RRB NTPC CBT 2 (Level-3) Official Paper (Held On: 14 June 2022 Shift 2) (Previous Year Paper)

RRB NTPC • 2022 • 120 questions • 90 minutes • Answer key and solutions

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FULL TEST

Q1. Who among the following is not an Odissi Dancer?

(a) Shagun Bhutani
(b) Darshana Jhaveri
(c) Chitra Krishnamurti
(d) Kumkum Mohanty

Q2. Select the alphanumeric-cluster from among the given options that can replace the question mark (?) in the following series.

F6, H12, J18, L24,?

(a) M30
(b) M12
(c) N30
(d) N12

Q3. Simplify:

$4\sqrt{(1296^3)}$

(a) 288
(b) 512
(c) 864
(d) 216

Q4. Seven boxes of different colours, Red, Yellow, Blue, Green, Orange, Violet and Indigo were stocked one on the other, not necessarily in the same order. No other box was placed below the orange box. The Violet box was placed second to the top of the Blue box. The Green box was second to the bottom of the Indigo box. The Red box was placed at the topmost position. The Yellow box was exactly above the Indigo box. Which of the following is the correct pair of box and its position?

(a) Violet box – 7^(th) position from the top
(b) Yellow box – 5^(th) position from the top
(c) Green box – 3^(rd) position from the top
(d) Blue box – 6^(th) position from the top

Q5. 'BELATED' is related to 'TLEEDBA' and 'STOREY is related to 'YTSROE' in the same way as 'DOUBBLE' is related to '_____'.

(a) OULEDBC
(b) UOLEDBC
(c) OULEDBB
(d) UOLEDBB

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Q6. Emma Raducanu, recipient of BBC Sports Personality of the Year 2021 award, plays which of the following sports?

(a) Tennis
(b) Badminton
(c) Swimming
(d) Diving

Q7. Find the reciprocal of the sum of the reciprocals of the numbers. 1/4, 4/3, 5/7, 5/4, 8/5

(a) 23/22
(b) 22/23
(c) 40/303
(d) 607/120

Q8. Five candidates, J, K, L, M and N are sitting in the same row, facing north waiting to be interviewed by the HR Manager. N is to the left of K. L is an immediate neighbor of both K and J. If J is fourth from the left, then how far is N from the right?

(a) 2^(nd) from the right
(b) 4^(th) from the right
(c) 5^(th) from the right
(d) 3^(rd) from the right

Q9. Fill in the blank using words contained in the Preamble to the Constitution of India:

We, _____, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens....

(a) The Supreme Court
(b) The Indian Parliament
(c) The Central Government
(d) The People of India

Q10. A jar contains a mixture of two liquids A and B in the ratio 3 : 4. If 5 litres of liquid A is added into the jar, then their respective ratio becomes 4 : 5. The quantity of liquid B contained in the jar is:

(a) 75 litres
(b) 90 litres
(c) 80 litres
(d) 100 litres

Q11. Which of the following lakes is NOT located in the state of Kerala?

(a) Ashtamudi Lake
(b) Renuka Lake
(c) Vembanad Lake
(d) Sasthamcotta Lake

Q12. Rajpal is a resident of the 21^(st) floor from the top and 9^(th) from the ground (which is counted as floor no. 1) of a building. If the building has no basement, then how many total floors are there in the building?

(a) 27
(b) 30
(c) 28
(d) 29

Q13. Let x be the least four-digit number which when divided by 18, 27, 30, 40 and 45, the remainder in each case is 9. Find the remainder when x is divided by 37.

(a) 16
(b) 23
(c) 15
(d) 28

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Q14. Rahul started from his home to go to a park. He went 50 metres towards the East, then turned towards the South and walked 10 metres. He then turned right and walked for 40 metres. Finally, he turned to his right and walked 20 metres to reach the park. In which direction is his house from the park? (All turns are 90° turns only)

(a) South-east
(b) South-west
(c) North-east
(d) North-west

Q15. When was the Digital Sansad app launched to watch the parliamentary proceedings activities in the Indian Parliament?

(a) January 2022
(b) October 2021
(c) January 2021
(d) July 2021

Q16. The height of the frustum of a cone is 8 cm. The radius on the top of the frustum is 6 cm and the bottom of the frustum is 12 cm. What is the curved surface area of the frustum?

(a) 240π cm²
(b) 180π cm²
(c) 360π cm²
(d) 36π cm²

Q17. According to the Economic Survey of India, which of the following states had the highest share in the overall production of groundnut for the financial year 2020-21?

(a) Jharkhand
(b) Rajasthan
(c) Gujarat
(d) Punjab

Q18. If $3\cos^2\theta + 1 = 4\sin\theta$, $0° < \theta < 90°$, then the value of $\sec^2\theta$ is:

(a) 9/5
(b) 4/5
(c) 5/4
(d) 5/9

Q19. Select the number from among the given options that can replace the question mark (?) and continue the given series.

17, 31, 55, 93, 149, ?

(a) 223
(b) 227
(c) 247
(d) 219

Q20. A sum of Rs. 400 lent at compound interest amounts to Rs. 484 in 2 years, interest compounded yearly. What is the rate of interest p.a.?

(a) 10%
(b) 16%
(c) 11%
(d) 12%

Q21. If $[27/8 - \{3 - (11/4 - 5/8)\}] + P \times 1/8 = 0$, then what is the value of P?

(a) -4
(b) 2
(c) 4
(d) -2

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Q22. Given below are two statements and two conclusions. Take the 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:

All students are teachers.

Some professors are students.

Conclusions:

A. Some students are professors.

B. Some teachers are professors.

(a) Only conclusion A follows
(b) Neither conclusion A nor B follows
(c) Only conclusion B follows
(d) Both conclusions A and B follow

Q23. Find the volume of a cylinder whose base radius is 12.5 cm and whose height is 4/5 of the base radius.

(a) 1652.5 π cm^3
(b) 1562.5 π cm^3
(c) 1250 π cm^3
(d) 2441.4 π cm^3

Q24. Dengue is caused by _____.

(a) Viruses
(b) Fungi
(c) Bacteria
(d) Nematode

Q25. The Union List, State List and the Concurrent List is included in which 'Schedule' of the Indian Constitution?

(a) Seventh Schedule
(b) Tenth Schedule
(c) Twelfth Schedule
(d) Eighth Schedule

Q26. Manu purchased an old bike for Rs. 5,500, spent 12% of this amount on repairs, and had to later sell it at an overall loss of 5%. What was the price at which Manu sold the bike?

(a) Rs. 5,882
(b) Rs. 5,832
(c) Rs. 5,872
(d) Rs. 5,852

Q27. How many such pairs of letters are there in the word "VERSION" (in both the forward and backward directions) which have as many letters between them in the word as there are in the English alphabetical order?

(a) 5
(b) 6
(c) 4
(d) 3

Q28. A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

7B9, 14D18, 21G28, 28K39, ?

(a) 35P51
(b) 33P51
(c) 35P49
(d) 32P49

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Q29. Who won the Man of the Match award in the final of the U19 Cricket World Cup, 2022?

(a) Dinesh Bana
(b) Shaik Rasheed
(c) Raj Angad Bawa
(d) Yash Dhull

Q30. Which two signs should be interchanged to make the equation correct?

69 × 3 - 4 ÷ 5 + 6 = 9

(a) ÷ and +
(b) × and +
(c) • and -
(d) × and ÷

Q31. _____ was a blind poet who sang the glory of Krishna in his collection by the name 'Sursagar'.

(a) Surdas
(b) Virdas
(c) Chaitanya
(d) Vidyapati

Q32. Tarana Singer, Pandit Rattan Mohan Sharma belongs to the _____ gharana

(a) Mewati
(b) Agra
(c) Indore
(d) Dilli

Q33. A and B together can complete a piece of work in 36 days while B and C together can do it in 20 days. The efficiency of C is thrice the efficiency of A. B alone can complete two-third of the original work in

(a) 30 days
(b) 45 days
(c) 36 days
(d) 40 days

Q34. Which among the following is attributed to Kautilya?

(a) Indica
(b) Mudrarakshasa
(c) Arthashastra
(d) Ratnavali

Q35. In August 2021, which ministry decided to repeal the UAS Rules, 2021, and replaced the same with the liberalised Drone Rules, 2021?

(a) Ministry of Ports, Shipping and Waterways
(b) Ministry of Defence
(c) Ministry of Road Transport and Highways
(d) Ministry of Civil Aviation

Q36. In which of the following cities is World Economic Forum headquartered?

(a) London, the UK
(b) Geneva, Switzerland
(c) Washington DC, the US
(d) Paris, France

Q37. Who among the following was primarily associated with the establishment of Home Rule League of Madras?

(a) Sarojini Naidu
(b) Madam Bhikaji Cama
(c) Matangini Hazra

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(d) Annie Besant

Q38. Which country became the world's first country to transition to four-and-a half day work week?

(a) The UAE
(b) The UK
(c) France
(d) China

Q39. Which of the following values can replace K in 73/5 × 41/2 - K = 263/4 ? $x = (-b \pm \sqrt{(b^2-4ac)})/2a$

(a) 21/2
(b) 97/20
(c) 79/20
(d) 2

Q40. The marks obtained by A in a test are 20% more than the marks obtained by B, and C obtained 85% of the total marks obtained by A and B. By what percentage are the marks obtained by A less than the marks obtained by C? (Correct to one decimal place)

(a) 35.8%
(b) 34.6%
(c) 55.8%
(d) 37.2%

Q41. A can do a piece of work in 24 days and B can do 2/5 of the same work in 12 days. Both work together for 6 days. How much work is still left?

(a) 9/20
(b) 11/20
(c) 17/20
(d) 13/20

Q42. Select the combination of letters that when sequentially placed in the blanks of the given series will complete the series.

_h_ _ cd_p_c_h_k_dh_k_

(a) phcdkpchdk
(b) phdkpchkpc
(c) dphkchdpck
(d) dpkhkdpcpc

Q43. In a certain code language, 'club' is written as 'school', 'school' is written as 'playground', 'playground' is written as 'house', 'house is written as 'market' and 'market' is written as 'bus'.

Where do students go to study?

(a) Playground
(b) House
(c) Bus
(d) School

Q44. Two chords AB and CD of a circle intersect at point F inside the circle. If AF = 4 cm, BF = 6 cm and CF = 3 cm, then find the length of CD.

(a) 8 cm
(b) 11 cm
(c) 16 cm
(d) 12 cm

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Q45. Eight friends are sitting around a circular table at equal distances with their back towards the centre of the table. Ishin is sitting to the immediate right of Anshu. Amina is is not an immediate neighbour of Dhruv. Only three people sit between Harmeet and Fiza. Dhruv is to the immediate left of Varun. There are only two people between Mohit and Harmeet. Fiza is sitting to the immediate left of Anshu. Only three people sit between Ishin and Varun. Who is sitting to the immediate left of Harmeet?

(a) Dhruv
(b) Varun
(c) Amina
(d) Ishin

Q46. The chemical equation of water is H2O, Which of the following MS-Word features can be used to write H2O?

(a) Drop cap
(b) Superscript
(c) Subscript
(d) Strikethrough

Q47. If the ratio of the mode and median is 13 : 9, then find the ratio of the mean and mode using empirical relation.

(a) 9 : 8
(b) 8 : 13
(c) 8 : 9
(d) 7 : 13

Q48. Six classmates gave an exam. Yatharth scored more marks than Karan. Parth's marks were less than Amrita. Vineeta scored more marks than Parth. Parth scored exactly the same marks as Yatharth. Girish did not score more marks than Karan. Vineeta scored less marks than Amrita. Which of the following options is NOT correct according to above information?

(a) Karan scored less marks than Vineeta.
(b) Girish scored less marks than Parth.
(c) Amrita scored more marks than Karan.
(d) Yatharth scored more marks than Amrita.

Q49. Namita Gokhale, received the Sahitya Akademi Award 2021 for which novel?

(a) Things to Leave Behind
(b) A Himalayan Love Story
(c) Travelling In, Travelling Out
(d) Gods, Graves and Grandmother

Q50. A train passes a man, going in opposite direction, in 12 seconds and the speed of the man is 10 km/h. If the speed of the train is 62 km/h, then what is the length (in m) of the train?

(a) 240
(b) 200
(c) 220
(d) 250

Q51. In a division involving decimal fractions, the divisor is 22.8 and the quotient is 8.5, while the remainder is 0. What is the dividend?

(a) 193.2
(b) 193.8
(c) 193.6
(d) 193.4

Q52. Select the option that is related to the fifth letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster and the fourth letter-cluster is related to the third letter-cluster.

HUDK : KWGM :: RBNF : UDQH :: LPQV : ?

(a) NRSX
(b) OSTY

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(c) ORTX
(d) NSSY

Q53. ISDN is a digital telephone service that can transmit voice, data and control information over an existing single telephone line. What is the full form of ISDN?
(a) Integrated Server Digital Network
(b) Integrated Services Digital Network
(c) Integrated Services Diversified Network
(d) Interpreted Services Digital Network

Q54. If the 9-digit number 83x93678y is divisible by 72, then what is the value of (3x - 2y)?
(a) 8
(b) 10
(c) 12
(d) 15

Q55. From the given options, Rohingya Muslims are natives of _____.
(a) China
(b) Nepal
(c) Bhutan
(d) Myanmar

Q56. The Wangala Festival is primarily celebrated in _____.
(a) Meghalaya
(b) Ladakh
(c) Himachal Pradesh
(d) Uttarakhand

Q57. The Therigatha is a Buddhist text, part of the _____ is a collection of verses composed by bhikkhunis.
(a) Vinaya Pitaka
(b) Mahavamsa
(c) Dipavamsa
(d) Sutta Pitaka

Q58. For Rajya Sabha membership, the President nominates _____members on the basis of their excellence in literature, science, art and social service and the rest are elected.
(a) 11
(b) 10
(c) 12
(d) 13

Q59. In a group of 5 friends, J, K, L, M and N, all scored different marks. J scored higher marks than L and N, but less marks than K and M. K. scored more marks than M. L did not score the least marks. Who scored the least marks?
(a) J
(b) N
(c) K
(d) M

Q60. A certain sum amounts to Rs. 16,500 in 2 years at 5% p. a. simple interest. Find the sum.
(a) Rs. 14,500
(b) Rs. 15,000
(c) Rs. 14,000
(d) Rs. 15,500

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Q61. Of the total imports to India during April-November 2021, which country has the maximum share according to the Economic Survey 2021-22, Government of India?

(a) Germany
(b) The US
(c) China
(d) Singapore

Q62. A family's monthly income is Rs. 45,000. Out of the monthly income 20% is spent on food, 20% is spent on the house rent, 5% is spent on shopping, 10% is spent on personal expenses and the rest is saved. If they decided to donate 12% of the monthly savings to the poor, what is the amount that they donate to the poor?

(a) Rs. 2750
(b) Rs. 3230
(c) Rs. 3500
(d) Rs. 2430

Q63. Select the alphanumeric-cluster from among the given options that can replace the question mark (?) in the following series.

3Y7, 8X9, 15W11, 24V13, 35U15, ?

(a) 48T17
(b) 44S16
(c) 49T19
(d) 47S14

Q64. Which of the following statements is/are true?

1. The Chief Justice and other judges of the Supreme Court are appointed by the President of India.

2. No person who has held office of a judge of the Supreme Court is allowed to plead as an advocate in any court or before any authority within the territory of India.

3. The judges of the Supreme Court are paid such salaries as are determined by the Parliament from time to time.

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

Q65. Who became the youngest bowler to take 400 T20 wickets in T20 cricket during ICC T20 World Cup 2021?

(a) Dwayne Bravo
(b) Rashid Khan
(c) Martin Guptill
(d) Shakib Al Hasan

Q66. Which research institute launched a new popular online talk series called Steamboat, which integrates the arts with STEM (Science, Technology, Engineering and Mathematics) in November 2021?

(a) IISc, Bengaluru
(b) HBCSE, TIFR Mumbai
(c) IIT, New Delhi
(d) IIT, Mumbai

Q67. A train crosses a one km long bridge in one minute and a 750 m long tunnel in 50 seconds. Assuming the train is running at a uniform speed, what is its speed?

(a) 81 km/h
(b) 90 km/h
(c) 72 km/h
(d) 108 km/h

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Q68. Assuming 13^(th) June 2005 was a Friday, what day of the week was 5^(th) July 2005?

(a) Sunday
(b) Thursday
(c) Tuesday
(d) Saturday

Q69. If '+' means 'division', '÷' means 'subtraction', '-' means 'multiplication' and '×' means 'addition', then what is the value of X in the following equation?

200 + 10 - 25 × 60 ÷ 20 = X

(a) 500
(b) 540
(c) 560
(d) 520

Q70. In June 2021, India and _____ signed an MoU for developing cooperation and to open new vistas of bilateral co-operation in the area of climate change, waste management, etc.

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

Q71. Which of the following is predominantly used for making photovoltaic solar cells?

(a) Si
(b) S
(c) Se
(d) Sc

Q72. Read the given seating arrangement information and answer the question that follows.

Prashant, Kamal, Rishi, Sunita, Tanvi, Vimal, Wazir and Yogita are sitting at a square table in such a way that four of them are sitting at four corners of the table, while the other four are sitting in the middle of each of four sides of the table. The four who are sitting at the corners of the table are facing the centre, whereas those who are sitting in the middle of the sides of the table are facing outside. Prashant, who is facing the centre, is sitting third to the right of Vimal. Tanvi, who is facing the centre, is not an immediate neighbour of Vimal. Only one person is sitting between Vimal and Wazir. Sunita sits second to the right of Kamal. Kamal is facing the centre. Rishi is not an immediate neighbour of Prashant.

Which of the following statements regarding Kamal is true?

(a) Kamal is an immediate neighbour of Yogita.
(b) Kamal is an immediate neighbour of Vimal.
(c) Kamal is sitting to the immediate right of Tanvi.
(d) Kamal is an immediate neighbour of both Tanvi and Sunita.

Q73. With reference to the Sixteen Mahajanapadas, which among the following was NOT a capital city?

(a) Ujjain
(b) Avanti
(c) Sravasti
(d) Kausambi

Q74. In a certain code language, RAJAN is written as TDNFT, and STRAW is written as UWVFC. How will ENJOY be written in that language?

(a) GQNTE
(b) RCNTE
(c) GQRCL
(d) GQCRL

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Q75. Ajit was born on Monday, 24 March 1980. Which day of the week was it when he celebrated his birthday in the year 2021?

(a) Monday
(b) Sunday
(c) Wednesday
(d) Friday

Q76. Five years ago, the average age of A, B and C was 17 years. Seven years ago, the average age of A and B was 17 1/2 years. What will be the age (in years) of C after 2 years from now?

(a) 19
(b) 201/2
(c) 20
(d) 181/2

Q77. Iberian Peninsula can be found in which of the following continents?

(a) North America
(b) South America
(c) Asia
(d) Europe

Q78. In a certain code language, the letters are coded as per their alphabetical order (A as 1 and Z as 26). However, if a letter appears twice in a word, at the second occurrence, it is coded with its reverse alphabetical position. Also, if a vowel appears between two consonants, its corresponding number gets doubled.

Which among the following is the correct code for GLASS?

(a) 7121198
(b) 71221991
(c) 7122189
(d) 7122198

Q79. Five friends, Puneet. Jatin, Gautam, Arshil and Tina, like five different subjects namely Maths, English, Science, Computer and Hindi, but not necessarily in the same order. Each of the friends also like one sport, namely Cricket, Hockey, Badminton, Football and Basketball, such that no two has the same favourite sport.

Tina likes Science but does not like Hockey. The one who likes Hindi also likes Basketball. Arshil likes Badminton but does not like Computer or English. Gautam likes Hockey but does not like English or Maths. Tina likes Football. Puneet likes Cricket. Who likes Hindi?

(a) Jatin
(b) Arshil
(c) Puneet
(d) Gautam

Q80. Boro, an ethno-linguistic community is native to which of the following states/union territories of India?

(a) Assam
(b) Gujarat
(c) Madhya Pradesh
(d) Andaman and Nicobar

Q81. 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:

a) Some fries are cakes.

b) All burgers are cakes.

c) All cakes are chips.

Conclusions:

I. All fries are chips.

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II. Some chips are fries.

III. All burgers are chips.

(a) All the conclusions follow.
(b) Only conclusions II and III follow.
(c) Only conclusions I and II follow.
(d) Only conclusions I and III follow.

Q82. A field is in the shape of a rhombus, whose perimeter is 292 m and one of its diagonals is 96 m. What is the area of the field?

(a) 4800 m²
(b) 7008 m²
(c) 5280 m²
(d) 5040 m²

Q83. 'X is the mother of Y' is represented by 'X < Y'

'X is the husband of Y' is represented by 'X > Y'

'X is the sister of Y' is represented by 'X @ Y'

'X is the son of Y' is represented by 'X $ Y'

Which of the following indicates the relationship 'R is the daughter of Q'?

(a) R @ H > K < Q
(b) R @ H $ K > Q
(c) Q > K @ R $ H
(d) Q < K @ H $ R

Q84. On February 20, 1947, who announced that the power would be transferred to the Indians by June 1948?

(a) Jawaharlal Nehru
(b) Lord Wavell
(c) Lord Mountbatten
(d) Clement Attlee

Q85. The bisector of angle QPR of Δ PQR meets the side QR at S. If PQ = 12 cm, PR = 15 cm and QR = 18 cm, then the length of SR is

(a) 10 cm
(b) 12 cm
(c) 8 cm
(d) 13 cm

Q86. A 3200 m long cylindrical copper wire of radius 0.3 mm is melted and recast into a sphere (without wasting any material). What is the surface area (in cm²) of the sphere?

(a) 140 π
(b) 144π
(c) 198 π
(d) 256 π

Q87. According to the Article 243B of the Indian Constitution, Panchayats at the intermediate level may NOT be constituted in a State having a population not exceeding _____ lakhs.

(a) twenty
(b) five
(c) fifteen
(d) Ten

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Q88. The Industrial Policy Resolution (IPR) 1956 was adopted in order to achieve the aim of a socialist state with government controlling the major strategic industries of the economy. According to this resolution, industries were classified into _____.

(a) two categories
(b) five categories
(c) three categories
(d) four categories

Q89. Which of the following sentences about money is INCORRECT?

(a) Money acts as a convenient unit of account.
(b) The value of all goods and services cannot be expressed in monetary units.
(c) Economic exchanges without the mediation of money are referred to as barter exchanges
(d) The first and foremost role of money is that it acts as a medium of exchange.

Q90. According to the Census of India 2011 the decadal population growth rate of India for 2001-11 is approximately _____.

(a) 20.98%
(b) 17.64%
(c) 12%
(d) 14.8%

Q91. In a certain code language, the letters of the English alphabet are coded as per their alphabetical order (A as 1 and Z as 26). However, if a vowel is immediately preceded as well as immediately followed by a consonant, its code would be 99.

What will be the code for 'BLAST' in this language?

(a) 212994520
(b) 212991991920
(c) 212554920
(d) 212991920

Q92. According to UN Human Settlements Programme, which of the following countries had its highest population living in slums in the year 2018?

(a) Democratic Republic of the Congo
(b) South Sudan
(c) Central African Republic
(d) India

Q93. Eight friends are sitting around a square table, four at the corners and four in the middle of the four sides. All of them are facing the centre. Cindy is an immediate neighbour of both Leo and Roger. Both Leo and Roger are sitting at the corners. Only three people sit between Kate and Dylan. Ben is second to the right of Leo. Cindy is second to the right of Dylan. Only three people sit between Louis and Cindy. Myra is second to the left of Roger. Who is sitting to the immediate right of Dylan?

(a) Louis
(b) Roger
(c) Cindy
(d) Myra

Q94. Decreasing returns to scale occurs when_____

(a) an increase in all inputs (labour/capital) leads to a more than proportional increase in output
(b) an increase in all inputs (labour/capital) leads to a less than proportional increase in output
(c) a decrease in all inputs (labour/capital) leads to a more than proportional increase in output
(d) a decrease in all inputs (labour/capital) leads to a less than proportional increase in output

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Q95. India has a land border of about _____ km with neighbouring countries.

(a) 5055
(b) 20233
(c) 7516
(d) 15106

Q96. In an office, the number of male employees is 3/8 of the number of female employees. 1/3 of the males are non-graduates, whereas 4/9 of the females are non-graduates. If the number of non-graduate employees in the office is 164, then the total number of employees in the office is:

(a) 396
(b) 288
(c) 360
(d) 414

Q97. The Jawahar Rojgar Yojana was launched in 1989 with a motive to _____.

(a) train the daily wage workers to look for additional income
(b) create housing opportunities for the needy rural labours
(c) generate foreign investment for the needy rural labours
(d) generate wage employment for the needy rural labours

Q98. Mohan started travelling and he first went in the South direction. Then he took a turn to his left and walked a distance. Thereafter, he turned to his right and travelled some distance. Now if he turned to his left and walked again for a certain distance, in which direction is Mohan travelling now? (All turns are 90° turns only)

(a) West
(b) North
(c) East
(d) South

Q99. The second number in each of the number-pairs is obtained by performing certain mathematical operations on the first number. Three of the following four number-pairs follow the same pattern and thus form a group. Select the number- pair that does NOT belong to that group.

(a) 19 : 363
(b) 14 : 197
(c) 17 : 290
(d) 13 : 170

Q100. Which Article of the Indian Constitution casts an obligation on the State to provide early childhood care and education for all children until they complete the age of six years?

(a) Article 43
(b) Article 42
(c) Article 45
(d) Article 44

Q101. A sum of money is distributed by a father among his 4 sons A, B, C, D in the ratio 3 : 6 : 8 : 5. After the distribution, it has been observed that the amount of money that C received is Rs. 1,000 more than what B received. What is the total amount of money that has been distributed among the four?

(a) Rs. 13,000
(b) Rs. 12,450
(c) Rs. 12,000
(d) Rs. 11,000

Q102. Simplify $(7 + 3\sqrt{5})/(3 + \sqrt{5}) + (7 - 3\sqrt{5})/(3 - \sqrt{5})$.

(a) 14
(b) 6
(c) 3
(d) 4

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Q103. Kiran lent Rs. 40,000 to Kishore on compound interest for 2 years, compounded annually. The rate to interest is 20%. What is the Compound Interest that Kiran will receive after 2 years?

(a) Rs. 12,350
(b) Rs. 17,600
(c) Rs. 14,560
(d) Rs. 16,780

Q104. The average of 38 numbers is 51. The average of the first 24 numbers is 45, and that of the last 5 numbers is 60. What is the average of the remaining numbers?

(a) 59
(b) 60
(c) 62
(d) 61

Q105. The Asafi Imambara built by Asaf-ud-Daula, is located in _____

(a) Bijapur
(b) Delhi
(c) Agra
(d) Lucknow

Q106. What was the formal name of the Bombay Plan which was published in 1944-45?

(a) A plan of economic development for India
(b) A plan of industrial development of India
(c) A plan of infrastructure development of India
(d) A plan of strategic development of India

Q107. The sum of the ages of 5 children born at an interval of 5 years each, is 80. What is the age of the youngest child?

(a) 4 years
(b) 16 years
(c) 21 years
(d) 6 years

Q108. Four friends P, Q, R and S run around a circular track of length 400 m starting at the same point at the same time at speeds of 4, 8, 16 and 20 m/s, respectively. If all of them are moving in the same direction, after how much time would they meet for the first time?

(a) 100 s
(b) 120 s
(c) 145 s
(d) 90 s

Q109. Which of the following elements is part of heme (haem) of human blood?

(a) Iron
(b) Magnesium
(c) Cobalt
(d) Manganese

Q110. The HCF of two numbers is 8 and the product of the two numbers is 6400. How many pairs of numbers exist, which satisfy the above conditions?

(a) 6
(b) 2
(c) 3
(d) 5

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Q111. Which of the following countries ranked last in the Global Hunger Index of 2021?

(a) India
(b) Egypt
(c) Mali
(d) Somalia

Q112. Five containers of different shapes sphere, cube, prism, cuboid and cylinder have different patterns plain, checkered, floral, polka dots and stripes but not necessarily in the same order. Also each has a different colour blue, green, pink, black and yellow but not necessarily in the same order.

The cube and cylinder don't have floral design. Sphere is pink in colour. Prism has checkered design but is not yellow or black in colour. Cuboid is green in colour but doesn't have polka dots or stripes pattern. The plain container is pink in colour. Cube has polka dots and neither blue nor black in colour. Cylinder is not blue in colour.

Which container has floral pattern?

(a) Cuboid
(b) Cylinder
(c) Sphere
(d) Prism

Q113. What was India's rank in global rice production for the year 2019, according to Food and Agriculture Organization?

(a) First
(b) Third
(c) Fourth
(d) Second

Q114. Republic of Maldives which is also called Maldive Islands is an independent island country in the north-central:

(a) Indian Ocean
(b) Arabian Sea
(c) South China Sea
(d) Bay of Bengal

Q115. Who is the author of the book titled 'The Midway Battle: Modi's Roller-Coaster Second Term', which was launched by Venkaiah Naidu in December 2021?

(a) Jeet Thayil
(b) Aravind Adiga
(c) Gautam Chintamani
(d) Sekhar Bandyopadhyay

Q116. In the below question two statements I and II are given. These statements may either be independent causes or may be effects of independent causes or a common cause. One of these statements may be the effect of the other statement. Read both the statements and decide which of the following answer choice correctly depicts the relationship between these two statements.

Statements:

I) Saketh lost his job as a software professional due to the recession last month.

II) Ayansh, a salesperson, received only half his salary as there is fall in demand for their products in the market

(a) Statement I is the cause and statement II is its effect.
(b) Both the statements I and II are effects of a common cause.
(c) Both the statements I and II are independent causes.
(d) Statement II is the cause and statement I is its effect.

Q117. A question is given, followed by two statements labelled 1 and 2. Identify which of the statements is/are sufficient/necessary to answer the question.

Question:

What day is the 17^(th) of a given month?

Statements:

1. The last day of month is Monday.
2. The second Saturday of month is on 12^(th).

(a) Neither 1 nor 2 is sufficient
(b) Both 1 and 2 are necessary
(c) 2 alone is sufficient while 1 alone is not sufficient
(d) 1 alone is sufficient while 2 alone is not sufficient

Q118. The area of a rectangle is 2430 cm² and its width is 9 cm less than its length. Find the perimeter of the rectangle.

(a) 192 cm
(b) 180 cm
(c) 216 cm
(d) 198 cm

Q119. A _____ is a passive two-terminal electrical component that implements electrical resistance as a circuit element.

(a) capacitor
(b) transistor
(c) resistor
(d) diode

Q120. Given is the data on the weights of some students. What is the mean weight (in Kg) of all these students taken together?

No. of Students	Weights of the Students (in Kg)
5	31
7	25
6	20
4	35
3	20

(a) 22
(b) 26
(c) 23
(d) 28

ANSWER KEY

1	b	2	c	3	d	4	d	5	d	6	a	7	c	8	c	9	d	10	d
11	b	12	d	13	a	14	b	15	a	16	b	17	c	18	a	19	b	20	a
21	a	22	d	23	b	24	a	25	a	26	d	27	a	28	a	29	c	30	d
31	a	32	a	33	d	34	c	35	d	36	b	37	d	38	a	39	c	40	a
41	b	42	d	43	a	44	b	45	c	46	c	47	d	48	d	49	a	50	a
51	b	52	c	53	b	54	b	55	d	56	a	57	d	58	c	59	b	60	b
61	c	62	d	63	a	64	c	65	b	66	b	67	b	68	d	69	b	70	d
71	a	72	b	73	b	74	a	75	c	76	a	77	d	78	d	79	a	80	a
81	b	82	c	83	b	84	d	85	a	86	b	87	a	88	c	89	b	90	b
91	d	92	c	93	b	94	b	95	d	96	a	97	d	98	c	99	a	100	c
101	d	102	c	103	b	104	c	105	d	106	a	107	d	108	a	109	a	110	b
111	d	112	a	113	d	114	a	115	c	116	b	117	c	118	d	119	c	120	b

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SOLUTIONS

Q1. Answer: (b) Darshana Jhaveri

The correct answer is Darshana Jhaveri.

Key Points

• Darshana Jhaveri

• Darshana Jhaveri was born in Mumbai.

• Darshna Jhaveri is related to Manipuri dance.

• She learned Manipuri dance from Guru Bipin Singh.

• Later, she learned the traditional Raslila dances from Sutradhari Kshetritombi Devi, the Nata Pung from Guru Meitei Tomba Singh and traditional Maibi Jagoi from Kumar Maibi.

• Darshana Jhaveri received the Sangeet Natak Akademi Award in 1996 by Sangeet Natak Akademi.

• She was honored with the Padma Shri in 2002.

• She was awarded the Kalidas Samman Award in 2018.

Additional Information

Dance	Origin	Main Reviving Persons	Famous Proponents
Bharatnatyam	Tamil Nadu	E. Krishna Iyer, Rukmini devi Arindel	Yamini Krishnamurthy, Lakshmi Vishwanathan, Padma Subramaniam, Mrinalini Sarabhai, Mallika Sarabhai
Kuchipudi	Andhra Pradesh	Balasaraswati, Ragini devi	Radha Reddy And Raja Reddy, Yamini Krishnamurthy, Indrani Rehman
Kathakali	Kerala	V.N. Menon	Guru Kunchu Kurup, Gopinath, Kottakal Sivaraman, Rita Ganguly
Odissi	Odisha	Indrani Rehman, Charles Fabri	Guru Pankaj Charan Das, Kelu Charan Mohapatra, Sonal Mansingh, Sharon Lowen, MYrla Barvie
Manipuri	Manipur	Raja bhag Chandra, Rabindranath Tagore	Nayana, Suverna, Ranjana and Darshna, Guru Bipin Singha
Kathak	Uttar Pradesh	Lady Leela Sokhey	Birju Maharaj, Lacchu Maharaj, Sitara Devi, Damyanti Joshi
Sattriya	Assam	Shankaradeva	•
Mohiniattam	Kerala	V. N. Menon, kalayani Amma	Sunanda Nair, Kalamandalam kshmavathy, Madhuri Amma, Jayaprabha Menon

Q2. Answer: (c) N30

The logic followed here is:

Hence, ‘N30’ is the correct answer.

Q3. Answer: (d) 216

Given:

$4\sqrt{(1296^3)}$

Calculation:

$4\sqrt{(1296^3)}$

$=> 4\sqrt{((36 \times 36)^3)}$

$=> 4\sqrt{((6^2 \times 6^2)^3)}$

=> 4√(6× 6)^(2 × 3)

=> 4√((6× 6)^6)

=> 4√((6²)^6)

=> 4√(6)^(6 × 2)

=> 4√((6)¹²)

=> 6¹2/4

=> 6³

=> 216

Therefore The simplified answer of 4√(1296³) is 216.

Q4. Answer: (d) Blue box – 6^(th) position from the top

Seven boxes of different colours, Red, Yellow, Blue, Green, Orange, Violet and Indigo were stocked one on the other, not necessarily in the same order.

1. No other box was placed below the orange box.
2. The Red box was placed at the topmost position.

Red
Orange

3. The Green box was second to the bottom of the Indigo box.
4. The Yellow box was exactly above the Indigo box.

Case I	**Case II**
Red	Red
Yellow	
Indigo	Yellow
	Indigo
Green	
	Green
Orange	Orange

5. The Violet box was placed second to the top of the Blue box.

Clearly, the above condition cannot be satisfied in Case II, so it is eliminated.

The final arrangement is shown below:

Case I
Red
Yellow
Indigo
Violet
Green
Blue
Orange

1. Violet box – 7th position from the top → False (4th position from the top)
2. Yellow box – 5th position from the top → False (2^(nd) position from the top)

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3. Green box – 3rd position from the top → False (5th position from the top)

4. Blue box – 6th position from the top → True

Hence, 'Blue box – 6th position from the top' is the correct answer.

Q5. Answer: (d) UOLEDBB

The logic followed here is:

• BELATED

• Alphabetical order of letters: T > L > E = E > D > B > A

• Therefore, code = TLEEDBA

• STOREY

• Alphabetical order of letters: Y > T > S > R > O > E

• Therefore, code = YTSROE

• DOUBBLE

• Alphabetical order of letters: U > O > L > E > D > B = B

• Therefore, code = UOLEDBB

Hence, 'UOLEDBB' is the correct answer.

Q6. Answer: (a) Tennis

The correct answer is Tennis.

Key Points

• US Open champion Emma Raducanu has been voted BBC Sports Personality of the Year 2021.

• She has become the third WTA (Women's Tennis Association) player to win the award in its 67-year history.

• Raducanu became the first British woman to win a Grand Slam singles title after defeating Leylah Fernandez in the Flushing Meadows final in September 2021.

Important Points

• Raducanu follows in the footsteps of three-time Grand Slam champions Wade and Ann Jones as BBC Sports Personality of the Year winners.

• Wade and Jones collected the award after their Wimbledon triumphs in 1977 and 1969, respectively.

• Additionally, on the ATP (Association of Tennis Professionals) side, Greg Rusedski (1997) and Andy Murray (2013, 2015-16) have won the award.

• Raducanu beat two Olympic gold medallists into second and third place - diver Tom Daley and swimmer Adam Peaty.

• She is the first woman to win the BBC Sports Personality of the Year since equestrian Zara Phillips in 2006.

Q7. Answer: (c) 40/303

Given:

1/4, 4/3, 5/7, 5/4, 8/5

Concept used:

If A/B is a fraction, the reciprocal of A/B = B/A.

Calculation:

Reciprocals of the given numbers are:

1/4 => 4

4/3 => 3/4

5/7 => 7/5

5/4 => 4/5

8/5 => 5/8

Hence, the sum of the reciprocals of the number

=> 4 + 3/4 + 7/5 + 4/5 + 5/8

=> (160 + 30 + 56 + 32 + 25) over 40

=> 303over 40

Thus, the reciprocal of the sum of the reciprocals of the numbers = 40/303

Therefore The reciprocal of the sum of the reciprocals of the numbers is 40/303.

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Q8. Answer: (c) 5^(th) from the right

Five candidates - J, K, L, M and N are sitting in the same row, facing north waiting to be interviewed by the HR Manager.

1. J is fourth from the left.

2. L is an immediate neighbor of both K and J.

3. N is to the left of K.

M, the only remaining person will occupy the vacant position.

The final arrangement will be as shown below:

Clearly, N is 5th from the right.

Hence, '5th from the right' is the correct answer.

Q9. Answer: (d) The People of India

The correct answer is The People of India.

Key Points

• Preamble:- WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizens:

JUSTICE, social, economic and political; LIBERTY of thought, expression, belief, faith and worship; EQUALITY of status and of opportunity; and to promote among them all FRATERNITY assuring the dignity of the individual and the unity and integrity of the Nation; IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November 1949, (26th Nov 1949) do HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION

• The preamble of the Indian constitution is taken from the constitution of the USA. But its ideals of Liberty, Equality, and Fraternity from the French Constitution.

• It has been amended by the 42nd constitutional amendment act, 1976, which added three new words:

• Socialist

• Secular

• Integrity.

• The preamble to the Indian constitution is based on the objective resolution drafted and moved by Pandit Nehru and adopted by the constituent assembly.

Q10. Answer: (d) 100 litres

Shortcut Trick

Initial ratio of liquid A and liquid B is 3 : 4 and the new ratio is 4 : 5 after adding 5 litres of liquid A.

Since liquid B remains constant, equate its units by multiplying the first ratio by 5 and the second by 4.

Initial Ratio → 15 : 20 | New Ratio → 16 : 20

Increase in liquid A = 16 − 15 = 1 unit → 5 litres.

Quantity of liquid B = 20 units = 20 × 5 = 100 litres.

Therefore The correct answer is 100 litres.

Alternate Method

Given: Initial ratio A : B = 3 : 4. Added quantity of A = 5 litres. New ratio A : B = 4 : 5.

=> Let the initial quantity of liquid A be 3x and liquid B be 4x.

=> According to the question: (3x + 5) / 4x = 4 / 5

=> Cross-multiplying: 5 × (3x + 5) = 4 × 4x

=> 15x + 25 = 16x

=> 16x − 15x = 25

=> x = 25

=> Quantity of liquid B = 4x = 4 × 25 = 100 litres.

Therefore, the total quantity of liquid B in the mixture is 100 litres, which corresponds to option (4).

Therefore The correct answer is 100 litres.

Additional Information

Concept of Constant Quantity

When only one component of a mixture is added or removed, the quantity of the other component remains unchanged. Use this to equate the ratio parts of the constant component.

Ratio and Proportion Properties

If a : b is the initial ratio and x is added to 'a' to make the ratio c : d, then (a × k + x) / (b × k) = c / d, where k is a constant multiplier.

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Alligation Rule

The ratio of the weights of two items mixed is inversely proportional to the differences between their concentrations and the mean concentration: (Quantity 1 / Quantity 2) = (C2 − Cm) / (Cm − C1).

Q11. Answer: (b) Renuka Lake

The correct answer is Renuka Lake.

Key Points

• Renuka lake is situated in the Sirmour district of Himachal Pradesh.

• It is 672 m above sea level.

• Renuka Lake is located at a distance of 37 km from Nahan and 60 km from Paonta Sahib covering an area of 2.5 km.

• One of the popular temples of Himachal Pradesh, Renukaji is situated on the bank of this lake.

Additional Information

• Ashtamudi lake is an estuary which lies in the Kollam district.

• This is the second-largest wetland in Kerala with a palm-shaped extensive water body and eight prominent arms, adjoining the Kollam town.

• Vembanad Lake is also known as Vembanad Kayal, Vembanad Kol, Punnamada Lake and Kochi Lake (in Kochi).

• This is the largest lake in Kerala and the longest lake in India.

• Vallam Kali (i.e Nehru Trophy Boat Race) is a Snake Boat Race held every year in the month of August in Vembanad Lake.

• Sasthamkotta Lake, also categorized as a wetland, is the largest freshwater lake in Kerala.

• The lake is named after the ancient Sastha temple (a pilgrimage center) located on its bank.

Q12. Answer: (d) 29

Rajpal is a resident of the 21st floor from the top and 9th from the ground (which is counted as floor no. 1) of a building.

If the building has no basement.

Total number of floors in the building = 21 + 9 - 1

= 30 - 1

= 29

Hence, ‘29’ is the correct answer.

Q13. Answer: (a) 16

Shortcut Trick

LCM of 18, 27, 30, 40, and 45 = 1080.

Required number x = (LCM × k) + Remainder.

For the least four-digit number, k = 1 → x = 1080 × 1 + 9 = 1089.

Required Remainder = 1089 ÷ 37 → 1089 = (37 × 29) + 16.

Therefore The correct answer is 16.

Alternate Method

Given: Divisors are 18, 27, 30, 40, and 45. Remainder in each case = 9.

Formula Used: Number (x) = [LCM(Divisors) × k] + Common Remainder.

=> Prime Factorization:

=> 18 = 2 × 32

=> 27 = 33

=> 30 = 2 × 3 × 5

=> 40 = 23 × 5

=> 45 = 32 × 5

=> LCM = 23 × 33 × 5 = 8 × 27 × 5 = 1080.

=> Since 1080 is a four-digit number, the least value of x occurs at k = 1.

=> x = 1080 + 9 = 1089.

=> Now, divide 1089 by 37:

=> 1089 ÷ 37 = 29 with a remainder of 16.

Therefore The correct answer is 16.

Additional Information

LCM Method for Remainders

When a number is divided by a, b, c and leaves the same remainder r in each case, the number is of the form: [LCM(a, b, c) × k] + r.

Least n-digit Number

To find the least n-digit number, we adjust 'k' such that the product (LCM × k) is just above the smallest n-digit power (like 1000 for 4 digits).

Remainder Theorem

If a number N is divided by D, then N = D × Q + R, where Q is the quotient and 0 ≤ R < D.

Q14. Answer: (b) South-west

Rahul started from his home to go to a park.

• He went 50 metres towards the East.

• Then turned towards the South and walked 10 metres.

• He then turned right and walked for 40 metres.

• Finally, he turned to his right and walked 20 metres to reach the park.

Clearly, the house is to the south-west of the park.

Hence, 'South-west' is the correct answer.

Q15. Answer: (a) January 2022

The correct answer is January 2022.

Key Points

• The Lok Sabha secretariat launched a new app titled “Digital Sansad” on January 27, 2022.

• About Digital Sansad App:

• The digital sandad app was launched to make it easier for people to follow proceedings in Parliament and their lawmakers.

• The app is available in both android and IOS platform.

• It carries all the major content of interlinked portal of Indian Parliament.

• This app is launched:

• Legislature is required to keep its constituents apprised of its routine proceedings.

• This objective needs Parliament to keep its communication channels up-to-date with evolving technological landscape.

• Thus, parliament started expanding its digital footprint.

• Launch of ’Digital Sansad App’ is an initiative in that direction.

• Digital Sansad App is the brainchild of Lok Sabha Speaker, Om Birla.

• With this app, he sought to make parliamentary proceedings more accessible to people.

Q16. Answer: (b) 180π cm²

Shortcut Trick

Find the slant height (l) using the triplet: $l = \sqrt{(8^2 + (12 - 6)^2)} = \sqrt{(8^2 + 6^2)} = 10$ cm.

Curved Surface Area = π × (sum of radii) × slant height

=> CSA = π × (12 + 6) × 10 = 180π cm².

Therefore The correct answer is 180π cm².

Alternate Method

Given data:

Height (h) = 8 cm

Top radius (r) = 6 cm

Bottom radius (R) = 12 cm

Formula used:

Slant height (l) = $\sqrt{(h^2 + (R - r)^2)}$

Curved Surface Area (CSA) = π × (R + r) × l

Calculations:

=> $l = \sqrt{(8^2 + (12 - 6)^2)}$

=> $l = \sqrt{(64 + 6^2)} = \sqrt{(64 + 36)}$

=> $l = \sqrt{100} = 10$ cm

=> CSA = π × (12 + 6) × 10

=> CSA = π × 18 × 10

=> CSA = 180π cm²

Therefore The correct answer is 180π cm².

Additional Information

Total Surface Area (TSA) of Frustum

TSA = CSA + Area of top circle + Area of bottom circle = π(R + r)l + πR² + πr².

Volume of Frustum of a Cone

Volume (V) = (1/3) × π × h × (R² + r² + Rr).

Slant Height Relation

The slant height (l) is the hypotenuse of a right-angled triangle formed by the height (h) and the difference in radii (R − r).

Q17. Answer: (c) Gujarat

The correct answer is Gujarat.

Key Points

• Gujarat state’s groundnut exports surged to 4.7 lakh metric tonnes (MT) in fiscal year.

• The maximum quantity of groundnut was exported to Vietnam, Indonesia, Philippines and China.

• Gujarat, the largest producer of the oilseed in India.

• Gujarat, it was sown in 20.65 lakh hectares followed by Andhra Pradesh 7.50 lakh ha, Rajasthan 7.28 lakh ha, Karnataka 5.34 lakh ha and Madhya Pradesh 2.80 lakh ha.

Additional Information

• Peanut or groundnut (Arachis hypogaea), is a species in the legume or "bean" family.

• The peanut was probably first domesticated and cultivated in the valleys of Paraguay.

• Peanuts are known by many other local names such as earthnuts, ground nuts, goober peas, monkey nuts, pygmy nuts and pig nuts.

• The main Groundnut varieties produced in India are Kadiri-2, Kadiri-3, BG-1, BG-2, Kuber, GAUG-1, GAUG-10, PG-1, T-28, T-64, Chandra, Chitra, Kaushal, Parkash, Amber etc.

• Major Growing States:

• Gujarat, Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra ,Rajasthan, Madhya Pradesh, Orissa, and Uttar Pradesh.

Q18. Answer: (a) 9/5

Shortcut Trick

Test standard angles for 0° < θ < 90°.

Let θ = 30°: 3 × cos2 30° + 1 = 3 × (3/4) + 1 = 9/4 + 1 = 13/4. (Does not match 4 sin 30° = 2)

Let sin θ = 1/3: 3(1 − 1/9) + 1 = 3(8/9) + 1 = 8/3 + 1 = 11/3. (Does not match 4/3)

Solving the quadratic in sin θ gives sin θ = 2/3.

Then sec2 θ = 1 / (1 − sin2 θ) = 1 / (1 − 4/9) = 9/5.

Therefore The correct answer is 9/5.

Alternate Method

Given: 3 cos2 θ + 1 = 4 sin θ

Formula Used: cos2 θ = 1 − sin2 θ; sec2 θ = 1 / cos2 θ

=> 3(1 − sin2 θ) + 1 = 4 sin θ

=> 3 − 3 sin2 θ + 1 = 4 sin θ

=> 3 sin2 θ + 4 sin θ − 4 = 0

=> 3 sin2 θ + 6 sin θ − 2 sin θ − 4 = 0

=> 3 sin θ(sin θ + 2) − 2(sin θ + 2) = 0

=> (3 sin θ − 2)(sin θ + 2) = 0

=> sin θ = 2/3 (Since sin θ cannot be −2)

=> cos2 θ = 1 − (2/3)2 = 1 − 4/9 = 5/9

=> sec2 θ = 1 / (5/9) = 9/5

Therefore The correct answer is 9/5.

Additional Information

Trigonometric Identities

Fundamental identities include sin2 θ + cos2 θ = 1, 1 + tan2 θ = sec2 θ, and 1 + cot2 θ = cosec2 θ.

Reciprocal Relations

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sec θ = 1/cos θ, cosec θ = 1/sin θ, and cot θ = 1/tan θ.

Pythagorean Theorem

In a right-angled triangle, Hypotenuse2 = Perpendicular2 + Base2.

Q19. Answer: (b) 227

The logic followed here is:

Hence, '227' is the correct answer.

Q20. Answer: (a) 10%

Shortcut Trick

For a 2-year period, the ratio of Principal (P) to Amount (A) is used by taking the square root.

Ratio of P : A → 400 : 484

Divide by 4 → 100 : 121

Square root for 1 year → √100 : √121 = 10 : 11

Interest for 1 year = 11 − 10 = 1 unit

Rate % = (1 ÷ 10) × 100 = 10%

Therefore The correct answer is 10%.

Alternate Method

Given:

Principal (P) = Rs. 400

Amount (A) = Rs. 484

Time (n) = 2 years

Formula Used: $A = P(1 + R/100)^n$

Calculations:

=> $484 = 400(1 + R/100)^2$

=> $484 \div 400 = (1 + R/100)^2$

=> $121 \div 100 = (1 + R/100)^2$

=> $\sqrt{(121 \div 100)} = 1 + R/100$

=> $11 \div 10 = 1 + R/100$

=> $R/100 = (11 \div 10) - 1$

=> $R/100 = 1 \div 10$

=> $R = (1 \times 100) \div 10$

=> R = 10%

Therefore The correct answer is 10%.

Additional Information

Compound Interest Formula

The total amount A is given by A = P(1 + r/n)^(nt), where n is the number of times interest is compounded per year.

Effective Rate of Interest

When interest is compounded more than once a year, the effective rate is higher than the nominal rate: $E = (1 + r/n)^n - 1$.

CI vs SI for 2 Years

The difference between CI and SI for 2 years is given by: $D = P(R/100)^2$.

Rule of 72

A quick way to estimate how long it takes to double your money: Time ≈ 72 ÷ Interest Rate.

Q21. Answer: (a) -4

Given:

[27/8 - {3 - (11/4 - 5/8)}] + P × 1/8 = 0

Concept used:

Calculation:

[27/8 - {3 - (11/4 - 5/8)}] + P × 1/8 = 0

=> [27/8 - {3 - (5/4 - 5/8)}] + P × 1/8 = 0

=> [27/8 - {3 - ((10 - 5)/8)}] + P × 1/8 = 0

=> [27/8 - {3 - 5/8}] + P × 1/8 = 0

=> [27/8 - {(24-5)/8}] + P × 1/8 = 0
=> [23/8 - 19/8] + P × 1/8 = 0
=> [(23-19)/8] + P × 1/8 = 0
=> 1/2 + P × 1/8 = 0
=> 1/2 + (P)/8 = 0
=> (4+P)/8 = 0
=> 4 + P = 0
=> P = - 4
Therefore Required answer of P is - 4.

Q22. Answer: (d) Both conclusions A and B follow

Venn diagram:
Conclusions:
A. Some students are professors. → True (Some professors are students.)
B. Some teachers are professors. → True (As all students are teachers and Some professors are students)
Hence, Both conclusions A and B follow.

Q23. Answer: (b) 1562.5 π cm^3

Shortcut Trick
Height (h) = 4/5 × 12.5 = 10 cm
Volume = π × r^2 × h
Volume = π × 156.25 × 10 = 1562.5 π cm^3
Therefore The correct answer is 1562.5 π cm^3.
Alternate Method
Given:
Base radius (r) = 12.5 cm
Height (h) = 4/5 × radius
Formula Used:
Volume of a cylinder = $\pi r^2 h$
Calculations:
=> h = (4/5) × 12.5 cm
=> h = 4 × 2.5 = 10 cm
=> Volume = π × $(12.5)^2$ × 10
=> Volume = π × 156.25 × 10
=> Volume = 1562.5 π cm^3
Therefore The correct answer is 1562.5 π cm^3.
Additional Information
Curved Surface Area (CSA) of Cylinder
The area of the side surface of the cylinder is given by $2\pi rh$.
Total Surface Area (TSA) of Cylinder
The sum of the CSA and the area of the two circular bases: $2\pi rh + 2\pi r^2 = 2\pi r(h + r)$.
Volume of a Cone
For the same radius and height, the volume of a cone is exactly one-third of the volume of a cylinder: $(1/3)\pi r^2 h$.

Q24. Answer: (a) Viruses

The correct answer is Viruses.
Key Points
• Dengue is caused by the Dengue virus and mosquito-borne viral disease.
• The dengue virus is transmitted by female mosquitoes called – Aedes aegypti.
• These dengue mosquitos are found everywhere (Both inside and outside the house) and generally bite during the daytime.
• These mosquitos are found to be at the peak of their activeness at dawn and dusk.
• The symptoms of the disease can develop only after 6 to 10 days after being bitten by an infected mosquito.

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Q25. Answer: (a) Seventh Schedule

The correct answer is Seventh Schedule.

Key Points

• The 7th Schedule of the Indian Constitution deals with the division of powers between the Union government and State governments.

• Article 246 deals with the 7th Schedule of the Indian Constitution.

• It mentions three lists named Union List, State List, and Concurrent List which specify the divisions of power between Union and States.

• There are 100 subjects on the union list, 61 subjects on the state list, and 52 subjects on the concurrent list.

Additional Information

• Eighth Schedule:

• The provisions relating to the 8th Schedule are in articles 344(1) and 351.

• 22 official languages in India are covered under the 8th schedule.

• Ninth Schedule:

• The Schedule contains a list of central and state laws which cannot be challenged in courts and was added by the Constitution (First Amendment) Act, 1951.

• The first Amendment added 13 laws to the Schedule. Subsequent amendments in various years have taken the number of protected laws to 284 currently.

• It was created by the new Article 31B, which along with Article 31A was brought in by the government to protect laws related to agrarian reform and for abolishing the Zamindari system.

Q26. Answer: (d) Rs. 5,852

Given:

Manu purchased an old bike for Rs. 5,500 and spent 12% of this amount on repairs.

Sold the bike at an overall loss of 5%.

Concept used:

Selling Price = Cost Price - Cost Price × Loss%

Calculation:

Amount spent on repairing the bike

=> 5500 × 12%

=> Rs. 660

Overall cost price of the bike = 5500 + 660 = Rs. 6160

Hence, the selling price of the bike

=> 6160 - 6160 × 5%

=> 6160 - 6160 × 0.05

=> 6160 - 308

=> Rs. 5852

Therefore The price at which Manu sold the bike was Rs. 5852.

Q27. Answer: (a) 5

Pairs of letters in the word "VERSION" (in both the forward and backward directions) which have as many letters between them in the word as there are in the English alphabetical order is shown below:

1. RS
2. NO
3. NR
4. OR
5. SV

Hence, ‘5’ is the correct answer.

Q28. Answer: (a) 35P51

The logic followed here is:

According to the alphabetical positions of the letters,

Hence, ‘35P51’ is the correct answer.

Q29. Answer: (c) Raj Angad Bawa

The correct answer is Raj Angad Bawa.

Key Points

• Raj Angad Bawa takes 5/31 in U19 World Cup final.

• India win the 2022 U19 World Cup title, by beating England by 4 wickets

• Shaik Rasheed and Nishant Sindhu cracked the 50s in chase of 190 as India clinched record-extending fifth U19 World Cup title in Antigua.

• Raj Bawa claimed a fifer while Ravi Kumar bagged 4 wickets to fold England for 189.

• BCCI president Sourav Ganguly announced a cash prize of 40 lakhs.

Additional Information

• The 2022 ICC Under-19 Cricket World Cup was held in the West Indies in January and February 2022 with sixteen teams taking part.

• It was the fourteenth edition of the Under-19 Cricket World Cup, and the first that was held in the West Indies.

• England became the first team to reach the final of the tournament after they beat Afghanistan by 15 runs in the first Super League semi-final match.

• It was the first time that England had reached the final of the Under-19 Cricket World cup since winning the 1998 tournament in South Africa.

• In the second semi-final, India beat Australia by 96 runs.

Q30. Answer: (d) × and ÷

Let's check each option:

1. ÷ and +

Given equation: 69 × 3 - 4 ÷ 5 + 6 = 9

After interchanging the signs, we get:

L.H.S = 69 × 3 - 4 + 5 ÷ 6

= 69 × 3 - 4 + 0.83

= 207 - 4 + 0.83

= 207.83 - 4

= 203.83 ≠ R.H.S

2. × and +

Given equation: 69 × 3 - 4 ÷ 5 + 6 = 9

After interchanging the signs, we get:

L.H.S = 69 + 3 - 4 ÷ 5 × 6

= 69 + 3 - 0.8 × 6

= 69 + 3 - 4.8

= 72 - 4.8

= 67.2 ≠ R.H.S

3. + and -

Given equation: 69 × 3 - 4 ÷ 5 + 6 = 9

After interchanging the signs, we get:

L.H.S = 69 × 3 + 4 ÷ 5 - 6

= 69 × 3 + 0.8 - 6

= 207 + 0.8 - 6

= 207.8 - 6

= 201.8 ≠ R.H.S

4. × and ÷

Given equation: 69 × 3 - 4 ÷ 5 + 6 = 9

After interchanging the signs, we get:

L.H.S = 69 ÷ 3 - 4 × 5 + 6

= 23 - 4 × 5 + 6

= 23 - 20 + 6

= 29 - 20

= 9 = R.H.S

Hence, '× and ÷' is the correct answer.

Q31. Answer: (a) Surdas

The correct answer is Surdas.

Key Points

• The Sursagar is a poetic composition by Surdas.
• Surdas was a great devotee of Lord Krishna.
• In Sursagar, most of the compositions are attributed to Lord Krishna.
• He was one of the prominent figures in the Bhakti Movement between the 14th to 17th centuries of India.
• He was blind and was a poet.
• Other literary works of Surdas are Sur Saravali, and Sahitya Lahari.
• His most of poems were written praising Lord Krishna.

Additional Information

• Virdas
• He is an Indian comedian, actor, and musician.
• Also, a bollywood actor worked in films like Badmaash Company, Delhi Belly, and Go Goa Gone.
• Chaitanya
• Born at Navadwip, West Bengal, in 1486 A.D.
• He was famous for his unique devotion to Krishna with ecstatic song and dance.
• Chaitanya introduced the Sankhya philosophy of "Achintya bhedabheda".
• Vidyapati
• Vidyapati Thakur was a Maithili Brahman writer and poet.
• He was known for his Sanskrit works and also for his erotic poetry written in the Maithili language.
• He was a devotee of Shiva, but also wrote love songs and devotional Vaishnava songs.

Q32. Answer: (a) Mewati

The correct answer is Mewati.

Key Points

• Rattan Mohan Sharma is an Indian classical vocalist, belonging to the Mewati Gharana.
• He is one of the highest-selling recording artists ever in the Spiritual and Devotional categories.
• His trendsetting albums such as "Gayatri Mantra" have sold over half a million copies the world over.
• He has more than "300 BEST SELLING ALBUMS" to his credit.
• He has received several awards and the title of "Badshah-e-Taraana" for creating a breathtaking unique style of "Taraana".
• He has trained under Pandit Jasraj and Pandit Pratap Narayan (Tabla).
• His melodious rendition of "Haveli Sangeet" and "Rajasthani Folk" has always left audiences worldwide spellbound.
• More than 5000 of his performances worldwide have been in temples, colleges, and prestigious music festivals.
• He is the Founder of Pandit Jasraj School of Music Foun dation- Mumbai and also a faculty in Pandit Jasraj School of Music Foundation- Tampa, Florida, US.

Additional Information

• Indian Music Gharanas

Gharana	Place	Founder
Gwalior	Gwalior	Nanthan Khan
Agra	Agra	Hajisujan Khan
Rangeela	Agra	Faiyyaz Khan
Jaipur Atrauli	Jaipur	Alladiya Khan
Kirana	Awadh	Abdul Wahid Khan

Q33. Answer: (d) 40 days

Given:

A and B together can complete a piece of work in 36 days while B and C together can do it in 20 days.
The efficiency of C is thrice the efficiency of A.
Concept used:
Total work = Work done per day × Total time taken
Calculation:
LCM (36, 20) = 180
Let the total work be the LCM of the individual like taken by the group of workers.
Hence, total work = 180 units
Similarly, let A and B do P and Q units work a day respectively.
Thus, C does = 3 × P = 3P units work a day.
According to the question,
(P + Q) × 36 = 180
=> P + Q = 180/36
=> P + Q = 5
=> Q = (5 - P) ....(1)
(Q + 3P) × 20 = 180
=> Q + 3P = 180/20
=> Q + 3P = 9
=> (5 - P) + 3P = 9 (From 1)
=> 2P = 4
=> P = 2
Now,
Q = 5 - P
=> 5 - 2 = 3
Hence, B alone can complete two-third of the original work in
=> 180 × 2/3 over 3
=> 180 × 2/9
=> 40 days
Therefore B alone can complete two-third of the original work in 40 days.

Q34. Answer: (c) Arthashastra

The correct answer is Arthashastra.
Key Points
• Kautilya's Arthashastra is an ancient Indian Sanskrit treatise on statecraft, economic policy, and military strategy.
• The book on statecraft was written in the Mauryan period.
• The text is divided into 15 chapters known as books.
• The book was written in Sanskrit.
• Even before the final version of Arthashastra was written in the fourth century B.C. by Kautilya, there appeared a tradition of writing on and teaching of statecraft because Kautilya acknowledges his debt to his predecessors in the field.
• Kautilya was the Prime Minister of Chandragupta Maurya.
Additional Information
• Indica was written by Megasthenes.
• Megasthenes was the Greek ambassador at Chandragupta Maurya's court.
-

Q35. Answer: (d) Ministry of Civil Aviation

The correct answer is Ministry of Civil Aviation.
Key Points
• The Ministry of Civil Aviation (MoCA) published the UAS Rules, 2021.
• They were perceived by academia, Startups, end-users and other stakeholders as being restrictive in nature as they involved considerable paperwork, required permissions for every drone flight and very few "free to fly" green zones were available.
• In view of its traditional strengths in innovation, information technology, frugal engineering and huge domestic demand, India has the potential to be global drone hub by 2030.

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Additional Information

• key features of Drone Rules 2021

• Built on a premise of trust, self-certification and non-intrusive monitoring.

• Designed to usher in an era of super-normal growth while balancing safety and security considerations.

• Digital sky platform shall be developed as a user-friendly single-window system.

• There will be minimal human interface and most permissions will be self-generated.

• No remote pilot licence required for micro drones (for non-commercial use) and nano drones.

• No requirement for security clearance before issuance of any registration or licence.

Q36. Answer: (b) Geneva, Switzerland

The correct answer is Geneva, Switzerland.

It was established in 1971 as a not-for-profit foundation that is headquartered in Geneva, Switzerland.

• The World Economic Forum is the International Organization for Public-Private Cooperation.

• The WEF was founded by Klaus Schwab, a business professor at the University of Geneva.

• The Forum engages the foremost political, business, cultural and other leaders of society to shape global, regional and industry agendas.

• Reports released by the WEF - Global Competitiveness Report, the Global Risks Report and the Global Gender Gap Report.

Additional Information

• The annual meeting of the World Economic Forum took place in Switzerland.

• The World Economic Forum's Annual Meeting will take place in Davos-Klosters, Switzerland from 22-26 May 2022.

• It will take place under the theme of Working Together, Restoring Trust.

• It will be the first global in-person leadership event since the outbreak of the COVID-19 pandemic.

• The World Economic Forum is pleased to announce that it will hold its Annual Meeting 2022 in Davos-Klosters, Switzerland, from Sunday 22 to Thursday 26 May.

• The Annual Meeting 2022, returning to Davos-Klosters after a two-year hiatus, will offer world leaders an opportunity to take stock of the state of the world and shape partnerships and policies for the crucial period ahead.

Q37. Answer: (d) Annie Besant

The correct answer is Annie Besant.

Key Points

• Annie Besant was connected to the Home Rule Movement in India.

• Annie Besant launched the All India Home Rule League in 1916 along with Bal Gangadhar Tilak.

• Annie Besant was an ardent supporter of Irish self-rule.

• Annie Besant fought for the freedom of thought, secularism, women’s rights, and various social issues.

• Annie Besant Besant converted to Theosophy after meeting Helena Blavatsky in 1889.

• She came to India for the first time in 1893 as part of the Theosophical Society.

• Annie Besant was the society’s president from 1907 to 1933.

• Annie Besant set up the Central Hindu College (CHC) at Benares in 1898.

• She also joined the Indian National Congress (INC) in 1914.

• She also became the Congress President in the Calcutta session in 1917.

Additional Information

• Sarojini Naidu

• Sarojini Naidu was the first Indian woman president of the Indian National Congress.

• She became the president of the Indian National Congress in the Kanpur session in 1925.

• She was given the title of "Nightingale of India" for her contributions in the field of poetry writing.

• She was called 'Bharat Kokila'.

• She is the first woman to hold the office of governor in the dominion of India.

• She became the governor of the United Provinces in 1947.

• Madam Bhikaji Cama

• Madam Bhikaji Cama hoisted the Indian Flag in Germany.

• International Socialist Conference was being held at Stuttgart where the flag was hoisted in the year 1907.

• She is also known as the mother of the Indian Revolution.

• She founded the Paris Indian Society.

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• Matangini Hazra

• She was an Indian revolutionary who participated in the Indian independence movement until she was shot dead by the British Indian police in front of the Tamluk Police Station, Midnapore District.

• She was affectionately known as "Gandhi buri" and "Bangla for old lady Gandhi".

• In 1920, she took part in the Non-Cooperation Movement and was arrested for breaking the Salt Act.

• She also participated in the 'Chowkidari Tax Bandha' (abolition of chowkidari tax) movement.

Q38. Answer: (a) The UAE

The correct answer is The UAE.

Key Points

• The United Arab Emirates has announced to change its existing five-day workweek to a four-and-a-half day starting January 1, 2022.

• It has become the world's first country to make the employee-friendly transition as part of its efforts to improve productivity and work-life balance.

• Monday to Thursday the work timings would be from 7.30 am to 3.30 pm, followed by a half-day on Friday.

Additional Information

• Saturdays and Sundays are full-day holidays under the new rule.

• Further, employees would be offered flexible working hours and work-from-home options on Friday.

• The new system will first be implemented in all federal government entities; schools, colleges, and private institutions are expected to follow suit.

Q39. Answer: (c) 79/20

Given:

73/5 × 41/2 - K = 263/4

Concept used:

Calculation:

73/5 × 41/2 - K = 263/4

=> 38/5 × 9/2 - K = 107/4

=> 342 over 10 - 107/4 = K

=> K = 684 - 535 over 20

=> K = 149 over 20

=> K = 79/20

Therefore 79/20 can replace K in 73/5 × 41/2 - K = 263/4.

$x = (-b \pm \sqrt{(b^2-4ac)})/2a$

Q40. Answer: (a) 35.8%

Given:

The marks obtained by A in a test are 20% more than the marks obtained by B, and C obtained 85% of the total marks obtained by A and B.

Calculation:

Let marks obtained by B be 100Q.

Hence, marks obtained by A = 100Q + 100Q × 20% = 120Q

Thus, marks obtained by C

=> (100Q + 120Q) × 85%

=> 220Q × 85%

=> 187Q

Now,

% = (187Q - 120Q)/187Q × 100%

=> 67Q/187Q × 100% ≈ 35.82% ≈ 35.8%

Therefore By 35.8% the marks obtained by A are less than the marks obtained by C.

Q41. Answer: (b) 11/20

Given:

A can do a piece of work in 24 days and B can do 2/5 of the same work in 12 days.

Both work together for 6 days.
Concept used:
Total work = Work done per day × Total time taken
Calculation:
B can do 2/5 of the same work in 12 days
Hence, time taken by B to complete the work = 12 ÷ 2/5 = 30 days
LCM (24, 30) = 120
Let the total work be the LCM of the individual time taken by the workers.
Hence, total work = 120 units
Thus,
A does a day = 120/24 = 5 units work
B does a day= 120/30 = 4 units work
Now, work done by them together in 6 days
=> 6 × (5 + 4)
=> 54 units
Hence, the remaining work in fraction = (120 - 54)/120
=> 66/120 = 11/20
Therefore 11/20 work is still left.

Q42. Answer: (d) dpkhkdpcpc

Given sequence: _h__cd_p_c_h_k_dh_k_
1. phcdkpchdk → phhcc - ddpkc - phckh - dhdkk
2. phdkpchkpc → phhdc - dkppc - chhkk - dhpkc
3. dphkchdpck → dhphc - dkpcc - hhdkp - dhckk
4. dpkhkdpcpc → dhpkc - dhpkc - dhpkc - dhpkc
• In option 4, dhpkc is repeated
Hence, ‘dpkhkdpcpc’ is the correct answer.

Q43. Answer: (a) Playground

In a certain code language,
• 'club' is written as 'school'
• 'school' is written as 'playground'
• 'playground' is written as 'house'
• 'house is written as 'market'
• 'market' is written as 'bus'
Students go to study to 'School' and 'school' is written as 'playground'.
Therefore, students go to study to Playground.
Hence, ‘Playground’ is the correct answer.

Q44. Answer: (b) 11 cm

Given:
Two chords AB and CD of a circle intersect at point F inside the circle. If AF = 4 cm, BF = 6 cm and CF = 3 cm.
Concept used:
If PQ and RS are two chords of a circle that intersect at a point M, we can conclude
PM × QM = RM × SM
Calculation:
Accoding to the concept,
AF × BF = CF × DF
=> 4 × 6 = 3 × DF
=> DF = 24/3
=> DF = 8
Now, the length of CD
=> (CF + DF)

=> 3 + 8

=> 11 cm

Therefore The length of CD is 11 cm.

Q45. Answer: (c) Amina

Eight friends are sitting around a circular table at equal distances with their back towards the centre of the table.

1. Ishin is sitting to the immediate right of Anshu.
2. Only three people sit between Ishin and Varun.
3. Fiza is sitting to the immediate left of Anshu.
4. Dhruv is to the immediate left of Varun.
5. Amina is is not an immediate neighbour of Dhruv.
6. Only three people sit between Harmeet and Fiza.
7. There are only two people between Mohit and Harmeet.

The vacant position will be occupied by the only left person Amina.

Therefore, the final arrangement will be as shown below:

Clearly, Amina is sitting to the immediate left of Harmeet.

Hence, 'Amina' is the correct answer.

Q46. Answer: (c) Subscript

The correct answer is Subscript.

Key Points

• While writing a chemical formula H2O, the number of molecules is denoted in the subscript form.

• There is a provision in Microsoft Office Word to write the number in the subscript form by using the 'Subscript' option.

• Subscript:

• The _(tag is used to add a subscript text to the HTML document.

• The tag defines the subscript text.

• Subscript text appears half a character below the normal line and is sometimes rendered in a smaller font.

• Subscript text can be used for chemical formulas, like H2)O to be written as H2O.

Additional Information

• Drop cap

• MS Word provides a special feature known as a drop cap.

• A drop cap is a large capital letter that presents at the beginning of a text block or a paragraph and has the depth of two or more lines of regular text.

• A drop cap is the largest capital letter or a word(according to the user requirement) which is used as a decorative element at the beginning of a paragraph.

• Superscript

• Superscript is a character(s) half the height of a standard character and printed higher than the rest of the text.

• An example of a superscript is 2^5.

• Superscript can be used for exponents in mathematics.

• Strikethrough

• Strikethrough is a font effect that causes text to appear as though it is crossed out.

• Strikethrough is often used to indicate text that is no longer valid in a document or on a web page.

Q47. Answer: (d) 7 : 13

Shortcut Trick

Let Mode = 13 and Median = 9 based on the given ratio.

Empirical formula: Mode = 3 × Median − 2 × Mean

=> 13 = 3 × 9 − 2 × Mean

=> 2 × Mean = 27 − 13 = 14

=> Mean = 7

Therefore The correct answer is 7 : 13.

Alternate Method

Given:

Ratio of Mode to Median = 13 : 9

Formula Used:

Empirical Relation: Mode = 3 × Median − 2 × Mean

Empirical Formula Ratio

Mean

7 Parts

Median

9 Parts

Mode

13 Parts

Calculations:

=> Let Mode = 13x and Median = 9x

=> Substituting the values into the empirical formula:

=> 13x = 3 × (9x) − 2 × Mean

=> 13x = 27x − 2 × Mean

=> 2 × Mean = 27x − 13x

=> 2 × Mean = 14x

=> Mean = 7x

=> Required ratio = Mean : Mode

=> Ratio = 7x : 13x = 7 : 13

Therefore The correct answer is 7 : 13.

Additional Information

Empirical Relationship

For a moderately skewed distribution, the relationship between the three measures of central tendency is given by: Mode = 3 × Median − 2 × Mean.

Types of Distribution Skewness

Symmetrical Distribution: Mean = Median = Mode.Positively Skewed: Mean > Median > Mode.Negatively Skewed: Mean < Median < Mode.

Measures of Central Tendency

Mean is the average of all data points. Median is the middlemost value when data is arranged in ascending order. Mode is the value that occurs most frequently in the dataset.

Q48. Answer: (d) Yatharth scored more marks than Amrita.

1. Yatharth scored more marks than Karan.

Yatharth > Karan

2. Parth's marks were less than Amrita.

Amrita > Parth

3. Vineeta scored more marks than Parth.

Vineeta > Parth

4. Parth scored exactly the same marks as Yatharth.

Parth = Yatharth

5. Girish did not score more marks than Karan.

Karan > Girish

6. Vineeta scored less marks than Amrita.

Amrita > Vineeta

From all the 6 statements, we get:

Amrita > Vineeta > Parth = Yatharth > Karan > Girish

1. Karan scored less marks than Vineeta. → True

2. Girish scored less marks than Parth. → True

3. Amrita scored more marks than Karan. → True

4. Yatharth scored more marks than Amrita. → False (Amrita scored more marks than Yatharth)

Clearly, option 4 is NOT correct according to above information.

Hence, 'option 4' is the correct answer.

Q49. Answer: (a) Things to Leave Behind

The correct answer is Things to Leave Behind.

Key Points

• The Sahitya Akademi, on 30 December 2021, announced its awards for 2021 for literary works in 20 languages, including novels in Assamese and English.

• In English, Author Namita Gokhale won the award for her book Things to Leave Behind.

• This year, 7 books of poetry, five short stories, two plays, one each of biography, autobiography, criticism and epic poetry have been chosen for the award.

Additional Information

• Ms Gokhale was awarded for her novel Things to Leave Behind and Ms Pujari for Iyat Ekhan Aaronya Asil.

• Daya Prakash Sinha was awarded in Hindi for Samrat Ashok (Play).

• Among the winners for poetry were Mwdai Gahai (Bodo), Sanjiv Verenkar (Konkani), Hrushikesh Mallick (Odia), Meethesh Nirmohi (Rajasthani), Vindeshwariprasad Mishr 'Vinay' (Sanskrit), Arjun Chawla (Sindhi) and Gorati Venkanna (Telugu).

• Books of short stories by writers Raj Rahi (Dogri), Kiran Gurav (Marathi), Khalid Hussain (Punjabi), Niranjan Hansda (Santali) and Ambai (Tamil) were among those chosen for the awards.

• A biography by D.S. Nagabhushana in Kannada, an autobiography by George Onakkoor in Malayalam, a work of criticism by Wali Mohd.

• Aseer Kashtawari in Kashmiri and a book of epic poetry by Chhabilal Upadhyaya.

• For Hindi the Daya Prakash Sinha got the award for the Play

Q50. Answer: (a) 240

Shortcut Trick

Relative Speed (Opposite direction) = 62 + 10 = 72 km/h

Convert to m/s: 72 × (5/18) = 20 m/s

Length of train = Relative Speed × Time = 20 × 12 = 240 m

Therefore The correct answer is 240 m.

Alternate Method

Given:

Speed of train (S1) = 62 km/h

Speed of man (S2) = 10 km/h

Time taken (t) = 12 sec

Formula Used:

Relative Speed (Opposite Direction) = S1 + S2

Distance (Length of train) = Relative Speed × Time

Conversion: 1 km/h = 5/18 m/s

Calculations:

=> Relative Speed = 62 + 10 = 72 km/h

=> Relative Speed in m/s = 72 × (5/18)

=> Relative Speed = 4 × 5 = 20 m/s

=> Length of train = 20 × 12

=> Length of train = 240 m

Therefore The correct answer is 240 m.

Additional Information

Relative Speed Concept

When two objects move in opposite directions, their relative speed is the sum of their speeds (u + v). When they move in the same direction, it is the difference (u − v).

Unit Conversion

To convert km/h to m/s, multiply by 5/18. To convert m/s to km/h, multiply by 18/5.

Train Crossing a Man

When a train crosses a stationary or moving point object (like a man, pole, or tree), the distance covered is equal to the length of the train.

Q51. Answer: (b) 193.8

Given:

The divisor is 22.8 and the quotient is 8.5.

Remainder = 0

Concept used:

Dividend = Divisor × Quotient + Remainder

Calculation:

According to the question, the dividend

=> 22.8 × 8.5 + 0

=> 193.8

Therefore The dividend is 193.8.

Q52. Answer: (c) ORTX

The logic followed here is:

• Similarly,

• Hence, 'ORTX' is the correct answer.

Q53. Answer: (b) Integrated Services Digital Network

The correct answer is Integrated Services Digital Network.

Key Points

• ISDN is a set of communication standards for simultaneous digital transmission of voice, video, data, and other network services over the traditional circuits of the public switched telephone network.

• This results in potentially better voice or data quality than an analog phone can provide.

• It provides a packet-switched connection for data in increments of 64 kilobit/s.

• It provided a maximum of 128 kbit/s bandwidth in both upstream and downstream directions.

• A greater data rate was achieved through channel bonding.

• It can integrate speech and data on the same lines, which were not available in the classic telephone system.

Additional Information

• Advantages of ISDN:

• ISDN channels have a reliable connection.

• ISDN is used to facilitate the user with multiple digital channels.

• It has a faster data transfer rate.

• Disadvantages of ISDN:

• ISDN lines are costlier than the other telephone system.

• It requires specialized digital devices.

• It is less flexible.

Q54. Answer: (b) 10

Shortcut Trick

For divisibility by 72, the number must be divisible by 8 and 9.

Divisibility by 8: Check last three digits 78y => 784 is divisible by 8, so y = 4.

Divisibility by 9: Sum of digits (8+3+x+9+3+6+7+8+4) = 48 + x => x = 6 (since 54 is divisible by 9).

Value = 3(6) − 2(4) = 18 − 8 = 10.

Therefore The correct answer is 10.

Alternate Method

Given: Number 83x93678y is divisible by 72.

Step 1: Check Divisibility by 8

=> Last three digits 78y must be divisible by 8.

=> 78y ÷ 8 => 8 × 9 = 72; Remainder = 6. To be divisible, 6y must be 64.

=> y = 4.

Step 2: Check Divisibility by 9

=> Sum of digits = 8 + 3 + x + 9 + 3 + 6 + 7 + 8 + 4 = 48 + x.

=> For divisibility by 9, the nearest multiple of 9 after 48 is 54.

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=> 48 + x = 54 => x = 6.

Step 3: Calculate (3x − 2y)

=> 3 × 6 − 2 × 4

=> 18 − 8 = 10.

Therefore The correct answer is 10.

Additional Information

Divisibility Rule of 8

A number is divisible by 8 if its last three digits are divisible by 8 or if they are 000.

Divisibility Rule of 9

A number is divisible by 9 if the sum of its digits is divisible by 9.

Composite Divisibility

If a number is divisible by two co-prime numbers a and b, then it is also divisible by their product (a × b).

Q55. Answer: (d) Myanmar

The correct answer is Myanmar.

Key Points

• The Rohingya people are an ethnic group originating from Myanmar.

• Myanmar is a majority-Buddhist state, but the Rohingya people are primarily Muslim, though a small number are Hindus too.

• They live mostly in Rakhine State on Myanmar's western coast.

• The Rohingya people are considered "the most persecuted minority in the world" by the United Nations.

• The story of that persecution has its roots in Britain's colonization of Burma, and modern-day Myanmar's refusal to recognize the existence of people who have existed for thousands of years.

• As non-citizens, Rohingya people lack basic rights within Myanmar and are considered stateless.

• Myanmar recognizes 135 distinct ethnic groups, the Rohingya are not one of them.

• Today, the Rohingya are considered illegal immigrants by Myanmar and are not recognized under the law.

• Rohingya people cannot access social services or education, and their movement outside of Rakhine State is closely restricted.

• The UN has accused Myanmar of ethnic cleansing.

Additional Information

• The United Nations (UN)

• It was founded in 1945.

• Members- 193

• The Charter of the United Nations is the founding document of the United Nations.

• It was signed on 26 June 1945, in San Francisco, US.

• Purposes of UN:

• To maintain international peace and security,

• To develop friendly relations among nations,

• To achieve international co-operation in solving international problems,

• To be a center for harmonizing the actions of nations in the attainment of these common ends.

• Secretary-General- António Guterres

• Secreteriat- New York City, USA

Q56. Answer: (a) Meghalaya

The correct answer is Meghalaya.

Key Points

• Known as the '100 Drum Festival', the Wangala Festival is a traditional festival in the northeastern Indian state of Meghalaya.

• The festival kicked off on November 12th, 2021.

• The festival lasts from two days to a week.

• It is one of the most important festivals of the Garo Tribe.

• The tribesmen make sacrifices to please their god Saljong.

Additional Information

• The Wangala festival marks the end of a period of toil, that brings good results to the fields which also signifies the onset of winter.

• It is also celebrated in honour of the Sun God that marks the end of the long harvest season.

• Wangala is celebrated with different forms of dance.
• These dances are performed on the tunes of folk songs that are played on drums and primitive flute.
• Additionally, these flutes are made of buffalo horns.
• On the first day of the festival, people celebrate it with a ceremony called Ragula.
• This ceremony is performed in the house of the village's chief.
• Then on the second day of celebration, which is called Kakkat, people begin the ceremony by dancing to the rhythms of long oval-shaped drums.
• In this celebration, young and old join together while men play the drums and women perform traditional dance forms. The dance form is known as Dama Dagota.

Important Points

• Meghalaya:
• Lok Sabha seats - 2.
• Rajya Sabha seats - 1.
• State Animal - Clouded leopard.
• State Bird - Common hill myna.
• National Parks - Balphakram National Park, Nokrek Ridge National Park.

Q57. Answer: (d) Sutta Pitaka

The correct answer is Sutta Pitaka.

Key Points

• Therigatha is classified as part of the Khuddaka Nikaya, the collection of short books in the Sutta Pitaka.
• Therigatha is the "earliest extant text depicting women's spiritual experiences." in Theravada Buddhism.
• The Therigatha is a collection of 73 poems written by Buddhist nuns over a period of 300 years.
• It is a collection of short poems in Pali attributed to members of the early Buddhist sangha.
• Sutta Pitaka
• The Sutta Pitaka contains the Buddha's teachings recorded mainly as sermons delivered in historical settings.
• It includes the Dhammapada.
• The Dhammapada means 'the path or verses of truth' and is the best known of all the Buddhist scriptures in the West.

Additional Information

• Vinaya Pitaka
• The Vinaya-Pitaka, or "basket of discipline," is the first of three parts of the Tipitaka, a collection of the earliest Buddhist texts.
• The Vinaya Pitaka records the Buddha's rules of discipline for monks and nuns.
• It also contains stories about the first Buddhist monks and nuns and how they lived.
• Mahavamsa
• Mahavamsa is a historical chronology of Ceylon (modern Sri Lanka), written in the 5th or 6th century.
• It deals more with the history of Buddhism and with dynastic succession in Ceylon.
• The text was written in Pali, the sacred language of Buddhism.
• Dipavamsa
• The meaning of Dipavamsa is "Chronicle of Island".
• It is the oldest historical record of Sri Lanka.
• It is believed to have been compiled around the 3rd or 4th century BC somewhere in Anuradhapura in Sri Lanka.
• It is written during the reign of King Dhatusena of Sri Lanka, the first Mauryan King of Sri Lanka.

Q58. Answer: (c) 12

The correct answer is 12.

Key Points

• The main contribution of members is to provide support towards arts, literature, sciences, and social services.
• The Rajya Sabha should consist of a maximum of 250 members.
• Out of a total of 250 members, 238 members are representing the States and Union Territories and 12 members are nominated by the President.

Additional Information

• Rajya Sabha is a permanent body that cannot be dissolved.
• However, one-third of its members retire every second year and are replaced by newly elected members for the next six years.

• The Vice-President of India is the Chairman of the Rajya Sabha.

• In Rajya Sabha, twelve members are nominated by the President of India for a period of six years.

Q59. Answer: (b) N

In a group of 5 friends, J, K, L, M and N, all scored different marks.

1. J scored higher marks than L and N, but less marks than K and M.

K, M > J > L, N

2. K scored more marks than M.

K > M > J > L, N

3. L did not score the least marks.

K > M > J > L > N

Clearly, N scored the least marks.

Hence, 'N' is the correct answer.

Q60. Answer: (b) Rs. 15,000

Shortcut Trick

Total interest percentage = Rate × Time = 5% × 2 = 10%.

Total Amount percentage = 100% (Principal) + 10% (Interest) = 110%.

As per the question, 110% corresponds to Rs. 16,500.

Therefore, 100% (Principal) = (16,500 ÷ 110) × 100 = 150 × 100 = Rs. 15,000.

Therefore The correct answer is Rs. 15,000.

Alternate Method

Given: Amount (A) = Rs. 16,500, Rate (R) = 5% p. a., Time (T) = 2 years.

Formula Used: A = P(1 + (R × T) ÷ 100)

=> 16,500 = P × (1 + (5 × 2) ÷ 100)

=> 16,500 = P × (1 + 10 ÷ 100)

=> 16,500 = P × (1 + 0.1)

=> 16,500 = 1.1P

=> P = 16,500 ÷ 1.1

=> P = 15,000

Therefore The correct answer is Rs. 15,000.

Additional Information

Simple Interest (SI) formula

Simple Interest is calculated only on the initial Principal: SI = (P × R × T) ÷ 100.

Principal from Amount

To find the original sum when Amount is known: P = (100 × A) ÷ (100 + RT).

Compound Interest (CI)

Unlike SI, Compound Interest is calculated on the principal plus any accumulated interest from previous periods: A = P(1 + R/100)^T.

Q61. Answer: (c) China

The correct answer is China.

Key Points

• In a separate reply, Commerce and Industry Minister Piyush Goyal said that imports from China have increased from USD 60.41 billion in 2014-15 to USD 65.21 billion in 2020-21, exhibiting a marginal increase of 7.94 per cent over FY15.

• Despite India's efforts to reduce dependence on Chinese Imports amid an increased policy emphasis on self-reliance and the continuing tension along the border, the country's bilateral trade with China has grown 44 per cent in 2021, according to Chinese government data for the full calendar year. Imports grew over a record 46 per cent while exports were up 35 per cent.

Additional Information

• President of China is Xi Jinping.

• Capital of China is Beijing.

• currency of china is Renminbi.

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Q62. Answer: (d) Rs. 2430

Given:

A family's monthly income is Rs. 45,000.

Out of the monthly income, 20% is spent on food, 20% is spent on the house rent, 5% is spent on shopping, 10% is spent on personal expenses and the rest is saved.

They decided to donate 12% of the monthly savings to the poor.

Calculation:

Let the total income be 100%.

Total percentage of the total expenditure

=> (20 + 20 + 5 + 10)%

=> 55%

Hence, the saving percentage = (100 - 55) = 45%

Thus, the donation percentage = 45 × 12% = 5.4%

Now, the amount that they donate to the poor

=> 45000 × 5.4%

=> Rs. 2430

Therefore The amount that they donate to the poor is Rs. 2430.

Q63. Answer: (a) 48T17

The logic followed here is:

Hence, '48T17' is the correct answer.

Q64. Answer: (c) 1, 2 and 3

The correct answer is 1,2 and 3.

Key Points

• Clause (2) of Article 124:

• The Chief Justice of India and the Judges of the Supreme Court are appointed by the President.

• Art. 124(7) provides:

• "No person who has held office as a Judge of the Supreme Court shall plead or act in any court or before any authority within the territory of India."

• Article 125(1):

• There shall be paid to the Judges of the Supreme Court such salaries as may be determined by Parliament by law and, until provision in that behalf is so made, such salaries as are specified in the Second Schedule.

• Hence, Statements 1,2, and 3 are true.

Additional Information

• Facts about Judges of the Supreme court of India

• The Chief Justice of India and the Judges of the Supreme Court are appointed by the President under clause (2) of Article 124 of the Constitution.

• Supreme Court Judges retire upon attaining the age of 65 years.

• The chief justice is responsible for the allocation of cases and the appointment of constitutional benches.

• Justice Y. V. Chandrachud is the longest-serving Chief Justice in India, who served 2696 days.

• The current and 50thth chief justice of India is Justice D.Y. Chandrachud.

Q65. Answer: (b) Rashid Khan

The correct answer is Rashid Khan.

Key Points

• Afghanistan's leg-spinner Rashid Khan picked up his 400th wicket in competitive T20 cricket during the team's T20 World Cup match against New Zealand on 7 Nov'21.

• He achieved the feat in his 289th T20 match.

• He also holds the record for most T20 scalps in a calendar year, having picked a staggering 96 wickets in 2018.

• Only three other bowlers have crossed the 400-wicket mark in T20 cricket.

Additional Information

• Dwayne Bravo, the first to achieve 400 wickets, also became the first bowler to cross 500 T20 wickets.

• Two other bowlers that followed him to the feat are Imran Tahir (in 320 matches) and Sunil Narine (in 362 matches), both

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reaching the milestone earlier in 2021.

• Rashid is only the fourth man, after Tim Southee, Shakib Al Hasan and Lasith Malinga, to achieve the milestone of 100 wickets in T20Is.

Important Points

• Afghanistan: (as of July 2022)

• Capital: Kabul.

• Currency: Afghan afghani

Q66. Answer: (b) HBCSE, TIFR Mumbai

The correct answer is HBCSE, TIFR Mumbai.

Key Points

• The Homi Bhabha Centre for Science Education (HSCSE) at the Tata Institute of Fundamental Research (TIFR), Mumbai, has launched a new online popular talk series called STEAMboat on Children's Day on Sunday, November 14,2021.

• The program consists of exciting talks, animated videos, and much more in multiple languages, exploring Science, Technology, Engineering, Arts, Mathematics, and their intersections.

• The initiative aims to use new media technologies and the internet to widen and consolidate the outreach endeavor in the digital space.

• Engaging sessions on STEAM and related topics in Indian regional languages as well as English.

• For starters, a STEAMboat session will be released every second Sunday of the month.

• These sessions may be live or pre-recorded and will cover a range of topics from all disciplines which are of general interest to people.

• The sessions will be available on HBCSE's YouTube channel.

Additional Information

• Tata Institute of Fundamental Research (TIFR), Mumbai

• TIFR is a National Centre of the Government of India, under the Department of Atomic Energy, as well as a deemed University awarding degrees for master's and doctoral programs.

• The Institute was founded in 1945 with support from the Sir Dorabji Tata Trust under the vision of Dr. Homi Bhabha.

• TIFR, carry out basic research in physics, chemistry, biology, mathematics, computer science ,and science education.

• The main campus is located in Mumbai, with centers at Pune, Bengaluru, and Hyderabad.

Q67. Answer: (b) 90 km/h

Shortcut Trick

Difference in length = 1000 m − 750 m = 250 m

Difference in time = 60 s − 50 s = 10 s

Speed = 250 ÷ 10 = 25 m/s

Speed in km/h = 25 × 18 ÷ 5 = 90 km/h

Therefore The correct answer is 90 km/h.

Alternate Method

Given:

Bridge length = 1 km = 1000 m, Time taken = 1 min = 60 s

Tunnel length = 750 m, Time taken = 50 s

Formula Used:

Distance = Speed × Time

When a train crosses an object with length (bridge/tunnel), Total Distance = Train Length + Object Length

Calculations:

Let the length of the train be L.

=> Speed = (L + 1000) ÷ 60 --- (Equation 1)

=> Speed = (L + 750) ÷ 50 --- (Equation 2)

=> (L + 1000) ÷ 60 = (L + 750) ÷ 50

=> 5 × (L + 1000) = 6 × (L + 750)

=> 5L + 5000 = 6L + 4500

=> L = 500 m

=> Speed = (500 + 1000) ÷ 60 = 1500 ÷ 60 = 25 m/s

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=> Speed in km/h = 25 × 18 ÷ 5

=> Speed = 5 × 18 = 90 km/h

Therefore The correct answer is 90 km/h.

Additional Information

Speed Conversion

To convert speed from m/s to km/h, multiply by 18/5. To convert km/h to m/s, multiply by 5/18.

Train Crossing a Pole or Stationary Point

When a train crosses a pole or a person, the distance covered is equal to the length of the train (L).

Relative Speed (Same Direction)

When two objects move in the same direction with speeds u and v, the relative speed is |u − v|.

Relative Speed (Opposite Direction)

When two objects move in opposite directions with speeds u and v, the relative speed is (u + v).

Q68. Answer: (d) Saturday

13th June 2005 → Friday

13th June 2005 + 17 days = 30^(th) June 2005

Number of days from 1^(st) July 2005 to 5th July 2005 = 5

=> 17 + 5 = 22

• 13th June 2005 + 22 days = 5th July 2005

22 when divided by 7 leaves 1 as remainder.

3th June 2005 + 1 odd day = 5th July 2005

=> Friday + 1 odd = Saturday

So, it was Saturday on 5th July 2005.

Hence, ‘Saturday’ is the correct answer.

Q69. Answer: (b) 540

Symbol	•	÷	•	×
Meaning	÷	•	×	•

Given equation: 200 + 10 - 25 × 60 ÷ 20 = X

After replacing the symbols by their meaning, we get:

L.H.S. = 200 ÷ 10 × 25 + 60 - 20

= 20 × 25 + 40

= 500 + 40

= 540 = X

Hence, ‘540’ is the correct answer.

Q70. Answer: (d) Bhutan

The correct answer is Bhutan.

Key Points

• India and Bhutan today inked an MoU for developing cooperation between two countries in the area of environment.

• The MoU was signed virtually by Minister of Environment, Forest and Climate Change Prakash Javadekar from the Indian side and Minister of Foreign Affairs and Chairperson of the National Environment Commission Lyonpo Dr. Tandi Dorji from the Bhutanese side.

• This MoU strengthen scientific, technological, and management capabilities.

Additional Information

• Prime Minister of Bhutan is Lotay Tshering.

• Capital of Bhutan is Thimpu.

• Currency of Bhutan is ngultrum.

Q71. Answer: (a) Si

The correct answer is Si.

Key Points

• The element used in making solar cells is silicon.
• Solar cells contain a p-n junction diode which is usually made of Si and GaAs.
• The device used to convert solar energy into electrical energy is known as solar cells.
• It is based on photovoltaic effects.
• The photoelectric effect is defined as the generation of voltage due to the bombardment of light photons.
• Pure silicon which is crystalline in nature is a poor conductor of electricity as it is a semiconductor material at its core.

Important Points
• Working Principle of Solar cells.
• Works on the principle of photovoltaic effect.
• When light falls on the solar panel, the light photons reach the silicon junction.
• They excite electrons from the valence band to the conduction band, leaving behind an equal number of holes in the valence band.
• These electron –holes pairs generated in the depletion region move in opposite directions due to the barrier field.
• Photo-generated electrons move towards the n side and holes towards the p side.
• The collection of these charge carriers makes the p-side a positive electrode and the n side a negative electrode.
• Hence a photovoltage is set up across the junction.

Additional Information
• Advantages of solar cells are:
• Pollution free.
• Long-lasting.
• Maintenance free.
• Can be used anywhere as a self-generating source of electricity.
• Disadvantages:
• High cost of installation.
• Low efficiency.

Q72. Answer: (b) Kamal is an immediate neighbour of Vimal.

Prashant, Kamal, Rishi, Sunita, Tanvi, Vimal, Wazir and Yogita are sitting at a square table in such a way that four of them are sitting at four corners of the table, while the other four are sitting in the middle of each of four sides of the table.

The four who are sitting at the corners of the table are facing the centre, whereas those who are sitting in the middle of the sides of the table are facing outside.

1. Prashant, who is facing the centre, is sitting third to the right of Vimal.

2. Tanvi, who is facing the centre, is not an immediate neighbour of Vimal.

Clearly, Tanvi is sitting second to the left of Prashant as she is facing the centre and the only vacant possible position for Tanvi is second to the left of Prashant.

3. Only one person is sitting between Vimal and Wazir.

4. Rishi is not an immediate neighbour of Prashant.

5. Sunita sits second to the right of Kamal.

6. Kamal is facing the centre.

Case I is eliminated as there is no vacant position left for Rishi to occupy.

Rishi is sitting between Tanvi and Sunita.

Yogita is sitting between Prashant and Tanvi.

The final arrangement will be as shown below:

1. Kamal is an immediate neighbour of Yogita. → False (Prashant and Tanvi are immediate neighbours of Yogita)

2. Kamal is an immediate neighbour of Vimal. → True

3. Kamal is sitting to the immediate right of Tanvi. → False (Kamal is sitting diagonally opposite to Tanvi)

4. Kamal is an immediate neighbour of both Tanvi and Sunita. → False (Kamal is sitting diagonally opposite to Tanvi)

Hence, 'Kamal is an immediate neighbour of Vimal' is the correct answer.

Q73. Answer: (b) Avanti

The correct answer is Avanti.

Key Points Avanti was an ancient Indian Mahajanapada (great region), which at present belonged to the Malwa region.

According to the Buddhist text, Anguttara Nikaya, Avanti was one of the Solasa Mahajanapadas (sixteen great regions) of the 6th

century BCE.

The district was divided into two parts by the Vindhyas, the capital of the northern part was in Ujjayini and the southern part was the Mahishmati center.

Additional Information

Q74. Answer: (a) GQNTE

The logic followed here is:

• And

• Similarly,

• Hence, ‘GQNTE’ is the correct answer.

Q75. Answer: (c) Wednesday

Ajit was born on Monday, 24 March 1980.

24 March 1980 → Monday

An ordinary year has 1 odd day and a leap year has 2 odd days.

24 March 1980 + 41 years = 24 March 2021

• In 41 years, there are 10 leap years and 31 non-leap years.

• No. of odd days in 41 years = 10 × 2 + 31 × 1 = 20 + 31 = 51

51 when divided by 7, leaves 2 as remainder.

=> 24 March 1980 + 2 odd days = 24 March 2021

=> Monday + 2 = Wednesday

So, it will be Wednesday on 24 March 1980.

Hence, ‘Wednesday’ is the correct answer.

Q76. Answer: (a) 19

Given:

Five years ago, the average age of A, B, and C was 17 years.

Seven years ago, the average age of A and B was 17 1/2 years i.e. 17.5 years.

Calculation:

Let A, B, and C be P, Q, and R years old. (Presently)

According to the question,

(P - 7) + (Q - 7) = 17.5 × 2

=> P + Q = 35 + 14

=> P + Q = 49 ....(1)

(P - 5) + (Q - 5) + (R - 5) = 17 × 3

=> P + Q + R = 51 + 15

=> P + Q + R = 66

=> 49 + R = 66

=> R = 66 - 49

=> R = 17

Hence, C's age after 2 years from now

=> R + 2

=> 17 + 2 = 19

Therefore The age of C after 2 years will be 19 years.

Q77. Answer: (d) Europe

The correct answer is Europe.

Key Points

• The Iberian Peninsula is a peninsula in southwestern Europe, occupied by Spain and Portugal.

• The Iberian Peninsula is located on Europe's southwestern tip.

• It is part of the southern Europe peninsula, which comprises three peninsulas; Iberian, Balkan, and Italian peninsulas.

• The Iberian is the westernmost peninsula of the three peninsulas.

• The largest country which is part of the Iberian Peninsula in Spain, which makes up about 79% of the peninsula.

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• The other countries part of this region is Portugal, France, Andorra, and Gibraltar.

Important Points

• Peninsula

• landform surrounded by water on most of its border (three sides) while being connected to a mainland from which it extends.

• Arabian Peninsula or Arabia is the largest peninsula in the world which occupies an area of 3.2 million square Km.

Additional Information

• List of Peninsulas of the World:

Peninsula	Location	Countries
Arabian	Middle East	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE, Yemen
Indian (Deccan) Peninsula	South Asia	South India
Indo-china Peninsula	Southeast Asia	Cambodia, Laos, Myanmar, Thailand, Vietnam
Horn of Africa(Somali Peninsula)	East Africa	Djibouti, Eritria, Ethiopia, Somalia,
Alaska Peninsula	Alaska	US
Labrador Peninsula	North America	Canada
Scandinavian Peninsula	North Europe	Norway, Sweden, north Finland
Balkan Peninsula	Southeast Europe	Albania, Bosnia & Herzegovina, Bulgaria, Croatia, Greece, Kosovo, Macedonia, Montenegro, Romania, Serbia, Slovenia, north Turkey
Iberian Peninsula	Southwest Europe	Andora, Portugal, Spain, France
Kamchatka Peninsula	Far-east Russia	Russia
Korean Peninsula	Northeast Asia	North Korea, South Korea
Floridan Peninsula	North America	US (Florida state)
Baja California Peninsula	North America	Mexico
Italian Peninsula	South Europe	Italy, San Marino, Vatican City
Kola Peninsula	Northwest Russia	Russia
Sinai Peninsula	Egypt-Israel border	Egypt
Crimean Peninsula	East Europe	Ukraine (now Russia)
Tasman Peninsula	Southeast Australia	Australia
Chukchi Peninsula	Northeast Russia	Russia
Malay Peninsula	Southeast Asia	South Thailand, South Myanmar, Malaysia
Yucatan Peninsula	Southeast Mexico	The Gulf of Mexico, Caribbean sea

Q78. Answer: (d) 7122198

The logic followed here is:

• if a letter appears twice in a word, at the second occurrence, it is coded with its reverse alphabetical position → So, 'S', the last letter is coded as 8 as the reverse alphabetical position of S is 8.

• if a vowel appears between two consonants, its corresponding number gets doubled → So, A is coded as 2 as the corresponding number of A is 1.

• The remaining letters are coded as per their alphabetical order; so G is coded as 7, L is coded as 12 and S is coded as 19.

Hence, '7122198' is the correct answer.

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Q79. Answer: (a) Jatin

Five friends, Puneet, Jatin, Gautam, Arshil and Tina, like five different subjects namely Maths, English, Science, Computer and Hindi, but not necessarily in the same order. Each of the friends also like one sport, namely Cricket, Hockey, Badminton, Football and Basketball, such that no two has the same favourite sport.

1. Tina likes Science but does not like Hockey.
2. Tina likes Football.
3. The one who likes Hindi also likes Basketball.
4. Arshil likes Badminton but does not like Computer or English.
5. Gautam likes Hockey but does not like English or Maths.
6. Puneet likes Cricket.

Person	Subject	Sport
Tina	Science	Football
	Hindi	Basketball
Arshil		Badminton
Gautam	English, Maths	Hockey
Puneet		Cricket

Only Jatin is left and Jatin will occupy the only vacant position in Person's box.

Gautam likes Computer as Gautam does not like English or Maths and the other two positions in Subject's box will be occupied by English and Maths.

Person	Subject	Sport
Tina	Science	Football
Jatin	Hindi	Basketball
Arshil	English/Maths	Badminton
Gautam	Computer	Hockey
Puneet	English/Maths	Cricket

Clearly, Jatin likes Hindi.

Hence, 'Jatin' is the correct answer.

Q80. Answer: (a) Assam

The correct answer is Assam.

Key Points

• Boro, an ethno-linguistic community is native to the northeastern state of Assam.
• Bodo tribes are inhabitants of Garo hills.
• The language spoken by the Boro people is recognized by the Indian constitution and finds a place in the Eighth schedule.
• They are members of the Sino-Tibetan family.
• They are polytheist Hindus.
• Most of the people of the Boro tribe are settlers and farmers.

Additional Information

• Important tribes and their states

State	Tribes
Andhra Pradesh	Bhil, Bhaghata, Dhulia,rona, Kolam, Gond, Thoti, Goundu, Kammara, Savaras, Dabba Yerukula, Sugalis, Nakkala, Pardhan
Arunachal Pradesh	Singpho, Monpa, Abor, Sherdukpen, Galo, Apatanis
Assam	Khasis, Chakma, Dimasa, Gangte, Garos, Hajong, Chutiya
Bihar	Gond, Birjia, Asur, Savar, Parhaiya, Chero, Birhor, Santhals, Baiga
Chhattisgarh	Nagasia, Biar, Khond, Agariya, Bhattra, Mawasi, Bhaina,

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Goa	Varli, Dubia, Siddi, Dhodia, Naikda
Gujarat	Patelia, Bhil, Dhodia, Bamcha, Barda, Paradhi, Charan, Gamta
Himachal Pradesh	Swangal, Gujjars, Lahaulas, Khas, Pangwala, Lamba, Gaddis
Jammu and Kashmir	Balti, Garra, Sippi, Bakarwal, Mon, Gaddi, Purigpa, Beda
Jharkhand	Gonds, Birhors, Savar, Mundas, Santhals, Khaira, Bhumji
Karnataka	Gond, Patelia, Barda, Yerava, Bhil, Koraga, Adiyan, Iruliga,
Kerala	Malai, Aarayan, Arandan, Uralis, Kurumbas, Arandan, Eranvallan
Madhya Pradesh	Kharia, Bhils, Murias, Birhors, Baigas, Katkari, Kol, Bharia, Khond, Gonds,
Maharashtra	Warlis, Khond, Bhaina, Katkari, Bhunjia, Rathawa, Dhodia.
Manipur	Thadou, Aimol, Maram, Paite, Chiru, Purum, Kuki, Monsang, Angami
Meghalaya	Pawai, Chakma, Raba, Hajong, Lakher, Garos, Jaintias Khasis
Mizoram	Dimasa, Raba, Chakma, Lakher, Khasi, Synteng, Kuki, Pawai.
Nagaland	Nagas, Angami, Sema, Garo, Kuki, Kachari, Mikir
Odisha	Gadaba, Ghara, Kharia, Khond, Matya, Oraons, Rajuar, Santhals.
Rajasthan	Bhils, Damaria, Dhanka, Meenas(Minas), Patelia, Sahariya.
Sikkim	Bhutia, Khas, Lepchas.
Tamil Nadu	Adiyan, Aranadan, Eravallan, Irular, Kadar, Kanikar, Kotas, Todas.
Telangana	Chenchus.
Tripura	Bhil, Bhutia, Chaimal, Chakma, Halam, Khasia, Lushai, Mizel, Namte.
Uttarakhand	Bhotias, Buksa, Jannsari, Khas, Raji, Tharu.
Uttar Pradesh	Bhotia, Buksa, Jaunsari, Kol, Raji, Tharu.
West Bengal	Asur, Khond, Hajong, Ho, Parhaiya, Rabha, Santhals, Savar.
Andaman and Nicobar	Oraons, Onges, Sentinelese, Shompens.
Little Andaman	Jarawa
North-East	Abhors, Chang, Galaong, Mishimi, Singpho, Wancho.

Q81. Answer: (b) Only conclusions II and III follow.

Venn diagram:

Conclusions:

I. All fries are chips. → False (it is possible but not definite)

II. Some chips are fries. → True (As, Some fries are cakes and All cakes are chips → Some fries are chips)

III. All burgers are chips. → True (As, All burgers are cakes and All cakes are chips)

Hence, Only conclusions II and III follow.

Q82. Answer: (c) 5280 m²

Shortcut Trick

Side of the rhombus = 292 ÷ 4 = 73 m.

The diagonals of a rhombus bisect each other at 90°. Using the Pythagorean triplet (48, 55, 73):

Half of the second diagonal = $\sqrt{(73^2 - 48^2)} = \sqrt{(5329 - 2304)} = \sqrt{3025} = 55$ m.

Full second diagonal (d2) = 55 × 2 = 110 m.

Area = (1/2) × d1 × d2 = (1/2) × 96 × 110 = 48 × 110 = 5280 m².

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Therefore The correct answer is 5280 m².

Alternate Method

Given: Perimeter of the rhombus = 292 m, Diagonal 1 (d1) = 96 m.

Formula Used: Area of rhombus = (1/2) × d1 × d2; 4 × (side)² = d1² + d2².

=> Side of rhombus (a) = Perimeter / 4 = 292 / 4 = 73 m.

=> In right-angled triangle ABE (where E is the intersection of diagonals):

=> AE² + EB² = AB²

=> AE² + (96/2)² = 73²

=> AE² + 48² = 5329

=> AE² = 5329 − 2304 = 3025

=> AE = √3025 = 55 m.

=> Second diagonal (d2) = 2 × AE = 2 × 55 = 110 m.

=> Area of the field = (1/2) × 96 × 110

=> Area = 48 × 110 = 5280 m².

Thus, the correct option is (3).

Therefore The correct answer is 5280 m².

Additional Information

Properties of a Rhombus

All sides are equal, and diagonals bisect each other at right angles (90°). The relationship between sides and diagonals is $4a^2 = d1^2 + d2^2$.

Area using Trigonometry

The area of a rhombus can also be calculated if a side (a) and an interior angle (θ) are known: Area = $a^2 \times \sin(\theta)$.

Pythagorean Triplets in Rhombus

Frequent triplets in rhombus problems include (3, 4, 5), (5, 12, 13), (8, 15, 17), (20, 21, 29), and (48, 55, 73).

Q83. Answer: (b) R @ H $ K > Q

X is				
Symbol	<		@	$
Meaning	mother	husband	sister	son
to Y				

By using the symbols in the table given below, we can draw the following family tree:

• R @ H > K < Q → R is sister of H, H is husband of K, K is mother of Q.

=> R is the aunt of Q.

• R @ H $ K > Q → R is sister of H, H is son of K, K is husband of Q.

=> R is the daughter of Q.

• Q > K @ R $ H → Q is husband of K, K is sister of R, R is son of H.

=> R is the brother-in-law of Q.

• Q < K @ H $ R → Q is mother of K, K is sister of H, H is son of R.

=> R is the husband of Q.

Clearly, R @ H $ K > Q indicates the relationship 'R is the daughter of Q'.

Hence, 'R @ H $ K > Q' is the correct answer.

Q84. Answer: (d) Clement Attlee

The correct answer is Clement Attlee.

Key Points

• Clement Attlee, the Prime Minister of the United Kingdom, announced on 20 February 1947 that:

• The British Government would grant full self-government to British India by 30 June 1948 at the latest.

• He also announced the appointment of Lord Mountbatten as Viceroy in place of Lord Wavell.

Important Points

• Lord Mountbatten's immediate task was to restore peace among the two warring sections and keep India united if possible.

• He tried to resolve the political deadlock of our country.

• He made an important announcement on June 3, 1947.
• This announcement was known Mountbatten plan or June 3rd plan. According to this plan:-
• India had to be divided into two independent Countries namely Indian Union and Pakistan Union.
• The Princely States were given the option to join either of the two new nations or to remain independent.
• Both Congress and the Muslim League accepted this plan.

Additional Information

• Jawaharlal Nehru
• Jawaharlal Nehru was a freedom fighter who became the first prime minister of independent India.
• Nehru was a principal leader of the Indian nationalist movement in the 1930s and 1940s.
• Upon India's independence in 1947, he served as the country's prime minister for 17 years.
• Nehru promoted parliamentary democracy, secularism, and science and technology during the 1950s.
• Lord Wavell
• In October 1944, Lord Wavell was appointed Viceroy of India.
• He attempted to break the existing deadlock in India, hence the name "The Breakdown Plan."
• He went to England for consultations and later proposed the Wavell Plan to end the deadlock in India on June 14th.
• He was succeeded by Lord Mount Batten.
• Lord Mountbatten
• In March 1947, Mountbatten was appointed Viceroy of India.
• He oversaw the Partition of British India into India and Pakistan.
• He then served as the first Governor-General of India until June 1948.

Q85. Answer: (a) 10 cm

Shortcut Trick

By the Angle Bisector Theorem, the ratio of the divided segments equals the ratio of the adjacent sides.

=> QS : SR = PQ : PR = 12 : 15 = 4 : 5

Total parts for QR = 4 + 5 = 9 parts, which represents 18 cm.

=> 1 part = 18 ÷ 9 = 2 cm.

Length of SR (5 parts) = 5 × 2 = 10 cm.

Therefore The correct answer is 10 cm.

Alternate Method

Given:

Length of side PQ = 12 cm

Length of side PR = 15 cm

Length of side QR = 18 cm

PS is the internal angle bisector of angle QPR.

Formula Used:

Angle Bisector Theorem: An angle bisector of a triangle divides the opposite side into two segments that are proportional to the other two adjacent sides.

=> PQ / PR = QS / SR

P

Q

R

S

12 cm

15 cm

18 cm

QS

SR

Calculation:

Let the length of SR be x cm.

Then, the length of QS will be (18 − x) cm.

Applying the theorem in ΔPQR:

=> 12 / 15 = (18 − x) / x

=> 4 / 5 = (18 − x) / x

Cross-multiplying the terms:

=> 4 × x = 5 × (18 − x)

=> 4x = 90 − 5x

=> 9x = 90

=> x = 10

Therefore The correct answer is 10 cm.

Additional Information

Internal Angle Bisector Theorem

The internal bisector of an angle of a triangle divides the opposite side internally in the ratio of the corresponding sides containing the angle. (AB / AC = BD / DC)

External Angle Bisector Theorem

The external bisector of an angle of a triangle divides the opposite side externally in the ratio of the corresponding sides containing the angle.

Incenter of a Triangle

The point of concurrency (where all three internal angle bisectors intersect) is called the incenter of the triangle. It acts as the center of the incircle and is equidistant from all three sides.

Length of Angle Bisector

The length of the internal angle bisector PS can be found directly using the derived formula: $PS^2 = (PQ \times PR) - (QS \times SR)$.

Q86. Answer: (b) 144π

Given:

A 3200 m long cylindrical copper wire of radius 0.3 mm is melted and recast into a sphere.

Concept used:

Surface area of the sphere = 4πR2

Volume of a sphere = 4πR3/3

Where R is the radius of the sphere.

Volume of a cylinder = πR^2H

Where R and H are the radius of the base and height respectively.

Calculation:

Volume of the cylindrical wire

=> $\pi \times 0.0003^2 \times 3200$

=> 0.000288π m^3

Since the cylindrical wire is melted and recast into a sphere, the volume of the cylindrical wire and sphere must be equal.

Let the radius of the sphere be R m.

According to the question,

$4\pi R^3/3 = 0.000288\pi$

=> $R^3 = 0.000288 \times 3/4$

=> R3 = 0.000216

=> $R^3 = 0.06^3$

=> R = 0.06

Now, surface area of the sphere = $4\pi R^2$

=> $4\pi \times (0.06)^2$

=> 0.0144 m^2

=> 0.0144×10000 cm^2

=> 144π cm^2

Therefore The surface area of the sphere is 144π cm2.

Q87. Answer: (a) twenty

The correct answer is twenty.

Key Points

• Article 243B deals with the Constitution of Panchayats.-

• Clause(1) There shall be constituted in every State, Panchayats at the village, intermediate and district levels in accordance with the provisions of this Part.

• Clause(2) Notwithstanding anything in clause (1), Panchayats at the intermediate level may not be constituted in a State having a population not exceeding twenty lakhs.

• PART IX Article 243(B) provides for Panchayati raj institutions in every village, district, and state.

Important Points

• The 73rd Constitutional Amendment Act(1992) provided a Constitutional status to the Panchayati Raj Institutions in India.

• Insertion of Article 243 to Part IX of the Indian Constitution.

• Part IX focused on organizing the 3 tier Panchayat system, which would be constituted in every state at the village level, intermediate level, and district level.

• It is based on the recommendation of, the Balwant Rai Mehta Committee 1957 which recommended:

• Three-tier Panchayats

• Gram Panchayat at the village level.

• The Panchayat committee at the block level.

• Zilla Parishad.

Q88. Answer: (c) three categories

The correct answer is three categories.

Key Points

• The Industrial Policy Resolution (IPR) 1956

• Adopted to achieve the aim of a socialist state with the government controlling the major strategic industries of the economy.

• According to this resolution, industries were classified into the following three categories:

• Category 1: Those industries that were established and owned exclusively by the public sector.

• Category 2: Those industries in which the public sector would perform the primary role while the private sector would play the secondary role i.e., the private sector supplements the public sector In these industries and new units could be set up only by the public sector.

• Category 3: Those industries that are not included in Category 1 and Category 2 were left to the private sector.

• The government kept indirect control of the industries in the private sector through the policy of industrial licensing.

Important Points

• Highlights of IPR 1956:

• In order to initiate a new industry or expand existing capacity, private entrepreneurs were supposed to obtain licenses from the government.

• Licensing, imposition of the tax, tax exemptions, and subsidies were used by the government:

• to regulate private industries.

• bring about a reduction in regional disparities in industrial development.

• to keep a check on the production of goods that are socially undesirable.

• Hence, the government fully controlled the private sector either directly or Indirectly through the IPR 1956.

Q89. Answer: (b) The value of all goods and services cannot be expressed in monetary units.

The correct answer is The value of all goods and services cannot be expressed in monetary units.

Key Points

• The value of all goods and services can be expressed in monetary units.

• For example:

• the value of a certain wristwatch is Rs 500 which means that the wristwatch can be exchanged for 500 units of money, where a unit of money is a rupee in this case.

Important Points

• Money also acts as a convenient unit of account.

• If the price of a pencil is Rs 2 and that of a pen is Rs 10 we can calculate the relative price of a pen with respect to a pencil, viz. a pen is worth 10 ÷ 2 = 5 pencils.

• The same notion can be used to calculate the value of money itself with respect to other commodities.

• In the above example, a rupee is worth 1 ÷ 2 = 0.5 pencil or 1 ÷ 10 = 0.1 pen.

• The first and foremost role of money is that it acts as a medium of exchange.

• Barter exchanges become extremely difficult in a large economy because of the high costs people would have to incur looking for suitable persons to exchange their surpluses.

• To smoothen the transaction, an intermediate good is necessary which is acceptable to both parties.
• Such a good is called money.
• Economic exchanges without the mediation of money are referred to as barter exchanges
• A barter system refers to a system in which goods are exchanged for other goods.

Q90. Answer: (b) 17.64%

The correct answer is 17.64%.

Key Points

• Census 2011 highlights:
• India's population growth rate is 17.64 percent in the decade 2001-11, the slowest rate of growth this past century, as per data put out by the registrar-general of the census.
• India's population in 2011 is estimated to be 1.21 billion, comprising 624 million males and 587 million females.
• While the gender imbalance in the population remains.
• India's female population grew by 18.12% over the past decade against 17.19% for males.
• India's literacy rate has gone up from 64.83% in 2001 to 74.04% in 2011.
• Literates constitute 74 percent of the total population aged seven and above.
• The sex ratio, that is the number of females per 1,000 males, has improved to 940 from 933 a decade ago.
• The child sex ratio is 914, the lowest since independence.

Important Points

• Census
• Defined by the United Nations, is "the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specified time, to all persons in a country or a well-defined part of the country".

Additional Information

• The first synchronous census was taken under British rule on February 17, 1881, by W.C. Plowden (Census Commissioner of India).
• It has been conducted by the Registrar General and Census Commissioner of India.
• Shri Vivek Joshi is the present Registrar General and Census Commissioner, Ministry of Home Affairs.

Q91. Answer: (d) 212991920

The logic followed here is:

According to the alphabetical positions of the letters,

• If a vowel is immediately preceded as well as immediately followed by a consonant, its code would be 99. So, A is coded as 99.
• The remaining letters of the English alphabet are coded as per their alphabetical order

Hence, '212991920' is the correct answer.

Q92. Answer: (c) Central African Republic

The correct answer is Central African Republic.

Key PointsAccording to the UN Human Settlements Programme, the top 10 countries with maximum Population living in slums (% of urban population).

Rank	Country	Value	Year
1	The Central African Republic	95.40	2018
2	Sudan	88.40	2018
3	Chad	86.90	2018
4	Sao Tome and Principe	85.70	2018
5	Dem. Rep. Congo	77.50	2018
6	Mozambique	77.20	2018
7	Guinea-Bissau	74.40	2018
8	Mauritania	73.20	2018
9	Somalia	72.10	2018

10	Afghanistan	70.70	2018

Additional Information

• Population living in slums is the proportion of the urban population living in slum households.

• A slum household is defined as a group of individuals living under the same roof lacking one or more of the following conditions:

• access to improved water,

• access to improved sanitation,

• sufficient living area,

• durability of housing.

• India ranked 57th out of 118 countries on the list with 35.20% of the urban population living in slums.

Q93. Answer: (b) Roger

Eight friends are sitting around a square table, four at the corners and four in the middle of the four sides.

All of them are facing the centre.

1. Cindy is an immediate neighbour of both Leo and Roger.

2. Both Leo and Roger are sitting at the corners.

3. Ben is second to the right of Leo.

The above condition cannot be satisfied in Case II, so it is eliminated.

4. Cindy is second to the right of Dylan.

5. Only three people sit between Kate and Dylan.

6. Only three people sit between Louis and Cindy.

7. Myra is second to the left of Roger.

Clearly, Roger is sitting to the immediate right of Dylan.

Hence, 'Roger' is the correct answer.

Q94. Answer: (b) an increase in all inputs (labour/capital) leads to a less than proportional increase in output

The correct answer is an increase in all inputs (labour/capital) leads to a less than proportional increase in output.

Key Points

• A decreasing return to scale occurs when the proportion of output is less than the desired increased input during the production process.

• For example,

• if the input is increased by 3 times, but the output is reduced 2 times, the firm or economy has experienced decreasing returns to scale.

• Decreasing returns to scale occur if the production process becomes less efficient as production is expanded.

• As in case, a firm becomes too large to be managed effectively as a single unit.

Additional Information

• Returns to scale

• Returns to scale are the variation or change in productivity that is the outcome of a proportionate increase of all the input.

• An increasing return to scale occurs when the output increases by a larger proportion than the increase in inputs during the production process.

• For example, if the input is increased by 3 times, but output increases by 3.75 times, then the firm or economy has experienced an increasing return to scale.

Q95. Answer: (d) 15106

The correct answer is 15106.

Key Points

• India has a land frontier of 15106 km.

• The total length of the coastline of the mainland, Lakshadweep Islands, and Andaman and the Nicobar Islands is 7,516.6 km.

• India shares its border with seven countries- Afghanistan and Pakistan to the North-West, China, Bhutan, and Nepal to the North, Myanmar to the far East, and Bangladesh to the East. Sri Lanka (from the South-East) and Maldives (from the South-West) are two countries with water borders.

• Across the sea to the south, lie our island neighbours- Sri Lanka and the Maldives.

Additional Information

• India Pakistan border is called the line of control.

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• The Indian states of Punjab, Rajasthan, Jammu, and Kashmir, and Gujarat have the India-Pakistan border.
• Manipur, Mizoram, Arunachal Pradesh, and Nagaland share the land border with Myanmar.
• Arunachal Pradesh and Sikkim share the border with China.
• Assam, Mizoram, Meghalaya, Tripura, and West Bengal share their border with Bangladesh.
• Uttarakhand, Uttar Pradesh, West Bengal, Bihar, and Sikkim share a border with Nepal.

Q96. Answer: (a) 396

Given:
In an office, the number of male employees is 3/8 of the number of female employees.
1/3 of the males are non-graduates, whereas 4/9 of the females are non-graduates.
The number of non-graduate employees in the office is 164.
Calculation:
Hence, the ratio of male employees to female employees = 3 : 8
Let the common ratio be Q.
Now, the number of male and female employees are 3Q and 8Q.
Thus,
The number of male non-graduates = 3Q × 1/3 = Q
The number of female non-graduates = 8Q × 4/9 = 32Q/9
According to the question,
Q + 32Q/9 = 164
=> 41Q/9 = 164
=> Q = 164 × 9/41
=> Q = 36
Now, the number of total employees
=> 3Q + 8Q
=> 11Q
=> 11 × 36
=> 396
Therefore The total number of employees in the office is 396.

Q97. Answer: (d) generate wage employment for the needy rural labours

The correct answer is generate wage employment for the needy rural labours.
Key Points
• Under the Wage Employment Programmes, the National Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme (RLEGP) were started in Sixth and Seventh Plans.
• The NREP and RLEGP were merged in April 1989 under the Jawahar Rozgar Yojana (JRY).
• The JRY was meant to generate meaningful employment opportunities for the unemployed and underemployed in rural areas through the creation of economic infrastructure and community and social assets.
Additional Information
• The JRY was revamped from 1st April 1999 and came to be known as Jawahar Gram Samriddhi Yojana (JGSY).
• It now became a programme for the creation of rural economic infrastructure with employment generation as the secondary objective.

Q98. Answer: (c) East

According to given conditions,
• Mohan started travelling and he first went in the South direction.
• Then he took a turn to his left and walked a distance.
• Thereafter, he turned to his right and travelled some distance.
• Now if he turned to his left and walked again for a certain distance
Clearly, Mohan is travelling in East direction now.
Hence, 'East' is the correct answer.

Q99. Answer: (a) 19 : 363

The logic followed here is:

1. 19 : 363 → 192 + 1 = 361 + 1 = 362 ≠ 363

2. 14 : 197 → 14^2 + 1 = 196 + 1 = 197

3. 17 : 290 → 172 + 1 = 289 + 1 = 290

4. 13 : 170 → 132 + 1 = 169 + 1 = 170

Hence, '19 : 363' is the odd one out.

Q100. Answer: (c) Article 45

The correct answer is Article 45.

Key Points

Right to education:

• 21A The State shall provide free and compulsory education to all children of the age of six to fourteen years in such manner as the State may, by law, determine.".

• Substitution of new article for article 45.- For article 45 of the Constitution, the following article shall be substituted, namely Provision for early childhood care and education to children below the age of six years

• The State shall endeavor to provide early childhood care and education for all children until they complete the age of six years.

• Amendment of article 51A - In article 51A of the Constitution, after clause (J), the following clause shall be added, namely:-"(k) who is a parent or guardian to provide opportunities for education to his child or, as the case may be, ward between the age of six and fourteen years.

Additional Information

Articles	Details
Article 43	The State shall endeavour to secure, by suitable legislation or economic organisation or in any other way, to all workers, industrial
Article 42	Provision for just and humane conditions of work and maternity relief The State shall make provision for securing just and humane conditions of work and for maternity relief
Article 44	Uniform civil code for the citizens The State shall endeavour to secure for the citizens a uniform civil code throughout the territory of India

Q101. Answer: (d) Rs. 11,000

Given:

A sum of money is distributed by a father among his 4 sons A, B, C, and D in the ratio 3 : 6 : 8 : 5.

C received is Rs. 1,000 more than what B received.

Calculation:

Let the common ratio be Q.

Hence, the amount of money received by his 4 sons A, B, C, and D are 3Q, 6Q, 8Q, and 5Q respectively.

According to the question,

8Q - 6Q = 1000

=> 2Q = 1000

=> Q = 500

Now, the total amount

=> 3Q + 6Q + 8Q + 5Q

=> 22Q

=> 22 × 500

=> Rs. 11,000

Therefore The total amount of money that has been distributed among the four was Rs. 11,000.

Q102. Answer: (c) 3

Given:

$(7 + 3\sqrt{5})/(3 + \sqrt{5}) + (7 - 3\sqrt{5})/(3 - \sqrt{5})$

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Concept used:

$A^2 - B^2 = (A + B) (A - B)$

Calculation:

$(7 + 3\sqrt{5})/(3 + \sqrt{5}) + (7 - 3\sqrt{5})/(3 - \sqrt{5})$

=> $(7 + 3\sqrt{5}) (3 - \sqrt{5})$ over $(3 + \sqrt{5}) (3 - \sqrt{5}) + (7 - 3\sqrt{5}) (3 + \sqrt{5})$ over $(3 - \sqrt{5}) (3 + \sqrt{5})$

=> $21 + 9\sqrt{5} - 7\sqrt{5} -15$ over $3^2 - (\sqrt{5})^2 + 21 - 9\sqrt{5} + 7\sqrt{5} -15$ over $3^2 - (\sqrt{5})^2$

=> $21 + 9\sqrt{5} - 7\sqrt{5} -15 + 21 - 9\sqrt{5} + 7\sqrt{5} -15$ over 4

=> 12/4

=> 3

Therefore The simplified value is 3.

Q103. Answer: (b) Rs. 17,600

Given:

Principal amount = Rs. 40,000

Rate of interest = 20%

Time = 2 years

Concept used:

Compound interest, $CI = P(1 + R/100)^n - P$

where

P = Principal amount

R = Rate of interest per year

N = Time in years

Calculation:

According to the concept,

The incurred compound interest

=> $40000(1 + 20/100)^2 - 40000$

=> 57600 - 40000

=> Rs. 17,600

Therefore The compound interest that Kiran will receive after 2 years is Rs. 17,600.

Q104. Answer: (c) 62

Shortcut Trick

Net deviation from overall average 51:

For 24 numbers: 24 × (45 − 51) = −144

For 5 numbers: 5 × (60 − 51) = +45

Net deficit to be covered by remaining 9 numbers = 144 − 45 = 99

Average increase for 9 numbers = 99 ÷ 9 = 11

Required average = 51 + 11 = 62

Therefore The correct answer is 62.

Alternate Method

Given: Total numbers = 38, Total average = 51, First group = 24 (avg 45), Second group = 5 (avg 60).

Formula: Sum = Average × Total Numbers

=> Total Sum of 38 numbers = 38 × 51 = 1938

=> Sum of first 24 numbers = 24 × 45 = 1080

=> Sum of last 5 numbers = 5 × 60 = 300

=> Sum of remaining 9 numbers = 1938 − (1080 + 300)

=> Sum of remaining 9 numbers = 1938 − 1380 = 558

=> Average of remaining numbers = 558 ÷ 9 = 62

Therefore The correct answer is 62.

Additional Information

Weighted Average Formula

The combined average of different groups is given by: A_(combined) = (n1a1 + n2a2 + ... + n_ka_k) ÷ (n1 + n2 + ... + n_k).

Deviation Concept

The sum of deviations of all observations from their arithmetic mean is always zero. This shortcut helps in finding missing values quickly.

Change in Average

If a new value 'x' is added to 'n' numbers with average 'A', the new average = A + (x − A) ÷ (n + 1).

Q105. Answer: (d) Lucknow

The correct answer is Lucknow.

Key Points

• Bara Imambara, also known as Asfi Imambara is an imambara complex in Lucknow, India.

• It was built by Asaf-ud-Daula, Nawab of Awadh in 1784.

• This imambara is the second largest after the Nizamat Imambara.

• Imambara is a shrine built by Shia Muslims for the purpose of Azadari.

• It was built to employ people during the 11-year famine, the nawab planned to build it.

• The famine affected the nobles and the common people.

• Kifayatullah was the architect and designer of the monument who came from Delhi and designed it.

Additional Information

• Asaf-ud-Daula

• Asaf-ud-Daula was the Nawab Wazir of Oudh from 26 January 1775 to 21 September 1797.

• He was the son of Shuja-ud-Dowlah.

• He shifted his capital from Faizabad to Lucknow in 1755 which contributed to its significant growth.

• He built the 'Daulat Khana' as a residence for himself to the west of Macchi Bhawan, the Rumi Darvaza, and the Bara Imam Bara.

Q106. Answer: (a) A plan of economic development for India

The correct answer is A plan of economic development for India.

Key Points

• The Bombay Plan of 1944 was set up by a group of leading industrialists in India for the economic development of the country.

• It proposed the importance of state intervention in the development of a nation, especially economically.

• Industrialists like J.R.D Tata, Birla, Purushottam Das Thakurdas, Ardeshir Shroff, Kasturbhai Lalbhai, Ardeshir Dalal, John Matthai, and Lal Shri Ram came together.

• It was a manifesto on the future of the Indian economy post-Independence.

• It was written in two parts and published in 1944 and 1945.

Additional Information

• Recently Sanjay Baru has written a book "The Bombay Plan: Blueprint for Economic Resurgence".

• This book revisits the Bombay Plan to show how it was not only prescient in its approach to development.

Q107. Answer: (d) 6 years

Given:

The sum of the ages of 5 children born at an interval of 5 years each, is 80.

Calculation:

Let the present age of the youngest child be Q.

Hence, the ages of other children in the ascending order is (Q + 5), (Q + 10), (Q + 15), (Q + 20)

According to the question,

Q + (Q + 5) + (Q + 10) + (Q + 15) + (Q + 20) = 80

=> 5Q + 50 = 80

=> Q = 30/5

=> Q = 6

Therefore The age of the youngest child is 6 years.

Q108. Answer: (a) 100 s

Given:

Distance = 400 m

Speed of P = 4 m/sec

Speed of Q = 8 m/sec

Speed of R = 16 m/sec

Speed of S = 20 m/sec

Concept used:

Time taken to meet for the first time = LCM of time taken by the runners individually

Where,

L = distance

p, q, r, and s are the speeds of the runner P, Q, R, and S respectively.

Calculation:

Here,

L = 400 m

Also,

p = 4 m/s

q = 8 m/s

r = 16 m/s

s = 20 m/s

So, P takes 400/4 = 100 sec

Q takes = 400/8 = 50 sec

R takes = 400/16 = 25 sec

S takes = 400/20 = 20 sec

LCM of (100, 50, 25, 20) = 100 s

So, they will meet for the 1st time after 100s

Therefore They would meet for the first time after 100 s

Q109. Answer: (a) Iron

The correct answer is Iron.

Key Points

• Hemoglobin is a molecule inside the red blood cells of human blood.

• It has two parts: the Heme and the Globin.

• The heme contains iron and transports oxygen from the lungs to the tissues as well as takes carbon dioxide from the tissues to the lungs.

Additional Information

• The oxygen carried by hemeproteins such as haemoglobin and myoglobin is bound directly to the ferrous iron (Fe2+) atom of the heme prosthetic group.

• Oxidation of the iron to the ferric (Fe3+) state renders the molecule incapable of normal oxygen binding.

• Haemoglobin is a molecule inside the red blood cells of human blood.

• It has two parts: the heme and the globin

• The heme contains iron and transports oxygen from the lungs to the tissues as well as takes carbon dioxide from the tissues to the lungs.

• The most common types of normal hemoglobin are:

• Hemoglobin A - This is the most common type of hemoglobin found normally in adults.

• Hemoglobin F (fetal hemoglobin) - This type is normally found in fetuses and newborn babies.

• Hemoglobin A2 - This is a normal type of hemoglobin found in small amounts in adults.

Q110. Answer: (b) 2

Given:

The HCF of two numbers is 8 and the product of the two numbers is 6400.

Concept used:

HCF of two or more numbers is the greatest factor that divides the numbers.

Calculation:

Since the HCF of the aforementioned numbers is 8, let the two numbers be 8P and 8Q respectively. (Where P and Q are co-prime to each other)

According to the question,

8P × 8Q = 6400

=> PQ = 6400/64

=> PQ = 100

Now, 100 = $2^2 \times 5^2$

Thus, the only possible co-prime pairs are (1, 100) and (4,25).

Therefore Only two pairs of numbers exist, which satisfy the above conditions.

Q111. Answer: (d) Somalia

The correct answer is Somalia.

Key Points

• Somalia ranked last in the 2021 Global Hunger Index.

• In the 2021 Global Hunger Index, Somalia ranks 116th out of the 116 countries with sufficient data to calculate 2021 GHI scores.

• With a score of 50.8, Somalia has a level of hunger that is extremely alarming.

• Global Hunger Index ranks countries on a 0 to 100 point scale.

• Global Hunger Index ranks the Countries based on the following Data.

• Undernourishment

• Child Stunting

• Child Wasting

• Child Mortality

Additional Information

• India ranks 101st out of 116 Countries in the 2021 ranking.

• Global Hunger Index is the 16th edition of the Hunger Index in 2021 (since 2006).

• India is ranked behind most of the neighboring countries

• Pakistan - 92

• Sri Lanka - 65

• Nepal - 76

• Bangladesh - 76

Q112. Answer: (a) Cuboid

Five containers of different shapes sphere, cube, prism, cuboid and cylinder have different patterns plain, checkered, floral, polka dots and stripes but not necessarily in the same order. Also each has a different colour blue, green, pink, black and yellow but not necessarily in the same order.

1. The cube and cylinder don't have floral design.

2. Sphere is pink in colour.

Shape	Pattern	Colour
Cube	Floral	
Cylinder	Floral	
Sphere		Pink

3. Prism has checkered design but is not yellow or black in colour.

4. Cuboid is green in colour but doesn't have polka dots or stripes pattern.

Shape	Pattern	Colour
Cube	Floral	
Cylinder	Floral	
Sphere		Pink
Prism	Checkered	Yellow, Black
Cuboid	Polka, Stripes	Green

5. The plain container is pink in colour.

Shape	Pattern	Colour
Cube	Floral	
Cylinder	Floral	
Sphere	Plain	Pink
Prism	Checkered	Yellow, Black
Cuboid	Polka, Stripes	Green

6. Cube has polka dots and neither blue nor black in colour.

Shape	Pattern	Colour
Cube	Polka dots	Blue, Black
Cylinder	Floral	
Sphere	Plain	Pink
Prism	Checkered	Yellow, Black
Cuboid	Polka, Stripes	Green

7. Cylinder is not blue in colour.

Shape	Pattern	Colour
Cube	Polka dots	Blue, Black
Cylinder	Floral	Blue
Sphere	Plain	Pink
Prism	Checkered	Yellow, Black
Cuboid	Polka, Stripes	Green

Cuboid has floral pattern and Cylinder has Stripes pattern as these are the only vacant positions left.

• Only choice for Blue Colour is prism.

• Therefore, cylinder has black colour and then cube has yellow colour.

Shape	Pattern	Colour
Cube	Polka dots	Yellow
Cylinder	Stripes	Black
Sphere	Plain	Pink
Prism	Checkered	Blue
Cuboid	Floral	Green

Clearly, Cuboid container has floral pattern.

Hence, 'Cuboid' is the correct answer.

Q113. Answer: (d) Second

The correct answer is Second.

Key Points

• India is the world's second-largest producer of rice and the largest exporter of rice in the world.

• Production increased from 53.6 million tons in FY 1980 to 120 million metric tons in FY2019-20.

• China stands in the first position in the production of Rice in the world.

• China produced some 148.5 million metric tons of milled rice.

Important Points

• Rice

• Rice is the most important cereal crop in the developing world.

• It is the most important staple food of more than half of the world's population.
• Rice grows best in areas of warm, humid climates.
• Requires temperatures between 20°C and 35°C.
• Rainfall of about 100 cm or irrigation facilities.

The states with the rice production (in million tonnes):

Rank	State	Rice Production in million tonnes
1	West Bengal	15.75
2	Uttar Pradesh	5.86
3	Punjab	11.82
4	Tamil Nadu	7.98
5	Andhra Pradesh	7.49
6	Bihar	6.5
7	Chhattisgarh	6.09
8	Odisha	5.87
9	Assam	5.14
10	Haryana	4.14

Additional InformationList of Major rice producing Nations:

Country	Production (Tons)
China	211.090.813
India	158.756.871
Indonesia	77.297.509
Bangladesh	52.590.000
Vietnam	43.437.229

Q114. Answer: (a) Indian Ocean

The correct answer is Indian Ocean.

Key Points

• The Maldives, in the full Republic of Maldives, is an independent island country in the north-central Indian Ocean.
• It consists of a chain of about 1,200 small coral islands and sandbanks, grouped in clusters, or atolls.
• The Maldives is one of those few places on earth where one can spot the gorgeous whale sharks, the world's biggest fish, all year round.
• The Maldives is home to five of the seven species of marine turtles in the world.
• These are the leatherback, Olive Ridley turtles, loggerhead, green turtle, and hawksbill.
• The Maldives is the flattest country on earth, with an average altitude of 1.5 m from sea level.

Additional Information

• Indian Ocean
• The Indian Ocean is the third-largest of the world's among five oceanic divisions.
• Holds 19.8% of the water on Earth's surface.
• It is bounded by Asia to the north, Africa to the west, and Australia to the east.
• Arabian Sea
• The Arabian Sea is considered to be one of the world's busiest shipping lanes, primarily due to its proximity to the Red Sea and the Persian Gulf.
• Arabian Sea is only a part of the Indian Ocean that is located between the Arabian Peninsula and the Indian subcontinent.
• South China Sea
• The South China Sea is a marginal sea of the Western Pacific Ocean.
• It is bounded in the north by the shores of South China.

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• In the west it is surrounded by the Indochinese Peninsula, and in the east by the islands of Taiwan and the northwestern Philippines.

• Bay of Bengal

• It is called the "Bay of Bengal", because to the north is the Indian state of West Bengal and the country of Bangladesh.

• It is an extended part of the Indian Ocean.

• Most of the part the see landed on part of Bangladesh.

Q115. Answer: (c) Gautam Chintamani

The correct answer is Gautam Chintamani.

Key Points

• Vice President (VP) M. Venkaiah Naidu launched a book titled 'The Midway Battle: Modi's Roller-coaster Second Term' authored by Gautam Chintamani in December 2021.

• The book was published by Bloomsbury India at Upa-Rashtrapati Nivas, New Delhi.

• The book mentioned the political scenario of India after the second tenure of the current Prime Minister Narendra Modi.

• The book shed light on the various events in his tenure such as:

1. Jammu and Kashmir Reorganization Act.

2. Triple talaq.

3. The Citizenship (Amendment) Act.

4. Farm laws.

Additional Information

• Important Current Affairs are related to book releases in 2021-22.

• HarperCollins India has announced the acquisition of Vauhini Vara's debut novel - The Immortal King Rao.

• India's first-ever season style book 'The Class of 2006: Sneak Peek into the Misadventures of the Great Indian Engineering Life', has been released.

• It has been written by management professional Akash Kansal.

• It consists of 18 different episodes, each with a Learning Box.

• Shubira Prasad is the author of the book "The Angels of Kailash", a second book of the trilogy of the battle between humans and demons.

• Anukrti Upadhyay has won the Sushila Devi Award 2021 for the Best Book of Fiction for her critically acclaimed novel, Kintsugi in December 2021.

• The Vice President, M. Venkaiah Naidu released the book 'Dr. V L Dutt: Glimpses of a Pioneer's Life Journey written by V L Indira Dutt, Chairperson, and MD of KCP Group in Chennai.

• Vice President M. Venkaiah Naidu has released the memoir 'Raj Kapoor: The Master at Work' written by filmmaker Rahul Rawail on 14 December 2021.

• A new book that unearths true stories of the 1971 Indo-Pak war, '1971: Charge of the Gorkhas and Other Stories, written by Rachna Bisht Rawat released in December 2021.

• A biography titled 'Naoroji: Pioneer of Indian Nationalism', authored by Dinyar Patel won the 4th Kamaladevi Chattopadhyay NIF (New India Foundation) Book Prize 2021.

• In December 2021, the Vice President of India, M. Venkaiah Naidu launched a book titled 'Public Service Ethics- A Quest for Naitik Bharat', authored by Prabhat Kumar.

• In December 2021, the Vice President of India, M. Venkaiah Naidu on the 72nd anniversary of the adoption of the 'Constitution of India' released a book titled "Democracy, Politics, and Governance", authored by Dr. A. Surya Prakash.

Q116. Answer: (b) Both the statements I and II are effects of a common cause.

• Saketh and Ayansh are working in two different fields, therefore, they cannot be the cause or effect of each other.

• Saketh losing his job and Ayansh receiving less salary are effects of some event and not causes.

• Both statements indicate the existence of an economic struggle in industries. Thus, it is likely that statements I and II are effects of a common cause.

Hence, option 2 is the correct answer.

Q117. Answer: (c) 2 alone is sufficient while 1 alone is not sufficient

Statements:

1. The last day of month is Monday.

Statement 1 alone is not sufficient to answer the question as we do not know the total number of days in the month.

2. The second Saturday of month is on 12th.

12 → Saturday
12 + 5 = 17
=> Saturday + 5 = Thursday
So, 17^(th) of the given month is Thursday.
Statement 2 alone is sufficient to answer the question.
Hence, 2 alone is sufficient while 1 alone is not sufficient.

Q118. Answer: (d) 198 cm

Given:
The area of a rectangle is 2430 cm2 and its width is 9 cm less than its length.
Concept used:
Perimeter of a rectangle = 2 × (Length + Width)
Area of a rectangle = Length × Width
Calculation:
Let the width of the rectangle be Q cm.
Hence, the length of the rectangle = (Q + 9) cm
According to the question,
Q × (Q + 9) = 2430
=> Q^2 + 9Q - 2430 = 0
=> Q2 + 54Q - 45Q - 2430 = 0
=> Q (Q + 54) - 45 (Q + 54) = 0
=> (Q + 54) (Q - 45) = 0
Since Q can't be negative,
(Q - 45) = 0
=> Q = 45
Then, the length of the rectangle = (45 + 9) = 54 cm
Now, the perimeter of the rectangle = 2 × (45 + 54) = 198 cm
Therefore The perimeter of the rectangle is 198 cm.

Q119. Answer: (c) resistor

The correct answer is resistor.
Key Points
• A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element.
• In electronic circuits, resistors are used:
• to reduce current flow.
• adjust signal levels.
• divide voltages.
• bias active elements.
• terminate transmission lines.
• A passive element is an electrical component that does not generate power, but instead dissipates, stores, and/or releases it.
• Passive elements include resistances, capacitors, and coils (also called inductors).
• The ohm (symbol: Ω) is the SI-derived unit of electrical resistance, named after German physicist Georg Ohm.
Additional Information
• Capacitor
• A capacitor is a device that stores electrical energy in an electric field.
• It is a passive electronic component with two terminals.
• The effect of a capacitor is known as capacitance.
• Transistor
• A transistor can act as a switch or gate for electronic signals, opening and closing an electronic gate many times per second.
• It ensures the circuit is on if the current is flowing and switched off if it isn't.
• Transistors are used in complex switching circuits that comprise all modern telecommunications systems.
• Diode

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- It allows current to flow easily in one direction but severely restricts current from flowing in the opposite direction.
- Diodes are also known as rectifiers because they change alternating current (ac) into pulsating direct current (dc).

Q120. Answer: (b) 26

Calculation:

The mean weight of all these students taken together

=> (5 × 31 + 7 × 25 + 6 × 20 + 4 × 35 + 3 × 20) ÷ (5 + 7 + 6 + 4 + 3)

=> 650 ÷ 25

=> 26

Therefore The mean weight of all these students taken together is 26 kg.

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