/hr, 8 km/hr and 5km/hr. His average speed for the entire journey is:

(a) 7271/287 km/hr
(b) 5271/287 km/hr
(c) 13271/287 km/hr
(d) 3271/287 km/hr

Q82. Which meristematic tissue is found at nodes and helps in regrowth of grasses?

(a) Apical
(b) Lateral
(c) Permanent
(d) Intercalary

Q83. In July 2025, the Indian Army began restructuring single-arm brigades into integrated combat units combining infantry, tanks, artillery, engineers, UAVs and Special Forces. What are these units called?

(a) Sena Combined Operations Brigades
(b) Agni Multi-Domain Combat Units
(c) Vajra Integrated Battle Groups
(d) Rudra All-Arms Brigades

Q84. The price of fuel decreases by 10%, 45% and 10% in three successive months, but increases by 65% in the fourth month. What is the percentage increase/decrease in the price of fuel in the fourth month as compared to its original price? (Round off the answer to two decimal places.)

(a) Increases by 21.55%
(b) Increases by 25.16%
(c) Decreases by 30.57%
(d) Decreases by 26.49%

Q85. Pure ghee costs Rs. 112/kg. After adulterating it with vegetable oil costing Rs. 56/kg, a dishonest shopkeeper sells the mixture at the rate of Rs. 91/kg, thereby making a profit of 30%. In what ratio does he mix the two?

(a) 2 : 3
(b) 6 : 5
(c) 1 : 3

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(d) 3 : 5

Q86. In the substitution of methane with chlorine, sunlight is required to:

(a) absorb chlorine
(b) prevent oxidation
(c) initiate free radical formation
(d) provide heat

Q87. Which country will host the 2034 FIFA World Cup?

(a) Saudi Arabia
(b) Brazil
(c) Qatar
(d) Russia

Q88. if x varies inversely as $y^3 - 1$ and x is equal to 6 when y = 4, find the value of x when y = 8.

(a) 54/73
(b) 147/115
(c) 143/141
(d) 83/98

Q89. MPQO is related to UXYW in a certain way based on the English alphabetical order. In the same way, DGHF is related to LOPN. To which of the given options is KNOM related, following the same logic?

(a) SWUV
(b) SWVU
(c) SUWV
(d) SVWU

Q90. What does the number of compressions or rarefactions passing a point per unit time represent in a sound wave?

(a) Frequency
(b) Amplitude
(c) Wavelength
(d) Loudness

Q91. Find the weighted average of the numbers 17, 12, 23, 45, and 301, using the respective weights 29, 87, 15, 26, and 18.

(a) 42.5
(b) 42.42
(c) 48.4
(d) 58.4

Q92. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) XBC
(b) SWX
(c) NSS
(d) LPQ

Q93. A, B, C, D, E and F have different heights. C is shorter than exactly 1 person. D is shorter than A but taller than F. E is shorter than F, and C is shorter than B. How many people are taller than D?

(a) 4
(b) 3
(c) 2
(d) 1

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Q94. Which of the following is NOT a component of essential maternal care?

(a) Tetanus immunisation
(b) Supplementation of iron and folic acid
(c) Intrauterine insemination (IUI)
(d) Education on breastfeeding practices

Q95. Refer to the given letter, number, symbol series and answer the question that follows.

(Left) D 4 & A $ Z G 7 R 5 % W 2 @ 3 # V 6 & F Y (Right)

If all the numbers are dropped from the series, which of the following will be seventh from the right?

(a) W
(b) G
(c) %
(d) @

Q96. In August 2025, Spanish tennis star Carlos Alcaraz won his first-ever Cincinnati Open title after which player retired in the final?

(a) Jannik Sinner
(b) Daniil Medvedev
(c) Novak Djokovic
(d) Alexander Zverev

Q97. Which of the following zones lies between low and high tide in sea margins?

(a) Tidal zone
(b) Near-shore
(c) Shoreline
(d) Foreshore

Q98. What should come in place of the question mark (?) in the given series?

12, 25, 51, 90, 142, ?

(a) 207
(b) 209
(c) 208
(d) 206

Q99. What is the percentage of population living in cities referred to as?

(a) Crude Birth Rate
(b) Growth Rate
(c) Population Density
(d) Urbanisation

Q100. Who was appointed as the president and chief executive officer of BMW Group India as of September 2025?

(a) Santosh Iyer
(b) Hardeep Singh Brar
(c) Balbir Singh Dhillon
(d) Anurag Mehrotra

Q101. In a terrestrial ecosystem, green plants capture approximately what percentage of solar energy falling on their leaves?

(a) 10%
(b) 5%
(c) 1%
(d) 0.01%

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Q102. The ratio of the cost prices of articles X and Y is 3 : 7. A man earns a profit of 14% by selling X and loses 11% by selling Y. What is his gain/loss percentage in the entire transaction?

(a) Gain, 5%
(b) Gain, 3.5%
(c) Loss, 3%
(d) Loss, 3.5%

Q103. What should come in place of the question mark (?) in the given series?

7, 25, 61, 115, 187, ?

(a) 277
(b) 275
(c) 276
(d) 278

Q104. Who among the following was the Prime Minister of India when India launched its Chandrayaan-2 mission?

(a) PV Narasimha Rao
(b) Dr Manmohan Singh
(c) Atal Bihari Vajpayee
(d) Narendra Modi

Q105. Samar starts from point A and drives 7 km towards east. He then takes a right turn and drives 9 km. He takes a final right turn and drives 13 km and stops at point B. Wahid starts from point P, which is 14 km east of Point A, and drives 3 km towards west. He then takes a left turn and drives 9 km. He takes a final right turn and drives 8 km and stops at Point Q. What is the shortest distance between Point Q and Point B? (All turns are 90 degree turns only.)

(a) 9 km
(b) 11 km
(c) 10 km
(d) 8 km

Q106. In the following series, only one letter-cluster is incorrect. Select the INCORRECT letter-cluster.

HQK KNN NKQ QHS TEW WBZ

(a) WBZ
(b) NKQ
(c) QHS
(d) TEW

Q107. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some calculators are stones.

All calculators are pens.

No calculator is an octopus.

Conclusions:

(I): No octopus is a stone.

(II): Some pens are octopuses.

(a) Only conclusion (II) follows
(b) Both conclusions (I) and (II) follow
(c) Only conclusion (I) follows
(d) Neither conclusion (I) nor (II) follows

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Q108. Evaluate the following.

4/3+(1/(1+2/7))-4/3

(a) 7/9
(b) 10/3
(c) 9/8
(d) 3/13

Q109. The number 977340 is divisible by:

(a) 24
(b) 35
(c) 37
(d) 34

Q110. In this question, a statement is given followed by two courses of action, numbered I and II. You must assume everything in the statement to be true, and on the basis of the information given in the statement, decide which of the given courses of action logically follow(s) for pursuing.

Statement:

Reports indicate that fish populations in River Y have declined sharply due to excessive fishing and industrial pollution.

Courses of Action:

I. Fishing in River Y should be regulated for at least six months.

II. Industries should be ordered to treat waste before discharging into River Y.

(a) Only I follows
(b) Neither I nor II follows
(c) Both I and II follow
(d) Only II follows

Q111. Which statement about lyophilic sols is correct?

(a) They do not show the Tyndall effect.
(b) They are unstable compared to lyophobic sols.
(c) They are easily coagulated by electrolytes.
(d) They have strong affinity for the dispersion medium.

Q112. The average of five consecutive integers is 12. What is the largest of these integers?

(a) 14
(b) 13
(c) 11
(d) 16

Q113. In August 2025, India launched its first Artificial Intelligence (AI)-powered Anganwadi at which location, marking a major advancement in early childhood education?

(a) Khargone village, Maharashtra
(b) Dharampur village, Gujarat
(c) Pipariya village, Madhya Pradesh
(d) Waddhamna village, Nagpur district, Maharashtra

Q114. In a certain code, ‘books are knowledge’ is coded as ‘mk xp zj’, ‘knowledge is power’ is coded as ‘zk xp vr’, and ‘power brings success’ is coded as ‘vr mk gt’. What is the code for ‘is’ in that code? (All codes are two-letter codes.)

(a) mk
(b) vr
(c) xp
(d) zk

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Q115. Which of the following traditional dance forms in India incorporates the use of a pair of decorated sticks and is traditionally performed during Navratri?

(a) Bihu
(b) Koli
(c) Bhangra
(d) Dandiya

Q116. From a taxi stand, two cabs start at a speed of 57 km/hr at an interval of 12 minutes, both cabs travelling in the same direction. A man coming in the opposite direction towards the taxi stand meets the cabs at an interval of 10 minutes. Find the speed (in km/hr) of the man.

(a) 9.5
(b) 7.9
(c) 11.4
(d) 12.7

Q117. Infant mortality rate is the number of infants per thousand who die before reaching _____ year(s) of age.

(a) three
(b) six
(c) one
(d) two

Q118. Who among the following was the Chola conqueror of Ganga?

(a) Aditya
(b) Vijayalaya
(c) Rajaraja I
(d) Rajendra I

Q119. Life expectancy is an indicator of which of the following?

(a) World Employment Report
(b) Human Development Report
(c) Commodities and Development Report
(d) Technology and Innovation Report

Q120. A solid metal cylinder of height 20 cm and diameter 14 cm is melted and recast into two solid cones having volumes in the ratio 3 : 4, keeping the height 35 cm. What would be the percentage change in the flat surface area (area of the bases) before and after?

(a) 91/11% increase
(b) 221/9% increase
(c) 142/7% decrease
(d) 261/13% decrease

ANSWER KEY

1	d	2	d	3	c	4	d	5	a	6	d	7	a	8	d	9	c	10	c
11	d	12	a	13	a	14	a	15	b	16	d	17	b	18	b	19	b	20	d
21	a	22	a	23	b	24	a	25	c	26	b	27	c	28	a	29	a	30	b
31	b	32	b	33	a	34	d	35	b	36	c	37	c	38	a	39	c	40	d
41	b	42	d	43	d	44	a	45	d	46	a	47	b	48	a	49	c	50	a
51	d	52	c	53	a	54	d	55	b	56	b	57	d	58	c	59	d	60	b
61	a	62	b	63	a	64	a	65	c	66	b	67	d	68	a	69	c	70	b
71	b	72	c	73	d	74	b	75	a	76	b	77	c	78	a	79	c	80	d
81	a	82	d	83	d	84	d	85	c	86	c	87	a	88	a	89	d	90	a

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91	c	92	c	93	b	94	c	95	a	96	a	97	a	98	a	99	d	100	b
101	c	102	d	103	a	104	d	105	a	106	c	107	d	108	a	109	b	110	c
111	d	112	a	113	d	114	d	115	d	116	c	117	c	118	d	119	b	120	c

SOLUTIONS

Q1. Answer: (d) OILS - SLOI - OLIS

The logic followed here is:
WASH - HSWA - WSAH
And,
NEST - TSNE - NSET
Similarly,
OILS - SLOI - OLIS
Hence, the correct answer is "Option 4"

Q2. Answer: (d) 102

Here, we use the BODMAS table given below:
Given Equation: 32 − 15 ÷ 5 + 10 × 2 = ?
If '+' and '−' are interchanged and '×' and '÷' are interchanged.
New Equation: 32 + 15 × 5 − 10 ÷ 2 = ?
32 + 15 × 5 − 10 ÷ 2 = ?
32 + 15 × 5 − 5 = ?
32 + 75 − 5 = ?
102.
Hence, the correct answer is "Option 4"

Q3. Answer: (c) Rs. 81,000

Shortcut Trick
Rate of depreciation = 10% = 1/10.
Multiplying factor for each year = 1 − 1/10 = 9/10.
Value after 2 years = 1,00,000 × (9/10) × (9/10)
=> Value = 1,00,000 × 81/100 = 81,000
Therefore The correct answer is Rs. 81,000.
Alternate Method
Given:
Initial Value (P) = Rs. 1,00,000
Rate of depreciation (R) = 10% per annum
Time (n) = 2 years
Formula Used:
$A = P(1 - R/100)^n$
Current
Rs. 1,00,000
−10%
1 Year
Rs. 90,000
−10%
2 Years
Rs. 81,000
Successive Depreciation Method
Calculations:
=> $A = 1,00,000 \times (1 - 10/100)^2$

=> A = 1,00,000 × $(90/100)^2$

=> A = 1,00,000 × (9/10) × (9/10)

=> A = 1,00,000 × 81/100

=> A = 1000 × 81 = 81,000

Therefore The correct answer is Rs. 81,000.

Additional Information

Appreciation Formula

If an item appreciates in value at R% per annum, the value after n years is given by $A = P(1 + R/100)^n$.

Successive Percentage Change

For two consecutive percentage changes x% and y%, the net percentage change is given by (x + y + xy/100)%. For 10% depreciation twice, it is (−10 − 10 + 100/100)% = −19%. Value becomes 100% − 19% = 81% of the original.

Value n Years Ago

If the current value is P and it has been depreciating at R% per annum, its value n years ago was $P \div (1 - R/100)^n$.

Q4. Answer: (d) International Institute of Administrative Sciences (IIAS)

The correct answer is International Institute of Administrative Sciences (IIAS).

Key Points

• On 3 June 2025, India secured the presidency of the International Institute of Administrative Sciences (IIAS) by defeating Austria with 87 out of 141 votes.

• IIAS is a global organization dedicated to advancing administrative sciences and public governance worldwide.

• India’s presidency marks a significant achievement in strengthening its role in the field of governance and administrative reforms on an international scale.

• IIAS provides a platform for countries to exchange knowledge, best practices, and research related to public administration and governance.

• This achievement highlights India’s growing influence in shaping global discussions around administrative innovations and public sector efficiency.

Additional Information

• International Institute of Administrative Sciences (IIAS)

• Founded in 1930, IIAS is headquartered in Brussels, Belgium.

• It aims to promote understanding and innovation in administrative sciences and public governance globally.

• The institute organizes conferences, seminars, and publishes research to address administrative challenges and solutions.

• IIAS has members from over 100 countries, fostering international collaboration in public administration.

• India's Role in Global Governance

• India has been actively participating in global governance forums and organizations to contribute to policy-making and administrative reforms.

• Its presidency in IIAS enhances its reputation as a leader in promoting effective governance and public administration practices.

• India’s initiatives like Digital India and e-Governance have been recognized globally as innovative governance strategies.

• India’s leadership role in IIAS can facilitate sharing of indigenous knowledge systems and best practices with other nations.

• Impact of IIAS Presidency

• India’s presidency will enable it to host key events, seminars, and workshops to discuss global administrative challenges.

• It offers India an opportunity to influence international policies and standards in public administration.

• Strengthens India’s diplomatic relationships with member states through collaboration in governance initiatives.

• Provides a platform for Indian administrative professionals to share their expertise and learn from global counterparts.

• Global Trends in Public Administration

• Increased adoption of technology to enhance government efficiency and transparency.

• Focus on participatory governance, involving citizens in decision-making processes.

• Sustainability and green governance are becoming central themes in administrative reforms globally.

• Emphasis on capacity building and training programs for public officials to address emerging challenges.

Q5. Answer: (a) Prayagraj

The correct answer is Prayagraj.

Key Points

• The headquarters of the North Central Railway Zone is located in Prayagraj, Uttar Pradesh.

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• It is one of the 18 railway zones in India, established on 1st April 2003.
• The North Central Railway Zone covers major states including Uttar Pradesh, Madhya Pradesh, Rajasthan, and Haryana.
• This zone is known as the "Workhorse of Indian Railways" due to its significant role in freight and passenger movement.
• The zone operates through three divisions: Prayagraj, Jhansi, and Agra.

Additional Information

• Railway Zones in India
• Indian Railways is divided into 18 zones, each headed by a General Manager.
• The zones are further subdivided into divisions, each managed by Divisional Railway Managers.
• Zones are categorized based on geographical coverage and operational efficiency.
• Importance of Prayagraj
• Prayagraj, formerly known as Allahabad, is historically and culturally significant in India.
• It is a major hub for railways, with important routes connecting northern and central India.
• The city hosts the Kumbh Mela, one of the largest religious gatherings in the world.
• North Central Railway Zone Infrastructure
• The zone is critical for freight operations, especially coal transportation from Madhya Pradesh.
• It handles key passenger routes, including Delhi-Mumbai and Delhi-Howrah corridors.
• It is equipped with modern infrastructure like automatic signaling systems.
• Other Railway Zones
• Some other major railway zones include Northern Railway Zone (New Delhi), Western Railway Zone (Mumbai), and Southern Railway Zone (Chennai).
• Each zone plays a unique role in ensuring connectivity and efficient transportation across India.

Q6. Answer: (d) Ctrl + Backspace

The correct answer is Ctrl + Backspace.

Key Points

• The Ctrl + Backspace shortcut in MS Word allows users to delete the entire word to the left of the cursor quickly.
• This shortcut is highly efficient for editing large documents as it saves time compared to manually deleting characters.
• It works irrespective of whether the word is selected or not, making it versatile for text editing.
• It is available across multiple versions of MS Word, including MS Word 2019.
• Keyboard shortcuts like Ctrl + Backspace improve productivity by minimizing the use of a mouse during text editing.

Additional Information

• Keyboard Shortcuts in MS Word:
• Ctrl + Delete: Deletes the word to the right of the cursor.
• Ctrl + Z: Undoes the last action performed.
• Ctrl + X: Cuts the selected text or object.
• Ctrl + C: Copies the selected text or object.
• Ctrl + V: Pastes the copied or cut text or object.
• Text Navigation Shortcuts:
• Ctrl + Left Arrow: Moves the cursor one word to the left.
• Ctrl + Right Arrow: Moves the cursor one word to the right.
• Home: Moves the cursor to the beginning of the line.
• End: Moves the cursor to the end of the line.
• Importance of Keyboard Shortcuts:
• Keyboard shortcuts boost productivity by speeding up repetitive tasks.
• They help reduce strain on the hands by minimizing mouse usage.
• They can be customized in MS Word to suit user preferences.
• MS Word 2019 Features:
• Improved collaboration tools for team editing in real-time.
• Advanced formatting options for better document layout.
• Integration with cloud services like OneDrive for seamless access.
• Enhanced accessibility features for individuals with disabilities.

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Q7. Answer: (a) 90°

Shortcut Trick

The sum of all interior angles of a quadrilateral is always 360°.

Total parts in the ratio = 2 + 3 + 3 + 4 = 12 parts.

12 parts = 360° => 1 part = 30°.

Value of angle x = 3 parts = 3 × 30° = 90°.

Therefore The correct answer is 90°.

Alternate Method

Given:

Ratio of angles angle w : angle x : angle y : angle z = 2 : 3 : 3 : 4

Formula Used:

Sum of interior angles of a quadrilateral = 360°

w (2k)

x (3k)

y (3k)

z (4k)

Sum of interior angles = 360°

Calculations:

=> Let the four angles be 2k, 3k, 3k, and 4k respectively.

=> angle w + angle x + angle y + angle z = 360°

=> 2k + 3k + 3k + 4k = 360°

=> 12k = 360°

=> k = 360° ÷ 12

=> k = 30°

=> The value of angle x = 3k

=> angle x = 3 × 30° = 90°

Therefore The correct answer is 90°.

Additional Information

Sum of Interior Angles

For any polygon with n sides, the sum of interior angles is calculated as (n − 2) × 180°. For a quadrilateral, it is (4 − 2) × 180° = 360°.

Sum of Exterior Angles

The sum of the exterior angles of any convex polygon, including a quadrilateral, is always 360° regardless of the number of sides.

Types of Quadrilaterals

If consecutive adjacent angles in a quadrilateral sum to 180°, the opposite sides are parallel. In this problem, angle x + angle y = 90° + 90° = 180°, meaning it forms a right-angled trapezium.

Q8. Answer: (d) dv

The logic follows here,

Meal is coded as dv.

Hence, the correct answer is "Option 4"

Q9. Answer: (c) Ananda Mohan Bose, Sib Chandra Deb and Umesh Chandra Dutta

The correct answer is Ananda Mohan Bose, Sib Chandra Deb and Umesh Chandra Dutta.

Key Points

• The Sadharan Brahmo Samaj was established in 1878 by dissatisfied followers of Keshab Chandra Sen who opposed his autocratic leadership and deviation from Brahmo principles.

• Its primary founders were Ananda Mohan Bose, Sib Chandra Deb, and Umesh Chandra Dutta, who sought to uphold the democratic and liberal ideals of Brahmoism.

• The organization emphasized equality, rationalism, and monotheism, which were core tenets of the Brahmo faith.

• The Sadharan Brahmo Samaj also advocated for social reform, including the abolition of caste discrimination, child marriage, and promotion of women's education.

• This division marked a pivotal moment in the history of the Brahmo movement, leading to a more progressive and inclusive

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approach within the Samaj.

Additional Information

• Brahmo Samaj:

• Founded by Raja Ram Mohan Roy in 1828, Brahmo Samaj was a socio-religious reform movement in India advocating monotheism and rejecting idol worship.

• It sought to promote rational thinking, social justice, and equality among all individuals.

• Keshab Chandra Sen:

• A prominent Brahmo leader, Keshab Chandra Sen emphasized the need for spiritual and social reform.

• His leadership style and theological deviations led to the split within the Brahmo Samaj in 1878.

• Ananda Mohan Bose:

• Ananda Mohan Bose was an educator, politician, and one of the prominent leaders of the Sadharan Brahmo Samaj.

• He played a significant role in promoting education and social reform in India.

• Social Impact:

• The Brahmo Samaj contributed significantly to India's socio-religious reform movements during British rule.

• It influenced other reform movements such as the Arya Samaj and helped shape modern Indian society.

Q10. Answer: (c) Evergreen broad-leaf trees, such as oaks and chestnuts predominate here.

The correct answer is Evergreen broad-leaf trees, such as oaks and chestnuts predominate here..

Key Points

• Montane forests are characterized by the presence of evergreen broad-leaf trees such as oaks, chestnuts, and other species adapted to cool and moist conditions.

• These forests are typically found in hilly and mountainous regions, especially at elevations ranging from 1000 to 3000 meters.

• They are known for their dense canopy cover, which supports a rich biodiversity including unique flora and fauna.

• Montane forests often experience cooler temperatures and higher rainfall, making them distinct from tropical forests.

• The vegetation in montane forests changes with altitude, ranging from evergreen forests at lower elevations to coniferous forests at higher altitudes.

Additional Information

• Montane Ecosystem:

• This ecosystem is associated with mountainous regions and is highly influenced by altitude, climate, and soil types.

• It supports a variety of flora and fauna, including species that are endemic to these regions.

• Altitudinal Zonation:

• The vegetation in montane forests varies by altitude, transitioning from tropical forests at lower elevations to alpine vegetation at higher altitudes.

• Common zones include tropical montane forests, temperate montane forests, and alpine meadows.

• Climatic Influence:

• Montane forests are typically found in areas with cool and moist climates.

• They play a crucial role in regulating water cycles and preventing soil erosion in mountainous regions.

• Biodiversity:

• Montane forests are home to a wide variety of plants and animals, including many rare and endangered species.

• The unique climate and elevation make these forests a biodiversity hotspot.

Q11. Answer: (d) Article 243C

The correct answer is Article 243C.

Key Points

• Article 243C deals with the composition of Panchayats in India as per the 73rd Constitutional Amendment Act, 1992.

• The composition of Panchayats includes directly elected members at the village, intermediate, and district levels.

• It mandates that the Chairperson of a Panchayat at the village level is elected as per the procedure established by state legislation.

• It provides flexibility to states to determine the representation of members, reservation for Scheduled Castes (SCs), Scheduled Tribes (STs), and women, and other relevant details.

• Reservation of seats in every Panchayat is done according to Articles 243D and 243T, ensuring inclusivity.

Additional Information

• 73rd Constitutional Amendment Act, 1992:

• Introduced Panchayati Raj institutions (PRIs) in India to promote decentralized governance.
• Added Part IX to the Constitution and Articles 243 to 243O.
• Mandates a three-tier system: Village, Intermediate, and District levels.
• Article 243A:
• Empowers Gram Sabha as the foundation of the Panchayati Raj system.
• The Gram Sabha comprises all registered voters within a village Panchayat's jurisdiction.
• Article 243B:
• Provides for the establishment of Panchayats at various levels in every state.
• States have the discretion to decide whether to establish Panchayats at the intermediate level based on population.
• Article 243D:
• Mandates reservation of seats for Scheduled Castes (SCs), Scheduled Tribes (STs), and women in Panchayats.
• Reservation for women is not less than one-third of the total seats.
• Panchayati Raj:
• It is a system of governance at the rural level to ensure grassroots democracy.
• First introduced in Nagaur, Rajasthan, on 2nd October 1959.

Q12. Answer: (a) Sustainable Development

The correct answer is Sustainable Development.

Key Points

• The concept of Sustainable Development was formally introduced in the Brundtland Report, titled Our Common Future, published in 1987 by the United Nations World Commission on Environment and Development (WCED).
• Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."
• The Brundtland Report highlighted the interconnectedness of economic, social, and environmental dimensions, emphasizing the need for a balance between these factors to ensure long-term global sustainability.
• It paved the way for major international agreements and frameworks, such as the United Nations Sustainable Development Goals (SDGs), which were adopted in 2015.
• The report brought global attention to critical issues like environmental degradation, social inequality, and the need for sustainable resource management.

Additional Information

• Brundtland Commission:
• Also known as the World Commission on Environment and Development (WCED), it was established by the United Nations in 1983.
• The commission was chaired by Gro Harlem Brundtland, the former Prime Minister of Norway, hence the name.
• Its objective was to address the growing concern about environmental degradation and its impact on economic and social development.
• Sustainable Development Goals (SDGs):
• The SDGs are a set of 17 interconnected global goals adopted by the UN in 2015 as part of the 2030 Agenda for Sustainable Development.
• They aim to eradicate poverty, combat climate change, and promote economic growth, social inclusion, and environmental sustainability.
• Examples of SDGs include Goal 13 (Climate Action), Goal 1 (No Poverty), and Goal 7 (Affordable and Clean Energy).
• Key Principles of Sustainable Development:
• Intergenerational Equity: Ensuring that resources are available for future generations.
• Integration: Balancing environmental, social, and economic factors in decision-making.
• Precautionary Principle: Taking preventive action to protect the environment, even in the absence of full scientific certainty.
• Global Impact:
• The Brundtland Report inspired the 1992 Earth Summit in Rio de Janeiro, where nations adopted the Agenda 21, a comprehensive plan for sustainable development.
• It also influenced the creation of the Paris Agreement in 2015, aimed at combating climate change and limiting global temperature rise.

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Q13. Answer: (a) Rs. 40

Shortcut Trick

Let pen price = P, notebook price = N. Initial: 4P + 5N = 130

New price equation: 2 × (1.25P) + 4 × (0.8N) = 82 => 2.5P + 3.2N = 82

Multiply new equation by 1.6 to equate P: 4P + 5.12N = 131.2

Subtracting initial from new: 0.12N = 1.2 => N = 10

Substitute N = 10: 4P + 50 = 130 => 4P = 80 => P = 20

Therefore The correct answer is Rs. 40.

Alternate Method

Given:

Cost of 4 pens and 5 notebooks = Rs. 130

Increase in pen's price = 25%

Decrease in notebook's price = 20%

New cost of 2 pens and 4 notebooks = Rs. 82

Calculations:

=> Let the original price of 1 pen be P and 1 notebook be N.

=> 4P + 5N = 130 --- (Equation 1)

=> New price of 1 pen = P × (100 + 25) ÷ 100 = 1.25P

=> New price of 1 notebook = N × (100 − 20) ÷ 100 = 0.8N

=> According to the second condition:

=> 2 × (1.25P) + 4 × (0.8N) = 82

=> 2.5P + 3.2N = 82

=> Multiplying the entire equation by 10 to remove decimals:

=> 25P + 32N = 820 --- (Equation 2)

=> Multiplying Equation 1 by 25 and Equation 2 by 4:

=> 100P + 125N = 3250

=> 100P + 128N = 3280

=> Subtracting the two equations:

=> 3N = 30 => N = 10

=> Substitute N = 10 into Equation 1:

=> 4P + 5(10) = 130

=> 4P + 50 = 130

=> 4P = 80 => P = 20

=> Required price = 1 Pen + 2 Notebooks

=> Price = 20 + 2 × 10 = 20 + 20 = 40

Therefore The correct answer is Rs. 40.

Additional Information

Simultaneous Linear Equations

When solving a system of two linear equations with two variables, methods such as substitution or elimination are used. Equating the coefficients by multiplying the equations with suitable constants is often the fastest approach to eliminate one variable.

Percentage Change

When a base value is increased by x%, the new value becomes Base × (100 + x) ÷ 100. Similarly, a decrease of y% results in Base × (100 − y) ÷ 100.

Q14. Answer: (a) Data in statements I and II together are NOT sufficient to answer the question

Given: Among 5 students, F, A, K, E and D each having a different height

Statements:

After combining both statements or using alone statement I or II, it is not possible to find which student is the shortest.

Data in statements I and II together are NOT sufficient to answer the question.

Hence, the correct answer is "Option 1"

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Q15. Answer: (b) 58

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 2"

Q16. Answer: (d) Indigo farmers in Bihar

The correct answer is Indigo farmers in Bihar.

Key Points

• The Champaran Satyagraha of 1917 marked Mahatma Gandhi's first major involvement in India's freedom struggle.

• It was launched in support of Indigo farmers in Bihar, who were oppressed under the exploitative tinkathia system.

• The farmers were forced to grow indigo on a portion of their land and sell it at fixed prices, leading to severe financial hardship.

• Mahatma Gandhi's intervention in Champaran was aimed at addressing the farmers' grievances and demonstrating the power of nonviolent resistance.

• The success of the Champaran movement brought attention to the plight of farmers and strengthened Gandhi's leadership in the national movement.

Additional Information

• Tinkathia System:

• Under this system, farmers were forced to cultivate indigo on 3/20th of their land, regardless of their own preferences.

• The system was exploitative and caused significant economic distress for the farmers.

• Role of Gandhi:

• Mahatma Gandhi visited Champaran in 1917 after being requested by local leaders like Raj Kumar Shukla.

• He adopted the method of Satyagraha (nonviolent resistance) to address the injustice faced by farmers.

• Impact of Champaran Movement:

• The movement led to the abolition of the tinkathia system and improved the condition of farmers in the region.

• It demonstrated the effectiveness of nonviolent resistance and became a precursor to future freedom struggles under Gandhi's leadership.

• Indigo Cultivation:

• Indigo was a dye plant that was in high demand in Europe during colonial times.

• The forced cultivation of indigo caused soil depletion, which further impacted farmers' livelihoods.

Q17. Answer: (b) Rs. 231

Shortcut Trick

The amount by which the Selling Price is less than the Marked Price is simply the Total Discount.

Effective percentage of two successive discounts (5% and 15%) = 5 + 15 − (5 × 15) ÷ 100

=> Effective discount = 20 − 0.75 = 19.25%

Total Discount Amount = 19.25% of Rs. 1200

=> Total Discount = (19.25 ÷ 100) × 1200 = Rs. 231

Therefore The correct answer is Rs. 231.

Alternate Method

Given:

Marked Price (MP) = Rs. 1200

First successive discount (D1) = 5%

Second successive discount (D2) = 15%

Formula Used:

Selling Price (SP) = MP × (100 − D1)÷100 × (100 − D2)÷100

Difference = MP − SP

MP

Rs. 1200

−5%

Rs. 1140

−15%

SP

Rs. 969

Total Discount = Rs. 231

Calculations:

=> Price after first discount = 1200 × (100 − 5) ÷ 100

=> Price after first discount = 1200 × 95 ÷ 100 = Rs. 1140

=> Final Selling Price (SP) = 1140 × (100 − 15) ÷ 100

=> Final Selling Price (SP) = 1140 × 85 ÷ 100 = Rs. 969

=> Amount by which SP is less than MP = MP − SP

=> Amount = 1200 − 969 = Rs. 231

Therefore The correct answer is Rs. 231.

Additional Information

Successive Discount Formula

When two successive discounts d1% and d2% are given, the equivalent single discount is given by: D = d1 + d2 − (d1 × d2) ÷ 100.

Marked Price & Selling Price Relationship

Discount is always calculated on the Marked Price (MP). The Selling Price (SP) is strictly defined as MP minus the total Discount.

Three Successive Discounts

For three successive discounts, first calculate the effective discount of the first two. Then apply the same formula using that result and the third discount to find the final effective equivalent percentage.

Q18. Answer: (b) 99

The correct answer is 99.

Key Points

• India's ranking in the Sustainable Development Goals (SDG) Index for the year 2025 was 99, as per the Sustainable Development Report released in June 2025.

• The Sustainable Development Goals Index measures the progress of countries in achieving the 17 SDGs adopted by the United Nations in 2015.

• India showed improvement in areas such as renewable energy adoption, sanitation coverage, and access to basic services.

• Challenges remain in areas like climate action, gender equality, and quality education, which impacted India's overall ranking.

• The report is published annually by the Sustainable Development Solutions Network (SDSN) and tracks global progress toward achieving the SDGs.

Additional Information

• Sustainable Development Goals (SDGs)

• The SDGs are a set of 17 global goals aimed at addressing social, economic, and environmental challenges by 2030.

• They include goals such as no poverty, zero hunger, quality education, and climate action.

• Adopted by all United Nations member states in 2015, they provide a framework for sustainable global development.

• Sustainable Development Report

• The report is an annual publication that evaluates countries based on their progress toward achieving the SDGs.

• It includes the SDG Index, which ranks countries based on their performance across the 17 goals.

• Prepared by the Sustainable Development Solutions Network (SDSN) and experts from academia and research institutions.

• India’s Initiatives for SDGs

• Programs like Swachh Bharat Abhiyan, Ayushman Bharat, and National Solar Mission contribute to achieving SDGs in health, sanitation, and clean energy.

• India has been actively working on sustainable development through its National Action Plan on Climate Change (NAPCC).

• Challenges remain in areas like reducing greenhouse gas emissions and improving gender equality.

• Global Ranking Trends

• Nordic countries like Finland, Sweden, and Denmark often top the SDG Index due to their advanced social policies and environmental sustainability.

• Developing countries face challenges in achieving SDGs due to resource constraints and socio-economic disparities.

Q19. Answer: (b) Value Added Tax (VAT)

The correct answer is Value Added Tax (VAT).

Key Points

• Value Added Tax (VAT) is an indirect tax levied on goods and services at each stage of production or distribution, based on the value added at that stage.

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• It is collected by businesses on behalf of the government and is included in the price paid by consumers, making it an indirect tax.

• Unlike direct taxes such as income tax or corporate tax, VAT is not paid directly by individuals but is included in the price of goods and services.

• Direct taxes, such as income tax, corporate tax, and tax on capital gains, are paid directly by individuals or entities to the government based on their income or earnings.

• The primary difference lies in the point of incidence: direct taxes are levied on income/profits, while indirect taxes like VAT are levied on consumption.

Additional Information

• Direct Taxes:

• Direct taxes are levied directly on the income or wealth of individuals, companies, or other entities.

• Examples include income tax, corporate tax, and capital gains tax.

• These taxes are progressive, meaning higher income earners pay a larger proportion.

• Indirect Taxes:

• Indirect taxes are levied on goods and services, and the burden is passed on to the final consumer.

• Examples include VAT, Goods and Services Tax (GST), excise duty, and customs duty.

• These taxes are regressive, as all consumers, regardless of their income level, pay the same rate.

• Value Added Tax (VAT):

• VAT is a consumption tax placed on a product whenever value is added at any stage of the supply chain.

• It is implemented in most countries, but India now uses Goods and Services Tax (GST), which subsumes VAT.

• VAT ensures tax collection at multiple points in the production and distribution process.

• Goods and Services Tax (GST):

• GST replaced VAT and other indirect taxes in India in July 2017.

• It is a unified tax system that simplifies indirect taxation by combining multiple taxes into one.

• GST is categorized into CGST, SGST, and IGST, based on intrastate and interstate transactions.

Q20. Answer: (d) 5.8%

Shortcut Trick

By applying the successive percentage formula: Net % change = a + b + (a × b) ÷ 100

Here, a = +15 (price increase) and b = −8 (discount).

=> Net change = 15 − 8 − (15 × 8) ÷ 100

=> Net change = 7 − 1.2 = 5.8%

Therefore The correct answer is 5.8%.

Alternate Method

Given:

Initial price increase = 15%

Discount applied afterwards = 8%

Method Used:

Let the initial price of the product be 100 units. We apply the changes sequentially.

100 Initial 115 Increased 105.8 Final +15% −8% Net: +5.8%

Calculation:

=> Price after 15% increase = 100 + (15% of 100)

=> Increased price = 100 + 15 = 115

=> Price after 8% discount = 115 − (8% of 115)

=> Discount amount = (8 ÷ 100) × 115 = 9.2

=> Final price = 115 − 9.2 = 105.8

=> Net increase = Final price − Initial price

=> Net increase = 105.8 − 100 = 5.8

=> Net percentage increase = (5.8 ÷ 100) × 100 = 5.8%

Therefore The correct answer is 5.8%.

Additional Information

Successive Percentage Change

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When a value is sequentially changed by a% and b%, the overall effect is given directly by: Net Change = (a + b + a × b ÷ 100)%. Use positive signs for percentage increases and negative signs for decreases (or discounts).

Multiplying Factor Method

For multiple successive percentage changes, you can simply convert each percentage to a decimal factor: Final Value = Initial Value × (1 ± a/100) × (1 ± b/100).

Equivalent Single Discount

If a shopkeeper offers two successive discounts of x% and y%, the single effective discount is calculated as: Equivalent Discount = (x + y − x × y ÷ 100)%.

Q21. Answer: (a) 0.55

Shortcut Trick

Apply the BODMAS rule directly to the expression to solve division first, then multiplication, then addition.

Part 1: 0.848 ÷ 0.8 × 1/2 = 1.06 × 0.5 = 0.53

Part 2: 0.125 ÷ 5/2 × 0.4 = 0.125 × 2/5 × 0.4 = 0.05 × 0.4 = 0.02

Total = 0.53 + 0.02 = 0.55

Therefore The correct answer is 0.55.

Alternate Method

Given:

Expression: 0.848 ÷ 0.8 × 1/2 + 0.125 ÷ 5/2 × 0.4

Method Used:

BODMAS Rule (Brackets, Orders, Division, Multiplication, Addition, Subtraction)

Calculations:

=> 0.848 ÷ 0.8 × 1/2 + 0.125 ÷ 5/2 × 0.4

=> (0.848 ÷ 0.8) × 1/2 + (0.125 ÷ 2.5) × 0.4

=> 1.06 × 0.5 + 0.05 × 0.4

=> 0.53 + 0.02

=> 0.55

Therefore The correct answer is 0.55.

Additional Information

BODMAS Rule

The rule dictates the order of operations: Brackets, Orders, Division, Multiplication, Addition, and Subtraction.

Dividing by Fractions

To divide by a fraction, multiply by its reciprocal. Example: A ÷ (B/C) = A × (C/B).

Decimal Multiplication

Multiply as whole numbers, then position the decimal point so the total decimal places match the sum of decimal places in the multiplied numbers.

Q22. Answer: (a) 11 : 16

Shortcut Trick

Multiply the ratio parts directly by their new percentage equivalents.

First employee's new salary equivalent = 3 × 110% = 330%

Second employee's new salary equivalent = 4 × 120% = 480%

New Ratio = 330% : 480% = 33 : 48 = 11 : 16

Therefore The correct answer is 11 : 16.

Alternate Method

Given:

=> Initial ratio of salaries = 3 : 4

=> Increase in first employee's salary = 10%

=> Increase in second employee's salary = 20%

Employee 1 (10% Increase)

Old = 300x

New = 330x

Employee 2 (20% Increase)

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Old = 400x

New = 480x

New Ratio = 330x : 480x = 11 : 16

Calculations:

=> To simplify percentage calculations, let the initial salaries of the first and second employees be 300x and 400x respectively.

=> New salary of the first employee = 300x + (10% of 300x)

=> New salary of the first employee = 300x + 30x = 330x

=> New salary of the second employee = 400x + (20% of 400x)

=> New salary of the second employee = 400x + 80x = 480x

=> New ratio of their salaries = 330x : 480x

=> Simplifying the ratio by dividing both sides by 30x:

=> New ratio = 11 : 16

Therefore The correct answer is 11 : 16.

Additional Information

Ratio Simplification

A ratio remains unchanged if both of its terms are multiplied or divided by the same non-zero number. For instance, a : b = (a × k) : (b × k).

Percentage Increase

When a value is increased by R%, the new value becomes (100 + R)% of the original value. Final Value = Initial Value × (100 + R) ÷ 100.

Compound Ratio

If two ratios are a : b and c : d, then their compound ratio is formed by multiplying the antecedents and consequents respectively, resulting in (a × c) : (b × d).

Q23. Answer: (b) All 1, 2, 3 and 4

The correct answer is All 1, 2, 3 and 4.

Key Points

• The legislative relations between the Centre and States in India are governed by Part XI of the Constitution, specifically Articles 245 to 255.

• Territorial extent of legislation: Article 245 specifies the extent of laws made by the Parliament and the State Legislatures within their respective territories.

• Distribution of legislative subjects: The Constitution lists subjects under the Union List, State List, and Concurrent List (Schedule VII), assigning legislative powers accordingly.

• Parliamentary legislation in state matters: Articles 249, 250, and 252 allow Parliament to legislate on matters in the State List under special circumstances like national interest or state consent.

• Centre's control over state legislation: Article 254 ensures that in case of conflict between a state law and central law on a Concurrent List subject, the central law prevails.

Additional Information

• Union List: Contains subjects on which only the Parliament can legislate, including defense, foreign affairs, atomic energy, etc.

• State List: Contains subjects on which State Legislatures have exclusive power to legislate, such as police, public health, agriculture, etc.

• Concurrent List: Includes subjects like education, marriage, trade unions, etc., where both the Centre and States can make laws. However, central law prevails in case of conflict.

• Residuary Powers: Matters not enumerated in any of the lists fall under the purview of the Parliament as per Article 248.

• President's role: State legislation on certain matters may require the President’s assent, especially if it affects the Centre-State legislative framework.

Q24. Answer: (a) Wildlife Conservation Finance: Investing in People and Planet

The correct answer is Wildlife Conservation Finance: Investing in People and Planet.

Key Points

• World Wildlife Day 2025 was observed with the theme Wildlife Conservation Finance: Investing in People and Planet, emphasizing the importance of financial investments in conserving wildlife and supporting human livelihoods.

• This theme highlights the role of sustainable financing mechanisms to address biodiversity loss and ecosystem degradation.

• The event aims to foster global collaboration to ensure the protection of wildlife species and habitats through innovative funding solutions.

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• World Wildlife Day is an annual event proclaimed by the United Nations General Assembly (UNGA) in 2013 to celebrate and raise awareness of the world's wild fauna and flora.

• The theme aligns with the UN's Sustainable Development Goals (SDGs), particularly Goal 15: Life on Land, which focuses on protecting, restoring, and promoting sustainable use of terrestrial ecosystems.

Additional Information

• Wildlife Conservation Finance

• It refers to financial strategies, investments, and mechanisms aimed at conserving biodiversity and wildlife habitats.

• Examples include carbon credits, biodiversity offsets, environmental impact bonds, and private-sector financing.

• Innovative approaches such as nature-based solutions help integrate conservation efforts with sustainable economic growth.

• Importance of Biodiversity

• Biodiversity ensures ecosystem resilience, providing essential services such as pollination, water purification, and climate regulation.

• It underpins food security, health, and livelihoods for billions of people globally.

• Protecting biodiversity is critical to combating climate change and achieving sustainable development goals.

• Sustainable Development Goals (SDGs)

• The SDGs are a set of 17 global goals adopted by the UN in 2015 to address challenges such as poverty, inequality, and climate change.

• Goal 15 focuses on "Life on Land" to protect, restore, and promote sustainable use of terrestrial ecosystems.

• SDGs provide a framework for governments, businesses, and communities to work towards a sustainable future.

• United Nations General Assembly Resolution 68/205

• This resolution declared March 3 as World Wildlife Day to celebrate and raise awareness of wildlife globally.

• March 3 commemorates the signing of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1973.

• CITES is an international agreement aimed at ensuring that the trade of wild animals and plants does not threaten their survival.

Q25. Answer: (c) Agnishodh, the Indian Army Research Cell (IARC)

The correct answer is Agnishodh, the Indian Army Research Cell (IARC).

Key Points

• The Indian Army inaugurated Agnishodh, the Indian Army Research Cell (IARC), at IIT Madras in August 2025.

• The facility aims to bridge military requirements with advanced academic research to develop cutting-edge solutions.

• The Research Cell is a collaborative effort between the Indian Army and IIT Madras under the Defence Research and Development Organisation (DRDO).

• Its focus areas include Artificial Intelligence, Quantum Computing, Autonomous Systems, and Modern Military Technologies.

• General Upendra Dwivedi, the Chief of the Army Staff (COAS), inaugurated the facility, marking a significant step towards military-academic partnership.

Additional Information

• Indian Army Research Cell (IARC):

• A specialized research hub aimed at leveraging academic expertise for military advancements.

• It focuses on innovations in areas such as cybersecurity, unmanned aerial systems, and defense technologies.

• Promotes collaboration between scientists, academicians, and military experts.

• Role of IIT Madras in Defense Research:

• Renowned for its contributions in technology and engineering research, including defense applications.

• Collaborates with DRDO and other defense agencies on advanced projects.

• IIT Madras hosts several defense-focused labs, including those for AI and autonomous systems.

• Quantum Computing and Military Applications:

• Quantum computing has the potential to revolutionize encryption, secure communication, and data analysis.

• It enhances decision-making capabilities in complex battlefield scenarios.

• India is investing heavily in quantum research under national initiatives like the Quantum Mission.

• Artificial Intelligence in Defense:

• AI-based systems are being developed for autonomous drones, surveillance, and threat detection.

• AI enables real-time battlefield analysis for better operational strategies.

• India’s defense sector is increasingly adopting AI technologies for modern warfare.

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Q26. Answer: (b) 74

Shortcut Trick

Ratio of number of students = 30 : 20 = 3 : 2.

Let the base average be 70; deviation of the second group = 80 − 70 = +10.

Average increase = (Deviation × Parts) ÷ Total parts = (10 × 2) ÷ (3 + 2) = +4.

Combined average = 70 + 4 = 74.

Therefore The correct answer is 74 marks.

Alternate Method

Given:

Number of students in group 1 (n1) = 30

Average marks of group 1 (A1) = 70

Number of students in group 2 (n2) = 20

Average marks of group 2 (A2) = 80

Formula Used:

Combined Average = (n1A1 + n2A2) ÷ (n1 + n2)

Group 1: 30 Students

Avg Marks = 70

Group 2: 20 Students

Avg Marks = 80

Combined Average = 74

Calculations:

=> Total marks of group 1 = 30 × 70 = 2100

=> Total marks of group 2 = 20 × 80 = 1600

=> Total marks of both groups = 2100 + 1600 = 3700

=> Total number of students = 30 + 20 = 50

=> Combined Average = 3700 ÷ 50

=> Combined Average = 74

Therefore The correct answer is 74 marks.

Additional Information

Weighted Average

When combining multiple groups, the overall average is computed as A_w = (w1x1 + w2x2) ÷ (w1 + w2), where w corresponds to the weight or sample size of each component.

Deviation Method

Calculations can be simplified by assuming an arbitrary base average, determining the net sum of positive and negative deviations from it, and distributing this net deviation equally across all elements.

Alligation Approach

The rule of alligation can also be utilized to discover the ratio in which two groups must be combined. It works on the principle that Ratio = (A2 − A_c) : (A_c − A1).

Q27. Answer: (c) Bhutan

The correct answer is Bhutan.

Key Points

• Bhutan is unique for being a constitutional monarchy with a king referred to as the 'Dragon King' or Druk Gyalpo in Dzongkha, the official language of Bhutan.

• The monarchy was established in Bhutan in 1907, with Ugyen Wangchuck being the first king.

• The current king, Jigme Khesar Namgyel Wangchuck, ascended the throne in 2006 and is known for his progressive policies and focus on Gross National Happiness (GNH).

• The concept of Gross National Happiness was introduced as a guiding philosophy by Bhutan's monarchy to prioritize well-being over economic growth.

• Bhutan's monarchy is deeply respected and plays a significant role in the country's political and cultural identity.

Additional Information

• Constitutional Monarchy:

• A form of monarchy where the monarch's powers are limited by a constitution, ensuring democratic governance alongside the

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royal institution.

• Bhutan transitioned to a constitutional monarchy in 2008, with the adoption of its first constitution.

• Gross National Happiness (GNH):

• A development philosophy introduced by Bhutan that prioritizes collective happiness and well-being over material wealth.

• GNH focuses on sustainable development, environmental conservation, cultural preservation, and good governance.

• Druk Gyalpo:

• The title 'Druk Gyalpo' translates to 'Dragon King' and symbolizes Bhutan's identity as the 'Land of the Thunder Dragon.'

• The term 'Druk' refers to the mythical thunder dragon, an important symbol in Bhutanese culture.

• Bhutan's Political System:

• Bhutan has a two-tier parliamentary system, consisting of the National Council and the National Assembly.

• The king's role is primarily ceremonial, with executive powers vested in elected representatives.

Q28. Answer: (a) It increases.

The correct answer is It increases.

Key Points

• The speed of sound in a medium increases with the rise in temperature because the molecules of the medium move faster, enhancing the transmission of sound waves.

• In gases, the speed of sound is directly proportional to the square root of the absolute temperature (v prop. to √T), as per the formula v = √(γRT/M), where T is the temperature in Kelvin.

• An increase in temperature reduces the density of the medium, which also contributes to the increased speed of sound.

• For every 1°C rise in temperature, the speed of sound in air increases by approximately 0.6 m/s.

• The relationship between speed of sound and temperature is particularly significant in gases but less pronounced in liquids and solids.

Additional Information

• Speed of Sound:

• The speed of sound depends on the medium through which it travels: it is fastest in solids, slower in liquids, and slowest in gases.

• For example, in air at 20°C, the speed of sound is approximately 343 m/s, while in water, it is around 1,480 m/s, and in steel, it is about 5,960 m/s.

• Factors Affecting Speed of Sound:

• Temperature: Higher temperatures lead to a higher speed of sound due to increased molecular activity.

• Density: Lower density usually results in higher speeds in gases, while in solids and liquids, the relationship is more complex.

• Elasticity: A medium with higher elasticity transmits sound faster.

• Formula for Speed of Sound in Gases:

• The formula is v = √(γRT/M), where:

• γ: Adiabatic index (ratio of specific heats).

• R: Universal gas constant.

• T: Absolute temperature in Kelvin.

• M: Molar mass of the gas.

• Practical Applications:

• Understanding the speed of sound is crucial in fields like meteorology, aviation, and acoustics.

• The temperature dependence of sound speed is used in weather forecasting and studying atmospheric layers.

Q29. Answer: (a) Because particles absorb latent heat from the surroundings during evaporation

The correct answer is Because particles absorb latent heat from the surroundings during evaporation.

Key Points

• Evaporation is a surface phenomenon where particles at the surface of a liquid absorb energy and change into the gaseous state.

• During evaporation, particles absorb latent heat from their surroundings, which lowers the temperature of the surroundings and causes cooling.

• Latent heat is the energy required for a substance to change its state without a change in its temperature.

• Evaporation occurs faster in conditions such as higher temperature, increased surface area, lower humidity, and faster wind speed.

• This cooling effect is commonly observed in daily life, such as sweating, where evaporation helps regulate body temperature.

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Additional Information

• Latent Heat:

• It is the heat energy absorbed or released during a phase change without altering the temperature.

• Types include latent heat of fusion (solid to liquid) and latent heat of vaporization (liquid to gas).

• Factors Affecting Evaporation:

• Temperature: Higher temperatures increase the rate of evaporation.

• Surface Area: Larger surface areas allow more particles to evaporate simultaneously.

• Humidity: Lower humidity increases evaporation as the air can hold more water vapor.

• Wind Speed: Faster winds remove water vapor from the surface, enhancing evaporation.

• Applications of Evaporation:

• Evaporation is used in cooling systems like air coolers and refrigerators.

• It plays a key role in the water cycle, contributing to cloud formation and precipitation.

• Industrial processes such as salt extraction rely on evaporation.

• Evaporation vs Boiling:

• Evaporation occurs at any temperature and only at the surface of the liquid.

• Boiling occurs at a specific temperature (boiling point) and throughout the liquid.

Q30. Answer: (b) Panthalassa

The correct answer is Panthalassa.

Key Points

• Panthalassa was the vast, global ocean that surrounded the supercontinent Pangaea during the late Paleozoic and early Mesozoic eras.

• The name Panthalassa is derived from Greek, meaning "all sea" (pan = all, thalassa = sea).

• It played a crucial role in shaping Earth's climate and ocean currents during the time of Pangaea’s existence, approximately 335 to 175 million years ago.

• As Pangaea began to break apart, Panthalassa gradually transformed into the Pacific Ocean, the largest ocean on Earth today.

• Panthalassa's size and characteristics significantly influenced the formation of new continents and the evolution of marine species.

Additional Information

• Pangaea

• Pangaea was a supercontinent that existed during the late Paleozoic and early Mesozoic eras.

• It began forming around 335 million years ago and started breaking apart about 175 million years ago.

• The breakup of Pangaea led to the formation of the current continents and oceans.

• Tethys Ocean

• The Tethys Ocean was a smaller body of water that existed on the eastern side of Pangaea.

• It eventually gave rise to the present-day Mediterranean, Black, and Caspian Seas.

• Laurasia and Gondwana

• Pangaea split into two major landmasses: Laurasia in the northern hemisphere and Gondwana in the southern hemisphere.

• Laurasia included the present-day continents of North America, Europe, and Asia, while Gondwana consisted of South America, Africa, Antarctica, Australia, and India.

• Plate Tectonics

• The breakup of Pangaea was driven by the movement of Earth's tectonic plates.

• Continental drift, caused by convection currents in the Earth's mantle, led to the gradual separation and current positions of continents.

Q31. Answer: (b) 255 – Represents the number of characters in the default font that fit in a cell

The correct answer is 255 – Represents the number of characters in the default font that fit in a cell.

Key Points

• The maximum column width in MS Excel 2019 is 255, which defines the number of characters of the default font that can fit in a single cell.

• This width is measured in terms of the number of digits of the default font that can be displayed in a cell when zoomed to 100%.

• A column width of 1 equals the width of one digit of the default font size, typically Arial 10-point.

• Although the column width is limited to 255, the cell content can still store up to 32,767 characters, but not all will be visible

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without adjusting column width or using text wrapping.

• Setting an optimal column width ensures better visibility and readability of data in Excel worksheets.

Additional Information

• Row Height in Excel:

• The maximum row height in MS Excel is 409 points.

• This measurement is based on the height of characters in the default font size.

• Cell Character Limit:

• Each cell in MS Excel can store a maximum of 32,767 characters.

• However, only 1,024 characters are visible in a cell unless text wrapping or merging is applied.

• Pixel and Point Relationship:

• A point is a unit of measurement equivalent to 1/72 of an inch.

• Pixels represent the resolution of a display, and their size varies depending on the monitor's DPI (dots per inch).

• Adjusting Column Width:

• Column width can be adjusted manually by dragging the column boundary or automatically using the "AutoFit Column Width" feature.

• AutoFit adjusts the column width to fit the longest entry in the column.

• Excel Default Settings:

• The default column width in Excel is 8.43, which equals the width of 8 characters in the default font.

• The default row height is 15 points, sufficient to display a single line of text in the default font size.

Q32. Answer: (b) 500

Shortcut Trick

Total effective interest rate for 2 years = Rate × Time = 5% × 2 = 10%

Simple Interest = 10% of Principal

SI = (10 ÷ 100) × 5000 = 500

Therefore The correct answer is Rs. 500.

Alternate Method

Given:

Principal (P) = Rs. 5,000

Rate (R) = 5% per annum

Time (T) = 2 years

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

Rs. 5000

Principal

5% p.a. for 2 years

Total Interest = 10%

Rs. 500

Simple Interest

Calculation:

=> SI = (5000 × 5 × 2) ÷ 100

=> SI = (5000 × 10) ÷ 100

=> SI = 50000 ÷ 100

=> SI = 500

Therefore The correct answer is Rs. 500.

Additional Information

Compound Interest (CI)

When interest is compounded annually, Amount (A) = P × (1 + R÷100)^T and CI = A − P.

Difference between CI and SI

For 2 years, the difference between CI and SI on a certain principal P at a rate of R% is given by the formula: Difference = P × (R÷100)².

Amount in Simple Interest

The total amount at the end of the period is the sum of principal and interest: A = P + SI = P × [1 + (R × T)÷100].

Q33. Answer: (a) 17, 104

The logic follows here,

Similarly,

Hence, the correct answer is "Option 1"

Q34. Answer: (d) transpiration

The correct answer is transpiration.

Key Points

• Transpiration is the process by which water evaporates from the aerial parts of plants, primarily through the stomata present in leaves.

• The evaporation of water creates a negative pressure or suction force, known as the transpiration pull, which helps to draw water upward through the xylem vessels.

• Transpiration plays a crucial role in maintaining the flow of water and nutrients from the roots to the leaves and other parts of the plant.

• This process is most significant in tall plants, where the force generated by transpiration pull is essential to overcome gravity and transport water to the top.

• Environmental factors such as temperature, humidity, wind, and light intensity influence the rate of transpiration.

Additional Information

• Xylem

• Xylem is the vascular tissue responsible for transporting water and dissolved minerals from the roots to the rest of the plant.

• It consists of specialized cells such as tracheids and vessel elements that facilitate the movement of water.

• The cohesion and adhesion properties of water molecules play a key role in maintaining the continuous water column in xylem vessels.

• Root Pressure

• Root pressure is a positive pressure generated by the active absorption of nutrients and water by root cells.

• Although root pressure contributes to water movement, it is insufficient for tall plants and is only effective in smaller plants.

• Guttation

• Guttation is the exudation of water droplets from the edges of leaves, typically occurring at night or under conditions of high soil moisture and low transpiration.

• It should not be confused with transpiration, which is the evaporation of water vapor from plant surfaces.

• Osmosis

• Osmosis is the passive movement of water molecules across a semi-permeable membrane from a region of low solute concentration to a region of high solute concentration.

• While osmosis is critical for water absorption by root cells, it does not contribute to the upward movement of water in tall plants.

Q35. Answer: (b) 1

Given: Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week.

• Q has an exam on Thursday.

• Exactly four people have their exam between U and P, neither of whom has an exam on Sunday.

• R has an exam immediately before S.

• V does not have an exam on Friday.

• U does not have an exam after S

• The Final Arrangement is

• | Monday | U |

Tuesday	**R**
Wednesday	S
Thursday	Q
Friday	T
Saturday	P

Sunday	V

• Only one person have exams after P is V.

Hence, the correct answer is "Option 2"

Q36. Answer: (c) 720

The logic here is,

Hence, the correct answer is "Option 3"

Q37. Answer: (c) 90%

Shortcut Trick

Use the direct ratio formula combining discount, profit and free articles:

CP / MP = [(100 − D%) / (100 + P%)] × [Paid Quantity / Total Quantity]

CP / MP = [(100 − 10) / (100 + 35)] × [15 / (15 + 4)]

CP / MP = (90 / 135) × (15 / 19) = (2 / 3) × (15 / 19) = 10 / 19

Markup % = [(19 − 10) / 10] × 100 = 90%

Therefore The correct answer is 90%.

Alternate Method

Given:

Discount given by trader = 10%

Free articles = 4 for every 15 bought

Paid articles by customer = 15

Overall transaction profit = 35%

Formula Used:

Total Selling Price (SP) = Total Cost Price (CP) × (100 + Profit)% / 100

Total SP = Paid articles × MP × (100 − Discount)% / 100

Total CP

19 × CP

+35% Profit

Total SP

19 × 1.35 CP

Total SP

15 × 0.9 MP

Equate

15 Paid + 4 Free

Total = 19 Articles

13.5 MP = 25.65 CP => MP = 1.9 CP

Calculation:

=> Let the Cost Price of 1 article be CP and Marked Price be MP.

=> Total articles given to the customer = 15 (paid) + 4 (free) = 19 articles.

=> Total Cost Price for the trader = 19 × CP

=> Since discount is 10%, Selling Price of 1 article = 90% of MP = 0.9 MP.

=> Total Selling Price obtained by the trader = 15 × 0.9 MP = 13.5 MP

=> Given that overall profit is 35%:

=> Total SP = Total CP × 135%

=> 13.5 MP = 19 CP × 1.35

=> 13.5 MP = 25.65 CP

=> MP / CP = 25.65 / 13.5 = 1.9

=> This means MP is 190% of CP, which is 90% more than CP.

Therefore The correct answer is 90%.

Additional Information

Marked Price and Discount

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Discount is always calculated on the Marked Price (MP). SP = MP × (100 − D%) ÷ 100.

Buy X Get Y Free

The equivalent discount percentage when a trader gives Y items free on buying X items is given by [Y ÷ (X + Y)] × 100.

Direct Relationship between CP and MP

When no free items are given, the direct ratio between CP and MP is: CP ÷ MP = (100 − Discount%) ÷ (100 + Profit%).

Q38. Answer: (a) One

A, B, C, D, X and Y each scored different marks. Only two people have scored more than A.

Only B has scored less than D. X has scored more than Y but less than C.

Only one people have scored more than X is C

Hence, the correct answer is "Option 1"

Mistake Points

When it is stated that 'Only B has scored less than D', it mathematically means every other person (A, C, X, Y) must have scored more than D. This places B at the 6th position and D at the 5th.

Combining this with other clues,

Thus, the order is C > X > A > Y > D > B.

Q39. Answer: (c) 2

Shortcut Trick

Solve directly by expanding powers and roots using BODMAS:

=> $6^2 + \sqrt{(2^2)} - 5\sqrt{25} - 11$

=> $36 + 2 - 5 \times 5 - 11$

=> $38 - 25 - 11$

=> $38 - 36 = 2$

Therefore The correct answer is 2.

Alternate Method

Given:

Expression: $6^2 + \sqrt{(2^2)} - 5\sqrt{25} - 11$

Concept Used:

BODMAS Rule (Brackets, Orders, Division, Multiplication, Addition, Subtraction)

Calculations:

=> Evaluate the powers and roots first (Orders):

=> $6^2 = 36$

=> $\sqrt{(2^2)} = \sqrt{4} = 2$

=> $\sqrt{25} = 5$

=> Substitute these evaluated terms back into the main expression:

=> $36 + 2 - 5 \times 5 - 11$

=> Perform multiplication:

=> $36 + 2 - 25 - 11$

=> Perform addition and subtraction from left to right:

=> $38 - 25 - 11$

=> $38 - 36$

=> 2

Therefore The correct answer is 2.

Additional Information

BODMAS Rule

The fundamental order of mathematical operations is Brackets, Orders (powers and roots), Division, Multiplication, Addition, and Subtraction.

Perfect Squares and Roots

Memorizing basic squares up to 30 significantly helps speed up simplification calculations. For instance, the principal square root of x^2 is x for any positive number.

Simplifying Multiple Subtractions

When an expression contains multiple numbers to be subtracted consecutively, you can add all the negative terms first and then

subtract the sum. For example, −25 − 11 = −(25 + 11) = −36.

Q40. Answer: (d) 73rd Amendment

The correct answer is 73rd Amendment.

Key Points

• The 73rd Constitutional Amendment Act, passed in 1992, introduced provisions for the establishment of Panchayati Raj institutions in India.

• It mandated the reservation of one-third of seats for women, including the position of chairpersons, in Panchayati Raj institutions.

• This amendment added Part IX to the Constitution, titled "The Panchayats," and a new Schedule, Schedule XI, enumerating 29 subjects under the Panchayati Raj's jurisdiction.

• The amendment aimed at empowering women and ensuring their active participation in local self-governance.

• The reservation for women was designed to enhance political representation and decision-making capabilities for women in rural governance.

Additional Information

• Part IX of the Constitution:

• Part IX was introduced through the 73rd Amendment, focusing on rural self-governance through Panchayati Raj institutions.

• The Gram Sabha serves as the foundation of the Panchayati Raj system.

• It stipulates a three-tier structure: Gram Panchayat at the village level, Panchayat Samiti at the block level, and Zila Parishad at the district level.

• Reservation for Women in Local Governance:

• The provision for reservation of seats for women in Panchayati Raj institutions aims to enhance women's representation in politics.

• One-third of the total seats, including the positions of chairpersons, are reserved for women across all levels.

• This reservation is applicable to Scheduled Castes and Scheduled Tribes as well.

• Schedule XI:

• It lists 29 functional items that Panchayati Raj institutions are responsible for, such as agriculture, education, health, sanitation, and rural development.

• These subjects enable decentralized governance and decision-making at the local level.

• Impact of the 73rd Amendment:

• It strengthened grassroots democracy and decentralized governance.

• The amendment empowered marginalized groups, including women, Scheduled Castes, and Scheduled Tribes, to participate in governance.

• This institutionalized local self-government, making it a constitutional mandate.

Q41. Answer: (b) National Cooperative Consumers' Federation of India

The correct answer is National Cooperative Consumers' Federation of India.

Key Points

• The National Cooperative Consumers' Federation of India (NCCF) is an apex organization of consumer cooperatives in the country.

• It was established in 1965 under the Multi-State Cooperative Societies Act.

• NCCF is primarily responsible for promoting the distribution of essential commodities, including food items, to consumers at reasonable prices.

• The organization works to stabilize market prices and ensure the availability of goods, especially during times of crisis or shortage.

• NCCF supports initiatives like mobile van distribution of essential goods, as seen in Mumbai during September 2025, to make items like onions accessible at subsidized rates.

Additional Information

• Consumer Cooperatives in India:

• Consumer cooperatives are set up to ensure the supply of essential items at reasonable prices to the public.

• They operate through a network of retail outlets, wholesale centers, and mobile distribution systems.

• Multi-State Cooperative Societies Act:

• This Act governs the functioning of multi-state cooperatives like NCCF.

• It provides a legal framework for cooperatives operating in more than one state in India.

• Role of NCCF in Crisis Management:

• NCCF plays a critical role in stabilizing prices of essential commodities during times of inflation or shortage.
• It procures items directly from producers and ensures efficient distribution to consumers.
• Subsidized Food Programs:
• Subsidized food distribution programs are aimed at providing food items at affordable prices to the economically weaker sections of society.
• These programs help mitigate the impact of price hikes on essential commodities.

Q42. Answer: (d) Ctrl + O

The correct answer is Ctrl + O.

Key Points

• The Ctrl + O shortcut is commonly used in Microsoft Office applications, including MS PowerPoint 2019, to open the "Open" dialog box for selecting files.
• Using Ctrl + O directly navigates users to the file selection interface without accessing menus manually.
• This shortcut enhances productivity by reducing the need for mouse clicks and allows quick access to previously saved files.
• It is a universally recognized shortcut in most Microsoft Office products, including Word, Excel, and PowerPoint.
• Ctrl + O is part of the essential keyboard shortcuts recommended for efficient software navigation in Microsoft Office tools.

Additional Information

• Keyboard Shortcuts in MS PowerPoint:
• Ctrl + S: Saves the current presentation.
• Ctrl + N: Creates a new presentation.
• Ctrl + P: Opens the print dialog box.
• Ctrl + M: Adds a new slide to the presentation.
• These shortcuts are designed to improve efficiency and ease of use for users.
• Importance of Shortcuts:
• Shortcuts help reduce reliance on manual menu navigation and allow faster software operation.
• They are especially useful for professionals who handle large-scale presentations regularly.
• Learning key shortcuts ensures better time management and productivity.
• Accessibility Features in MS PowerPoint:
• Microsoft PowerPoint includes accessibility options to support users with disabilities.
• Features include screen reader compatibility, keyboard navigation, and high contrast mode.
• These ensure that PowerPoint remains inclusive and usable for a wide range of users.
• Microsoft Office 2019 Enhancements:
• Improved collaboration features for real-time editing.
• Enhanced tools for data visualization and slide design.
• Integration with cloud services for easier file sharing and storage.

Q43. Answer: (d) 358

The correct answer is Article 358.

Key Points

• Article 358 of the Indian Constitution provides for the automatic suspension of Fundamental Rights under Article 19 during a National Emergency.
• It applies only when the emergency is proclaimed due to war or external aggression (not in cases of internal disturbance).
• During such emergencies, legislative and executive actions violating Article 19 cannot be challenged in a court of law.
• Article 358 ceases to operate once the Emergency ends, and Article 19 is automatically restored.
• Only rights under Article 19 are affected; other Fundamental Rights remain enforceable unless specifically suspended under Article 359.

Additional Information

• Article 359:
• Allows the President to suspend the right to move courts for enforcement of Fundamental Rights (except Articles 20 and 21) during a National Emergency.
• Unlike Article 358, Article 359 requires a specific presidential order for suspension.
• Article 352:
• Deals with the proclamation of National Emergency in case of war, external aggression, or armed rebellion.

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• It forms the constitutional basis for invoking Articles 358 and 359 during emergencies.

• Fundamental Rights:

• These are enshrined in Part III of the Constitution, guaranteeing essential rights to Indian citizens.

• Key rights include the Right to Equality, Right to Freedom, Right to Constitutional Remedies, etc.

• Historical Context:

• The suspension of Fundamental Rights under Articles 358 and 359 was notably applied during the Emergency of 1975-77.

• The Emergency was declared under Article 352 due to "internal disturbance," later amended to "armed rebellion" by the 44th Constitutional Amendment Act, 1978.

Q44. Answer: (a) 1:00 p.m.

Shortcut Trick

The bells will ring together again after the LCM of their individual intervals.

LCM of 12, 15, and 18 = 180 minutes.

180 minutes = 180 ÷ 60 = 3 hours.

Next ringing time = 10:00 a.m. + 3 hours = 1:00 p.m.

Therefore The correct answer is 1:00 p.m.

Alternate Method

Given:

Intervals of the three bells = 12, 15, and 18 minutes.

Initial simultaneous ringing time = 10:00 a.m.

Concept Used:

The time after which all bells will ring together again is the Least Common Multiple (LCM) of their individual time intervals.

Calculations:

=> Prime factorization of 12 = $2^2 \times 3$

=> Prime factorization of 15 = 3×5

=> Prime factorization of 18 = 2×3^2

=> LCM(12, 15, 18) = Highest power of all prime factors = $2^2 \times 3^2 \times 5$

=> LCM = $4 \times 9 \times 5 = 180$

=> Thus, the bells will ring together after 180 minutes.

=> Converting minutes into hours: 180 minutes = 180 ÷ 60 = 3 hours

=> Next time they ring together = 10:00 a.m. + 3 hours = 1:00 p.m.

Therefore The correct answer is 1:00 p.m.

Additional Information

LCM in Real-Life Scenarios

LCM is used to find when different events running at different regular intervals will coincide again, such as bells ringing, traffic lights changing, or runners meeting on a circular track.

HCF vs LCM

HCF (Highest Common Factor) is used to split items into smaller equal sections or to distribute things equally, whereas LCM (Least Common Multiple) is used to find a common future event.

Relation between HCF and LCM

For any two given numbers a and b, the product of the numbers is equal to the product of their HCF and LCM. Formula: a × b = HCF(a, b) × LCM(a, b).

Q45. Answer: (d) 10412/3

Shortcut Trick

Total distance travelled = Average speed × Total time

Average speed for a round trip = $(2 \times S_d \times S_u) \div (S_d + S_u)$

Average speed = $(2 \times 125 \times 25) \div (125 + 25) = 6250 \div 150 = 125/3$ km/hr

Total distance = $(125/3) \times 25 = 3125/3$ km = $1041^2/3$ km.

Therefore The correct answer is $1041^2/3$ km.

Alternate Method

Given:

Downstream speed (S_d) = 125 km/hr

Upstream speed (S_u) = 25 km/hr

Total time taken (T) = 25 hours

Downstream: 125 km/hr Upstream: 25 km/hr Distance D Total Time = 25 hrs

Formula Used:

Time = Distance ÷ Speed

Total Time = (Distance ÷ S_d) + (Distance ÷ S_u)

Calculation:

=> Let the one-way distance be D km.

=> Total time = (D ÷ 125) + (D ÷ 25)

=> 25 = (D + 5D) ÷ 125

=> 25 = 6D ÷ 125

=> 6D = 25 × 125

=> 6D = 3125

=> D = 3125 ÷ 6 km

=> Total distance travelled by boat = 2D

=> Total distance = 2 × (3125 ÷ 6) = 3125 ÷ 3 km

=> Total distance = $1041^2/3$ km.

Therefore The correct answer is $1041^2/3$ km.

Additional Information

Speed of Boat in Still Water

Speed of boat (u) = (Downstream Speed + Upstream Speed) ÷ 2

Speed of Stream

Speed of stream (v) = (Downstream Speed − Upstream Speed) ÷ 2

Average Speed

When equal distances are covered at speeds x and y, the Average Speed = (2 × x × y) ÷ (x + y)

Q46. Answer: (a) Process Control Block

The correct answer is Process Control Block.

Key Points

• A Process Control Block (PCB) is a data structure in the operating system that stores information about a process.

• PCB contains important details such as the process ID, process state, program counter, CPU registers, memory management information, and I/O status.

• It is used by the operating system to track and manage processes during execution.

• Whenever a context switch occurs, the PCB ensures that the state of the process is saved and restored correctly.

• The operating system maintains a PCB for each process to efficiently manage multitasking and resource allocation.

Additional Information

• Process States:

• Processes in an operating system can exist in various states such as New, Ready, Running, Waiting, and Terminated.

• The PCB keeps track of the current state of the process.

• Context Switching:

• Context switching refers to the process of storing the state of one process and loading the state of another process.

• The PCB plays a vital role in saving and restoring process information during context switches.

• Memory Management Information:

• The PCB contains details about the memory allocated to a process, such as page tables or segment tables.

• This information ensures efficient memory usage and prevents conflicts between processes.

• Process Scheduling:

• The operating system uses PCB to determine the priority and scheduling of processes.

• Scheduling decisions are based on information stored in the PCB, such as priority level and execution time.

• Interprocess Communication (IPC):

• PCBs also store information necessary for communication between processes, such as shared memory or message queues.

• Efficient IPC mechanisms are vital for the coordination of processes in a multitasking environment.

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Q47. Answer: (b) 100

Shortcut Trick

If the ratio of two numbers is a : b (where a and b are co-prime) and their HCF is H, then:

LCM = H × a × b

Here, a = 5, b = 4, and H = 5.

LCM = 5 × 5 × 4 = 100

Therefore The correct answer is 100.

Alternate Method

Given:

Ratio of two numbers = 5 : 4

HCF of the numbers = 5

HCF = 5

Ratio Part = 5

Ratio Part = 4

LCM = 5 × 5 × 4 = 100

Formula Used:

Number = HCF × Ratio part

LCM = Product of highest powers of all prime factors involved

Calculations:

=> Let the two numbers be 5x and 4x, where x is the common factor.

=> Since x represents the highest common factor, x = 5.

=> First number = 5 × 5 = 25

=> Second number = 4 × 5 = 20

=> Now, finding the LCM of 25 and 20 using prime factorization:

=> $25 = 5^2$

=> $20 = 2^2 \times 5$

=> LCM = $2^2 \times 5^2$

=> LCM = 4 × 25 = 100

Therefore The correct answer is 100.

Additional Information

Product Rule of HCF and LCM

The product of two numbers is always equal to the product of their HCF and LCM. Formula: N1 × N2 = HCF × LCM.

Relation between HCF and LCM

The HCF of two or more numbers is always a direct factor of their LCM. Thus, the LCM is always completely divisible by the HCF.

Co-prime Ratio Rule

When the ratio of two numbers is a : b (where a and b are co-prime), the numbers are H×a and H×b, and their LCM is derived directly as H×a×b.

Q48. Answer: (a) Both statements I and II together are NOT sufficient to answer the question

Statements:

(I) Rahul was born when his father was 33 years old.

This only gives a relationship between Rahul's age and his father's age, not their actual ages.

So alone, it is not sufficient.

(II) Rahul is 29 years younger than his mother.

This gives a difference between Rahul's age and his mother's age, but not the actual ages.

So alone, it is not sufficient.

Combining (I) and (II):

From I: Father's age = Rahul's age + 33

From II: Mother's age = Rahul's age + 29

But still, we don't know either parent's current age — no absolute value is provided.

So, even together, the data are not sufficient to find Rahul's age.

Hence, the correct answer is "Option 1"

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Q49. Answer: (c) 8

The number of ministerswho are Managers but NOT Engineers is shaded in given below figure:

Hence, the correct answer is "Option 3"

Q50. Answer: (a) RSW

The logic follows here,

All follow the same logic except RSW.

Hence, the correct answer is "Option 1"

Q51. Answer: (d) Rs. 1,070

Shortcut Trick

Effective CI rate for 2 years = X + Y + (X × Y)÷100 %

Effective rate for Scheme 1 (8%) = 8 + 8 + (8 × 8)÷100 = 16.64%

Effective rate for Scheme 2 (6%) = 6 + 6 + (6 × 6)÷100 = 12.36%

Difference in effective rate = 16.64% − 12.36% = 4.28%

Difference in Compound Interest = 4.28% of 25000 = 0.0428 × 25000 = Rs. 1070

Therefore The correct answer is Rs. 1070.

Alternate Method

Given:

Principal (P) = Rs. 25,000

Time (T) = 2 years

Rate for Scheme 1 (R1) = 8% per annum

Rate for Scheme 2 (R2) = 6% per annum

Formula Used:

Compound Interest (CI) = P × [(1 + R÷100)^T − 1]

P = Rs. 25,000

8% CI

6% CI

Scheme 1 (8%)

Yr 1 Int: 2000

Yr 2 Int: 2160

Total: Rs. 4160

Scheme 2 (6%)

Yr 1 Int: 1500

Yr 2 Int: 1590

Total: Rs. 3090

Diff = Rs. 1070

Calculations:

=> CI for Scheme 1 = 25000 × [(1 + 8÷100)² − 1]

=> CI1 = 25000 × [1.08² − 1]

=> CI1 = 25000 × [1.1664 − 1] = 25000 × 0.1664

=> CI1 = Rs. 4160

=> CI for Scheme 2 = 25000 × [(1 + 6÷100)² − 1]

=> CI2 = 25000 × [1.06² − 1]

=> CI2 = 25000 × [1.1236 − 1] = 25000 × 0.1236

=> CI2 = Rs. 3090

=> Difference in CI = CI1 − CI2

=> Difference = 4160 − 3090 = Rs. 1070

Therefore The correct answer is Rs. 1070.

Additional Information

Effective Rate of CI for 2 Years

For a rate of R% compounded annually, the effective compound interest rate for 2 years is calculated directly as R + R +

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$(R^2 \div 100)\%$.

Difference Between CI and SI for 2 Years

The difference between Compound Interest and Simple Interest for 2 years on a principal P at rate R% is given by the direct formula Diff = $P \times (R \div 100)^2$.

Difference Between CI and SI for 3 Years

The difference for 3 years is determined by the formula Diff = $P \times (R \div 100)^2 \times (3 + R \div 100)$.

Q52. Answer: (c) NR – GL

The logic follows here,

All follow the same logic except NR-GL.

Hence, the correct answer is "Option 3."

Q53. Answer: (a) 1/(1001^8)

Shortcut Trick

When multiplying expressions with the same exponent, directly multiply their bases.

=> 7^(−8) × 11^(−8) × 13^(−8) = (7 × 11 × 13)^(−8)

=> (1001)^(−8) = 1 / 1001^8

Therefore The correct answer is 1 / 1001^8.

Alternate Method

Given:

Expression: 7^(−8) × 11^(−8) × 13^(−8)

Formula Used:

a^m × b^m × c^m = (a × b × c)^m

a^(−m) = 1 / a^m

Calculation:

=> 7^(−8) × 11^(−8) × 13^(−8)

=> (7 × 11 × 13)^(−8)

=> (77 × 13)^(−8)

=> 1001^(−8)

=> 1 / 1001^8

Therefore The correct answer is 1 / 1001^8.

Additional Information

Product of Powers Rule

When multiplying terms with the same base, add their exponents: $a^m \times a^n = a^{(m+n)}$.

Power of a Power Rule

When raising an exponent to another power, multiply the exponents: $(a^m)^n = a^{(m \times n)}$.

Negative Exponent Rule

A negative exponent means taking the reciprocal of the base raised to a positive power: $a^{(-m)} = 1 / a^m$.

Q54. Answer: (d) 11.5

Shortcut Trick

Let the total quantity of goods be 100 units.

The divided parts are: 50 units (+45%), 15 units (+27%), and 35 units (−43%).

Net Profit % = [(50 × 45) + (15 × 27) + (35 × −43)] ÷ 100

Net Profit % = [2250 + 405 − 1505] ÷ 100 = 1150 ÷ 100 = 11.5%

Therefore The correct answer is 11.5%.

Alternate Method

Given:

50% of goods sold at 45% profit.

30% of remaining goods sold at 27% profit.

Still remaining goods sold at 43% loss.

50 units

+45%

15 units

+27%

35 units

-43%

Total Base = 100 units

Overall Net Profit = 11.5%

Calculations:

=> Let the total number of goods be 100 units with each unit costing Rs. 1.

=> Goods in the 1st part = 50% of 100 = 50 units

=> Remaining goods = 100 − 50 = 50 units

=> Goods in the 2nd part = 30% of 50 = 15 units

=> Goods in the 3rd part = Total goods − (1st part + 2nd part) = 100 − (50 + 15) = 35 units

=> Overall net profit/loss = (Profit on 1st part) + (Profit on 2nd part) − (Loss on 3rd part)

=> Overall net profit/loss = (50 × 45%) + (15 × 27%) − (35 × 43%)

=> Overall net profit/loss = 22.5 + 4.05 − 15.05

=> Overall net profit/loss = 26.55 − 15.05 = 11.5 units

=> Since the total cost price is 100 units, the overall profit percentage is 11.5%.

=> Comparing this with x%, the value of x is 11.5.

Therefore The correct answer is 11.5%.

Additional Information

Weighted Average Profit & Loss

When a quantity is divided into parts n1, n2, ..., n_k and sold at respective profit/loss percentages p1, p2, ..., p_k, the overall percentage change is given by the weighted sum: (n1p1 + n2p2 + ... + n_kp_k) ÷ (n1 + n2 + ... + n_k).

Loss Percentage Convention

In profit and loss mixture equations, always treat profit as a positive value (+) and loss as a negative value (−) to easily calculate the net aggregate effect.

Remaining Quantity Calculation

When calculating successive proportions (e.g., "x% of the remaining"), it is essential to subtract the already allocated quantity from the total before calculating the new specific fraction.

Q55. Answer: (b) 20 km

Given:

• Namesh starts from point A and drives 4 km towards west.

• He then takes a left turn and drives 5 km.

• He takes a final left turn and drives 6 km and stops at point B.

• Rimit starts from point P, which is 16 km east of Point A, and drives 3 km towards east.

• He then takes a right turn and drives 5 km.

• He takes a final left turn and drives 3 km and stops at Point Q.

The final Diagram,

Shortest distance between Point Q and Point B is 20 km.

Hence, the correct answer is "Option 2"

Q56. Answer: (b) 1176

Shortcut Trick

The given sides of the triangle are 42 cm, 56 cm, and 70 cm.

Ratio of the sides = 42 : 56 : 70 = 3 : 4 : 5.

Since the ratio of the sides follows the Pythagorean triplet ($3^2 + 4^2 = 5^2$), the given triangle is a right-angled triangle.

Area of a right-angled triangle = (1/2) × Base × Height.

Area = (1/2) × 42 × 56 = 1176 cm^2.

Therefore The correct answer is 1176 cm^2.

Alternate Method

56 cm

42 cm

70 cm

Given:

Sides of the triangle, a = 70 cm, b = 56 cm, and c = 42 cm.

Formula Used:

Heron's Formula for Area of a Triangle = √[s(s − a)(s − b)(s − c)]

Where s = Semi-perimeter = (a + b + c) ÷ 2

Calculations:

=> s = (70 + 56 + 42) ÷ 2

=> s = 168 ÷ 2 = 84 cm

=> Area = √[84 × (84 − 70) × (84 − 56) × (84 − 42)]

=> Area = √[84 × 14 × 28 × 42]

=> Area = √[(42 × 2) × 14 × (14 × 2) × 42]

=> Area = √[$42^2 \times 14^2 \times 2^2$]

=> Area = 42 × 14 × 2

=> Area = 1176 cm^2

Therefore The correct answer is 1176 cm^2.

Additional Information

Heron's Formula

Used to find the area of a scalene triangle when all three side lengths are known. This method does not require identifying whether the triangle is right-angled or not.

Pythagorean Triplets

A set of three positive integers (a, b, c) that perfectly satisfy the relation $a^2 + b^2 = c^2$. Common fundamental triplets include (3, 4, 5), (5, 12, 13), (7, 24, 25), and (8, 15, 17).

Equilateral Triangle Properties

For a triangle with all equal sides (a), the Area = (√3 ÷ 4) × a^2 and the Altitude/Height = (√3 ÷ 2) × a.

Q57. Answer: (d) GK−IP

The logic follows here,

All follow the same logic except G K - IP.

Hence, the correct answer is "Option 4"

Q58. Answer: (c) 625092

Shortcut Trick

For a number to be divisible by 39, it must be divisible by its co-prime factors 3 and 13.

Check divisibility by 3: The sum of digits for 625092 is 6 + 2 + 5 + 0 + 9 + 2 = 24 (Divisible by 3).

Check divisibility by 13: The difference of alternating 3-digit blocks for 625092 is |625 − 092| = 533.

Since 533 ÷ 13 = 41, it is perfectly divisible by 13.

Therefore The correct answer is 625092.

Alternate Method

Given:

Options provided: 625649, 622710, 625092, 622776

Formula Used:

Divisibility by 39 = Divisibility by both 3 and 13.

Calculations:

=> First, check divisibility by 3 (the sum of all digits must be a multiple of 3).

=> 625649: 6 + 2 + 5 + 6 + 4 + 9 = 32 (Not divisible by 3)

=> 622710: 6 + 2 + 2 + 7 + 1 + 0 = 18 (Divisible by 3)

=> 625092: 6 + 2 + 5 + 0 + 9 + 2 = 24 (Divisible by 3)

=> 622776: 6 + 2 + 2 + 7 + 7 + 6 = 30 (Divisible by 3)

=> Next, check divisibility by 13 for the remaining valid options (difference between alternating 3-digit blocks must be a multiple of 13).

=> 622710: |710 − 622| = 88 → 88 is not divisible by 13.

=> 625092: |092 − 625| = 533 → 533 ÷ 13 = 41 (Divisible by 13)

=> 622776: |776 − 622| = 154 → 154 is not divisible by 13.

=> Only 625092 fully satisfies both conditions.

Therefore The correct answer is 625092.

Additional Information

Co-prime Factor Rule

If a given number is perfectly divisible by two co-prime numbers a and b, it is guaranteed to be divisible by their product (a × b).

Divisibility by 13

Group the digits in sets of three starting from right to left. If the absolute difference of the alternating sums of these groups is 0 or a multiple of 13, the complete number is divisible by 13.

Divisibility by 7, 11, and 13

The 3-digit block alternating difference method works identically for 7, 11, and 13 since their product is exactly 1001.

Q59. Answer: (d) 84

Shortcut Trick

Total sum = Average × 3 = 49 × 3 = 147.

Ratio of First : Second : Third = 4 : 2 : 1.

Total ratio parts = 4 + 2 + 1 = 7 parts.

7 parts = 147 => 1 part = 21.

Largest number (4 parts) = 4 × 21 = 84.

Therefore The correct answer is 84.

Alternate Method

Given:

The average of three numbers is 49.

The first number is twice the second.

The second number is twice the third.

First Number (4x)

Second (2x)

Third (x)

84

42

21

Total Sum = 7x = 147

Average = 49 × 3 = 147

Formula Used:

Sum of observations = Average × Total number of observations

Calculation:

=> Let the third number be x.

=> Second number = 2x.

=> First number = 2 × 2x = 4x.

=> Sum of the three numbers = 49 × 3 = 147.

=> 4x + 2x + x = 147

=> 7x = 147

=> x = 147 ÷ 7

=> x = 21

=> The largest number is the first number, which is 4x.

=> Largest number = 4 × 21 = 84.

Therefore The correct answer is 84.

Additional Information

Averages

The average (or arithmetic mean) of a set of numbers is the total sum divided by the number of elements. Thus, Total Sum = Average × Count.

Ratios in Averages

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When numerical terms are given in a proportional ratio (such as 4x, 2x, 1x), you can compute their overall sum to determine the actual value of a single ratio part.

Compound Ratio

If A : B = m : n and B : C = p : q, the combined ratio A : B : C can be formed by making the common term B strictly proportional between the two sets.

Q60. Answer: (b) A

Given:

Eight people are sitting in two parallel rows containing 4 people each in such a way that there is equal distance between adjacent persons.

• In row 1 – A, D, O and P are seated and all of them are facing south.

• In row 2 – U,W, Y and F are seated and all of them are facing north.

• Thus each person faces another person from the other row.

• U sits third to the left of Y.

• The one facing P is an immediate neighbour of Y.

• A sits at some place to the right of P and is not facing W.

• D sits third to the right of O

The final Arrangement is

A is faces F.

Hence, the correct answer is "Option 2"

Q61. Answer: (a) Hindustani Classical Music

The correct answer is Hindustani Classical Music.

Key Points

• The term Gharana refers to a system of social organization linking musicians or dancers by lineage or apprenticeship.

• In Hindustani Classical Music, Gharanas represent schools or traditions of music, each with its distinct style and techniques.

• Some well-known Hindustani Gharanas include Gwalior, Agra, Jaipur-Atrauli, Patiala, and Kirana.

• The Gharana system became prominent during the Mughal period, where court musicians passed on their skills to disciples or family members.

• Each Gharana has unique characteristics in terms of raga rendition, ornamentation, and improvisation techniques, contributing to the diversity of Hindustani Classical Music.

Additional Information

• Hindustani Classical Music:

• It is one of the two main traditions of Indian classical music, the other being Carnatic music from South India.

• This tradition is characterized by a greater emphasis on improvisation and exploration of ragas.

• It primarily evolved in North India and has influences from Persian and Mughal music.

• Key Elements of Hindustani Classical Music:

• Raga: A melodic framework for improvisation and composition.

• Tala: A rhythmic cycle that forms the foundation of performance.

• Alap: A slow, unmetered introduction to a raga, showcasing its essence.

• Notable Musicians from Hindustani Classical Music:

• Ustad Bismillah Khan: Shehnai maestro and Bharat Ratna awardee.

• Pt. Ravi Shankar: Renowned sitar player and global ambassador of Indian classical music.

• Ustad Amir Khan: Founder of the Indore Gharana.

• Difference Between Hindustani and Carnatic Music:

• Hindustani: More focused on improvisation and has influences from Persian music.

• Carnatic: Structured compositions with emphasis on kritis (compositions) and devotional themes.

Q62. Answer: (b) 82

Given Equation : 25 C 3 B 12 D 4 A 10 = ?

If ‘A’ stands for ‘+’, ‘B’ stands for ‘−’, ‘C’ stands for ‘×’ and ‘D’ stands for ‘÷‘,

New Equation : 25 × 3 − 12 ÷ 4 + 10 = ?

25 × 3 − 12 ÷ 4 + 10 = ?

25 × 3 − 3 + 10 = ?

75 − 3 + 10 = ?

85 − 3 = ?

82.

Hence, the correct answer is "Option 2"

Q63. Answer: (a) 20 : 38

Shortcut Trick

Convert the given ratios into approximate percentages for a quick comparison:

20 : 38 => (20 ÷ 38) × 100 ≈ 52.6%

19 : 43 => (19 ÷ 43) × 100 ≈ 44.2%

23 : 45 => (23 ÷ 45) × 100 ≈ 51.1%

13 : 40 => (13 ÷ 40) × 100 = 32.5%

Comparing the values, 52.6% is the largest percentage.

Therefore The correct answer is 20 : 38.

Alternate Method

Given:

The ratios to compare are 20 : 38, 19 : 43, 23 : 45, and 13 : 40.

20 : 38

52.6%

19 : 43

44.2%

23 : 45

51.1%

13 : 40

32.5%

Calculations:

=> Let's write the given ratios as fractions: 20/38, 19/43, 23/45, and 13/40.

=> Simplify 20/38 to 10/19 for easier calculation.

=> We can use the cross-multiplication method to compare fractions pairwise.

=> Compare 10/19 and 23/45:

=> 10 × 45 = 450 and 19 × 23 = 437

=> Since 450 > 437, 10/19 > 23/45.

=> Compare 10/19 and 19/43:

=> 10 × 43 = 430 and 19 × 19 = 361

=> Since 430 > 361, 10/19 > 19/43.

=> Compare 10/19 and 13/40:

=> 10 × 40 = 400 and 19 × 13 = 247

=> Since 400 > 247, 10/19 > 13/40.

=> In all comparisons, 10/19 (which is exactly 20/38) is the largest value.

Therefore The correct answer is 20 : 38.

Additional Information

Cross-Multiplication Method

For comparing two fractions a/b and c/d, evaluate the products a × d and b × c. If a × d > b × c, then a/b > c/d. This is typically the fastest manual method without division.

Percentage Conversion

Converting fractions to percentages by multiplying the fraction by 100 provides a common 100-point scale that easily highlights the exact relative magnitude of values, especially when denominators vary widely.

Difference Method

If the numerical difference between the numerator and denominator in given proper fractions is perfectly identical across all fractions, the fraction with the largest numerator represents the greatest value.

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Q64. Answer: (a) sin i ÷ sin r = constant

The correct answer is sin i ÷ sin r = constant.

Key Points

• Snell's law states that the ratio of the sine of the angle of incidence (i) to the sine of the angle of refraction (r) is constant for a given pair of media and is equal to the refractive index.

• The mathematical expression for Snell's law is sin i ÷ sin r = n, where n is the refractive index of the second medium with respect to the first.

• This law explains the bending of light when it passes from one medium to another with a different refractive index.

• Snell's law is crucial in understanding optical phenomena such as refraction and total internal reflection.

• The constant value (n) depends on the optical density of the two media involved in the transition of light.

Additional Information

• Refractive Index (n):

• The refractive index is a dimensionless quantity that describes how light propagates through a medium.

• It is defined as the ratio of the speed of light in a vacuum to the speed of light in the medium: n = c/v.

• Angle of Incidence (i):

• This is the angle between the incident ray and the normal (perpendicular) to the surface at the point of incidence.

• Angle of Refraction (r):

• This is the angle between the refracted ray and the normal to the surface at the point of refraction.

• Total Internal Reflection:

• This phenomenon occurs when the angle of incidence exceeds the critical angle, causing the light to reflect entirely within the denser medium.

• Applications of Snell's Law:

• Used in designing lenses, prisms, and optical instruments like microscopes and telescopes.

• Essential in fiber optic communication for guiding light signals through cables.

Q65. Answer: (c) Lord Dalhousie

The correct answer is Lord Dalhousie.

Key Points

• Lord Dalhousie served as the Governor-General of India from 1848 to 1856.

• He is best known for implementing the Doctrine of Lapse, a policy used to annex Indian states that lacked a legitimate male heir.

• Under this doctrine, princely states like Satara (1848), Jhansi (1854), and Nagpur (1853) were annexed by the British Empire.

• The Doctrine of Lapse was a controversial policy as it disregarded the traditional right of rulers to adopt heirs, leading to widespread discontent among Indian rulers.

• Dalhousie's annexation policies played a significant role in increasing British control over India but also contributed to the resentment that led to the 1857 Revolt.

Additional Information

• Doctrine of Lapse:

• A policy formulated by Lord Dalhousie, stating that if a ruler of a princely state died without a direct male heir, his state would "lapse" to the British Empire.

• This doctrine overrode the traditional rights of rulers to adopt heirs and was viewed as a coercive measure to expand British territories.

• Impact of Dalhousie's Policies:

• Dalhousie's policies led to the expansion of British territory but also increased dissatisfaction among Indian rulers and subjects.

• The annexations under the Doctrine of Lapse were a significant factor contributing to the Indian Revolt of 1857.

• Other Contributions of Lord Dalhousie:

• Dalhousie introduced modern infrastructure like railways, telegraphs, and postal services in India.

• He established English-medium education institutions and laid the foundation for modernization in India.

• Indian Revolt of 1857:

• The widespread discontent caused by annexation policies, including the Doctrine of Lapse, was one of the primary reasons for the revolt.

• The revolt marked the beginning of the end of the East India Company's rule, leading to the establishment of direct British governance in India.

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Q66. Answer: (b) P ÷ Q x R – S + T

Preparing the family tree diagram by using the following symbols:

As per the given information:

A is				
Symbol	•	•	×	÷
Means	Mother	Brother	wife	Father
of B				

P ÷ Q x R – S + T

R is brother of S and S is mother of T.

Hence, the correct answer is "Option 2"

Q67. Answer: (d) Rowlatt Act

The correct answer is Rowlatt Act.

Key Points

• The Rowlatt Act, officially known as the Anarchical and Revolutionary Crimes Act of 1919, was passed by the British colonial government to suppress nationalist activities.

• Mahatma Gandhi labeled the Rowlatt Act as the 'Black Act' due to its oppressive nature and disregard for civil liberties.

• The act allowed the British government to arrest and detain individuals without trial and search premises without warrants, leading to widespread public outrage.

• In response to the Rowlatt Act, Gandhi organized the All-India Hartal on April 6, 1919, marking one of the first mass protests against British rule.

• The act was a major factor behind the Jallianwala Bagh massacre in Amritsar on April 13, 1919, where peaceful protestors were brutally killed, further intensifying the freedom movement.

Additional Information

• Vernacular Press Act:

• Enacted in 1878 by Lord Lytton to control the vernacular press and curb criticism of British policies.

• Allowed the colonial government to confiscate press materials that were deemed seditious.

• Faced widespread opposition and was later repealed in 1882 by Lord Ripon.

• Indian Councils Act:

• Passed in 1861, 1892, and 1909 to expand Indian participation in legislative councils.

• The 1909 Act, also known as the Morley-Minto reforms, introduced separate electorates for Muslims.

• These acts were significant milestones in the evolution of legislative governance in colonial India.

Q68. Answer: (a) 4

Shortcut Trick

Apply the BODMAS rule directly, solving the brackets from the innermost to the outermost.

Expression: 72 ÷ [2 × [12 − (10 − 7)]]

72 ÷ [2 × [12 − 3]]

72 ÷ [2 × 9] = 72 ÷ 18

Therefore The correct answer is 4.

Alternate Method

Given:

72 ÷ [(12/6) × [3 + 9 − (5 + 5 − (2 + 5))]]

Concept Used:

BODMAS Rule: Brackets, Order, Division, Multiplication, Addition, and Subtraction.

Calculations:

=> 72 ÷ [(12/6) × [3 + 9 − (5 + 5 − 7)]]

=> 72 ÷ [2 × [12 − (10 − 7)]]

=> 72 ÷ [2 × [12 − 3]]

=> 72 ÷ [2 × 9]

=> 72 ÷ 18

=> 4

Therefore The correct answer is 4.

Additional Information

BODMAS Rule

It dictates the order of operations in simplification: Brackets, Orders (powers/roots), Division and Multiplication (left to right), Addition and Subtraction (left to right).

Types of Brackets

Always resolve brackets in this sequential order: Vinculum (Bar), Round Brackets (), Curly Brackets { }, and finally Square Brackets [].

Fraction Simplification

When solving divisions inside brackets such as 12/6, compute them exactly as regular division before applying outer operations.

Q69. Answer: (c) Bay of Bengal

The correct answer is Bay of Bengal.

Key Points

• Chennai Port is situated along the eastern coastline of India and faces the Bay of Bengal.

• It is one of the oldest and largest ports in India, established in the year 1881.

• Chennai Port is primarily used for handling bulk cargo, containers, automobiles, and petroleum products.

• The port plays a crucial role in India's maritime trade, serving as a gateway for exports and imports in the southern region of the country.

• Its strategic location on the Bay of Bengal provides easy connectivity to Southeast Asia and the Far East.

Additional Information

• The Bay of Bengal is the northeastern part of the Indian Ocean, bounded by India and Sri Lanka to the west, Bangladesh to the north, and Myanmar and the Andaman and Nicobar Islands to the east.

• It is the largest bay in the world, covering an area of around 2.2 million square kilometers.

• The Bay of Bengal is known for its high biodiversity, including coral reefs, mangroves, and marine species like dolphins, turtles, and whales.

• Prominent rivers such as the Ganges, Brahmaputra, and Mahanadi drain into the Bay of Bengal, making it a hub for sediment deposition.

• The region is prone to cyclones due to its climatic conditions, with several major cyclones originating here annually.

Q70. Answer: (b) AUGZ

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 2".

Q71. Answer: (b) Only II

The correct answer is Option 2: Only II.

Key Points

• Citizenship in India is covered under Articles 5 to 11 of the Constitution of India and deals with the different categories of persons who are entitled to citizenship at the commencement of the Constitution.

• Citizenship is not listed in the State List; it is in the Union List under the Seventh Schedule, making it a subject under the exclusive jurisdiction of the central government.

• Indian citizenship can be acquired through five ways: birth, descent, registration, naturalization, and incorporation of territory, as per the Citizenship Act, 1955.

• The Constitution provided initial provisions for citizenship, and subsequent changes have been made through amendments to the Citizenship Act.

• Correct statement here is "Articles 5 to 11 deal with various categories of persons entitled to citizenship," which aligns with the provisions in the Constitution.

Additional Information

• Indian Citizenship Act, 1955

• This Act governs the acquisition and termination of Indian citizenship.

• It lays down five modes of acquiring citizenship: birth, descent, registration, naturalization, and incorporation of territory.

• It also provides provisions for the termination and renunciation of citizenship.

• Union List vs State List

• The Union List contains subjects of national importance on which only the central government can make laws, including citizenship, defense, foreign affairs, and atomic energy.
• State List contains matters on which state governments can legislate, such as police, public health, and agriculture.
• Dual Citizenship
• India does not allow dual citizenship. Indian citizens cannot hold citizenship of another country simultaneously.
• However, the Overseas Citizenship of India (OCI) status provides certain rights to foreign nationals of Indian origin.
• Amendments to Citizenship Act
• The Citizenship Act has been amended several times, including the Citizenship (Amendment) Act, 2019, which provides citizenship to persecuted minorities from Afghanistan, Pakistan, and Bangladesh.
• This amendment has sparked debates around secularism and equality in India.

Q72. Answer: (c) 74

Given Expression: 26 + 8 × 4 − 10 ÷ 5 = ?
+' and '−' are interchanged and '×' and '÷' are interchanged
New Expression: 26 − 8 ÷ 4 + 10 × 5 = ?
26 − 8 ÷ 4 + 10 × 5 = ?
26 − 2 + 10 × 5 = ?
26 − 2 + 50 = ?
76 - 2 =?
74.
Hence, the correct answer is "Option 3"

Q73. Answer: (d) 12528

Shortcut Trick
Total Wall Volume = 81 × 29 × 0.8 = 1879.2 m^3
Volume of 1 brick = 0.72 × 0.50 × 0.25 = 0.09 m^3
Effective volume for bricks (60%) = 0.60 × 1879.2 m^3 = 1127.52 m^3
Number of bricks = 1127.52 ÷ 0.09 = 12528
Therefore The correct answer is 12528 bricks.
Alternate Method
Given:
Wall dimensions: Length (L) = 81 m, Height (H) = 29 m, Thickness (W) = 0.8 m
Brick dimensions: Length (l) = 72 cm = 0.72 m, Width (w) = 50 cm = 0.50 m, Height (h) = 25 cm = 0.25 m
Sand and cement mixture = 40% (So, bricks occupy 100% − 40% = 60% of the wall)
L = 81 m
H = 29 m
W = 0.8 m
72 cm
25 cm
50 cm
Wall contains 60% Bricks and 40% Mixture
Formula Used:
Number of bricks = (Volume of wall × % volume occupied by bricks) ÷ (Volume of one brick)
Calculations:
=> Volume of the wall = 81 × 29 × 0.8 = 1879.2 m^3
=> Volume occupied by bricks = 60% of 1879.2 m^3 = 1127.52 m^3
=> Volume of one brick = 0.72 × 0.50 × 0.25 = 0.09 m^3
=> Number of bricks required = 1127.52 ÷ 0.09 = 12528
Therefore The correct answer is 12528 bricks.
Additional Information
Volume of a Cuboid
The amount of 3D space enclosed by a rectangular cuboid is given by the product of its length, width, and height (V = L × B × H).
Unit Conversion

Always ensure all dimensions are in the exact same unit before calculating volumes. To convert from cm to meters, divide by 100.

Effective Volume Fraction

When a structure contains multiple materials (like bricks and cement), the required quantity of one material equals its percentage fraction multiplied by the total volume.

Q74. Answer: (b) 19/12

Shortcut Trick

Combine terms with the same denominator first: 5/2 − 3/2 = 2/2 = 1

Simplify the complex fraction: 1 / (1 + 5/7) = 1 / (12/7) = 7/12

Add the results together: 1 + 7/12 = 19/12

Therefore The correct answer is 19/12.

Alternate Method

Given:

Expression: 5/2 + 1 / (1 + 5/7) − 3/2

Calculations:

=> 5/2 + 1 / ((7 + 5) / 7) − 3/2

=> 5/2 + 1 / (12/7) − 3/2

=> 5/2 + 7/12 − 3/2

=> (5/2 − 3/2) + 7/12

=> 2/2 + 7/12

=> 1 + 7/12

=> (12 + 7) / 12

=> 19/12

Therefore The correct answer is 19/12.

Additional Information

BODMAS Rule

Always solve Brackets first, then Of, Division, Multiplication, Addition, and Subtraction. Nested fractions act as implicit brackets which must be simplified before division.

Fraction Division

When dividing by a fraction, multiply by its reciprocal. Example: 1 ÷ (a/b) = b/a.

Grouping Like Terms

In expressions with additions and subtractions, grouping fractions with the same denominator saves calculation time. Example: a/c − b/c = (a − b) / c.

Q75. Answer: (a) One

A, B, C, D, E, F, G and H are sitting around a square table facing the centre of the table.

• Some of them are sitting at the corners while some are sitting at the exact centre of the sides.

• F sits second to the right of G.

• F sits at one of the corners.

• Only three people sit between G and E when counted from the left of G.

• H sits third to the left of E. Only three people sit between H and B when counted from the left of H.

• C sits second to the right of B.

• D is not an immediate neighbour of E

The final arrangement is:

Only one person is sit between E and D, when counted from the left of D is B.

Hence, the correct answer is "Option 1"

Q76. Answer: (b) 1

• Each of P, Q, R, S, T, U and V has an exam on a different day of a week starting from Monday and ending on Sunday of the same week.

• S has an exam on Tuesday. Exactly two people have an exam between S and P.

• T has an exam immediately before U, and R has an exam immediately after Q.

• Only 1 person has an exam between U and Q

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The final arrangement is:

Monday	**V**
Tuesday	S
Wednesday	T
Thursday	U
Friday	P
Saturday	Q
Sunday	R

Hence, the correct answer is "Option 2"

Q77. Answer: (c) Hala

The correct answer is Hala.

Key Points

• Hala, a Satavahana king, is credited with composing the 'Gatha Saptasati', also known as 'Saptasati'.

• The text is a collection of around 700 Prakrit verses, primarily focusing on themes of love and human emotions.

• The Gatha Saptasati is written in Maharashtri Prakrit, which was a prominent literary dialect during the Satavahana period.

• It serves as a significant source for understanding the cultural and social life during the Satavahana dynasty, particularly in the Deccan region.

• Hala's contribution to classical literature highlights the importance of vernacular languages in ancient Indian literary traditions.

Additional Information

• Satavahana Dynasty:

• The Satavahanas ruled the Deccan region of India after the decline of the Mauryan Empire.

• They are known for their contributions to art, architecture, and literature, including the promotion of Prakrit as a literary language.

• Prominent rulers include Gautamiputra Satakarni and Hala.

• Maharashtri Prakrit:

• Maharashtri Prakrit was one of the primary literary dialects in ancient India, often used in poetry and drama.

• The Gatha Saptasati is one of the most notable works written in this language.

• Thematic Focus of Gatha Saptasati:

• The verses primarily explore themes of love, longing, and emotional relationships, reflecting the society and culture of the time.

• It provides insight into rural and urban life in ancient India, especially in the Deccan region.

• Historical Significance:

• The Gatha Saptasati is one of the earliest examples of secular literature in India.

• Its focus on human emotions and everyday life marks a shift from predominantly religious texts to secular literary traditions.

Q78. Answer: (a) text/plain; charset=UTF-8

The correct answer is text/plain; charset=UTF-8.

Key Points

• text/plain is the default MIME Content-Type for plain text email messages.

• The charset=UTF-8 specification ensures support for a wide range of characters, including international ones.

• MIME (Multipurpose Internet Mail Extensions) standards define how email content is formatted and transmitted.

• Plain text emails are simple and do not contain formatting, such as bold or italic text, images, or hyperlinks.

• Plain text is widely used for compatibility across email clients and platforms, ensuring readability.

Additional Information

• MIME Content-Type Terminology:

• text/plain: Specifies unformatted text content.

• text/html: Indicates HTML-formatted text, allowing rich formatting and multimedia elements.

• multipart/mixed: Used for emails containing multiple parts, such as text and attachments.

• application/octet-stream: Represents binary data, typically used for file attachments.

• Charset:

• Defines the character encoding used in the email.

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• UTF-8 is the most widely used encoding, supporting virtually all characters across languages.
• Plain Text vs HTML Emails:
• Plain text emails are lightweight and universally compatible.
• HTML emails allow for visually appealing designs but may not render correctly in all email clients.
• Email Header:
• Contains metadata about the email, such as sender, recipient, and Content-Type.
• The Content-Type header specifies the format of the message body.

Q79. Answer: (c) 7

Given: (Left) $ T 1 & 9 Z 7 * A M S 1 * D % 7 * (Right)
All the symbols are dropped from the series- (Left) T 1 9 Z 7 A M S 1 D 7 (Right)
Seventh from the right - (Left) T 1 9 Z 7 A M S 1 D 7 (Right)
Hence, the correct answer is "Option 3"

Q80. Answer: (d) PLK

The logic followed here is:
All follow the same logic except PLK.
Hence, the correct answer is "Option 4"

Q81. Answer: (a) 7271/287 km/hr

Shortcut Trick
For 3 equal distances covered at speeds x, y, and z, Average Speed = (3xyz) ÷ (xy + yz + zx).
Here, the given speeds are x = 19, y = 8, z = 5.
Average Speed = (3 × 19 × 8 × 5) ÷ (19×8 + 8×5 + 5×19)
Average Speed = 2280 ÷ (152 + 40 + 95) = 2280 ÷ 287
Average Speed = 7 ^(271)/287 km/hr
Therefore The correct answer is 7 ^(271)/287 km/hr.
Alternate Method
Given:
=> Speeds for three equal distances: S1 = 19 km/hr, S2 = 8 km/hr, S3 = 5 km/hr.
Formula Used:
=> Average Speed = Total Distance ÷ Total Time
Distance = d
Distance = d
Distance = d
Speed: 19 km/hr
Speed: 8 km/hr
Speed: 5 km/hr
Time = d/19
Time = d/8
Time = d/5
Total Distance = 3d
Average Speed = Total Distance ÷ Total Time
Calculations:
=> Let the equal distance covered in each part be d km.
=> Total Distance = d + d + d = 3d km.
=> Total Time = (d/19) + (d/8) + (d/5)
=> Taking LCM of 19, 8, and 5 which gives 760.
=> Total Time = d × [(40 + 95 + 152) ÷ 760]
=> Total Time = d × (287 ÷ 760)
=> Average Speed = 3d ÷ [d × (287 ÷ 760)]
=> Average Speed = (3 × 760) ÷ 287
=> Average Speed = 2280 ÷ 287 = 7 ^(271)/287 km/hr.

Therefore The correct answer is 7 ^(271)/287 km/hr.

Additional Information

Average Speed for Two Equal Distances

When a person covers two equal distances at speeds x and y, the average speed is directly given by (2xy) ÷ (x + y).

Average Speed for Unequal Distances

If distinct distances d1, d2, d3... are covered at individual speeds s1, s2, s3..., then Average Speed = (d1 + d2 + d3...) ÷ (t1 + t2 + t3...).

Relative Speed

When two bodies move in the exact same direction, relative speed = |s1 − s2|. When moving in opposite directions, relative speed = s1 + s2.

Q82. Answer: (d) Intercalary

The correct answer is Intercalary.

Key Points

• Intercalary meristem is a type of meristematic tissue located at the nodes of plants.

• It is responsible for the regrowth of grasses and contributes to the elongation of internodes.

• Intercalary meristems allow rapid regeneration in grasses after grazing or mowing.

• This tissue is present in monocots, particularly in grasses, which aids their survival in environments with regular disturbances.

• Unlike apical meristem, which is found at the tips of roots and shoots, intercalary meristem is strategically located at the base of nodes and leaf blades.

Additional Information

• Meristematic Tissue:

• Meristematic tissues are responsible for the growth of plants and consist of actively dividing cells.

• These tissues are classified into apical, lateral, and intercalary based on their location.

• Apical meristem contributes to the primary growth at the tips of roots and shoots.

• Lateral meristem is involved in secondary growth, leading to an increase in the girth of the plant.

• Monocots vs. Dicots:

• Monocots, like grasses, have intercalary meristems that help them regrow quickly after damage.

• Dicots generally lack intercalary meristems and rely on apical and lateral meristems for growth.

• Node and Internode:

• Nodes are points on the stem where leaves or branches originate.

• Internodes are the regions between two nodes, which elongate due to intercalary meristem activity.

• Adaptation in Grasses:

• Grasses are adapted to survive grazing, fire, or mowing due to the presence of intercalary meristems.

• These tissues regenerate leaf blades and stems quickly, ensuring survival and growth.

Q83. Answer: (d) Rudra All-Arms Brigades

The correct answer is Rudra All-Arms Brigades.

Key Points

• On 26 July 2025, Indian Army announced the formation of the “Rudra All-Arms Brigades” as part of its major restructuring drive.

• These brigades convert existing single-arm brigades into integrated combat formations combining infantry, armour (tanks), artillery, engineers, UAVs (unmanned aerial vehicles) and Special Forces.

• The “Rudra” units are brigade-sized, self-sufficient units designed for rapid deployment and multi-domain operations, reflecting a shift from traditional arm-specific brigades.

• The concept builds on, but differs from, earlier proposed “Integrated Battle Groups (IBGs)” — the Rudra brigades are intended as self-contained all-arms brigades rather than smaller mixed units.

Additional Information

• The name “Rudra” comes from Sanskrit, symbolising a fierce, transformative force — aligning with the Army’s aim to create agile, future-ready formations.

• Under the new structure, around 250 single-arm brigades are to be converted into all-arms ones, with tailored logistics, combat support and unmanned systems included.

• These brigades emphasise integration of support arms (engineers, electronic warfare, UAVs) within the brigade rather than relying on divisional assets — enabling quicker decision-making and deployment.

• The restructuring ties into the Army’s broader “Decade of Transformation (2023–2032)” plan to align with modern battlefield

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requirements including multi-domain operations.

• While the Rudra brigades are new, the Army is also raising other units such as “Bhairav Light Commando Battalions”, “Shaktibaan Artillery Regiments” and “Divyastra Batteries” to complement the all-arms approach.

Q84. Answer: (d) Decreases by 26.49%

Shortcut Trick

Net multiplying factor = (1 − 0.10) × (1 − 0.45) × (1 − 0.10) × (1 + 0.65)

=> Net multiplying factor = 0.90 × 0.55 × 0.90 × 1.65 = 0.735075

Final value in percentage = 0.735075 × 100% = 73.5075%

Net percentage change = 73.5075% − 100% = −26.4925%

Therefore The correct answer is 26.49% decrease.

Alternate Method

Given:

The price of fuel decreases successively by 10%, 45%, 10% in the first three months.

The price of fuel increases by 65% in the fourth month.

Formula Used:

Final Value = Initial Value × (1 ± R1/100) × (1 ± R2/100) × ...

Successive Percentage Changes

−10%

−45%

−10%

+65%

100

90

49.5

44.55

73.51

Net Change: −26.49%

Calculations:

Let the original price of fuel be 100.

=> Price after 1^(st) month = 100 − (10% of 100) = 100 − 10 = 90

=> Price after 2^(nd) month = 90 − (45% of 90) = 90 − 40.5 = 49.5

=> Price after 3^(rd) month = 49.5 − (10% of 49.5) = 49.5 − 4.95 = 44.55

=> Price after 4^(th) month = 44.55 + (65% of 44.55) = 44.55 + 28.9575 = 73.5075

=> Total change in price = Final Price − Original Price

=> Total change = 73.5075 − 100 = −26.4925

=> Percentage decrease = 26.4925% ≈ 26.49%

Therefore The correct answer is 26.49% decrease.

Additional Information

Successive Percentage Change

When a value undergoes multiple percentage changes back-to-back, the net change is computed multiplicatively: Final = Initial × (1 ± a/100) × (1 ± b/100).

Effective Percentage Formula

For two successive changes 'a' and 'b', the effective change % is given by the formula: (a + b + ab/100). Use negative signs for percentage decreases.

Base Independence

The final percentage change is completely independent of the initial absolute value. Using 100 as the starting base is typically the fastest way to trace calculation steps without fractions.

Q85. Answer: (c) 1 : 3

Shortcut Trick

Cost Price (CP) of the mixture = SP × 100 ÷ (100 + P%) = 91 × 100 ÷ 130 = Rs. 70/kg.

Applying the rule of alligation:

Ratio of Ghee to Oil = (Mean CP − Cost of Oil) : (Cost of Ghee − Mean CP)

Ratio = (70 − 56) : (112 − 70) = 14 : 42 = 1 : 3.

Therefore The correct answer is 1 : 3.

Alternate Method

Given:

Cost of pure ghee = Rs. 112/kg

Cost of vegetable oil = Rs. 56/kg

Selling price (SP) of the mixture = Rs. 91/kg

Profit = 30%

Formula Used:

Cost Price (CP) = SP × 100 ÷ (100 + Profit%)

Ghee: Rs. 112

Oil: Rs. 56

Mean: 70

70 − 56 = 14

112 − 70 = 42

Ratio = 14 : 42 = 1 : 3

Calculations:

=> Mean CP = 91 × 100 ÷ (100 + 30)

=> Mean CP = 9100 ÷ 130

=> Mean CP = Rs. 70/kg

=> Quantity of Ghee : Quantity of Oil = (Mean CP − CP of Oil) : (CP of Ghee − Mean CP)

=> Quantity of Ghee : Quantity of Oil = (70 − 56) : (112 − 70)

=> Required Ratio = 14 : 42

=> Required Ratio = 1 : 3

Therefore The correct answer is 1 : 3.

Additional Information

Rule of Alligation

A technique used to find the ratio in which two ingredients at given prices must be mixed to produce a mixture of a desired average price. Ratio = (Mean Price − Price of Cheaper) : (Price of Dearer − Mean Price).

Mean Price (CP of Mixture)

Always apply alligation on the Cost Price (CP) of the ingredients and mixture, never on the Selling Price (SP). If SP and Profit/Loss% are given, first calculate the Mean CP using CP = SP × 100 ÷ (100 ± Profit/Loss%).

Adulteration Principle

In profit and loss problems involving pure ingredients mixed with water or cheaper substitutes, if an adulterant like water is considered completely free, its Cost Price is taken as zero during alligation.

Q86. Answer: (c) initiate free radical formation

The correct answer is initiate free radical formation.

Key Points

• Sunlight provides energy in the form of ultraviolet (UV) radiation, which is essential to break the bond between chlorine molecules (Cl_2) and initiate the process of free radical formation.

• Free radicals are highly reactive species required for the chain reaction of methane substitution.

• The reaction begins with the homolytic cleavage of chlorine (Cl_2) under the influence of UV light, producing chlorine free radicals.

• These chlorine free radicals attack methane (CH_4), leading to the formation of methyl radicals and hydrogen chloride (HCl).

• This chain reaction results in successive substitutions where methane reacts with chlorine to form chlorinated products such as chloromethane, dichloromethane, etc.

Additional Information

• Free Radical:

• A free radical is an atom or molecule that contains an unpaired electron, making it highly reactive.

• In chemical reactions, free radicals play a crucial role in initiating chain processes.

• Homolytic Cleavage:

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• Homolytic cleavage refers to the breaking of a bond where each atom retains one electron, forming two free radicals.
• This process is often facilitated by UV light or heat.
• Substitution Reaction:
• Substitution reactions involve the replacement of one atom or group in a molecule with another atom or group.
• In this case, chlorine atoms replace hydrogen atoms in methane during the reaction.
• Photochemical Reaction:
• A photochemical reaction is initiated by the absorption of light energy, typically UV or visible light.
• The substitution of methane with chlorine is a classic example of a photochemical reaction.
• Reaction Products:
• Depending on the extent of substitution, products such as chloromethane (CH3Cl), dichloromethane (CH2Cl2), trichloromethane (CHCl3), and tetrachloromethane(CHCl3) can be formed.

Q87. Answer: (a) Saudi Arabia

The correct answer is Saudi Arabia.

Key Points

• The 2034 FIFA World Cup will be hosted by Saudi Arabia after the country was confirmed as the sole bidder for the event.
• This will be the first time Saudi Arabia will host the FIFA World Cup, following its increasing involvement in global sports initiatives.
• Saudi Arabia's bid was made possible through FIFA's continental rotation policy, which favors hosting by countries from specific regions.
• Saudi Arabia has heavily invested in sports infrastructure and events, aiming to position itself as a global sports hub.
• The decision was part of FIFA's strategy to expand football's global reach and include more countries in hosting major tournaments.

Additional Information

• FIFA World Cup Overview:
• The FIFA World Cup is the most prestigious football tournament globally, held every four years since its inception in 1930.
• The tournament features teams from FIFA's six continental confederations competing for the title.
• It is the world's most-watched sporting event, with billions of viewers tuning in during each edition.
• Saudi Arabia's Vision 2030:
• Saudi Arabia's Vision 2030 is a strategic framework to reduce its dependency on oil and diversify its economy.
• Sports and tourism are key components of this vision, with large investments in global sports events like Formula 1, LIV Golf, and now the FIFA World Cup.
• FIFA's Continental Rotation Policy:
• This policy ensures geographical diversity in hosting the World Cup by rotating the event among FIFA's member confederations.
• It played a pivotal role in awarding Saudi Arabia the rights to host the 2034 World Cup.
• 2030 FIFA World Cup:
• The 2030 FIFA World Cup will be hosted jointly by six countries: Spain, Portugal, Morocco, Argentina, Uruguay, and Paraguay, commemorating the tournament's centenary.
• Special matches in Uruguay, Argentina, and Paraguay will honor the tournament's origins in South America.

Q88. Answer: (a) 54/73

Shortcut Trick

For inverse variation, the product of the variables remains constant.

=> $x1 \times (y1^3 - 1) = x2 \times (y2^3 - 1)$

=> $6 \times (4^3 - 1) = x \times (8^3 - 1)$

=> $6 \times 63 = x \times 511$

=> $x = 378 \div 511 = 54/73$

Therefore The correct answer is 54/73.

Alternate Method

Given:

x varies inversely as $(y^3 - 1)$.

When x = 6, y = 4.

Formula Used:

If A is inversely proportional to B, then A = k ÷ B, where k is a constant.
Inverse Variation: x × (y^3 − 1) = Constant
State 1
x1 = 6
y1 = 4
$y1^3$ − 1 = 63
=
State 2
x2 = ?
y2 = 8
$y2^3$ − 1 = 511
6 × 63 = x2 × 511
Calculations:
=> x = k ÷ (y^3 − 1)
=> 6 = k ÷ (4^3 − 1)
=> 6 = k ÷ (64 − 1)
=> k = 6 × 63 = 378
Now, substitute y = 8 to find the new value of x:
=> x = 378 ÷ (8^3 − 1)
=> x = 378 ÷ (512 − 1)
=> x = 378 ÷ 511
Divide both the numerator and the denominator by their common factor, 7:
=> x = (7 × 54) ÷ (7 × 73)
=> x = 54/73
Therefore The correct answer is 54/73.
Additional Information
Direct Variation
If two quantities vary directly, their ratio is constant: A ÷ B = k or A = k × B.
Inverse Variation
If two quantities vary inversely, their product is constant: A × B = k or A = k ÷ B.
Joint Variation
A quantity varies jointly when it is directly proportional to the product of two or more other quantities: A = k × B × C.

Q89. Answer: (d) SVWU

The logic followed here is:
Similarly,
Hence, the correct answer is "Option 4"

Q90. Answer: (a) Frequency

The correct answer is Frequency.
Key Points
• Frequency refers to the number of compressions or rarefactions passing a given point per unit time in a sound wave.
• It is typically measured in Hertz (Hz), which represents cycles per second.
• High-frequency sound waves correspond to a high pitch, while low-frequency sound waves correspond to a low pitch.
• The frequency of a sound wave determines its tone, distinguishing one sound from another.
• In physics, frequency is an essential parameter in the study of wave phenomena, including sound and electromagnetic waves.
Additional Information
• Amplitude:
• Amplitude measures the maximum displacement of particles in a sound wave from their equilibrium position.
• It is related to the loudness of the sound—the greater the amplitude, the louder the sound.
• Wavelength:
• Wavelength is the distance between two consecutive compressions or rarefactions in a sound wave.

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• It is inversely proportional to frequency: higher frequency means shorter wavelength.
• Loudness:
• Loudness is a subjective measure of sound intensity perceived by the human ear.
• It is influenced by both the amplitude of the sound wave and the sensitivity of the listener's ear.
• Sound Wave Basics:
• Sound waves are longitudinal waves that propagate through a medium by compressing and rarefying particles.
• The speed of sound depends on the medium's properties, such as density and elasticity.

Q91. Answer: (c) 48.4

Shortcut Trick

Using the deviation method, assume a base weighted average of 12.

Net weighted deviation = ∑ [Weight × (Value − Base)]

Net deviation = 29×(17−12) + 87×(12−12) + 15×(23−12) + 26×(45−12) + 18×(301−12)

Net deviation = (29 × 5) + 0 + (15 × 11) + (26 × 33) + (18 × 289) = 145 + 0 + 165 + 858 + 5202 = 6370

Average deviation = 6370 ÷ (29 + 87 + 15 + 26 + 18) = 6370 ÷ 175 = 36.4

Weighted Average = Base + Average deviation = 12 + 36.4 = 48.4

Therefore The correct answer is 48.4.

Alternate Method

Given:

Numbers (X) = 17, 12, 23, 45, 301

Weights (W) = 29, 87, 15, 26, 18

Formula Used:

Weighted Average = ∑(W × X) ÷ ∑W

17

12

23

45

301

W:29

W:87

W:15

W:26

W:18

Weighted Average = Sum(Value × Weight) ÷ Total Weight

Therefore 8470 ÷ 175 = 48.4

Calculations:

=> Sum of Weights (∑W) = 29 + 87 + 15 + 26 + 18

=> ∑W = 175

=> Sum of Products (∑(W × X)) = (29 × 17) + (87 × 12) + (15 × 23) + (26 × 45) + (18 × 301)

=> ∑(W × X) = 493 + 1044 + 345 + 1170 + 5418

=> ∑(W × X) = 8470

=> Weighted Average = 8470 ÷ 175

=> Weighted Average = 48.4

Therefore The correct answer is 48.4.

Additional Information

Weighted Average

It is a type of average where some data points contribute more heavily to the final value than others. Formula used is A_w = ∑(w_ix_i) ÷ ∑w_i.

Arithmetic Mean

The standard mean calculated by adding up all the data values and dividing by the total number of items. It assumes all weights are strictly equal.

Combined Average

When two distinct groups of sizes n1 and n2 have individual averages A1 and A2 respectively, their overall combined average is represented as (n1A1 + n2A2) ÷ (n1 + n2).

Q92. Answer: (c) NSS

The logic followed here is:

Hence, the correct answer is "Option 3"

Q93. Answer: (b) 3

Given: A, B, C, D, E and F have different heights.

• C is shorter than exactly 1 person.

• D is shorter than A but taller than F.

• E is shorter than F, and C is shorter than B

• The final Arrangement is

• Hence, the correct answer is "Option 2"

Q94. Answer: (c) Intrauterine insemination (IUI)

The correct answer is Intrauterine insemination (IUI).

Key Points

• Intrauterine insemination (IUI) is a fertility treatment and not a component of essential maternal care.

• Essential maternal care includes interventions like tetanus immunisation, iron and folic acid supplementation, and education on breastfeeding practices.

• Maternal care focuses on protecting the health of the mother and fetus during pregnancy, childbirth, and postpartum.

• IUI is a medical procedure used to treat infertility by placing sperm directly into a woman's uterus, bypassing natural conception barriers.

• While important in fertility treatments, IUI does not fall under preventive or essential maternal health measures.

Additional Information

• Tetanus Immunisation:

• Tetanus immunisation during pregnancy protects both the mother and the newborn from tetanus infection.

• Pregnant women are advised to take at least two doses of tetanus toxoid during pregnancy.

• Iron and Folic Acid Supplementation:

• Supplementation prevents anemia in pregnant women and reduces the risk of neural tube defects in newborns.

• It is recommended as part of antenatal care to ensure healthy fetal development.

• Education on Breastfeeding Practices:

• Breastfeeding education helps mothers understand the importance of exclusive breastfeeding for the first six months.

• Proper breastfeeding practices contribute to the overall health and development of the infant.

• Intrauterine Insemination (IUI):

• IUI is a procedure that involves placing washed and concentrated sperm directly into the uterus.

• It is often recommended for couples facing unexplained infertility, mild male factor infertility, or cervical factor infertility.

• It is not a preventive measure but a specific medical intervention for infertility.

Q95. Answer: (a) W

Given Number- (Left) D 4 & A $ Z G 7 R 5 % W 2 @ 3 # V 6 & F Y (Right)

If all the numbers are dropped from the series.

(Left) D & $ Z G R % W @ # V & F Y (Right)

Seventh from the right—(left) D & $ Z G R % W @ # V & F Y (Right)

Hence, the correct answer is "Option 1"

Q96. Answer: (a) Jannik Sinner

The correct answer is Jannik Sinner.

Key Points

• Carlos Alcaraz, the Spanish tennis sensation, secured his first-ever Cincinnati Open title in August 2025.

• He defeated Italy's Jannik Sinner in the final, as Sinner retired due to an injury during the match.

• The Cincinnati Open, also known as the Western & Southern Open, is one of the prestigious ATP Masters 1000 tournaments.

• Carlos Alcaraz is known for his exceptional athleticism, powerful baseline shots, and mental resilience, which have propelled him

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to the top of the tennis rankings.

• Jannik Sinner, a rising star in tennis, has been competing at the highest level and is known for his aggressive playing style and consistent performance.

Additional Information

• Cincinnati Open (Western & Southern Open)

• It is an annual tennis tournament held in Cincinnati, Ohio, as part of the ATP Tour and WTA Tour.

• It is categorized under the ATP Masters 1000 series for men and the WTA 1000 series for women.

• The tournament has a rich history, dating back to 1899, making it one of the oldest tennis events in the U.S.

• Played on hard courts, it serves as a key preparatory event for the US Open.

• Carlos Alcaraz

• Born on May 5, 2003, Alcaraz is a professional tennis player from Spain.

• He won his first Grand Slam title at the US Open in 2022 and became the youngest ATP No. 1 in history.

• His playing style is characterized by explosive shot-making, excellent court coverage, and tactical versatility.

• Alcaraz is considered one of the brightest talents in modern tennis and has achieved multiple ATP titles.

• Jannik Sinner

• Born on August 16, 2001, Sinner is an Italian tennis player who turned professional in 2018.

• He has a strong playing style with powerful groundstrokes and a calm demeanor under pressure.

• Sinner has won several ATP titles and is regarded as one of the most promising players of his generation.

• He has consistently performed well in major tournaments, advancing deep into various competitions.

• ATP Masters 1000

• It is a series of nine tennis tournaments for men organized by the Association of Tennis Professionals (ATP).

• The Masters 1000 events are considered the most prestigious tournaments after the Grand Slams and the ATP Finals.

• These tournaments offer significant ranking points and prize money, attracting top players worldwide.

• Notable Masters 1000 events include Indian Wells, Miami, Madrid, Rome, and Cincinnati.

Q97. Answer: (a) Tidal zone

The correct answer is Tidal zone.

Key Points

• The tidal zone, also called the intertidal zone, is the area between the high tide and low tide marks on sea margins.

• It is a highly dynamic environment, as it is regularly submerged and exposed due to tidal movements.

• The tidal zone is known for its rich biodiversity, including species such as barnacles, mussels, crabs, and algae adapted to survive in these fluctuating conditions.

• This zone plays a critical role in coastal ecosystems by providing habitats, serving as a feeding ground, and acting as a buffer against coastal erosion.

• The tidal zone is divided into sub-zones, such as the spray zone, high tide zone, mid-tide zone, and low tide zone, based on the frequency and duration of water coverage.

Additional Information

• Tides

• Tides are the periodic rise and fall of sea levels caused by the gravitational interaction between the Earth, Moon, and Sun.

• There are two main types of tides: spring tides (higher high tides) and neap tides (lower high tides).

• Intertidal Ecology

• The intertidal zone is a critical environment that supports diverse life forms, including algae, invertebrates, and birds.

• Organisms in this zone must adapt to extreme conditions such as desiccation, salinity changes, and wave action.

• Coastal Protection

• The tidal zone helps in protecting coastal areas by dissipating wave energy and preventing erosion.

• It also acts as a natural filter, improving water quality by trapping sediments and pollutants.

• Human Impact

• Human activities, such as coastal development, pollution, and overharvesting of marine resources, threaten the health of tidal zones.

• Conservation efforts, such as marine protected areas and sustainable practices, aim to mitigate these impacts.

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Q98. Answer: (a) 207

The logic follows,

Hence, the correct answer is "Option 1"

Q99. Answer: (d) Urbanisation

The correct answer is Urbanisation.

Key Points

• Urbanisation refers to the process by which an increasing percentage of a population lives in urban areas, often due to migration from rural regions.

• The level of urbanisation is generally expressed as the percentage of a country's population living in cities or towns.

• Urbanisation is driven by factors such as industrialisation, better employment opportunities, enhanced living standards, and improved infrastructure in cities.

• As per the United Nations, over 56% of the global population resides in urban areas (2023 data), and this figure is projected to grow further.

• Countries with rapid urbanisation often experience challenges like overcrowding, strain on resources, pollution, and housing shortages.

Additional Information

• Population Density:

• Population density refers to the number of people living per unit area, usually expressed as persons per square kilometer.

• It helps in understanding the distribution of population in a specific region and is a key metric in demographic studies.

• Crude Birth Rate:

• It is defined as the number of live births occurring during a year per 1,000 people in a population.

• It provides insights into population growth trends and fertility rates.

• Growth Rate:

• The growth rate refers to the rate at which a population increases over a specific period, often expressed as a percentage.

• It accounts for factors like births, deaths, and migration.

• Challenges of Urbanisation:

• Urbanisation may lead to challenges such as inadequate housing, traffic congestion, waste management issues, and environmental degradation.

• Governments often implement urban planning strategies to mitigate these challenges and ensure sustainable development.

Q100. Answer: (b) Hardeep Singh Brar

The correct answer is Hardeep Singh Brar.

Key Points

• Hardeep Singh Brar was appointed as the President and Chief Executive Officer of BMW Group India effective September 2025.

• He succeeded Santosh Iyer, the previous CEO of BMW Group India.

• Hardeep Singh Brar has extensive experience in the automobile industry, having worked with leading brands such as Kia Motors, Hyundai, and Maruti Suzuki.

• BMW Group India is a subsidiary of the BMW Group, headquartered in Munich, Germany, and specializes in luxury vehicles, motorcycles, and premium services.

• The appointment reflects BMW's commitment to strengthening its leadership team and enhancing its market presence in India.

Additional Information

• BMW Group Overview:

• Founded in 1916, BMW stands for Bayerische Motoren Werke AG, headquartered in Munich, Germany.

• BMW is renowned for manufacturing luxury cars, motorcycles, and high-performance engines.

• Its brands include BMW, MINI, Rolls-Royce, and BMW Motorrad.

• BMW Group India:

• BMW India was established in 2006 and operates a manufacturing plant in Chennai, a parts warehouse in Mumbai, and training centers in Gurgaon.

• It imports and assembles BMW vehicles locally to cater to the Indian market.

• Luxury Car Market in India:

• The Indian luxury car market is growing steadily, driven by rising disposable income and increasing demand for premium products.

• BMW competes with brands like Mercedes-Benz, Audi, and Jaguar Land Rover in this segment.

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• Automotive Leadership Trends:

• Executives like Hardeep Singh Brar bring extensive experience in sales, marketing, and strategic planning to drive growth in competitive markets.

• Leadership appointments in global companies are often aimed at aligning regional strategies with global priorities.

Q101. Answer: (c) 1%

The correct answer is 1%.

Key Points

• Green plants in a terrestrial ecosystem capture approximately 1% of the solar energy that falls on their leaves and convert it into chemical energy via photosynthesis.

• Most of the solar energy (about 99%) is either reflected or absorbed as heat and is not utilized by plants.

• This captured energy forms the base of the food chain and supports all trophic levels in the ecosystem.

• The process of energy capture by plants is essential for the functioning of ecosystems, as it drives primary production.

• The efficiency of energy capture and its conversion into biomass varies depending on factors like plant species, climate, and environmental conditions.

Additional Information

• Photosynthesis

• Photosynthesis is the process by which green plants use sunlight, carbon dioxide, and water to produce glucose and oxygen.

• The chemical energy stored in glucose serves as the primary energy source for most living organisms.

• Gross Primary Productivity (GPP)

• GPP refers to the total amount of energy captured by green plants through photosynthesis in a given area and time.

• A significant portion of this energy is used by plants for respiration.

• Net Primary Productivity (NPP)

• NPP is the energy remaining after plants use a portion of GPP for respiration.

• NPP = GPP - Respiration; it represents the energy available to herbivores and higher trophic levels.

• Energy Flow in Ecosystems

• Energy flows through ecosystems in a unidirectional manner, starting from producers to various trophic levels (herbivores, carnivores, decomposers).

• Approximately 90% of energy is lost as heat at each trophic level due to metabolic processes.

• Terrestrial Ecosystems

• These ecosystems are land-based ecosystems, such as forests, grasslands, deserts, and tundras.

• The primary producers in terrestrial ecosystems are green plants, which form the foundation of the food web.

Q102. Answer: (d) Loss, 3.5%

Shortcut Trick

Apply the weighted average method to find the net profit or loss percentage directly.

Net Profit/Loss % = [(Ratio of X × Profit % on X) + (Ratio of Y × Loss % on Y)] ÷ (Sum of Ratios)

=> Net % = [(3 × 14) + (7 × −11)] ÷ (3 + 7)

=> Net % = (42 − 77) ÷ 10 = −35 ÷ 10 = −3.5%

The negative sign indicates a net loss of 3.5% in the entire transaction.

Therefore The correct answer is Loss, 3.5%.

Alternate Method

Given:

Ratio of Cost Prices of articles X and Y = 3 : 7

Profit earned on article X = 14%

Loss incurred on article Y = 11%

Article X

Ratio: 3 units

Profit: +14%

Article Y

Ratio: 7 units

Loss: −11%

Overall Transaction (10 units)

Net Change = (3 × 14) + (7 × −11) = 42 − 77 = −35

Net % = −35 ÷ 10 = −3.5% (Loss)

Calculations:

Let the cost price of article X be 300 units and the cost price of article Y be 700 units.

=> Total Cost Price = 300 + 700 = 1000 units

Profit on selling article X = 14% of 300 units

=> Profit = (14 ÷ 100) × 300 = 42 units

Loss on selling article Y = 11% of 700 units

=> Loss = (11 ÷ 100) × 700 = 77 units

Net change in the transaction = Profit on X − Loss on Y

=> Net Loss = 77 − 42 = 35 units

Net Loss Percentage = (Net Loss ÷ Total Cost Price) × 100

=> Loss % = (35 ÷ 1000) × 100

=> Loss % = 3.5%

Therefore The correct answer is Loss, 3.5%.

Additional Information

Weighted Average Formula

When quantities are mixed in a ratio n1 : n2 with percentage changes p1 and p2, the net change is (n1 × p1 + n2 × p2) ÷ (n1 + n2).

Overall Profit or Loss

The overall profit or loss percentage must always be calculated over the sum of the total cost prices, and never based on the individual selling prices alone.

Rule of Alligation

If the overall profit/loss percentage is already known, the rule of alligation can be used backwards to find the exact ratio of the cost prices of the two constituent articles.

Q103. Answer: (a) 277

The logic follows here,

Hence, the correct answer is "Option 1"

Q104. Answer: (d) Narendra Modi

The correct answer is Narendra Modi.

Key Points

• The Chandrayaan-2 mission was launched by the Indian Space Research Organisation (ISRO) on 22 July 2019.

• During this period, Narendra Modi served as the Prime Minister of India.

• Chandrayaan-2 aimed at exploring the Moon, focusing on the lunar south pole region.

• The mission comprised an orbiter, a lander (Vikram), and a rover (Pragyan).

• It was a significant step forward in India's space exploration journey, showcasing advancements in indigenous technology under PM Modi's leadership.

Additional Information

• Chandrayaan-1:

• India's first lunar mission, launched in October 2008.

• It confirmed the presence of water molecules on the Moon.

• Chandrayaan-1 paved the way for future lunar exploration missions.

• Chandrayaan-2 Objectives:

• To study the lunar surface, analyze its composition, and search for water ice.

• Investigate the Moon's topography, mineralogy, and exosphere.

• Focus on the unexplored lunar south pole region, which has potential reserves of water ice.

• ISRO Overview:

• The Indian Space Research Organisation (ISRO) is India's national space agency, established in 1969.

• ISRO operates under the Department of Space, which functions directly under the Prime Minister of India.

• ISRO's missions contribute to satellite communication, Earth observation, and interplanetary exploration.

• Vikram Lander:

• The lander component of Chandrayaan-2 was named after Dr. Vikram Sarabhai, the father of India's space program.
• Although it lost communication during its descent, the lander showcased India's technological prowess in space exploration.

Q105. Answer: (a) 9 km

• Samar starts from point A and drives 7 km towards east.
• He then takes a right turn and drives 9 km.
• He takes a final right turn and drives 13 km and stops at point B.
• Wahid starts from point P, which is 14 km east of Point A, and drives 3 km towards west.
• He then takes a left turn and drives 9 km.
• He takes a final right turn and drives 8 km and stops at Point Q.

The Final Diagram,

Hence, the correct answer is "Option 1"

Q106. Answer: (c) QHS

The logic is as follows-

All follows same logic except QHS. T in place of S

Hence, the correct answer is "Option 3"

Q107. Answer: (d) Neither conclusion (I) nor (II) follows

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

(I): No octopus is a stone. - False (Their is no direct relation between Octopus and Stone; maybe it's possible, but not definite.)

(II): Some pens are octopuses. - False (Their is no direct relation between Pens and octopuses; maybe it's possible, but not definite.)

Neither conclusion (I) nor (II) follows

Hence, the correct answer is "Option 4"

Q108. Answer: (a) 7/9

Shortcut Trick

Notice that the term 4/3 appears as both positive and negative in the given expression.

Cancel out +4/3 and −4/3 directly to save time.

The expression immediately reduces to 1 ÷ (1 + 2/7).

Solve the denominator: 1 + 2/7 = 9/7.

The reciprocal of 9/7 is 7/9.

Therefore The correct answer is 7/9.

Alternate Method

Given:

Expression: 4/3 + [1 ÷ (1 + 2/7)] − 4/3

Concept Used:

BODMAS Rule: Solve brackets first, followed by division, addition, and subtraction.

Calculation:

=> Let E = 4/3 + [1 ÷ (1 + 2/7)] − 4/3

=> First, simplify the term inside the inner parenthesis: 1 + 2/7

=> 1 + 2/7 = (7 + 2) / 7 = 9/7

=> Now, substitute this result back into the main expression:

=> E = 4/3 + [1 ÷ (9/7)] − 4/3

=> Dividing 1 by a fraction gives its reciprocal. So, 1 ÷ (9/7) = 7/9

=> E = 4/3 + 7/9 − 4/3

=> Rearranging the terms to group like fractions: E = (4/3 − 4/3) + 7/9

=> E = 0 + 7/9 = 7/9

Therefore The correct answer is 7/9.

Additional Information

BODMAS Rule

BODMAS stands for Brackets, Orders, Division, Multiplication, Addition, and Subtraction. It sets the standard sequence of operations for evaluating mathematical expressions correctly.

Reciprocal of a Fraction

The reciprocal of a fraction a/b is b/a. It is mathematically equivalent to dividing 1 by the fraction: 1 ÷ (a/b) = b/a.

Addition and Subtraction of Fractions

When adding or subtracting fractions with identical denominators, you can directly add or subtract the numerators while keeping the denominator the same.

Q109. Answer: (b) 35

Shortcut Trick

A number is divisible by 35 if it is divisible by its co-prime factors 5 and 7.

The number 977340 ends in 0, so it is clearly divisible by 5.

Applying the 7 divisibility rule (difference of alternate triplets): 977 − 340 = 637.

Since 637 is completely divisible by 7 (637 ÷ 7 = 91), the original number is divisible by 7.

Hence, the number is divisible by 5 × 7 = 35.

Therefore The correct answer is 35.

Alternate Method

Given:

Number = 977340

To check:

Which among 24, 35, 37, 34 divides 977340 completely.

Calculations:

=> Let's check 24: A number is divisible by 24 if it is divisible by both 3 and 8.

=> The last 3 digits are 340. 340 is not divisible by 8, so 977340 is not divisible by 24.

=> Let's check 35: A number is divisible by 35 if it is divisible by both 5 and 7.

=> Unit digit is 0, so it is divisible by 5.

=> To check for 7, divide the number directly: 977340 ÷ 7 = 139620 (Remainder is 0).

=> Since it is divisible by both 5 and 7, it is divisible by 35.

=> Checking 34 (17 × 2): 977340 ÷ 17 gives a remainder of 10, so it is not divisible.

=> Checking 37: 977340 ÷ 37 gives a remainder of 22, so it is not divisible.

Therefore The correct answer is 35.

Additional Information

Divisibility Rule of 7, 11, and 13

If the difference between the number formed by the last three digits and the number formed by the remaining digits is divisible by 7, 11, or 13, then the original number is divisible by 7, 11, or 13 respectively.

Divisibility Rule of 8

A number is divisible by 8 if the number formed by its last three digits is perfectly divisible by 8.

Divisibility Rule of Composite Numbers

To check divisibility by a composite number (like 35 or 24), factorize it into co-prime factors. The number must be individually divisible by all its co-prime factors.

Q110. Answer: (c) Both I and II follow

After knowing the fact that excessive fishing is one of the stated causes of the fish population decline, regulating (i.e., restricting) fishing would help fish populations recover.Industrial pollution is another stated cause of the problem.Ensuring that industries treat waste before discharge directly addresses this cause.

Both I and II follow

Hence, the correct answer is "Option 3"

Q111. Answer: (d) They have strong affinity for the dispersion medium.

The correct answer is They have strong affinity for the dispersion medium.

Key Points

• Lyophilic sols are characterized by their strong attraction for the dispersion medium (typically water).

• Due to their strong affinity for the dispersion medium, lyophilic sols are highly stable and do not coagulate easily.

• They exhibit low sensitivity to electrolytes, unlike lyophobic sols, which are easily coagulated.

• Lyophilic sols show the Tyndall effect, which involves scattering of light by colloidal particles.

• Examples of lyophilic sols include gum, gelatin, starch, and proteins, which dissolve easily in water and form stable colloidal solutions.

Additional Information

• Lyophilic colloids:

• These are also called reversible colloids because they can be easily converted back to their original state after coagulation.

• They are formed by substances that have a strong affinity for the dispersion medium.

• Lyophobic colloids:

• Also known as irreversible colloids, they do not have a strong affinity for the dispersion medium.

• They are less stable compared to lyophilic colloids and require stabilizing agents for their preparation.

• Tyndall Effect:

• It is the scattering of light by colloidal particles, making the path of the light visible.

• Both lyophilic and lyophobic sols exhibit the Tyndall effect.

• Coagulation:

• It refers to the process of aggregation of colloidal particles to form larger particles, leading to precipitation.

• Lyophilic sols are more resistant to coagulation due to their stability.

• Applications of Lyophilic Colloids:

• Used in food products like gelatin and starch-based foods.

• Play a role in biological systems, such as protein-based colloids in cells.

Q112. Answer: (a) 14

Shortcut Trick

For any arithmetic progression or sequence of consecutive integers with an odd number of terms, the average is always the exact middle term.

Since there are 5 consecutive integers, the 3rd integer (middle term) is equal to the average, which is 12.

The sequence of the five integers is: 10, 11, 12, 13, 14.

The largest integer in this sequence is 14.

Therefore The correct answer is 14.

Alternate Method

Given:

The average of five consecutive integers is 12.

Formula Used:

Average = Sum of all values ÷ Total number of values

Average of 5 Consecutive Integers x 10 x+1 11 x+2 12 Average / Middle x+3 13 x+4 14 Largest

Calculations:

=> Let the five consecutive integers be x, x + 1, x + 2, x + 3, and x + 4.

=> Sum of these integers = x + (x + 1) + (x + 2) + (x + 3) + (x + 4) = 5x + 10

=> Average = (5x + 10) ÷ 5

=> Average = x + 2

=> We are given that the average is 12.

=> x + 2 = 12

=> x = 12 − 2 = 10

=> The largest integer in the series is x + 4.

=> Largest integer = 10 + 4 = 14

Therefore The correct answer is 14.

Additional Information

Average of Consecutive Numbers

The average of any sequence of consecutive numbers (or an Arithmetic Progression) is always equal to (First Term + Last Term) ÷ 2.

Sum of First n Natural Numbers

The sum of the first n natural numbers is given by the mathematical formula: Sum = n × (n + 1) ÷ 2.

Average of Even and Odd Series

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The average of the first n consecutive even numbers is always (n + 1), and the average of the first n consecutive odd numbers is strictly n.

Q113. Answer: (d) Waddhamna village, Nagpur district, Maharashtra

The correct answer is Waddhamna village, Nagpur district, Maharashtra.

Key Points

• In August 2025, India launched its first Artificial Intelligence (AI)-powered Anganwadi at Waddhamna village, Nagpur district, Maharashtra.

• The initiative marks a significant step forward in integrating technology with early childhood education.

• The AI-powered Anganwadi is designed to enhance learning outcomes for children by incorporating interactive and personalized educational tools.

• This facility uses AI-driven learning modules, offering tailored educational content based on the child's learning pace and capabilities.

• It also focuses on health monitoring by integrating AI tools to track the nutritional status and growth of children.

Additional Information

• Anganwadi System in India

• Anganwadis are rural childcare centers established under the Integrated Child Development Services (ICDS) scheme, launched in 1975.

• They aim to provide supplementary nutrition, preschool education, and health services to children under six years and their mothers.

• The introduction of AI into Anganwadis is expected to revolutionize early childhood care and education in India.

• Artificial Intelligence in Education

• AI-driven tools provide personalized learning experiences by analyzing individual student data to tailor educational content.

• It helps in automating administrative tasks, enabling teachers to focus more on teaching and student engagement.

• AI also facilitates early identification of learning disabilities and offers remedial solutions.

• Significance of the AI-powered Anganwadi

• The initiative aligns with India's focus on Digital India and the use of advanced technology in public services.

• It is expected to narrow the urban-rural gap in early childhood education by providing modern learning tools to rural areas.

• The AI-powered Anganwadi also incorporates advanced health tracking systems for children, ensuring early detection of malnutrition or other health issues.

• Future Implications

• This project could serve as a pilot for scaling similar AI-powered facilities across India.

• It highlights India's commitment to leveraging technology for achieving Sustainable Development Goals (SDGs), particularly quality education (SDG 4) and good health and well-being (SDG 3).

Q114. Answer: (d) zk

The logic follows here,

Hence, the correct answer is "Option 4"

Q115. Answer: (d) Dandiya

The correct answer is Dandiya.

Key Points

• Dandiya Raas is a traditional folk dance form originating from Gujarat, India.

• It is performed using a pair of decorated sticks, symbolizing the swords of Goddess Durga.

• This dance is primarily performed during the Navratri festival, which is celebrated to honor Goddess Durga.

• Both men and women actively participate in Dandiya Raas, dressed in vibrant traditional attire such as chaniya choli for women and kediyu for men.

• The rhythmic beats of folk music and synchronized movements of dancers make Dandiya an energetic and visually appealing dance form.

Additional Information

• Navratri Festival:

• Navratri is a nine-day Hindu festival dedicated to the worship of Goddess Durga and her nine forms.

• It is celebrated with great enthusiasm across India, especially in Gujarat and West Bengal.

• During Navratri, people perform various traditional dances such as Garba and Dandiya Raas.

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• Garba Dance:
• Garba is another traditional dance form performed during Navratri alongside Dandiya.
• Unlike Dandiya, Garba is performed with circular movements and clapping, without the use of sticks.
• Both Garba and Dandiya have cultural significance in Gujarat's festivities.
• Symbolism of Dandiya:
• The decorated sticks used in Dandiya represent the swords of Goddess Durga.
• The dance symbolizes the fight between Goddess Durga and the demon Mahishasura.
• Traditional Costumes:
• Women wear colorful chaniya choli with intricate embroidery and mirror work.
• Men wear kediyu, a traditional outfit, paired with turbans.

Q116. Answer: (c) 11.4

Shortcut Trick
The distance between the cabs equals the distance travelled by one cab in 12 minutes.
The man and cab cover this same distance moving towards each other in 10 minutes.
Speed ratio = Inverse of Time ratio = 12 : 10 = 6 : 5.
Relative Speed : Cab Speed = (57 + Speed of man) : 57 = 6 : 5
=> 57 + Speed of man = 57 × 6 ÷ 5 = 68.4 km/hr
=> Speed of man = 68.4 − 57 = 11.4 km/hr.
Therefore The correct answer is 11.4 km/hr.
Alternate Method
Given:
Speed of cabs = 57 km/hr
Time interval between cabs = 12 minutes = 12 ÷ 60 hours
Time interval at which man meets the cabs = 10 minutes = 10 ÷ 60 hours
Formula Used:
Distance = Speed × Time
Relative Speed (Opposite Direction) = Speed of Object 1 + Speed of Object 2
Cab 2
57 km/hr
Cab 1
57 km/hr
Man
S km/hr
Distance = 12 min gap
Meets Cab 2 in 10 mins (Relative Speed)
Calculations:
Let the speed of the man be S km/hr.
Distance between two consecutive cabs = Speed of cab × Time interval
=> Distance = 57 × (12 ÷ 60) km
When the man meets the first cab, the distance to the second cab is exactly this calculated distance.
Since they move towards each other in the opposite direction, relative speed = (57 + S) km/hr.
Time taken to meet the second cab = Distance ÷ Relative Speed
=> 10 ÷ 60 = [57 × (12 ÷ 60)] ÷ (57 + S)
=> 10 × (57 + S) = 57 × 12
=> 570 + 10S = 684
=> 10S = 684 − 570
=> 10S = 114
=> S = 11.4 km/hr
Therefore The correct answer is 11.4 km/hr.
Additional Information
Relative Speed in Opposite Direction

When two objects move towards each other, their relative speed is the sum of their individual speeds: Relative Speed = S1 + S2.

Relative Speed in Same Direction

When two objects move in the same direction, their relative speed is the difference of their individual speeds: Relative Speed = |S1 − S2|.

Meeting Point Concept

If vehicles leave a point at a regular interval T, a person approaching from the opposite direction meets them at interval t. The relation is: Distance = Cab Speed × T = (Cab Speed + Person Speed) × t.

Q117. Answer: (c) one

The correct answer is one.

Key Points

• Infant mortality rate refers to the number of deaths of infants under one year of age per 1,000 live births.

• It is a critical indicator used to measure the overall health of a population, particularly maternal and child health services.

• The calculation of infant mortality rate is based on data collected from hospitals, birth registries, and surveys.

• Factors affecting infant mortality include access to healthcare, maternal nutrition, and socioeconomic conditions.

• Globally, organizations like WHO, UNICEF, and national health departments monitor infant mortality rates as part of public health assessment.

Additional Information

• Neonatal mortality rate: Refers to the number of deaths of newborns within the first 28 days of life per 1,000 live births.

• Postneonatal mortality rate: Refers to the number of deaths of infants aged 29 days to one year per 1,000 live births.

• Under-five mortality rate: Refers to the number of deaths of children under five years of age per 1,000 live births.

• Countries with higher infant mortality rates often face challenges like poor healthcare infrastructure, malnutrition, and lack of sanitation.

• Reducing infant mortality is a key focus of international development goals, including the United Nations' Sustainable Development Goal 3 (Good Health and Well-Being).

Q118. Answer: (d) Rajendra I

The correct answer is Rajendra I.

Key Points

• Rajendra I was one of the greatest Chola rulers and is well-known for his military conquests, including the conquest of the Ganga region.

• He succeeded his father Rajaraja I and expanded the Chola Empire beyond the boundaries established by his predecessors.

• The Ganga conquest was part of his northern expedition, referred to as the "Gangaikondachola Yatra," which symbolized his victory over the region.

• To commemorate this achievement, Rajendra I founded the new capital city "Gangaikonda Cholapuram," meaning "The Chola who brought the Ganga."

• Rajendra I's reign marked the zenith of Chola power, with significant territorial expansion and cultural prosperity.

Additional Information

• Chola Dynasty:

• The Chola Dynasty was one of the longest-ruling dynasties in the history of southern India, spanning from approximately 9th to 13th century CE.

• It is renowned for its contributions to art, architecture, trade, and military achievements.

• The Cholas built magnificent temples, including the Brihadeeswarar Temple, which is a UNESCO World Heritage Site.

• Gangaikonda Cholapuram:

• This city was established by Rajendra I as the capital of the Chola Empire after his conquest of the Ganga region.

• The name symbolizes his victory and the bringing of sacred Ganga water to the south.

• The Brihadeeswarar Temple at Gangaikonda Cholapuram is an architectural marvel and remains an important historical site in Tamil Nadu.

• Administrative and Military Achievements:

• Rajendra I maintained a well-organized administrative system and a powerful navy, enabling overseas expeditions.

• He conducted successful expeditions to Southeast Asia, including Srivijaya in modern-day Indonesia.

• These achievements further enhanced the Chola Empire's influence in international trade and politics.

• Legacy:

• Rajendra I's reign is considered the golden age of the Chola Empire, marked by prosperity and advancements in art and

architecture.

• His achievements in military conquests and governance set a high standard for subsequent rulers.

Q119. Answer: (b) Human Development Report

The correct answer is Human Development Report.

Key Points

• Life expectancy is a key indicator included in the Human Development Index (HDI), which is part of the Human Development Report published annually by the United Nations Development Programme (UNDP).

• The Human Development Report aims to measure and rank countries based on human development indicators such as life expectancy, education, and income levels.

• Life expectancy reflects the average number of years a person is expected to live, based on current mortality rates.

• It is used to assess the health and well-being of populations globally and is influenced by factors such as healthcare quality, nutrition, and socio-economic conditions.

• The report helps policymakers design strategies to improve living standards and address inequalities in health, education, and income.

Additional Information

• Human Development Index (HDI):

• HDI is a composite index measuring a country's average achievements in three basic aspects of human development: health (life expectancy), education (mean years of schooling and expected years of schooling), and standard of living (gross national income per capita).

• It was introduced by the UNDP in 1990 as a measure of development beyond economic growth.

• Factors Affecting Life Expectancy:

• Quality of healthcare services, access to medical facilities, and advancements in medical technology.

• Socio-economic factors, including poverty levels, education, and sanitation.

• Environmental factors, such as pollution levels and availability of clean water.

• Significance of Life Expectancy:

• It is a critical indicator of a country’s overall health infrastructure and development.

• Longer life expectancy often correlates with higher levels of socio-economic development and better living conditions.

• Global Trends in Life Expectancy:

• Life expectancy globally has increased due to advancements in healthcare, improved nutrition, and better living conditions.

• However, disparities exist between high-income and low-income countries due to unequal access to resources and healthcare.

Q120. Answer: (c) 142/7% decrease

Shortcut Trick

Total volume is conserved. Base area is Volume ÷ Height. The volume ratio 3:4 is extra information!

=> Old flat area (cylinder bases) = 2 × (Volume ÷ H) = 2V ÷ H

=> New flat area (cone bases) = 3 × (Volume ÷ h) = 3V ÷ h

=> Area Ratio (New : Old) = (3 ÷ h) : (2 ÷ H) = (3 ÷ 35) : (2 ÷ 20) = 60 : 70 = 6 : 7

=> Decrease in flat area = 7 − 6 = 1 part

=> Percentage decrease = (1 ÷ 7) × 100 = 14⅔7%

Therefore The correct answer is 14⅔7% decrease.

Alternate Method

Given:

Cylinder: Radius (R) = 7 cm, Height (H) = 20 cm

Cones: Height (h) = 35 cm, Volume ratio = 3 : 4

R=7

H=20

Old Area = $2\pi R^2$

→

Melted

r1

h=35

r2

h=35

New Area = $\pi r1^2 + \pi r2^2$

Volume Ratio 3 : 4

Step 1: Calculate Cylinder Volume

=> Total Volume (V) = $\pi R^2H = \pi \times 7^2 \times 20 = 980\pi$ cm³

Step 2: Calculate Cone Volumes

=> Total volume is distributed in 3 : 4 ratio (Sum of parts = 7).

=> V1 = $(3 \div 7) \times 980\pi = 420\pi$ cm³

=> V2 = $(4 \div 7) \times 980\pi = 560\pi$ cm³

Step 3: Calculate Base Areas (πr^2) of Cones

=> V1 = ⅓ × Base Area1 × h => $420\pi = ⅓ \times \pi r1^2 \times 35$

=> Base Area1 = $\pi r1^2 = (420\pi \times 3) \div 35 = 36\pi$ cm²

=> V2 = ⅓ × Base Area2 × h => $560\pi = ⅓ \times \pi r2^2 \times 35$

=> Base Area2 = $\pi r2^2 = (560\pi \times 3) \div 35 = 48\pi$ cm²

Step 4: Calculate Percentage Change in Flat Area

=> Old Flat Area (Top + Bottom bases) = $2 \times \pi R^2 = 2 \times 49\pi = 98\pi$ cm²

=> New Flat Area (Cone bases) = $36\pi + 48\pi = 84\pi$ cm²

=> Area Decrease = $98\pi - 84\pi = 14\pi$ cm²

=> Percentage Decrease = $(14\pi \div 98\pi) \times 100 = (1 \div 7) \times 100 = 14⅔\%$

Therefore The correct answer is 14⅔% decrease.

Additional Information

Recasting Solids Principle

When one 3D shape is melted to form another, the total volume strictly remains constant (V1 = V2), but the total surface area and flat surface area generally change depending on the new dimensions.

Flat Surface Area Geometry

For a solid cylinder, the flat surface consists of the top and bottom circular faces: Area = $2\pi r^2$. For a solid cone, the flat surface is only the bottom circular face: Area = πr^2.

Volume and Base Area Relation

Both shapes have volumes proportional to their base areas. Cylinder: V = Base Area × Height. Cone: V = ⅓ × Base Area × Height. Using this relation allows direct calculation of base areas without computing actual radii.

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