RRB NTPC (UG) CBT-I Official Paper (Held On: 08 Sept, 2025 Shift 2) (Previous Year Paper)

RRB Group D • 2025 • 100 questions • 90 minutes • Answer key and solutions

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GENERAL AWARENESS

Q1. Which of the following is not a reform suggested by Birsa Munda to the Munda tribal community during the Munda rebellion?

(a) Quit drinking alcohol
(b) Cultivating your land
(c) Stop living in the past
(d) Not believing in magic and witchcraft

Q2. What is the administrative jurisdiction of Central Service officers?

(a) Only for the Central Government
(b) Both the Union and the States
(c) Elected constitutional authorities
(d) joint between the state and the centre

Q3. Which of the following statements is incorrect regarding the Swadeshi Movement?

(a) Workers went on strike in different parts of the country.
(b) Widespread support was received from upper class Muslims.
(c) A large number of students participated.
(d) A large number of women participated.

Q4. According to the data of the Ministry of New and Renewable Energy, which state had the highest installed renewable energy capacity as of 13 November 2024?

(a) Tamil Nadu
(b) Uttar Pradesh
(c) Rajasthan
(d) Karnataka

Q5. The British export-oriented strategy harmed the domestic economy. What impact did export-oriented policies have on India's food security?

(a) Food shortages and famines occurred
(b) Increased grain storage
(c) Food prices decreased
(d) Improved food availability

Q6. A minimum of _____ seats have been ensured for women in Panchayats.

(a) 40%
(b) 33%
(c) 50%
(d) 25%

Q7. The India-Chile Joint Statement (April 2025) announced negotiations towards upgrading their PTA to a comprehensive _____.

(a) Currency Union
(b) Financial partnership agreements
(c) Free Trade Agreement
(d) NAFTA-style bloc

Q8. Globalization has increased cross-border flows of technology. What policy under globalization encourages technology transfer?

(a) Automatic route for FDI
(b) Nationalisation
(c) Import substitution policy
(d) Licensing raj

Q9. The rock shelters of Bhimbetka are located in which of the following states of India?

(a) Madhya Pradesh
(b) Haryana
(c) Bihar
(d) Odisha

Q10. Why is it important to organize files and folders?

(a) To install new software
(b) To keep the desktop clean
(c) To make the computer run faster
(d) To easily find and access files

Q11. By what name was the administrative head of the Mauryan city administration, as described in the Arthashastra, addressed?

(a) Local
(b) Regional
(c) Nagarika
(d) Gop

Q12. What is the primary objective of the 'AYUSH Suraksha' portal launched by the Union AYUSH Minister in 2025?

(a) To promote export of Ayurvedic medicines through global reach
(b) To monitor misleading advertising and adverse drug reactions in real-time
(c) To certify traditional healers and standardizing treatment protocols
(d) To trac the import of AYUSH medicines through digital interface

Q13. Which of the following is the aim of the Directive Principles of State Policy?

(a) Right to Constitutional Remedies
(b) Custody against arrest
(c) Promoting international peace and security
(d) Freedom of speech

Q14. In May 2025, DRDO achieved a significant milestone by conducting long-term ground tests of which hypersonic technology component?

(a) Hyperloop Module
(b) Supersonic Combustor
(c) Ramjet Propulsion System
(d) Scramjet Subscale Combustor

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Q15. According to Lenz's law, the direction of induced current is such that -

(a) It helps in changing the magnetic flux.
(b) It resists changes in magnetic flux.
(c) It strengthens the applied magnetic field.
(d) This completely neutralizes the magnetic field.

Q16. As of 1 May 2025, who among the following is not a full-time member of the 16th Finance Commission?

(a) Annie George Mathew
(b) Ajay Narayan Jha
(c) Dr. Manoj Panda
(d) Dr. Soumya Kanti Ghosh

Q17. Which lake located on the eastern coast of India is an important geographical structure?

(a) Chilka Lake
(b) Vembanad Lake
(c) Dal Lake
(d) Wular Lake

Q18. Following diplomatic tensions and a military coup, which three countries have officially been recognized for their withdrawal from ECOWAS in 2025?

(a) Nigeria, Ghana and Togo
(b) Senegal, Guinea and Sierra Leone
(c) Liberia, Côte d'Ivoire and Benin
(d) Mali, Burkina Faso and Niger

Q19. How has globalization helped India's exports?

(a) without making any changes
(b) by reducing it in
(c) by banning it
(d) by increasing exports to other countries

Q20. According to the census data, which Union Territory of India recorded the highest population density in 2011?

(a) Puducherry
(b) Delhi
(c) Chandigarh
(d) Lakshadweep

Q21. Which city in central India became the first to provide CAR T-cell therapy for blood cancer patients, marking a significant advancement in accessible cancer treatment in May 2025?

(a) Indore
(b) Raipur
(c) Nagpur
(d) Bhopal

Q22. Which macromolecule is primarily responsible for energy storage in plants?

(a) Starch
(b) Nucleic acid
(c) Protein
(d) Vitamins

Q23. Where do tropical cyclones occur?

(a) in very high altitude deserts
(b) Near the equatorial belt
(c) in tropical low-pressure areas
(d) In mid-latitude regions

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Q24. While renaming a file or folder in MS Windows, what happens if a user changes the file extension (e.g. from .txt to .doc)?

(a) The file will no longer open or be accessible.
(b) The file format automatically changes to match the new extension.
(c) A warning is displayed to confirm the change in extension.
(d) The file is converted to another program's file format.

Q25. Which of the following is not a component of the core infrastructure sectors of India (as per the Index of Eight Core Industries)?

(a) Steel
(b) Electricity
(c) Cement
(d) Telecommunications

Q26. Which of the following Acts abolished the Dyarchy at the provincial level during the colonial period in India?

(a) Indian Councils Act, 1909
(b) Charter Act of 1853
(c) Government of India Act, 1935
(d) Government of India Act, 1919

Q27. Which of the following statements is correct regarding action and reaction forces?

(a) The action and reaction forces act on the same body and cancel each other out.
(b) Action and reaction forces are equal, opposite and act on different bodies.
(c) The action is always greater in magnitude than the reaction.
(d) The internal action and reaction forces between different parts of a system do not cancel out.

Q28. Which political party formed the government in the state of Andhra Pradesh in 2025?

(a) Telugu Desam Party (TDP)
(b) Indian National Congress
(c) Bharatiya Janata Party
(d) YSR Congress Party

Q29. What is the primary objective of the International Organization for Mediation (IOMed) established by China in 2025?

(a) Providing a forum for implementing international trade agreements
(b) Providing a platform for conducting military peacekeeping operations
(c) Replacing the United Nations Security Council
(d) To provide a forum for peaceful resolution of disputes through mediation

Q30. Which of the following women athletes won three medals, including an individual gold, at the Archery World Cup Stage 2 in Shanghai, China in May 2025?

(a) Chikitha Taniparthi
(b) Madhura Dhamangaonkar
(c) Jyoti Surekha Vennam
(d) Deepika Kumari

Q31. Why is the peninsular plateau considered geologically stable?

(a) It is located on an ancient shield region with low seismic activity.
(b) It is located in a zone of frequent plate collisions.
(c) It is part of a young fold mountain system with active faults.
(d) It was formed by recent volcanic eruptions and earthquakes.

Q32. Which of the following financial powers is not vested in the Governor of a State?

(a) To assent to Money Bills
(b) To administer the State Contingency Fund
(c) Presenting the state budget to the Legislature

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(d) Approving taxes independently

Q33. Biological disasters are mainly caused by _____.

(a) Climate change
(b) infectious diseases and epidemics
(c) fire and smoke
(d) earthquakes and volcanic eruptions

Q34. In May 2025, who among the following became the first Indian driver to win a Formula 2 race at the Monaco Grand Prix?

(a) Jehan Daruwala
(b) Arjun Maini
(c) Karun Chandhok
(d) Kush Maini

Q35. Which Ministry organised the National Conference on 'Institutional Mediation: An Effective Framework for Dispute Resolution' on 14 June 2025 at Bharat Mandapam, New Delhi?

(a) Ministry of External Affairs
(b) Home Ministry
(c) Ministry of Law and Justice
(d) Ministry of Defence

Q36. Under which article of the Constitution is the Comptroller and Auditor General (CAG) of India appointed?

(a) Article 324
(b) Article 148
(c) Article 280
(d) Article 76

Q37. In May 2025, which Indian institute collaborated with INRIA Saclay to develop AI tools aimed at combating antimicrobial resistance?

(a) IISc Bangalore
(b) IIIT-Delhi
(c) IIT Bombay
(d) IIT Madras

Q38. How many sportspersons were awarded the Arjuna Award (Lifetime) for outstanding performance in sports in January 2025?

(a) 3
(b) 5
(c) 2
(d) 4

Q39. As of January 2025, how many Indian languages have been officially recognised as classical languages by the Government of India?

(a) 7
(b) 11
(c) 5
(d) 9

Q40. On which date in 2025 was World Health Day celebrated, which marked the beginning of the campaign "Healthy Start, Hopeful Future"?

(a) 10 April 2025
(b) 7 April 2025
(c) 12 April 2025
(d) 5 April 2025

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MATHEMATICS

Q41. Which of the following numbers is divisible by 14?

(a) 67,94,266
(b) 71,32,960
(c) 64,36,639
(d) 70,48,048

Q42. Train A leaves station M at 8:20 AM and reaches station N at 3:20 PM on the same day. Train B leaves station N at 10:20 AM and reaches station M at 3:20 PM on the same day. Find the time when trains A and B meet.

(a) 12:35 PM
(b) 12:15 PM
(c) 12:05 PM
(d) 12:25 PM

Q43. If the marked price of a calculator is Rs. 600 and Rs. 50 discount is offered on the calculator, then find the discount percentage (correct to two decimal places).

(a) 9.53%
(b) 10.33%
(c) 8.33%
(d) 7.53%

Q44. Anubhav and Gaurav start a business. Anubhav invests Rs. 37,000 more than Gaurav for 3 months and Gaurav invests for 4 months. Anubhav's share is Rs. 1,745 more than that of Gaurav, out of a total profit of Rs. 8,725. Find the capital contributed by Anubhav.

(a) Rs. 74,002
(b) Rs. 74,122
(c) Rs. 74,000
(d) Rs. 73,800

Q45. A, B and C started a business investing Rs. 2,410, Rs. 1,170 and Rs. 700, respectively. If B's share in the profit earned by them is Rs. 1,092. what is the difference in the profit (in Rs.) earned by A and C?

(a) Rs. 1,597
(b) Rs. 1,593
(c) Rs. 1,595
(d) Rs. 1,596

Q46. Find the value of $[592 \div \{12 + 2 \times (3 - 7)\}]$.

(a) 147
(b) 145
(c) 148
(d) 152

Q47. The marks scored by 10 students are given below.

12, 14, 16, 13, 15, 14, 16, 10, 16, 12

The mode of the data is:

(a) 13
(b) 12
(c) 16
(d) 14

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Q48. A bus travelling at 28 km/hr completes a journey in 20 hours. What should its speed be to cover the same distance in 14 hours?

(a) 39 km/hr
(b) 40 km/hr
(c) 50 km/hr
(d) 34 km/hr

Q49. In an election between two candidates, 95% of the registered voters cast their vote and 20% of the votes polled were found invalid. The winning candidate got 59% of the valid votes and won the election by a margin of 1881 votes. How many voters were registered?

(a) 13751
(b) 13750
(c) 13749
(d) 13747

Q50. By selling an article at 5/11 of its actual selling price, Hitesh incurs a loss of 15%. If he sells it at 90% of its actual selling price, then the profit percentage is:

(a) 67.4%
(b) 68.3%
(c) 69.8%
(d) 66.6%

Q51. The LCM of the numbers 2.1 and 0.35 is:

(a) 0.021
(b) 21
(c) 0.21
(d) 2.1

Q52. The H.C.F. and the L.C.M. of two numbers are 25 and 250 respectively. If one of the numbers is 50, find the other one.

(a) 175
(b) 150
(c) 75
(d) 125

Q53. ABCD is a quadrilateral with angle A = 3(x + 2)°, angle B = 2(2x − 7)°, angle C = 69° and angle D = angle C − 8°. What is the value of angle B?

(a) 128°
(b) 183°
(c) 122°
(d) 153°

Q54. A shopkeeper marks a product 40% above the cost price. He offers a discount of 20% on the marked price and sells it. What is his gain or loss percentage?

(a) 12% gain
(b) 15% gain
(c) 8% loss
(d) 10% loss

Q55. The average of first 153 odd natural numbers, is:

(a) 153
(b) 154
(c) 152.5
(d) 153.5

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Q56. If 2 times the age of Ram is 30 years more than 4 times the age of Ramya, and 5 times the age of Ramya is 6 year less than the age of Ram, then what is the difference (in years) between the ages of Ram and Ramya?

(a) 17
(b) 18
(c) 15
(d) 13

Q57. Find the total surface area of a cuboidal box whose length is 84 cm, breadth is 45 cm and height is 25 cm.

(a) 14,250 cm^2
(b) 14,010 cm^2
(c) 14,120 cm^2
(d) 14,380 cm^2

Q58. Pipe A can fill a tank in 12 hours, pipe B can fill the same tank in 21 hours and pipe C can fill the same tank in 16 hours. The time taken by them to fill the same tank if they operate together is::

(a) 111/65 hours
(b) 1111/65 hours
(c) 511/65 hours
(d) 211/65 hours

Q59. The cost of 7 pens and 13 pencils is Rs. 128. If the cost of a pen decreases by Rs. 7 and the cost of a pencil increases by Rs. 2, then the cost of 14 pens and 10 pencils is Rs. 98. What is the original cost of 9 pens and 7 pencils?

(a) Rs. 117
(b) Rs. 112
(c) Rs. 111
(d) Rs. 116

Q60. By selling 6 tablets for a rupee, a man loses 35%. To gain 30% how many must he sell for a rupee?

(a) 3
(b) 2
(c) 4
(d) 5

Q61. Find the simple interest (in Rs.) on Rs. 1,200 at an interest rate of 4% per month for 7 months.

(a) Rs. 336
(b) Rs. 28
(c) Rs. 56
(d) Rs. 48

Q62. The perimeter of a square is 52 m. Its area (in m^2) is:

(a) 172
(b) 168
(c) 169
(d) 180

Q63. 4 men can complete a piece of work in 18 days, while 9 women can do it in 8 days. In how many days can 3 women and 3 men complete this work?

(a) 17 days
(b) 11 days
(c) 12 days
(d) 16 days

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Q64. Find the value of: 66^(−5) ÷ 66^{11} × 66^(−12)

(a) 66^(−27)
(b) 66^(−34)
(c) 66^(−28)
(d) 66^(−25)

Q65. Simplify: 3((7/3)x^2 - 28x + 14) - 7(x^2 + 4x - 14)

(a) 112x + 140
(b) −112x − 140
(c) 112x − 140
(d) −112x + 140

Q66. Simplify: √(1 + cos A)/(1 - cos A)

(a) cosec A + tan A
(b) cos A + cot
(c) sin A + tan A
(d) cosec A + cot A

Q67. Find the mean proportional between 25 and 36.

(a) 33
(b) 30
(c) 27
(d) 32

Q68. Find the simple interest (in Rs.) on Rs. 4,000 at 7.5% per annum rate of interest deposited on 10 February 2024 and withdrawn on 11 April 2024.

(a) 51
(b) 48
(c) 49
(d) 50

Q69. A number, when decreased by 7%, gives 2790. The number is:

(a) 3000
(b) 1500
(c) 9000
(d) 6000

Q70. The number of prime numbers lying between 472 and 486, both included, is:

(a) 1
(b) 6
(c) 5
(d) 2

GENERAL INTELLIGENCE AND REASONING

Q71. 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 horses are cats.

No horse is a lion.

Conclusions:

(I): Some lions are cats.

(II): All cats are lions.

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

Q72. In a row of people all facing north, Pranali is 21^(st) from the left end and Anuj is 23^(rd) from the left end. Anuj is exactly between Pranali and Harish. If Harish is 8th from the right end of the row, how many people are there in the row?

(a) 31
(b) 32
(c) 33
(d) 30

Q73. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) OVP
(b) LSM
(c) IPJ
(d) RYT

Q74. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?'

CKS 11, ZHP 23, WEM 47, TBJ 95, QYG 191, ?

(a) NVD 383
(b) NOD 383
(c) DND 383
(d) NVD 381

Q75. What should come in place of the question mark (?) in the given series?

58, 64, 73, 85, 100, ?

(a) 121
(b) 118
(c) 119
(d) 120

Q76. Each of the digits in the number 31246978 is arranged in descending order from left to right. The position of how many digits will remain unchanged as compared to that in the original number?

(a) Two
(b) None
(c) Three
(d) One

Q77. In a certain code language,

A $ B means 'A is the son of B'

A + B means 'A is the brother of B'

A @ B means 'A is the wife of B'

A ÷ B means 'A is the father of B'

Based on the root, if 'E + F $ G @ M ÷ N', then how is E related to N?

(a) Son
(b) Husband
(c) Father
(d) Brother

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Q78. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

IQA 15 GMB 8 EIC -1 CED -12 ?

(a) BCE -54
(b) DNE -45
(c) AAE -25
(d) BAE -33

Q79. Six friends J, K, L, T, U, and V are sitting around a round table, facing the center. V sits second to the right of L, who is second to the right of U. J sits immediate right of U. T sits second to the left of K. How many people sit between T and U, counting from the left of T?

(a) Two
(b) Not even one
(c) One
(d) Three

Q80. MERIT is related to RJWNY in a certain way based on the English alphabetical order. In the same way, DRAWN is related to IWFBS. To which of the given options is SHAPE related, following the same logic?

(a) WLETI
(b) XMFUJ
(c) YNGVK
(d) YMETK

Q81. Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.

Only V is kept above E. Only W is kept between E and U. Only F is kept below X. How many boxes are kept between G and F?

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

Q82. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) GK - QI
(b) MQ - WN
(c) IM - SJ
(d) KO - UL

Q83. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

(32, 64, 54)

(23, 46, 36)

(a) (21, 42, 52)
(b) (29, 58, 48)
(c) (18, 36, 16)
(d) (25, 40, 30)

Q84. AJLR is related to XHIP in a certain way based on the English alphabetical order. In the same way, OBZJ is related to LZWH. To which of the given options is FVQD related, following the same logic?

(a) CBNT
(b) CTBN
(c) CTNB

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(d) CBTY

Q85. Kishan starts from Point A and drives 15 km towards East. He then takes a right turn, drives 9 km, turns right and drives 8 km. He then takes a left turn and drives 6 km. He takes a final right turn, drives 7 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 15 km towards South
(b) 18 km towards East
(c) 18 km towards North
(d) 15 km towards North

Q86. This question is based on the five, three-digit numbers given below.

(Left) 564 782 368 225 743 (Right)

(Example: 697 – First digit = 6, second digit = 9 and third digit = 7)

(NOTE: All operations to be done from left to right.)If 2 is added to the first digit of every number, in how many numbers will the first digit be exactly divisible by the second digit?

(a) Three
(b) Two
(c) None
(d) One

Q87. In a certain code language, 'PANK' is coded as '1846' and 'KINA' is coded as '1689'. What is the code for 'I' in the given code language?

(a) 9
(b) 1
(c) 8
(d) 6

Q88. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) © 7 # 6 $ 6 4 7 & % 4 % 2 7 € 6 5 8 * $ 4 4 (Right)

How many such numbers are there each of which is immediately preceded by a number and also immediately followed by a symbol?

(a) 5
(b) 2
(c) 3
(d) 4

Q89. If + means −, − means ×, × means ÷ and ÷ means +, then what will come in place of the question mark (?) in the following equation?

4 − 5 ÷ 40 × 4 + 23 = ?

(a) 19
(b) 7
(c) 2
(d) 13

Q90. What will come in the place of the question mark (?) in the following equation, if '+' and '−' are interchanged and '×' and '÷' are interchanged?

35 × 5 ÷ 7 − 11 + 8 = ?

(a) 53
(b) 52
(c) 51
(d) 50

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Q91. H, I, J, P, Q, R and S are sitting around a circular table facing the centre of the table. Only one person sits between H and Q when counted from the left of Q. S sits third to the right of R. J sits third to the left of P. S sits to the immediate right of J.

I is not an immediate neighbour of J. How many people sit between I and Q when counted from the right of I?

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

Q92. In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

DEAR - DRAE - RAED

BALM - BMLA - MLAB

(a) SWAG - SAWG - GAWS
(b) MEAL - MELA - EALM
(c) BURN - UBRN - NURB
(d) MOST - MTSO - TSOM

Q93. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) PL-IM
(b) KG-DI
(c) IE-BG
(d) NJ-GL

Q94. 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 jars are cups.

Some jars are kettles.

Conclusions:

(I) Some cups are kettles.

(II) Some kettles are jars.

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

Q95. Town A is to the east of Town B. Town C is to the south of Town A. Town D is to the east of Town C. Town E is to the south of Town D. Town F is to the east of Town E. What is the position of Town F with respect to Town A?

(a) Northwest
(b) North
(c) Northeast
(d) Southeast

Q96. Each of the digits in the number 3417659 is arranged in the ascending order from left to right. What will be the sum of the digits that are second from the left and second from the right in the new number thus formed?

(a) 12
(b) 10
(c) 11
(d) 9

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Q97. Seven boxes, A, B, C, D, E, F and G, are kept one over the other but not necessarily in the same order.

Only G is kept above B. Only F is kept between B and C. Only E is kept below A. How many boxes are kept between E and F?

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

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

285 260 237 216 197 ?

(a) 180
(b) 150
(c) 160
(d) 170

Q99. What should come in place of the question mark (?) in the given series?

879 880 884 893 909 ?

(a) 931
(b) 934
(c) 937
(d) 929

Q100. In a certain code language, 'OLEA' is coded as '1542' and 'PEAL' is coded as '4651'. What is the code for 'P' in that language?

(a) 4
(b) 1
(c) 5
(d) 6

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) Stop living in the past

The correct answer is Stop living in the past.

Key Points

• Birsa Munda, during the Munda rebellion, advocated for reforms within the tribal community to empower them socially and economically.

• He strongly opposed exploitative practices like bonded labor and the alienation of tribal lands by landlords and moneylenders.

• One of his key teachings was to quit drinking alcohol, which he believed harmed the moral and social fabric of the tribal

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community.

• Birsa emphasized cultivating one's land as a means of self-reliance and resistance against exploitative systems imposed by outsiders.

• However, "Stop living in the past" was not a part of the reforms suggested by Birsa Munda during the rebellion.

Additional Information

• Key Reforms Suggested by Birsa Munda:

• Spiritual & Religious Purity:

• Monotheism: Worship only one God (Singbonga).

• Reject Witchcraft & Sorcery: Give up beliefs in magic and superstitions.

• Give Up Bonga Worship: Move away from traditional spirit worship.

• Abstinence: Stop drinking liquor (alcohol).

• Faith & Prayer: Emphasized prayer and a new code of conduct.

• Social & Cultural Upliftment:

• Cleanliness: Keep villages clean.

• End Harmful Practices: Stop animal sacrifice and begging.

• Self-Reliance: Encourage hard work and agriculture for economic stability.

• Cultural Revival: Promote Munda identity and resist cultural change from missionaries.

• Political & Economic Autonomy (Ulgulan):

• Reject Exploitation: Mobilized against outsiders (Dikus) and British rule.

• Self-Rule (Munda Raj): Advocated for tribal self-determination with the slogan, "Abua raj seter jana, maharani raj tundu jana" (Let our rule prevail, let the Queen's rule end).

• Land Rights: Fought against land alienation to non-tribals.

Q2. Answer: (a) Only for the Central Government

The correct answer is Only for the Central Government.

Key Points

• Central Service Officers are employed by the Government of India to serve the administrative, executive, and operational needs of the Central Government.

• These officers are appointed through competitive examinations conducted by the Union Public Service Commission (UPSC), such as the Indian Administrative Service (IAS), Indian Police Service (IPS), and other Central Civil Services.

• Their jurisdiction is limited to central government departments, ministries, and associated bodies such as regulatory institutions, statutory organizations, and public enterprises.

• Examples of Central Services include the Indian Foreign Service (IFS), Indian Revenue Service (IRS), Indian Audit and Accounts Service (IAAS), and others.

• Their primary role is to implement policies and decisions of the Central Government and manage the administrative framework for governance at the national level.

Additional Information

• Both the Union and the States

• This option refers to the All India Services (AIS), such as IAS, IPS, and Indian Forest Service (IFoS).

• Officers of the AIS are recruited by the Central Government but serve both the Union and the States, depending on their cadre allocation.

• Elected constitutional authorities

• This term relates to officials such as the President, Vice President, Members of Parliament, and Members of State Legislatures.

• These authorities are directly elected by the people or through electoral colleges and serve constitutional roles distinct from the administrative jurisdiction of Central Service officers.

• Joint between the state and the centre

• This applies to subjects under the Concurrent List in the Indian Constitution, where both the Centre and State Governments have legislative authority.

• Examples of subjects in the Concurrent List include education, marriage, bankruptcy, and criminal law.

Q3. Answer: (b) Widespread support was received from upper class Muslims.

The correct answer is Widespread support was received from upper class Muslims.

Key Points

• During the Swadeshi Movement, the participation of Muslims was largely limited, especially among the upper-class Muslims, as

they viewed the movement with suspicion.

• Many upper-class Muslims were hesitant to join due to their political alignments and fears that the movement was largely Hindu-dominated.

• The Muslim League, formed in 1906, opposed the Swadeshi Movement and sought to protect the interests of Muslims separately.

• The Swadeshi Movement was mainly supported by Hindu middle-class leaders, students, and women, but it did not garner significant support from the upper-class Muslim community.

• As a result, the statement suggesting widespread support from upper-class Muslims is incorrect.

Additional Information

• Swadeshi Movement

• The Swadeshi Movement (1905-1908) was launched as a response to the partition of Bengal by Lord Curzon in 1905.

• It aimed to promote indigenous products and boycott British goods, thus encouraging self-reliance and economic independence.

• Key leaders included Bal Gangadhar Tilak, Bipin Chandra Pal, Lala Lajpat Rai, and Aurobindo Ghose.

• Major methods included boycotts, strikes, self-reliance, and the promotion of Swadeshi industries and education.

Q4. Answer: (c) Rajasthan

The correct answer is Rajasthan.

Key Points

• As of November 13, 2024, Rajasthan had the highest installed renewable energy capacity in India, contributing significantly to the country's renewable energy goals.

• The state has a total installed renewable energy capacity of over 23,000 MW, which includes solar, wind, and biomass energy projects.

• Rajasthan benefits from its vast desert areas and high solar irradiance, making it a leading state for solar energy production.

• The state is home to the world's largest solar park, Bhadla Solar Park, with a capacity of 2,245 MW.

• Rajasthan's proactive renewable energy policies and investments have made it a hub for solar and wind energy, attracting significant private and public investments.

Additional Information

• Key Renewable Energy Sources:

• Solar Energy: Captures sunlight using photovoltaic (PV) panels or concentrated solar power.

• Wind Energy: Uses turbines to convert wind's kinetic energy into electricity.

• Hydropower: Harnesses the energy of flowing or falling water (dams, rivers).

• Geothermal: Uses heat from within the Earth's crust for power and heating.

• Biomass: Energy from organic matter like wood, crops, and waste.

• Ocean Energy: Includes tidal and wave power.

Q5. Answer: (a) Food shortages and famines occurred

The correct answer is Food shortages and famines occurred.

Key Points

• The British colonial export-oriented strategy prioritized exporting cash crops like cotton, jute, and tea over growing staple food crops required for domestic consumption.

• This led to a significant reduction in agricultural land used for food production, causing food shortages in India.

• The focus on exports resulted in the exploitation of Indian agricultural resources, leaving the population vulnerable to famines during times of natural calamities or crop failures.

• Famines such as the Bengal famine of 1943 were exacerbated by the British policy of exporting grains while millions of Indians were starving.

• Export-oriented policies increased food insecurity as local farmers were forced to grow exportable crops instead of subsistence crops, disrupting the balance of food availability.

Additional Information

• Core Principles of export-oriented strategy:

• Outward Focus: Prioritizes selling goods and services abroad over domestic consumption.

• Comparative Advantage: Emphasizes producing goods where the nation has a cost or resource advantage.

• Industrialization: Drives development through manufacturing for export, moving from basic to more complex goods.

• Integration: Connects deeply with global markets and investment flows.

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Q6. Answer: (b) 33%

The correct answer is 33%.

Key Points

• The 73rd Amendment Act of 1992 introduced the provision for the reservation of seats for women in Panchayati Raj Institutions (PRIs).

• A minimum of 33% (one-third) of the seats in Panchayats at all levels (village, block, and district) are reserved for women.

• This reservation includes seats for women from Scheduled Castes (SCs) and Scheduled Tribes (STs) in proportion to their population.

• The provision ensures active participation of women in local self-governance, empowering them in the decision-making process at the grassroots level.

• Some states like Bihar, Rajasthan, and Madhya Pradesh have taken progressive steps by increasing the reservation to 50% for women in Panchayats.

Additional Information

• Women Empowerment through Panchayati Raj

• The 73rd Amendment Act of 1992 was a landmark step toward strengthening grassroots democracy in India through the Panchayati Raj system.

• By reserving one-third of the seats for women, the Act fosters gender equality and provides a platform for women to participate in governance and leadership roles.

• It has significantly contributed to empowering women and addressing issues related to education, health, and welfare at the local level.

Q7. Answer: (c) Free Trade Agreement

The correct answer is Free Trade Agreement.

Key Points

• The India-Chile Joint Statement announced negotiations aimed at upgrading their Preferential Trade Agreement (PTA) to a Comprehensive Free Trade Agreement (FTA) in April 2025.

• A Free Trade Agreement is a pact between two or more nations designed to reduce or eliminate trade barriers such as tariffs, quotas, and import/export restrictions to enhance economic cooperation.

• India and Chile have been strengthening economic ties since 2006, with the PTA already covering around 2,000 tariff lines. Upgrading to an FTA would further expand trade opportunities.

• Chile is India's largest trading partner in the Latin American region, and an FTA would help deepen bilateral trade, boost investments, and promote economic growth.

Additional Information

• Currency Union

• A currency union refers to an agreement between two or more countries to share a common currency or peg their currencies to a fixed exchange rate.

• Examples include the Eurozone, where 20 European Union member states use the euro.

• Financial Partnership Agreements

• Financial partnership agreements involve collaboration in areas such as banking, investment, and financial technology.

• NAFTA-style bloc

• NAFTA (North American Free Trade Agreement) was a regional trade bloc between the United States, Canada, and Mexico, later replaced by the USMCA (United States-Mexico-Canada Agreement).

Q8. Answer: (a) Automatic route for FDI

The correct answer is Automatic route for FDI.

Key Points

• Automatic route for FDI (Foreign Direct Investment) allows foreign investors to invest in Indian businesses without requiring prior approval from the government or the Reserve Bank of India (RBI).

• This policy ensures a smoother and faster inflow of foreign capital, including technology transfer, into the Indian economy.

• Under globalization, the automatic route has been instrumental in enabling sectors like IT, manufacturing, and renewable energy to gain access to advanced technologies from foreign entities.

• It encourages multinational corporations to establish joint ventures or wholly-owned subsidiaries in India, thereby facilitating technological advancements and innovation.

• As per the FDI Policy 2023, 100% FDI is allowed under the automatic route in various sectors like automobiles, computer software, and hardware, promoting cross-border technology exchange.

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Additional Information

• Nationalisation

• It refers to the process where the government takes ownership and control of private sector businesses or industries.

• Nationalization usually occurs to protect strategic industries or ensure equal access to resources and services.

• Import substitution policy

• This policy focuses on reducing dependency on imported goods by promoting domestic production.

• While it aims to strengthen local industries, it may hinder globalization by discouraging foreign investments and technology transfer.

• It was widely adopted in India during the pre-liberalization era (before 1991).

• Licensing raj

• The licensing raj refers to India's pre-1991 economic system, which required businesses to obtain licenses and permits to operate in various sectors.

• This bureaucratic system restricted foreign investments and technology transfer by creating regulatory hurdles.

• It was dismantled after the 1991 economic reforms, paving the way for liberalization and globalization.

Q9. Answer: (a) Madhya Pradesh

The correct answer is Madhya Pradesh.

Key Points

• The rock shelters of Bhimbetka are located in the Raisen district of Madhya Pradesh, India.

• These rock shelters were declared a UNESCO World Heritage Site in 2003 due to their archaeological and historical importance.

• The Bhimbetka rock shelters are renowned for their prehistoric cave paintings, which date back to the Mesolithic period and even earlier.

• These paintings depict scenes of hunting, dancing, and communal life, showcasing early human creativity and cultural development.

• The site contains over 750 rock shelters, spread across seven hills, and provides evidence of continuous human habitation from the Stone Age to historic times.

Additional Information

• Haryana:

• Haryana is known for its rich cultural heritage, including monuments like the Brahma Sarovar in Kurukshetra and the famous Surajkund Mela.

• Bihar:

• Bihar is famous for its association with ancient Indian history and Buddhism, with notable sites like Nalanda, Bodh Gaya, and Rajgir.

• Odisha:

• Odisha is well-known for its ancient temples, such as the Sun Temple at Konark and the Jagannath Temple in Puri.

• It also has rich biodiversity and tribal culture but lacks prehistoric rock shelters like those in Madhya Pradesh.

Q10. Answer: (d) To easily find and access files

The correct answer is To easily find and access files.

Key Points

• Organizing files and folders ensures quick and efficient access to important documents, reducing time spent searching for them.

• A structured folder system helps prevent loss or misplacement of important data.

• Proper organization allows users to categorize files by type, project, or priority, improving workflow management.

• It aids in maintaining clarity and simplifying file-sharing processes, especially in collaborative environments.

• An organized system facilitates data backup and recovery, ensuring the safety of essential files.

Additional Information

• Files: The Content Containers

• Definition: A unit of stored data (document, photo, app, etc.).

• Identification: Has a unique name and an extension (e.g., .pdf, .mp3, .exe) that tells the computer what type of file it is and which program opens it.

• Properties: Consumes a specific amount of memory/storage space.

• Folders (Directories): The Organizers

• Definition: Containers for files and other folders (subfolders).

• Identification: Has a name but no extension.

• Properties: Its size is determined by the files/folders it contains, not its own inherent size.

• Function: Provides structure (hierarchical system) for logical organization, making files easy to find.

Q11. Answer: (c) Nagarika

The correct answer is Nagarika.

Key Points

• The Nagarika was the chief administrative officer of a city in the Mauryan period.

• Mentioned in Kautilya's Arthashastra as responsible for urban administration.

• Duties included law and order, sanitation, trade regulation, and revenue collection.

Additional Information

• Gop

• Gopa/Gop was a rural administrative official, not an urban authority.

• Responsible for supervising villages and groups of households.

• Key Features of Mauryan Administration:

• Centralized Power: Emperor held ultimate authority, advised by a Council of Ministers (Mantriparishad).

• Bureaucracy: A vast, hierarchical system with senior officials like Tirthas (18 top officials) and Adhyakshyas (superintendents for various departments).

• Provincial Administration: Empire divided into provinces (e.g., Taxila, Ujjain, Tosali) governed by royal princes or governors (Kumaras, Rajukas).

• Military Strength: Maintained a massive army (infantry, cavalry, elephants, navy) under a board of 30 officers, essential for defense and control.

• Revenue & Economy: Revenue from agriculture, trade, and taxes; strong focus on trade routes, weights, and measures.

• Judiciary: King as head, with courts like Dharmasthiya (civil) and Kantakashodhana (criminal), plus local judges.

Q12. Answer: (b) To monitor misleading advertising and adverse drug reactions in real-time

The correct answer is To monitor misleading advertising and adverse drug reactions in real-time.

Key Points

• The AYUSH Suraksha portal has been developed to ensure real-time monitoring of misleading advertisements related to Ayurvedic, Homeopathic, Unani, Siddha, and other AYUSH products.

• It aims to provide a reliable mechanism for reporting adverse drug reactions to ensure consumer safety.

• The portal is equipped with tools for tracking and analyzing data about AYUSH medicines and their side effects.

• By addressing unethical marketing practices and ensuring authenticity, the portal helps in safeguarding the credibility of AYUSH systems.

• This initiative aligns with the Indian government's broader vision to regulate the AYUSH sector while promoting evidence-based practices.

Additional Information

• The AYUSH sector in India is regulated by the Ministry of AYUSH, which promotes traditional medical systems including Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homeopathy.

• Key initiatives include the National AYUSH Mission, AYUSH Health and Wellness Centers, and efforts to integrate AYUSH practices into mainstream healthcare.

• The AYUSH Suraksha portal is part of the government's efforts to enhance transparency, safety, and regulation in the sector.

Q13. Answer: (c) Promoting international peace and security

The correct answer is Promoting international peace and security.

Key Points

• The Directive Principles of State Policy (DPSP) are included in Part IV of the Indian Constitution (Articles 36-51).

• These principles act as guidelines for the state to establish a just society and frame laws and policies accordingly.

• One of the key aims of the DPSP is to promote international peace and security, as stated explicitly in Article 51 of the Constitution.

• Article 51 directs the state to foster respect for international law, treaty obligations, and encourage peaceful relations between nations.

• DPSPs are non-justiciable, meaning they cannot be enforced by a court, but they serve as essential guiding principles for governance and policymaking.

Additional Information

• Right to Constitutional Remedies:

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• It is covered under Article 32 of the Indian Constitution and is a Fundamental Right, not part of DPSPs.

• It empowers citizens to move the Supreme Court or High Courts for the enforcement of Fundamental Rights.

• Dr. B.R. Ambedkar referred to this right as the "heart and soul of the Constitution."

• Freedom of speech:

• Freedom of speech is enshrined under Article 19(1)(a) of the Indian Constitution as a Fundamental Right.

• It provides citizens the right to express their opinions freely, subject to reasonable restrictions like public order and national security.

Q14. Answer: (d) Scramjet Subscale Combustor

The correct answer is Scramjet Subscale Combustor.

Key Points

• In May 2025, DRDO successfully conducted long-duration ground tests of the Scramjet Subscale Combustor, marking a significant milestone in hypersonic technology development.

• A scramjet (Supersonic Combustion Ramjet) engine operates at hypersonic speeds, where air compression is achieved via the vehicle's forward motion without requiring rotating compressors.

• The subscale combustor tested by DRDO is a key component in the development of hypersonic propulsion systems for reusable launch vehicles and advanced missile systems.

• The test validated the combustor’s ability to maintain stable combustion and efficient performance under extreme conditions involving high speeds and temperatures.

• DRDO’s advancement in scramjet technology aligns with India’s long-term goals of achieving self-reliance in advanced aerospace technologies and strengthening its defense capabilities.

Additional Information

• Hyperloop Module

• The Hyperloop is a proposed high-speed transportation system using low-pressure tubes and magnetically levitated pods.

• It is not related to hypersonic propulsion systems but is instead aimed at revolutionizing ground transportation.

• Developed primarily by private companies like Virgin Hyperloop and SpaceX, this technology focuses on passenger travel rather than defense applications.

• Supersonic Combustor

• A supersonic combustor is a general term for devices enabling combustion at supersonic speeds, but it differs from a scramjet engine.

• While scramjets are specific to hypersonic propulsion, supersonic combustors find broader applications in experimental aerospace research.

• Ramjet Propulsion System

• Ramjet engines work efficiently at supersonic speeds (Mach 2-4) by compressing incoming air with no moving parts.

• However, unlike scramjets, ramjets cannot operate at hypersonic speeds (above Mach 5), limiting their use in advanced aerospace technologies.

Q15. Answer: (b) It resists changes in magnetic flux.

The correct answer is It resists changes in magnetic flux.

Key Points

• Lenz's Law states that the direction of the induced current in a conductor due to a changing magnetic field is such that the magnetic field created by the induced current opposes the change in the magnetic field that produced it.

• This law ensures that energy is conserved in the process of electromagnetic induction by resisting the change in the external magnetic flux.

• The negative sign in Faraday's law of electromagnetic induction represents Lenz's law mathematically, i.e., EMF = -dΦ/dt, where Φ is the magnetic flux.

• For example, when a magnet is pushed into a coil, the current induced in the coil generates a magnetic field that opposes the motion of the magnet.

• This principle is fundamental to the working of devices like electric generators, transformers, and induction coils.

Additional Information

• Understanding Lenz's Law

• Lenz's law is a fundamental concept in electromagnetic induction and is directly derived from the law of conservation of energy.

• It plays a critical role in the design of electrical machinery and circuits, ensuring stability and energy efficiency.

• Key Principles:

• Opposition: The induced current generates a magnetic field that pushes back against the magnetic change (e.g., a magnet

approaching a coil).

• Direction: If flux increases, the induced field opposes it; if flux decreases, the induced field tries to maintain it.

• Energy Conservation: Work must be done against this opposing force (mechanical energy), which is then converted into electrical energy, preventing perpetual motion.

• Faraday's Law Link: It's the physical meaning behind the negative sign in Faraday's equation, indicating opposing directions.

Q16. Answer: (d) Dr. Soumya Kanti Ghosh

The correct answer is Dr. Soumya Kanti Ghosh.

Key Points

• Dr. Soumya Kanti Ghosh is not a full-time member of the 16th Finance Commission as of 1 May 2025.

• The full-time members of the 16th Finance Commission include Annie George Mathew, Ajay Narayan Jha, and Dr. Manoj Panda.

• The Finance Commission is constituted under Article 280 of the Constitution of India, and its primary role is to recommend the distribution of taxes between the central and state governments.

• Full-time members of the Finance Commission are usually chosen based on their expertise in public finance, economics, and administrative experience.

• Dr. Soumya Kanti Ghosh is well-known as the Group Chief Economic Advisor at the State Bank of India, but he is not appointed as a member of the Finance Commission.

Additional Information

• Annie George Mathew

• Annie George Mathew is a full-time member of the 16th Finance Commission.

• She has served as a distinguished bureaucrat and has significant experience in public finance and policymaking.

• Her expertise is instrumental in shaping the Commission's recommendations on tax devolution and fiscal transfers.

• Ajay Narayan Jha

• Ajay Narayan Jha is a full-time member of the 16th Finance Commission.

• He is a former Finance Secretary of India and has vast experience in fiscal management and administrative reforms.

• He plays a crucial role in advising on fiscal consolidation measures and balanced fiscal policies.

• Dr. Manoj Panda

• Dr. Manoj Panda is a full-time member of the 16th Finance Commission.

• He is a renowned economist with expertise in macroeconomics, public policy, and statistics.

• His research contributions provide valuable inputs for the Commission's recommendations on economic growth and fiscal sustainability.

Q17. Answer: (a) Chilka Lake

The correct answer is Chilka Lake.

Key Points

• Chilka Lake is Asia's largest brackish water lagoon, located on the eastern coast of India, in the state of Odisha.

• It spans an area of about 1,100 square kilometers and is separated from the Bay of Bengal by a narrow strip of sand.

• The lake is a hotspot for biodiversity and is home to over 160 species of birds, including migratory species from as far as Siberia and the Caspian region.

• Chilka Lake is famous for its rich ecosystem, including fish, crabs, prawns, and other aquatic life, making it an important economic resource for fishermen in the region.

• The lake is also a significant tourist destination, attracting visitors for its scenic beauty, bird-watching opportunities, and the presence of the endangered Irrawaddy dolphins.

Additional Information

• Vembanad Lake:

• It is the longest lake in India and the largest lake in the state of Kerala.

• Vembanad is known for its backwaters, which are a major tourist attraction in Kerala.

• The annual Nehru Trophy Boat Race is conducted here, adding to its fame.

• Dal Lake:

• Located in Srinagar, Jammu and Kashmir, it is often referred to as the "Jewel in the crown of Kashmir."

• Dal Lake is famous for its houseboats, shikaras (traditional wooden boats), and floating gardens.

• It plays a vital role in the region's tourism and economy.

• Wular Lake:

• Wular Lake, located in Jammu and Kashmir, is one of the largest freshwater lakes in Asia.

• It is fed by the Jhelum River and serves as an important habitat for migratory birds and aquatic life.

• The lake plays a crucial role in flood control and is a significant source of fish for the local population.

Q18. Answer: (d) Mali, Burkina Faso and Niger

The correct answer is Mali, Burkina Faso, and Niger.

Key Points

• Mali, Burkina Faso, and Niger officially announced their withdrawal from the Economic Community of West African States (ECOWAS) following diplomatic tensions and political instability.

• The withdrawal was triggered by military coups in all three nations, which led to strained relations with ECOWAS.

• ECOWAS, a regional bloc founded to promote economic integration, political stability, and security, imposed sanctions on these nations due to non-compliance with democratic governance standards.

• These countries have criticized ECOWAS for its perceived interference in their internal affairs and its inability to address regional security challenges, particularly related to terrorism and insurgency.

• The withdrawal marks a significant shift in West African geopolitics, as these nations aim to establish alternative alliances and frameworks to address their economic and security needs.

Additional Information

• ECOWAS

• The Economic Community of West African States (ECOWAS) was established in 1975 to promote economic integration and political stability among its 15 member states.

• It plays a vital role in addressing regional security challenges, fostering trade agreements, and implementing development programs.

• ECOWAS has faced challenges in maintaining unity amid political instability, military coups, and varying economic priorities among member states.

Q19. Answer: (d) by increasing exports to other countries

The correct answer is by increasing exports to other countries.

Key Points

• Globalization has significantly enhanced India's exports by opening up international markets and increasing trade opportunities.

• India has been able to export goods such as textiles, software services, pharmaceuticals, and agricultural products to a larger number of countries due to reduced trade barriers.

• Globalization has attracted foreign investment in India, which has improved production quality and competitiveness in global markets.

• India's participation in global trade agreements and organizations like WTO has facilitated smoother export processes and better access to foreign markets.

• Technological advancements and international collaborations have further boosted export efficiency, helping Indian products reach global audiences effectively.

Additional Information

• Globalization and India's Exports

• Globalization refers to the integration of economies, cultures, and societies across the globe through trade, investment, and technology.

• India has been a major beneficiary of globalization, especially in sectors like IT, pharmaceuticals, and agriculture, which have witnessed exponential growth in exports.

• The liberalization policies introduced in 1991 marked a significant shift in India's economy, making it more export-oriented and globally competitive.

Q20. Answer: (b) Delhi

The correct answer is Delhi.

Key Points

• According to the 2011 Census of India, Delhi recorded the highest population density among all Union Territories, with a density of 11,297 people per square kilometer.

• Delhi's high population density is attributed to its status as the national capital, which attracts a significant number of migrants seeking better job opportunities and living standards.

• Its urbanization, infrastructure, and economic opportunities have made Delhi a central hub for people from across the country.

• Population density is calculated as the number of people living per square kilometer of land area, and Delhi's small geographical size combined with a large population contributes to its high figures.

• Over the years, the increasing density has put pressure on Delhi's resources, leading to challenges such as traffic congestion,

pollution, and strain on public infrastructure.

Additional Information

• Puducherry:

• Puducherry, also a Union Territory, had a population density of 2,547 people per square kilometer as per the 2011 Census.

• It is known for its French colonial heritage and tranquil environment.

• Chandigarh:

• Chandigarh, the capital of two states (Punjab and Haryana), recorded a population density of 9,252 people per square kilometer in 2011.

• The city's well-planned urban layout, designed by architect Le Corbusier, contributes to its organized structure despite the high density.

• Lakshadweep:

• With a population density of 2,013 people per square kilometer as per the 2011 Census, Lakshadweep has the lowest density among the options provided.

• This Union Territory comprises a group of 36 islands, with only a few inhabited, leading to a lower density compared to urbanized Union Territories like Delhi and Chandigarh.

Q21. Answer: (c) Nagpur

The correct answer is Nagpur.

Key Points

• Nagpur became the first city in central India to offer CAR T-cell therapy for blood cancer patients in May 2025.

• CAR T-cell therapy is a revolutionary treatment that involves reprogramming a patient's immune cells to attack cancer cells effectively.

• This therapy was made accessible in Nagpur at a lower cost compared to international standards, ensuring greater affordability for Indian patients.

• The treatment was introduced at a leading medical facility in Nagpur, reflecting the city's growing prominence in healthcare advancements.

• It marked a milestone in India's fight against cancer by bringing cutting-edge treatments closer to patients in central India.

Additional Information

• CAR T-Cell Therapy:

• CAR T-cell therapy stands for Chimeric Antigen Receptor T-cell therapy, a form of immunotherapy designed to combat blood cancers like leukemia and lymphoma.

• It involves modifying T-cells, a type of white blood cell, in the laboratory to enable them to identify and kill cancer cells.

• This therapy has shown promising results globally but remains expensive and is primarily available in specialized centers.

• By making this treatment accessible in Nagpur, India has taken a significant step toward democratizing advanced cancer care.

Q22. Answer: (a) Starch

The correct answer is Starch.

Key Points

• Starch is the primary macromolecule responsible for energy storage in plants, specifically in seeds, roots, and tubers.

• It is a polysaccharide composed of glucose monomers linked together, making it an efficient form of carbohydrate storage.

• Plants synthesize starch during photosynthesis and store it in plastids such as chloroplasts and amyloplasts.

• Starch exists in two forms: amylose (linear structure) and amylopectin (branched structure), both of which contribute to its stability and energy density.

• When energy is needed, plants break down starch into glucose molecules through enzymatic hydrolysis to fuel cellular processes.

Additional Information

• Nucleic Acid:

• Nucleic acids (DNA and RNA) are macromolecules responsible for storing and transmitting genetic information in organisms.

• DNA provides the blueprint for cellular functions, while RNA translates this information into proteins.

• Protein:

• Proteins are macromolecules made up of amino acids and play a wide range of roles, including enzymatic, structural, and regulatory functions.

• Proteins are essential for growth, repair, and maintenance of tissues in living organisms.

• Vitamins:

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• Vitamins are organic compounds required in small amounts for various metabolic processes in the body.

• Examples include Vitamin C for immune function and Vitamin D for calcium absorption.

Q23. Answer: (c) in tropical low-pressure areas

The correct answer is in tropical low-pressure areas.

Key Points

Tropical cyclones form in areas of low atmospheric pressure over tropical and subtropical oceans, where sea surface temperatures exceed 26.5°C.

The combination of warm ocean water, moist air, and the Coriolis effect (due to Earth's rotation) leads to the development of these cyclonic systems.

These cyclones typically occur between latitudes 5° and 30° north and south of the equator, as the Coriolis effect is essential for their spin and formation.

Regions such as the North Atlantic Ocean, Pacific Ocean, Indian Ocean, and the South Pacific Ocean are prone to tropical cyclones.

Tropical cyclones are known by different names based on their location, such as hurricanes (Atlantic and eastern Pacific), typhoons (western Pacific), and cyclones (Indian Ocean).

Additional Information

Formation & Energy

Warm Water Engine: They form over warm tropical waters (usually >26.5°C) and draw energy from the condensation of water vapor, releasing massive amounts of heat.

Coriolis Effect: The Earth's rotation deflects winds, causing counter-clockwise rotation in the Northern Hemisphere and clockwise in the Southern Hemisphere.

Weakening: They weaken over land or cooler waters as their energy source is cut off.

Key Structures & Features

Eye: The calm, clear center with low pressure.

Eyewall: The ring of most intense winds and heavy rainfall surrounding the eye.

Rainbands: Spiraling bands of thunderstorms extending from the center.

Q24. Answer: (c) A warning is displayed to confirm the change in extension.

The correct answer is A warning is displayed to confirm the change in extension.

Key Points

• In MS Windows, file extensions are used to identify the file type and determine which program should open it.

• When a user renames a file or folder and changes the file extension, a warning message is displayed by the system.

• The warning message helps to inform the user that changing the file extension might render the file unusable or inaccessible.

• The system does not automatically convert the file format to match the new extension; it simply changes the label associated with the file.

• This feature ensures that users are cautious while renaming files and helps prevent accidental changes that could affect file usability.

Additional Information

• File Extensions in Windows

• File extensions are the set of characters after the last period in a file name, indicating the file type.

• Examples include .txt (text file), .jpg (image file), .doc (Word document), etc.

• Changing extensions without understanding the implications can lead to confusion and errors in file handling.

Q25. Answer: (d) Telecommunications

The correct answer is Telecommunications.

Key Points

• The Index of Eight Core Industries represents the performance of eight key sectors that are essential for the growth of the Indian economy.

• The eight core sectors include Coal, Crude Oil, Natural Gas, Refinery Products, Fertilizers, Steel, Cement, and Electricity.

• Telecommunications is not a part of the Eight Core Industries as listed by the Ministry of Commerce and Industry, Government of India.

• The Eight Core Industries collectively contribute about 40.27% to the overall weight of items included in the Index of Industrial Production (IIP).

• The inclusion of these sectors is based on their significant impact on infrastructure development and industrial growth in the

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country.

Additional Information

• Steel

• Steel is one of the eight core industries and a key material used in construction, infrastructure, and manufacturing.

• India is among the top producers of steel globally, with significant contributions to industrial growth.

• The production and consumption of steel are closely linked to economic development and infrastructure expansion.

• Electricity

• Electricity generation is a crucial component of the core industries as it powers industrial and economic activities.

• India has a diverse electricity generation portfolio, including thermal, hydro, nuclear, and renewable energy sources.

• Electricity production is essential for sustaining industrial output and improving the standard of living.

• Cement

• Cement is a vital raw material for construction and infrastructure projects.

• The cement industry plays a crucial role in India's infrastructure development, including housing, roads, and bridges.

• India is one of the largest producers of cement globally, contributing significantly to economic growth.

• Telecommunications

• Telecommunications is a major sector in India but is not included in the Eight Core Industries.

• It is governed by the Department of Telecommunications and plays a vital role in connecting people and businesses.

• India is one of the largest mobile phone markets in the world, and advancements in telecommunications have supported the digital transformation of the country.

Q26. Answer: (c) Government of India Act, 1935

The correct answer is Government of India Act, 1935.

Key Points

• The Government of India Act, 1935 abolished the Dyarchy at the provincial level and introduced provincial autonomy.

• Under this Act, provinces were granted autonomy, where elected representatives had more control over administration, except in certain reserved subjects.

• This Act was aimed at decentralizing powers to provinces and empowering them with legislative and executive authorities.

• The Act also introduced a federal structure in India, although the federal part was never implemented due to the lack of agreement among princely states.

• It laid the foundation for the establishment of responsible government in provinces and influenced India's constitutional development significantly.

Additional Information

• Indian Councils Act, 1909:

• Also known as the Morley-Minto reforms, this Act introduced the concept of separate electorates for Muslims, marking a significant step in the communal division.

• It expanded the size of legislative councils and allowed Indians some representation in governance, but limited their role to advisory functions.

• Charter Act of 1853:

• This Act was primarily focused on the restructuring of the East India Company's administration.

• It introduced a separate legislative council for India but did not address provincial governance or Dyarchy.

• It marked the beginning of the decentralization of legislative functions but was far removed from the concept of provincial autonomy.

• Government of India Act, 1919:

• Known as the Montagu-Chelmsford reforms, this Act introduced Dyarchy at the provincial level.

• Dyarchy divided provincial subjects into two categories: transferred (administered by Indian ministers) and reserved (administered by British officials).

• Although it was a step toward responsible government, it was heavily criticized for limiting Indian autonomy and was abolished by the Government of India Act, 1935.

Q27. Answer: (b) Action and reaction forces are equal, opposite and act on different bodies.

The correct answer is Action and reaction forces are equal, opposite and act on different bodies..

Key Points

• The principle of action and reaction forces is based on Newton's Third Law of Motion, which states that "For every action, there is an equal and opposite reaction."

• The action and reaction forces act on different objects, not on the same object, which is why they do not cancel each other out.

• The forces are equal in magnitude and opposite in direction.

• For example, when a person pushes against a wall, the wall exerts an equal and opposite force back on the person.

• These forces are fundamental to understanding interactions in mechanics, such as propulsion, collisions, and equilibrium.

Additional Information

• First Law (Law of Inertia)

• What it says: An object at rest stays at rest, and an object in motion stays in motion (constant velocity in a straight line) unless acted upon by an unbalanced external force.

• Concept: This introduces inertia, the tendency of an object to resist changes in its motion, with mass being the measure of inertia.

• Example: A soccer ball on the field stays put until kicked; once rolling, it keeps going until friction or a player stops it.

• Second Law (F=ma)

• What it says: The acceleration of an object is directly proportional to the net force applied to it and inversely proportional to its mass (Force = mass × acceleration).

• Formula: F = maF=maF=maF=maConcept: A greater force causes greater acceleration; a more massive object requires more force for the same acceleration.

• Example: Pushing a light cart is easier (more acceleration) than pushing a heavy cart with the same force.

Q28. Answer: (a) Telugu Desam Party (TDP)

The correct answer is Telugu Desam Party (TDP).

Key Points

• The Telugu Desam Party (TDP) formed the government in Andhra Pradesh in 2025 after a decisive victory in the Assembly elections.

• TDP leader N. Chandrababu Naidu became the Chief Minister of Andhra Pradesh.

• The government was formed with the support of NDA allies, including Jana Sena Party and BJP.

Additional Information

• Indian National Congress

• The Congress party has limited presence in the Andhra Pradesh Assembly.

• It has not formed the government in the state since bifurcation (2014).

• Bharatiya Janata Party (BJP)

• BJP contested as an alliance partner with TDP and Jana Sena.

• It is part of the ruling coalition but not the leading party.

• YSR Congress Party (YSRCP)

• Led by Y. S. Jagan Mohan Reddy, it was the ruling party from 2019 to 2024.

• It lost power in the 2024–25 Assembly elections.

Q29. Answer: (d) To provide a forum for peaceful resolution of disputes through mediation

The correct answer is To provide a forum for peaceful resolution of disputes through mediation.

Key Points

• The International Organization for Mediation (IOMed) was established by China in 2025 to promote peaceful dispute resolution through mediation.

• IOMed focuses on resolving international disputes between states, organizations, and entities without resorting to litigation or conflict.

• Mediation is a voluntary and non-binding process that emphasizes cooperation and mutual understanding, making it an effective tool for resolving complex disputes.

• The organization's establishment aligns with China's diplomatic strategy to promote global peace, stability, and cooperation in international relations.

• It serves as an alternative mechanism to existing international legal institutions, such as arbitration and court proceedings, which are often perceived as adversarial.

Additional Information

• Mediation as a Tool for Peaceful Dispute Resolution

• Mediation has gained prominence in international diplomacy as it facilitates dialogue and helps prevent escalation into conflict.

• Countries and organizations increasingly recognize mediation as a cost-effective and time-saving approach to dispute resolution.

• By establishing IOMed, China underscores its commitment to peaceful conflict resolution and positions itself as a leader in global

mediation efforts.

Q30. Answer: (b) Madhura Dhamangaonkar

The correct answer is Madhura Dhamangaonkar.

Key Points

• Madhura Dhamangaonkar won three medals at the Archery World Cup Stage 2 in Shanghai:

• Individual gold in women's compound event

• Silver in women's team event

• Bronze in mixed team compound event with Abhishek Verma.

• Her individual gold was a maiden World Cup title, marking a major success in her comeback to international archery.

• This performance contributed to India's strong overall tally at the event.

Additional Information

• Chikitha Taniparthi

• Competed as part of India's women's compound team, which won medals at Shanghai Stage 2.

• She has participated in various national-level competitions, showcasing promising potential in the sport of archery.

• Deepika Kumari

• Deepika Kumari is one of India's most celebrated archers and a former world number one in recurve archery.

• She specializes in recurve archery, which is part of the Olympics, as opposed to compound archery, which is Jyoti Surekha Vennam's category.

• Deepika has won multiple medals in World Cups and represented India at the Olympics but was not a medalist at the Shanghai 2025 event.

• Jyoti Surekha Vennam

• She is one of India's top compound archers, known for winning medals at major international events including the World Archery Championships, Asian Games, and Archery World Cups.

• She has been a consistent performer in both individual and team events and plays a key role in India's archery success on the global stage.

Important Points

• Archery World Cup

• The Archery World Cup is an international competition organized by World Archery Federation.

• It includes multiple stages held in different countries, culminating in a final where the best archers compete for top honors.

• The event features two main categories: recurve and compound archery, with individual and team events.

• India has emerged as a strong contender in both categories, with several archers making their mark on the global stage.

Q31. Answer: (a) It is located on an ancient shield region with low seismic activity.

The correct answer is It is located on an ancient shield region with low seismic activity.

Key Points

• The Peninsular Plateau of India is part of the ancient Indian shield, which is geologically stable due to its composition of hard and crystalline rocks that date back to the Precambrian era.

• This region has experienced minimal tectonic activity over millions of years, making it less susceptible to earthquakes and volcanic eruptions compared to other areas.

• The plateau is primarily composed of igneous and metamorphic rocks, which contribute to its stability and resistance to deformation.

• Unlike the Himalayas, which are young fold mountains formed due to tectonic plate collisions, the Peninsular Plateau is much older and lies on stable continental crust.

• The lack of active fault lines and tectonic movement in the region further enhances its geological stability.

Additional Information

• Major Hill Ranges & Their Peaks

• Aravalli Range: Oldest fold mountains; Guru Shikhar (highest peak).

• Vindhyan Range: A central barrier; Sadbhavna Peak (highest peak).

• Satpura Range: A series of block mountains; Dhupgarh (highest peak).

• Western Ghats (Sahyadris): Run parallel to the Arabian Sea; Anaimudi (highest in all peninsular India).

• Eastern Ghats: Lower, discontinuous ranges; Jindhagada Peak (highest).

• Meghalaya Plateau: Extends east of Rajmahal Hills; Shillong Peak (highest point).

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Q32. Answer: (d) Approving taxes independently

The correct answer is Approving taxes independently.

Key Points

• The Governor of a state does not have the power to approve taxes independently. Taxation is a legislative matter that requires the approval of the State Legislature.

• As per the Indian Constitution, taxation powers are clearly defined under the Union, State, and Concurrent lists in the Seventh Schedule. Governors cannot impose or approve taxes unilaterally.

• While the Governor has financial powers, such as giving assent to Money Bills or presenting the budget, these are done in consultation with the State Legislature.

• Taxation decisions and proposals must be introduced and passed through legislative procedures in the State Assembly, and the Governor's role is limited to assent or withholding assent.

• Granting the Governor independent authority to approve taxes would undermine the democratic process and the role of the elected legislature.

Additional Information

• Financial Powers

• Budget: Causes the Annual Financial Statement (budget) to be laid before the legislature.

• Demands for Grants: Recommends Money Bills and demands for grants.

• Judicial Powers

• Pardons: Grants pardons, reprieves, respites, or remissions of punishment (except death penalty) for state law offenses (Article 161).

• Judges: Consulted by the President for High Court Judge appointments and appoints/promotes District Judges in consultation with the High Court.

• Discretionary Powers (Limited)

• Appointing the CM when no party has a clear majority.

• Dismissing the Council of Ministers if they lose the confidence of the assembly.

• Dissolving the Assembly if a stable government is impossible.

Q33. Answer: (b) infectious diseases and epidemics

The correct answer is infectious diseases and epidemics.

Key Points

• Biological disasters occur due to the spread of infectious diseases and epidemics, which are caused by microorganisms like bacteria, viruses, fungi, or parasites.

• Examples of biological disasters include the outbreak of pandemics like COVID-19, Ebola, SARS, and influenza.

• Such disasters result in large-scale illness or death and often require extensive public health interventions to control their spread.

• Factors like globalization, urbanization, and ecological disruptions contribute to the increased frequency and intensity of biological disasters.

• Organizations like the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) work globally to monitor, control, and mitigate the impact of these disasters.

Additional Information

• Climate Change:

• Climate change refers to long-term changes in global or regional climate patterns, often attributed to human activities such as deforestation and burning fossil fuels.

• Fire and Smoke:

• Fire and smoke disasters, such as forest fires and industrial fires, are categorized as environmental or man-made disasters rather than biological disasters.

• These events primarily result in respiratory health issues and environmental damage, rather than being caused by infectious agents.

• Earthquakes and Volcanic Eruptions:

• Earthquakes and volcanic eruptions are geological disasters caused by tectonic activity within the Earth's crust.

Q34. Answer: (d) Kush Maini

The correct answer is Kush Maini.

Key Points

• Kush Maini became the first Indian driver to win a Formula 2 race at the prestigious Monaco Grand Prix in May 2025.

• Formula 2 is considered a stepping stone to Formula 1, and winning at Monaco is a significant achievement due to the

challenging circuit.

• Kush Maini drives for the Campos Racing team, which has been a key contributor to his success in the 2025 Formula 2 season.

• The victory at Monaco marked a historic milestone for Indian motorsport, showcasing the growing presence of Indian drivers in international racing.

• Monaco Grand Prix is renowned for its narrow and twisting streets, making it one of the most difficult circuits in the world and a prestigious win for any driver.

Additional Information

• Jehan Daruwala:

• Jehan Daruwala is another prominent Indian motorsport driver competing in Formula 2.

• He has achieved multiple podium finishes in Formula 2.

• Jehan has been affiliated with teams like Carlin and Prema Racing during his career.

• Arjun Maini:

• Arjun Maini is an Indian racing driver who has competed in Formula 2 and other international motorsport championships.

• He has also participated in endurance racing, including the prestigious Le Mans 24 Hours race.

• Karun Chandhok:

• Karun Chandhok is a former Indian Formula 1 driver who has also competed in Formula 2 (formerly GP2) and endurance racing.

• He was one of the first Indians to race in Formula 1, representing teams like HRT and Lotus.

Important Points

• About Formula 2 race:

• Formula 2 is a feeder series to Formula 1, featuring highly competitive races and identical cars to ensure a focus on driver skill.

• The Monaco Grand Prix is a part of the Formula 2 calendar and is considered one of the most prestigious races due to its unique street circuit layout.

• Drivers often use their performances in Formula 2 as a stepping stone to secure seats in Formula 1.

Q35. Answer: (c) Ministry of Law and Justice

The correct answer is Ministry of Law and Justice.

Key Points

• The Ministry of Law and Justice organized the National Conference on 'Institutional Mediation: An Effective Framework for Dispute Resolution' on 14 June 2025 at Bharat Mandapam, New Delhi.

• The conference emphasized the importance of mediation as a key tool for alternative dispute resolution (ADR) and reducing the burden on traditional courts.

• The event also focused on institutionalizing mediation practices across sectors and creating a robust legal framework for its implementation.

• The Ministry of Law and Justice is responsible for managing legal affairs, legislative activities, and judicial reforms in the country, including introducing innovative dispute resolution mechanisms.

• This initiative aligns with the government's efforts to promote faster, cost-effective, and amicable resolution of disputes.

Additional Information

• Ministry of External Affairs:

• It is responsible for managing India's foreign relations and diplomatic affairs.

• The Ministry oversees India's representation in international organizations, consular services, and bilateral and multilateral negotiations.

• It plays a significant role in promoting India's global presence and securing economic, strategic, and cultural interests abroad.

• Home Ministry:

• The Ministry of Home Affairs (MHA) is responsible for internal security, law and order, and governance of Union Territories.

• It supervises paramilitary forces, disaster management, and border security.

• It is also responsible for counter-terrorism strategies and handling issues related to citizenship, fundamental rights, and national integration.

• Ministry of Defence:

• This Ministry is tasked with ensuring national security and the operational readiness of the armed forces.

• It oversees the Indian Army, Navy, Air Force, and Coast Guard.

• The Ministry also manages defense production, procurement, research, and development to strengthen India's defense capabilities.

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Q36. Answer: (b) Article 148

The correct answer is Article 148.

Key Points

• Article 148 of the Indian Constitution provides for the establishment and appointment of the Comptroller and Auditor General (CAG) of India.

• The CAG is responsible for auditing the accounts of the Union and State governments and public sector organizations.

• The CAG is appointed by the President of India and holds office for a term of six years or until the age of 65, whichever is earlier.

• The CAG is an independent authority and is considered the guardian of the public purse.

• As per the Constitution, the reports of the CAG are submitted to the President or Governor, who then places them before the legislature for discussion.

Additional Information

• Article 324

• This article pertains to the establishment and powers of the Election Commission of India.

• The Election Commission is responsible for conducting free and fair elections in India for the Parliament, State Legislatures, and the offices of the President and Vice-President.

• The Chief Election Commissioner and other Election Commissioners are appointed by the President of India.

• Article 280

• This article deals with the formation of the Finance Commission of India.

• The Finance Commission is constituted by the President every five years to recommend the distribution of financial resources between the Union and the States.

• The recommendations made by the Finance Commission are advisory in nature.

• Article 76

• This article establishes the office of the Attorney General of India.

• The Attorney General is the highest legal officer in the country and acts as the chief legal advisor to the Government of India.

• The Attorney General is appointed by the President and holds office during their pleasure.

Q37. Answer: (b) IIIT-Delhi

The correct answer is IIIT-Delhi.

Key Points

• In May 2025, the Indraprastha Institute of Information Technology Delhi (IIIT-Delhi) collaborated with INRIA Saclay, a renowned French research institution, to develop AI tools for combating antimicrobial resistance (AMR).

• This collaboration aims to leverage artificial intelligence and machine learning to analyze large datasets related to microbial infections and drug resistance patterns.

• The partnership focuses on creating innovative computational models to predict the emergence of AMR and facilitate better decision-making in the use of antibiotics.

• Antimicrobial resistance is a growing global challenge, and this initiative seeks to address it by integrating advanced AI techniques with microbiological research.

• The project aligns with global efforts such as the World Health Organization (WHO) Global Action Plan on Antimicrobial Resistance.

Additional Information

• Antimicrobial Resistance (AMR)

• AMR occurs when bacteria, viruses, fungi, and parasites evolve to resist the effects of medications, making infections harder to treat.

• It is considered one of the top 10 global public health threats by the WHO.

• The integration of AI in combating AMR involves analyzing genomic, clinical, and environmental data to design effective interventions and reduce the misuse of antibiotics.

Q38. Answer: (c) 2

The correct answer is 2.

Key Points

• In January 2025, a total of 2 sportspersons were honored with the prestigious Arjuna Award (Lifetime) for their exceptional contribution and performance in the field of sports.

• Murlikant Petkar (Paralympic Swimming) and

• Sucha Singh (Athletics), recognizing their lifelong contributions.

• This award recognizes sustained excellence and contribution to sports over a lifetime, distinct from the regular Arjuna Awards for recent performance.

Additional Information

• The Arjuna Award is one of the highest sporting honors in India, instituted in 1961, to recognize outstanding achievements in sports and games.

• The awardees receive a bronze statuette of Arjuna, a certificate, ceremonial dress, and a cash prize.

• The Lifetime category acknowledges sportspersons who have consistently delivered exceptional performances and made significant contributions to their respective sports over a long period.

• The selection of awardees is conducted by a committee constituted by the Ministry of Youth Affairs and Sports, based on nominations received from National Sports Federations and other recognized bodies.

Q39. Answer: (b) 11

The correct answer is 11.

Key Points

• As of January 2025, India officially recognises 11 Classical Languages, a number that increased in October 2024:

• When Marathi, Pali, Prakrit, Assamese, and Bengali were added to the original six (Tamil, Sanskrit, Telugu, Kannada, Malayalam, Odia), solidifying their ancient heritage and literary significance under the Ministry of Culture.

Additional Information

• About Classical Languages:

• The concept of classical languages was introduced by the Government of India to preserve and promote languages with significant ancient heritage.

• Classical languages must have a recorded history of over 1500 years and a body of ancient literature considered a valuable cultural heritage.

• The recognition of classical languages is crucial for safeguarding India's linguistic diversity and cultural richness.

Q40. Answer: (b) 7 April 2025

The correct answer is 7 April 2025.

Key Points

• World Health Day is celebrated annually on 7th April to mark the founding of the World Health Organization (WHO) in 1948.

• The theme for 2025 was "Healthy Start, Hopeful Future", emphasizing the importance of improving global health outcomes from childhood onwards.

• The day aims to raise awareness about global health issues and mobilize action to address them through education, policy changes, and community efforts.

• Various campaigns, events, and health initiatives are organized worldwide by WHO, governments, and other health organizations to promote the theme and its objectives.

• World Health Day serves as a reminder of the ongoing need to invest in health systems, ensure equitable access to healthcare, and prioritize preventive care.

Additional Information

• 12 April 2025

• This date marks International Day of Human Space Flight, celebrated in honor of Yuri Gagarin's first human spaceflight on 12 April 1961.

• It highlights achievements in space exploration and the importance of peaceful uses of outer space, unrelated to World Health Day.

• 5 April 2025

• This date may commemorate events such as National Maritime Day in India, observed annually on April 5th to honor the launch of the first Indian commercial vessel, SS Loyalty, in 1919.

• It is unrelated to global health initiatives or the WHO's efforts.

• World Health Organization (WHO)

• Founded on 7 April 1948, WHO is a specialized agency of the United Nations responsible for international public health.

• Its main objectives include combating diseases, promoting health and well-being, and ensuring universal health coverage worldwide.

• World Health Day is one of its most significant annual initiatives to draw attention to pressing global health challenges.

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Q41. Answer: (d) 70,48,048

Shortcut Trick

To be divisible by 14, the number must be perfectly divisible by its co-prime factors, 2 and 7.

Only an even number is divisible by 2. Option 3 (64,36,639) ends in an odd digit (9), so it is eliminated.

Check the remaining options for divisibility by 7 using direct division.

67,94,266 ÷ 7 gives a remainder of 3 | 71,32,960 ÷ 7 gives a remainder of 2.

70,48,048 can be cleanly split as 70,00,000 + 48,048, which are both obvious exact multiples of 7.

Therefore The correct answer is 70,48,048.

Alternate Method

Given:

Options: 67,94,266 | 71,32,960 | 64,36,639 | 70,48,048

Concept Used:

A number is divisible by 14 if it satisfies the divisibility rules for both 2 and 7.

Calculations:

=> Divisibility by 2 requires the unit digit to be an even number (0, 2, 4, 6, 8).

=> 64,36,639 ends with 9 (odd), thus it is not divisible by 2.

=> We now divide the remaining three options by 7 to check for a remainder of 0.

=> 67,94,266 ÷ 7 = 9,70,609 with a remainder of 3.

=> 71,32,960 ÷ 7 = 10,18,994 with a remainder of 2.

=> 70,48,048 = 70,00,000 + 48,048. Evaluating each part for 7:

=> 70,00,000 ÷ 7 = 10,00,000

=> 48,048 ÷ 7 = 6,864

=> Total division: 70,48,048 ÷ 7 = 10,06,864 with a remainder of 0.

=> Because 70,48,048 satisfies the divisibility criteria for both 2 and 7, it is a multiple of 14.

Therefore The correct answer is 70,48,048.

Additional Information

Co-prime Factor Rule

To verify if a number is divisible by a composite number (like 14), check its divisibility by the composite number's co-prime factors (2 and 7).

Divisibility Rule of 7

Double the last digit and subtract it from the remaining part of the number. Repeat this process until a small recognizable number is reached. If the final result is 0 or a multiple of 7, the original number is divisible by 7.

Divisibility Rule of 11

Find the difference between the sum of digits in odd positions and the sum of digits in even positions. If the difference is 0 or a multiple of 11, the number is divisible by 11.

Q42. Answer: (d) 12:25 PM

Shortcut Trick

Time taken by A = 7 hours, and time taken by B = 5 hours.

Let the total distance be the LCM of 7 and 5 = 35 units.

Speed of A = 35 ÷ 7 = 5 units/hr, and Speed of B = 35 ÷ 5 = 7 units/hr.

A travels 2 hours alone (8:20 AM to 10:20 AM), covering 2 × 5 = 10 units. Remaining distance = 35 − 10 = 25 units.

Time to meet after 10:20 AM = 25 ÷ (5 + 7) = 25/12 hours = 2 hours 5 minutes.

Therefore The correct answer is 12:25 PM.

Alternate Method

Given:

Train A travels from M to N: 8:20 AM to 3:20 PM.

Train B travels from N to M: 10:20 AM to 3:20 PM.

Formula Used:

Speed = Distance ÷ Time

Time = Distance ÷ Speed

Station M

Station N
A →
Starts 8:20 AM
← B
Starts 10:20 AM
Meeting Point
Total Distance = D km
Relative Speed = S_A + S_B
Calculations:
=> Total time taken by Train A = 8:20 AM to 3:20 PM = 7 hours.
=> Total time taken by Train B = 10:20 AM to 3:20 PM = 5 hours.
=> Let the total distance between station M and N be D km.
=> Speed of Train A = D/7 km/hr.
=> Speed of Train B = D/5 km/hr.
=> Distance covered by Train A in 2 hours (8:20 AM to 10:20 AM) = 2 × D/7 = 2D/7 km.
=> Remaining distance at 10:20 AM = D − 2D/7 = 5D/7 km.
=> Relative speed = D/7 + D/5 = 12D/35 km/hr.
=> Time taken to meet = Remaining Distance ÷ Relative Speed.
=> Time = (5D/7) ÷ (12D/35) = (5/7) × (35/12) = 25/12 hours.
=> 25/12 hours = 2 hours + 1/12 hours = 2 hours 5 minutes.
=> Time of meeting = 10:20 AM + 2 hours 5 minutes = 12:25 PM.
Therefore The correct answer is 12:25 PM.
Additional Information
Relative Speed (Opposite Directions)
When two objects move towards each other, their relative speed is the sum of their individual speeds: S_(rel) = S1 + S2.
Relative Speed (Same Direction)
When two objects move in the same direction, their relative speed is the difference of their individual speeds: S_(rel) = |S1 − S2|.
Meeting Time
If two bodies start moving at the same time towards each other, the time taken to meet is equal to the Initial Distance ÷ Relative Speed.

Q43. Answer: (c) 8.33%

Shortcut Trick
Discount % = (Discount ÷ Marked Price) × 100
=> Discount % = (50 ÷ 600) × 100
=> Discount % = 100 ÷ 12 = 8.33%
Therefore The correct answer is 8.33%.
Alternate Method
Given:
Marked Price (MP) = Rs. 600
Discount = Rs. 50
Formula Used:
Discount % = (Discount ÷ MP) × 100
Selling Price = Rs. 550
Disc = Rs. 50
Marked Price = Rs. 600
Discount % = (50 ÷ 600) × 100 = 8.33%
Calculation:
=> Discount % = (50 ÷ 600) × 100
=> Discount % = (1 ÷ 12) × 100
=> Discount % = 100 ÷ 12
=> Discount % = 25 ÷ 3

=> Discount % ≈ 8.33%

Therefore The correct answer is 8.33%.

Additional Information

Marked Price (MP)

The price printed on the label of an article. Any discount offered to the customer is always calculated on this price.

Selling Price (SP)

The actual price paid by the buyer after the deduction of the discount. Rule: SP = MP − Discount.

Successive Discounts

If two successive discounts of a% and b% are provided, the effective net discount is equivalent to (a + b − a × b ÷ 100)%.

Q44. Answer: (c) Rs. 74,000

Shortcut Trick

Anubhav's profit = (8725 + 1745) ÷ 2 = Rs. 5235; Gaurav's profit = Rs. 3490 => Profit Ratio = 3 : 2.

Capital ratio = Profit ratio ÷ Time ratio = (3 ÷ 3) : (2 ÷ 4) = 1 : 0.5 = 2 : 1.

Capital difference = 2 − 1 = 1 unit → Rs. 37,000.

Capital of Anubhav = 2 units = 2 × 37,000 = Rs. 74,000.

Therefore The correct answer is Rs. 74,000.

Alternate Method

Given:

Total profit = Rs. 8,725

Anubhav's profit is Rs. 1,745 more than Gaurav's.

Anubhav's investment time = 3 months, Gaurav's investment time = 4 months.

Anubhav invests Rs. 37,000 more than Gaurav.

Anubhav

Capital: x + 37000

Time: 3 months

Profit: 3 Units

Gaurav

Capital: x

Time: 4 months

Profit: 2 Units

Profit Ratio = (C1 × T1) : (C2 × T2)

Formula Used:

Profit = Capital × Time

Calculations:

Let Gaurav's profit be G. Then, Anubhav's profit = G + 1745.

=> Total profit = G + (G + 1745) = 8725

=> 2G + 1745 = 8725

=> 2G = 6980

=> G = Rs. 3,490

=> Anubhav's profit = 3490 + 1745 = Rs. 5,235

=> Profit ratio (Anubhav : Gaurav) = 5235 : 3490 = 3 : 2

Let Gaurav's capital be x. Then Anubhav's capital is x + 37000.

=> (Anubhav's Capital × 3) ÷ (Gaurav's Capital × 4) = 3 / 2

=> [(x + 37000) × 3] ÷ [x × 4] = 3 / 2

=> (x + 37000) ÷ 4x = 1 / 2

=> 2 × (x + 37000) = 4x

=> 2x + 74000 = 4x

=> 2x = 74000

=> x = Rs. 37,000

=> Anubhav's capital = x + 37000 = 37000 + 37000 = Rs. 74,000.

Therefore The correct answer is Rs. 74,000.

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Additional Information

Basic Partnership Rule

When investments are made for different time periods, the profit is distributed in the ratio of the product of their capital and the time period. Profit Ratio = (C1 × T1) : (C2 × T2).

Working vs Sleeping Partner

A working partner manages the business and receives a fixed salary or a certain percentage of the profit for their work, in addition to their share based on investment. A sleeping partner only invests money and gets a share based solely on investment.

Joining Mid-way

If a partner joins x months after the start of a 12-month business cycle, their effective investment time is taken as (12 − x) months for calculating the annual profit share.

Q45. Answer: (d) Rs. 1,596

Shortcut Trick

Profit ratio of A, B and C = 2410 : 1170 : 700 = 241 : 117 : 70

Difference in profit parts of A and C = 241 − 70 = 171 parts

Profit of B = 117 parts = Rs. 1,092

Difference in profit = (1092 ÷ 117) × 171 = (28 ÷ 3) × 171 = 28 × 57 = Rs. 1,596

Therefore The correct answer is Rs. 1,596.

Alternate Method

Given:

Investment of A = Rs. 2,410

Investment of B = Rs. 1,170

Investment of C = Rs. 700

B's share in the profit = Rs. 1,092

Formula Used:

Profit Ratio = Ratio of Product of Capital and Time

When the time period is identical for all partners, Profit Ratio = Ratio of Investment.

A

Rs. 2,410

241x

B

Rs. 1,170

117x

C

Rs. 700

70x

Diff = 171x

Calculations:

=> Profit Ratio (A : B : C) = 2410 : 1170 : 700 = 241 : 117 : 70

=> Let the profit shares of A, B, and C be 241x, 117x, and 70x respectively.

=> We are given B's profit = Rs. 1,092

=> 117x = 1092

=> x = 1092 ÷ 117 = 28 ÷ 3

=> Difference between A and C's profit = 241x − 70x = 171x

=> Difference = 171 × (28 ÷ 3) = 57 × 28 = Rs. 1,596

Therefore The correct answer is Rs. 1,596.

Additional Information

Partnership Profit Rule

Profit is distributed in the ratio of the product of Capital and Time Period (P = C × T). If time is constant, profit depends solely on the capital invested.

Sleeping vs Working Partner

A working partner receives a fixed salary or commission from the total profit, and the remaining profit is distributed among all partners based on their investment ratio.

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Joining Mid-way

If a partner joins after a few months (t months), their capital is considered only for the remaining duration of the business cycle (typically 12 − t months).

Q46. Answer: (c) 148

Shortcut Trick

Apply BODMAS directly by solving brackets first:

Inner bracket: (3 − 7) = −4

Curly bracket: {12 + 2 × (−4)} = 12 − 8 = 4

Final division: 592 ÷ 4 = 148

Therefore The correct answer is 148.

Alternate Method

Given:

[592 ÷ {12 + 2 × (3 − 7)}]

Concept Used:

BODMAS Rule: Brackets → Orders (powers/roots) → Division → Multiplication → Addition → Subtraction.

Calculations:

=> 592 ÷ {12 + 2 × (3 − 7)}

=> 592 ÷ {12 + 2 × (−4)}

=> 592 ÷ {12 − 8}

=> 592 ÷ 4

=> 148

Therefore The correct answer is 148.

Additional Information

BODMAS Rule

It defines the correct sequence to solve mathematical expressions: Brackets, Orders (powers and roots), Division, Multiplication, Addition, and Subtraction.

Order of Brackets

Always solve brackets from the inside out: First Round (), then Curly {}, and finally Square [].

Sign Rules for Multiplication

Multiplying numbers with opposite signs results in a negative product: Positive × Negative = Negative.

Q47. Answer: (c) 16

Shortcut Trick

The mode is the value that appears most frequently in a given dataset.

By visually scanning the given marks (12, 14, 16, 13, 15, 14, 16, 10, 16, 12), we can count their occurrences.

The mark 16 appears 3 times, while all other marks appear 1 or 2 times.

Since 16 has the highest frequency, it is the mode.

Therefore The correct answer is 16 marks.

Alternate Method

Given:

Marks scored by 10 students: 12, 14, 16, 13, 15, 14, 16, 10, 16, 12

Method Used:

Mode is the observation that has the maximum frequency in a given set of data.

0

1

2

3

Freq

10

12

13

14

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15
16
1
2
1
2
1
3
Marks Scored
Calculations:
=> Arrange the given data in ascending order to easily group and count the marks.
=> Ordered data: 10, 12, 12, 13, 14, 14, 15, 16, 16, 16
=> Mark 10 → Frequency = 1
=> Mark 12 → Frequency = 2
=> Mark 13 → Frequency = 1
=> Mark 14 → Frequency = 2
=> Mark 15 → Frequency = 1
=> Mark 16 → Frequency = 3
=> Comparing the frequencies, the mark 16 has the highest frequency of 3.
=> Therefore, the mode of the given data is 16.
Therefore The correct answer is 16 marks.
Additional Information
Mean
The mean is the arithmetic average of a data set, calculated by dividing the sum of all observations by the total number of observations.
Median
The median is the middlemost value of a sorted data set. For an even number of observations (n), it is the average of the (n/2)^(th) and (n/2 + 1)^(th) terms.
Empirical Relationship
For moderately skewed distributions, the mean, median, and mode are connected by the empirical formula: Mode ≈ 3 × Median − 2 × Mean.

Q48. Answer: (b) 40 km/hr

Shortcut Trick
For a constant distance, speed is inversely proportional to time.
Time ratio = 20 : 14 = 10 : 7
Speed ratio = 7 : 10
Given, 7 units = 28 km/hr => 1 unit = 4 km/hr
Required speed (10 units) = 10 × 4 = 40 km/hr
Therefore The correct answer is 40 km/hr.
Alternate Method
Given:
Initial speed (S1) = 28 km/hr
Initial time (T1) = 20 hours
New time (T2) = 14 hours
Formula Used:
Distance = Speed × Time
Distance is Constant
Distance (D)
S1 = 28 km/hr | T1 = 20 hours
Same Distance (D)
S2 = ? km/hr | T2 = 14 hours

S1 × T1 = S2 × T2

Calculations:

=> Distance covered in the first case = S1 × T1

=> Distance = 28 × 20 = 560 km

=> Since the distance remains the same, for the second case:

=> S2 × T2 = 560

=> S2 × 14 = 560

=> S2 = 560 ÷ 14

=> S2 = 40 km/hr

Therefore The correct answer is 40 km/hr.

Additional Information

Inverse Proportion

When Distance is constant, Speed and Time are inversely proportional. Thus, S1 × T1 = S2 × T2.

Average Speed

When traveling two equal halves of a distance at speeds S1 and S2, Average Speed = (2 × S1 × S2) ÷ (S1 + S2).

Relative Speed

If two objects move in the same direction, Relative Speed = S1 − S2. If they move in opposite directions, Relative Speed = S1 + S2.

Q49. Answer: (b) 13750

Shortcut Trick

Winning margin = 59% − 41% = 18% of the valid votes.

Valid votes = 80% of polled votes, and polled votes = 95% of total registered voters.

Let the total number of registered voters be T.

T × 95% × 80% × 18% = 1881

T × (19/20) × (4/5) × (9/50) = 1881 => T = 13750

Therefore The correct answer is 13750 voters.

Alternate Method

Given:

Registered voters who cast their vote = 95%

Invalid votes = 20%

Winning candidate's share = 59% of valid votes

Winning margin = 1881 votes

Total Voters (100x)

95% vote

Polled Votes (95x)

80% valid

Valid Votes (76x)

Winner

59% (44.84x)

Loser

41% (31.16x)

Margin = 18% of 76x = 13.68x = 1881

=> Let the total number of registered voters be 100x

=> Votes polled = 95% of 100x = 95x

=> Valid votes = (100% − 20%) of 95x = 80% of 95x = 76x

=> Winner's votes = 59% of 76x = 44.84x

=> Loser's votes = (100% − 59%) of 76x = 41% of 76x = 31.16x

=> Winning margin = Winner's votes − Loser's votes

=> Winning margin = 44.84x − 31.16x = 13.68x

=> 13.68x = 1881

=> x = 1881 ÷ 13.68 = 137.5

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=> Total registered voters = 100x = 100 × 137.5 = 13750

Therefore The correct answer is 13750 voters.

Additional Information

Election Percentage Concept

In election problems, always track the remaining pool of valid votes progressively. Flow: Total Voters → Polled Votes → Valid Votes → Distributed Votes.

Successive Percentage Formula

When a base value undergoes continuous percentage changes, Final Value = Initial Value × (1 ± R1/100) × (1 ± R2/100).

Margin of Victory

The winning margin is always calculated as the absolute difference between the winner's percentage share and the nearest rival's percentage share of the valid votes.

Q50. Answer: (b) 68.3%

Shortcut Trick

Let the Cost Price (CP) = 100.

There is a loss of 15%, so the first selling price (SP1) = 85.

Given SP1 = 5/11 of Actual SP, so Actual SP = 85 × 11/5 = 187.

New selling price = 90% of Actual SP = 187 × 0.90 = 168.3.

Profit = 168.3 − 100 = 68.3%.

Therefore The correct answer is 68.3%.

Alternate Method

Given:

SP1 = 5/11 of Actual SP

Loss at SP1 = 15%

New SP = 90% of Actual SP

← × 5/11 of Actual SP

← 90%

← 15% Loss

Profit = 68.3% →

SP1

(85)

CP

(100)

New SP

(168.3)

Actual SP

(187)

Calculations:

=> Let the Cost Price (CP) be 100x.

=> Selling price at 15% loss (SP1) = 100x − 15% of 100x = 85x.

=> SP1 = 5/11 × Actual SP

=> Actual SP = 85x × 11/5 = 187x.

=> New selling price = 90% of Actual SP = 0.90 × 187x = 168.3x.

=> Profit = New SP − CP = 168.3x − 100x = 68.3x.

=> Profit % = (68.3x ÷ 100x) × 100 = 68.3%.

Therefore The correct answer is 68.3%.

Additional Information

Marked Price & Discount

Discount is always calculated on the Marked Price (MP). SP = MP × (1 − Discount/100).

Profit/Loss Percentage

Profit or loss is always calculated on the Cost Price (CP). Profit % = (SP − CP) ÷ CP × 100.

Successive Changes

For two successive percentage changes of a% and b%, the effective net percentage change is given by (a + b + a×b/100)%.

Q51. Answer: (d) 2.1

Shortcut Trick

Convert the numbers to like decimals by equating the number of decimal places: 2.10 and 0.35.

Treat them as integers by temporarily removing the decimal point: 210 and 35.

Find the LCM of 210 and 35. Since 210 is directly divisible by 35 (35 × 6 = 210), their LCM is 210.

Place the decimal point back 2 places from the right to get the final LCM: 2.10 = 2.1.

Therefore The correct answer is 2.1.

Alternate Method

Given:

Numbers: 2.1 and 0.35

Formula Used:

LCM of fractions = LCM of numerators ÷ HCF of denominators

Calculations:

=> Convert the given decimals into fractions in their simplest form.

=> 2.1 = 21/10

=> 0.35 = 35/100 = 7/20

=> Now, find the LCM of the fractions 21/10 and 7/20.

=> LCM of numerators (21, 7) = 21

=> HCF of denominators (10, 20) = 10

=> LCM of fractions = 21 ÷ 10 = 2.1

Therefore The correct answer is 2.1.

Additional Information

HCF of Fractions

The Highest Common Factor (HCF) of two or more fractions is calculated as: HCF of numerators ÷ LCM of denominators.

Relation between LCM and HCF

For any two given numbers (or fractions), the product of the two numbers is exactly equal to the product of their LCM and HCF.

Like Decimals

Decimals having the same number of digits after the decimal point are called like decimals. It is highly recommended to convert decimal numbers to like decimals before finding their LCM or HCF to avoid incorrect place value calculation errors.

Q52. Answer: (d) 125

Shortcut Trick

The product of any two numbers is always equal to the product of their H.C.F. and L.C.M.

Second Number = (H.C.F. × L.C.M.) ÷ First Number

=> Second Number = (25 × 250) ÷ 50

=> Second Number = 25 × 5 = 125

Therefore The correct answer is 125.

Alternate Method

Given:

H.C.F. of the two numbers = 25

L.C.M. of the two numbers = 250

First number (N1) = 50

Formula Used:

N1 × N2 = H.C.F. × L.C.M.

Calculation:

=> 50 × N2 = 25 × 250

=> 50 × N2 = 6250

=> N2 = 6250 ÷ 50

=> N2 = 125

Therefore The correct answer is 125.

Additional Information

Co-prime Numbers

Two numbers are said to be co-prime if their H.C.F. is 1. For co-prime numbers, their L.C.M. is simply the product of the two numbers.

H.C.F. and L.C.M. of Fractions

H.C.F. = (H.C.F. of Numerators) ÷ (L.C.M. of Denominators) | L.C.M. = (L.C.M. of Numerators) ÷ (H.C.F. of Denominators).

Limitation of the Formula

The rule (N1 × N2 = H.C.F. × L.C.M.) is valid ONLY for two numbers. It cannot be applied to finding the product of three or more numbers.

Q53. Answer: (c) 122°

Shortcut Trick

Sum of interior angles in a quadrilateral is 360°.

angle A + angle B = 360° − (angle C + angle D) = 360° − (69° + 61°) = 230°

3(x + 2) + 2(2x − 7) = 230 => 7x − 8 = 230

7x = 238 => x = 34

angle B = 2(2 × 34 − 7) = 122°

Therefore The correct answer is 122°.

Alternate Method

Given:

angle A = 3(x + 2)°

angle B = 2(2x − 7)°

angle C = 69°

angle D = 69° − 8° = 61°

A

B

C

D

3(x+2)°

2(2x−7)°

69°

61°

Formula Used:

Sum of interior angles of a quadrilateral = 360°

Calculations:

=> angle A + angle B + angle C + angle D = 360°

=> 3(x + 2) + 2(2x − 7) + 69 + 61 = 360

=> 3x + 6 + 4x − 14 + 130 = 360

=> 7x + 122 = 360

=> 7x = 360 − 122

=> 7x = 238

=> x = 34

=> angle B = 2(2 × 34 − 7)°

=> angle B = 2(68 − 7)°

=> angle B = 122°

Therefore The correct answer is 122°.

Additional Information

Interior Angles of a Polygon

The sum of all interior angles of a polygon with n sides is given by the formula (n − 2) × 180°. For a quadrilateral (n = 4), the sum is exactly 360°.

Cyclic Quadrilateral

A quadrilateral whose vertices all lie on a single circle is called a cyclic quadrilateral. In such shapes, the sum of opposite interior

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angles is always equal to 180°.

Exterior Angles

The sum of the exterior angles of any convex polygon, taken one at each vertex, is always equal to 360° regardless of the number of sides the polygon has.

Q54. Answer: (a) 12% gain

Shortcut Trick

Net Profit / Loss % can be calculated directly using the successive percentage change formula: a + b + (a × b) ÷ 100

Here, Markup % (a) = +40% and Discount % (b) = −20%

Net % = 40 − 20 + (40 × (−20)) ÷ 100

Net % = 20 − 8 = +12%

Since the result is positive, it indicates a net gain of 12%.

Therefore The correct answer is 12% gain.

Alternate Method

Markup +40%

Discount −20%

Net Profit +12%

CP: 100

MP: 140

SP: 112

Given:

=> Markup % = 40%

=> Discount % = 20%

Calculations:

=> Let the Cost Price (CP) be 100 units.

=> Marked Price (MP) = CP + (40% of CP) = 100 + 40 = 140

=> The shopkeeper allows a 20% discount on the Marked Price.

=> Selling Price (SP) = MP − (20% of MP)

=> SP = 140 − (20 ÷ 100 × 140)

=> SP = 140 − 28 = 112

=> Profit = SP − CP = 112 − 100 = 12

=> Profit % = (Profit ÷ CP) × 100 = (12 ÷ 100) × 100 = 12%

Therefore The correct answer is 12% gain.

Additional Information

Marked Price & Discount

A discount is always calculated on the Marked Price (MP), never on the Cost Price (CP). The Selling Price (SP) is obtained after deducting the discount: SP = MP × (100 − D%) ÷ 100.

Successive Discount

When two successive discounts of a% and b% are given, the single equivalent discount percentage is given by (a + b − (a × b ÷ 100))%.

Dishonest Dealer Concept

If a trader professes to sell his goods at CP but uses a false weight to deceive the customer, his true Profit % is given by: (Error ÷ False Weight) × 100.

Q55. Answer: (a) 153

Shortcut Trick

The sum of the first n odd natural numbers is directly given by n^2.

The average of the first n odd natural numbers is calculated as $n^2 \div n = n$.

Here, the number of terms n = 153.

Average = 153.

Therefore The correct answer is 153.

Alternate Method

Average of First n Odd Numbers

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1
3
5
...
2n − 1
Total terms = n
Average = n
Given:
The first 153 odd natural numbers.
Formula Used:
Sum of an Arithmetic Progression (AP) = n÷2 × [2a + (n − 1)d]
Average = Sum of terms ÷ Number of terms
Calculations:
=> The sequence of the first 153 odd natural numbers is 1, 3, 5, 7, ... up to 153 terms.
=> First term (a) = 1
=> Common difference (d) = 2
=> Total terms (n) = 153
=> Sum = ^(153)÷2 × [2 × 1 + (153 − 1) × 2]
=> Sum = ^(153)÷2 × [2 + 152 × 2]
=> Sum = ^(153)÷2 × [2 + 304]
=> Sum = ^(153)÷2 × 306
=> Sum = 153 × 153
=> Average = Sum ÷ n = (153 × 153) ÷ 153 = 153
Therefore The correct answer is 153.
Additional Information
Average of first n natural numbers
The sum of the first n natural numbers is given by n(n + 1) ÷ 2. Therefore, their average is (n + 1) ÷ 2.
Average of first n even natural numbers
The sum of the first n even natural numbers is given by n(n + 1). Therefore, their average is (n + 1).
Sum of squares of first n natural numbers
The sum of the squares of the first n natural numbers is given by the formula n(n + 1)(2n + 1) ÷ 6.

Q56. Answer: (b) 18

Shortcut Trick
From the given conditions, we can deduce two directly related values for Ram's age:
Ram's age = 2 × Ramya's age + 15
Ram's age = 5 × Ramya's age + 6
Difference in multipliers (5 − 2 = 3) must equal the difference in constants (15 − 6 = 9).
Ramya's age = 9 ÷ 3 = 3 years, and Ram's age = 5 × 3 + 6 = 21 years.
Therefore The correct answer is 18 years.
Alternate Method
Given:
Let the present age of Ram be R and the present age of Ramya be y.
2 times the age of Ram is 30 years more than 4 times the age of Ramya.
5 times the age of Ramya is 6 years less than the age of Ram.
Ram
21 Years
Ramya
3
Difference = 18
Age Difference: 21 − 3 = 18 Years
Calculations:

From the first statement:

=> 2R = 4y + 30

Dividing the entire equation by 2:

=> R = 2y + 15 --- (Equation 1)

From the second statement:

=> 5y = R − 6

=> R = 5y + 6 --- (Equation 2)

Equating Equation 1 and Equation 2 for R:

=> 2y + 15 = 5y + 6

=> 5y − 2y = 15 − 6

=> 3y = 9

=> y = 3 years (Ramya's age)

Substitute y = 3 into Equation 1:

=> R = 2(3) + 15

=> R = 6 + 15 = 21 years (Ram's age)

Finding the difference between their present ages:

=> Difference = R − y

=> Difference = 21 − 3 = 18 years

Therefore The correct answer is 18 years.

Additional Information

Linear Equations in Ages

Age problems commonly require formulating simultaneous linear equations based on given statements to accurately find the present ages of the individuals involved.

Ratio of Ages

If the ratio of present ages is x : y, and after t years it becomes p : q, the cross-multiplication or gap-equalization method provides a remarkably fast mental solution without deep algebra.

Constant Difference in Ages

The absolute mathematical difference in ages between any two individuals always remains precisely constant regardless of the time passed, whether in the past or the future.

Q57. Answer: (b) 14,010 cm²

Shortcut Trick

Total Surface Area of Cuboid = 2 × (lb + bh + hl)

=> TSA = 2 × (84 × 45 + 45 × 25 + 25 × 84)

=> TSA = 2 × (3780 + 1125 + 2100)

=> TSA = 2 × 7005

Therefore The correct answer is 14,010 cm².

Alternate Method

Given:

Length (l) = 84 cm

Breadth (b) = 45 cm

Height (h) = 25 cm

l = 84 cm b = 45 cm h = 25 cm

Formula Used:

Total Surface Area of Cuboid = 2 × (lb + bh + hl)

Calculations:

=> Base area (lb) = 84 × 45 = 3780 cm²

=> Side area (bh) = 45 × 25 = 1125 cm²

=> Front area (hl) = 25 × 84 = 2100 cm²

=> Sum of three distinct faces = 3780 + 1125 + 2100 = 7005 cm²

=> Total Surface Area = 2 × 7005 = 14,010 cm²

Therefore The correct answer is 14,010 cm².

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Additional Information

Volume of a Cuboid

The volume represents the total 3D space occupied by the cuboid. Formula: V = l × b × h

Lateral Surface Area (LSA)

LSA includes the area of the four side walls, excluding the top and bottom faces. Formula: LSA = 2h(l + b)

Length of Diagonal

The longest line segment that can be placed inside a cuboidal box is its diagonal. Formula: d = √(l² + b² + h²)

Q58. Answer: (c) 511/65 hours

Shortcut Trick

Let Total Work = LCM of times = LCM(12, 21, 16) = 336 units.

Combined efficiency = (336 ÷ 12) + (336 ÷ 21) + (336 ÷ 16) = 28 + 16 + 21 = 65 units/hour.

Time taken together = Total Work ÷ Combined efficiency = 336 ÷ 65 hours.

Convert to mixed fraction: 336 ÷ 65 = 5 $^{11}/_{65}$ hours.

Therefore The correct answer is 5 $^{11}/_{65}$ hours.

Alternate Method

Given:

Time taken by Pipe A = 12 hours

Time taken by Pipe B = 21 hours

Time taken by Pipe C = 16 hours

Formula Used:

Time = Total Work ÷ Efficiency

LCM Table Method:

Pipe	Hours	Total Work	Efficiency
Pipe A	12	336	28
Pipe B	21	16	
Pipe C	16	21	

Calculations:

=> Total efficiency of Pipes A, B, and C together = 28 + 16 + 21 = 65 units/hour

=> Time taken when operating together = Total Work ÷ Total efficiency

=> Time taken = 336 ÷ 65

=> Time taken = 5 $^{11}/_{65}$ hours

Therefore The correct answer is 5 $^{11}/_{65}$ hours.

Additional Information

Inlet vs Outlet Pipes

An inlet pipe fills the tank (positive efficiency), while an outlet pipe or a leak empties the tank (negative efficiency). When operating together, the net efficiency is the sum of their individual positive and negative efficiencies.

Work and Wages

If multiple pipes or persons work together for the entirety of a job, the total wages or operational costs are distributed strictly in the ratio of their individual efficiencies.

Alternate Hour Working

When pipes operate alternately for one hour each, calculate the total work done in one complete cycle (e.g., 2 or 3 hours). Divide the total capacity by this cycle work to find the number of full cycles, and then manually calculate the remaining work for the final partial cycle.

Q59. Answer: (d) Rs. 116

Shortcut Trick

Let original cost of 1 pen = x and 1 pencil = y. So, 7x + 13y = 128.

With new prices: 14(x − 7) + 10(y + 2) = 98 => 14x + 10y = 176 => 7x + 5y = 88.

Subtracting the second simplified equation from the first: 8y = 40 => y = 5.

Substituting y = 5 in 7x + 5y = 88 => 7x + 25 = 88 => 7x = 63 => x = 9.

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Original cost of 9 pens and 7 pencils = 9 × 9 + 7 × 5 = 81 + 35 = 116.

Therefore The correct answer is Rs. 116.

Alternate Method

Given:

Cost of 7 pens and 13 pencils = Rs. 128

Cost of a pen decreases by Rs. 7 and cost of a pencil increases by Rs. 2

Cost of 14 pens and 10 pencils with new prices = Rs. 98

Method Used:

Forming linear equations in two variables and solving using the elimination method.

Calculation:

=> Let the original cost of one pen be Rs. x and one pencil be Rs. y.

=> From the first condition: 7x + 13y = 128

=> From the second condition: 14(x − 7) + 10(y + 2) = 98

=> 14x − 98 + 10y + 20 = 98

=> 14x + 10y − 78 = 98

=> 14x + 10y = 176

=> Dividing the entire equation by 2: 7x + 5y = 88

=> Subtracting the simplified second equation from the first equation: (7x + 13y) − (7x + 5y) = 128 − 88

=> 8y = 40

=> y = 5

=> Substitute y = 5 into the second equation: 7x + 5(5) = 88

=> 7x + 25 = 88

=> 7x = 63

=> x = 9

=> The original cost of a pen is Rs. 9 and a pencil is Rs. 5.

=> Original cost of 9 pens and 7 pencils = 9x + 7y

=> 9 × 9 + 7 × 5 = 81 + 35 = 116

Therefore The correct answer is Rs. 116.

Additional Information

Linear Equations in Two Variables

An equation representing a straight line when plotted on a graph, written in the form ax + by + c = 0, where a and b are not zero.

Elimination Method

A systematic way to solve a pair of linear equations by multiplying them by suitable constants and adding or subtracting them to eliminate one variable entirely.

Substitution Method

Another technique where one variable is isolated in one of the equations and substituted into the second equation to solve for the remaining variable.

Q60. Answer: (a) 3

Shortcut Trick

When the total selling amount (Rs. 1) is constant, the quantity sold is inversely proportional to the Selling Price percentage.

=> Quantity1 × SP1% = Quantity2 × SP2%

=> 6 × (100 − 35) = x × (100 + 30)

=> 6 × 65 = x × 130

=> 390 = 130x => x = 3

Therefore The correct answer is 3 tablets.

Alternate Method

Given:

Selling price of 6 tablets = Rs. 1

Loss percentage = 35%

Desired gain percentage = 30%

Formula Used:

Cost Price (CP) = (SP × 100) ÷ (100 − Loss%)

New Selling Price (SP) = CP × (100 + Gain%) ÷ 100

CP = 100%

SP1 = 65%

6 tablets / Rs. 1

SP2 = 130%

? tablets / Rs. 1

35% Loss

30% Gain

Calculations:

=> SP1 of 1 tablet = 1 ÷ 6 rupee

=> Since the loss is 35%, SP1 = (100 − 35)% of CP = 65% of CP

=> 65% of CP = 1 ÷ 6

=> CP = (1 ÷ 6) × (100 ÷ 65) = 100 ÷ 390 = 10 ÷ 39 rupee

=> For a gain of 30%, new SP2 = (100 + 30)% of CP = 130% of CP

=> SP2 of 1 tablet = (130 ÷ 100) × (10 ÷ 39)

=> SP2 = 1.3 × (10 ÷ 39) = 13 ÷ 39 = 1 ÷ 3 rupee

=> Since the SP2 is Rs. (1 ÷ 3) for 1 tablet, the man must sell 3 tablets for Rs. 1.

Therefore The correct answer is 3 tablets.

Additional Information

Marked Price and Discount

Discount is always calculated on the Marked Price (MP). Selling Price = MP − Discount. The direct relation between CP and MP is: CP × (100 + Profit%) = MP × (100 − Discount%).

Successive Discount

If two successive discounts of a% and b% are given, the equivalent single discount is given by the formula: [a + b − (a × b) ÷ 100]%.

Dishonest Dealer Concept

When a dealer claims to sell at the Cost Price but uses a false weight, the profit percentage is calculated as: [(True Weight − False Weight) ÷ False Weight] × 100.

Q61. Answer: (a) Rs. 336

Shortcut Trick

Effective rate of Simple Interest = Rate per period × Number of periods.

Effective Rate = 4% × 7 = 28%

Simple Interest = 28% of Principal

I = (28 ÷ 100) × 1200 = 336

Therefore The correct answer is Rs. 336.

Alternate Method

Principal

Rs. 1200

Time: 7 months

Rate: 4% / month

Total SI

Rs. 336

SI = Rs. 1200 × 28% = Rs. 336

Given:

Principal (P) = Rs. 1200

Rate of Interest (R) = 4% per month

Time (T) = 7 months

Formula Used:

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

Calculation:

=> Both rate and time are given in months, so no unit conversion is necessary.

=> SI = (1200 × 4 × 7) ÷ 100

=> SI = 12 × (4 × 7)

=> SI = 12 × 28

=> SI = 336

Therefore The correct answer is Rs. 336.

Additional Information

Effective Interest Rate in SI

In simple interest, the overall percentage of interest is simply the product of Rate per period and Total periods. Example: 4% per month for 7 months = 28% total interest.

Unit Consistency of Rate and Time

Always ensure the time unit matches the rate unit before using the SI formula. If the rate is per annum and time is in months, time must be converted to years by dividing by 12.

Compound Interest (CI)

If the interest was compounded monthly, the Amount formula A = P(1 + R÷100)^T would be used, and Compound Interest would be calculated as CI = A − P.

Q62. Answer: (c) 169

Shortcut Trick

Side of the square = Perimeter ÷ 4

Side = 52 ÷ 4 = 13 m

Area = Side² = 13 × 13 = 169 m²

Therefore The correct answer is 169 m².

Alternate Method

Given:

Perimeter of the square = 52 m

Formula Used:

Perimeter of a square = 4 × a

Area of a square = a² (where a is the side of the square)

a = 13 m

a = 13 m

a = 13 m

a = 13 m

Area = ?

P = 52 m

Calculations:

=> 4 × a = 52

=> a = 52 ÷ 4

=> a = 13 m

=> Area = a²

=> Area = 13 × 13

=> Area = 169 m²

Therefore The correct answer is 169 m².

Additional Information

Diagonal of a Square

The length of the diagonal of a square with side a is given by d = a√2.

Area in terms of Diagonal

If the diagonal (d) is known, the area of the square can be directly calculated as Area = d² ÷ 2.

Incircle and Circumcircle of a Square

Radius of incircle = a ÷ 2 | Radius of circumcircle = a ÷ √2.

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Q63. Answer: (c) 12 days

Shortcut Trick

Equating total work: 4 Men × 18 days = 9 Women × 8 days

=> 72 Men = 72 Women => 1 Man = 1 Woman (Efficiency ratio 1:1)

Total Work = 72 Men × 1 unit/day = 72 units

Required time for (3 Men + 3 Women) = 72 ÷ (3 × 1 + 3 × 1) = 72 ÷ 6 = 12 days.

Therefore The correct answer is 12 days.

Alternate Method

Given:

4 men complete the work in 18 days.

9 women complete the work in 8 days.

Formula Used:

Total Work = Efficiency × Time

Total Time = Total Work ÷ Combined Efficiency

Calculations:

=> Time taken by 1 man to complete the entire work = 18 × 4 = 72 days

=> Time taken by 1 woman to complete the entire work = 8 × 9 = 72 days

Person	Days	Total Work	Efficiency
1 Man	72	72	1
1 Woman	72	1	

=> Total efficiency of 3 men and 3 women = (3 × 1) + (3 × 1) = 6 units/day

=> Time required by them together = Total Work ÷ Combined Efficiency

=> Time required = 72 ÷ 6 = 12 days

Therefore The correct answer is 12 days.

Additional Information

MDH Formula

Used to solve chain rule problems: (M1 × D1 × H1) ÷ W1 = (M2 × D2 × H2) ÷ W2, where M is persons, D is days, H is hours, and W is total work.

Work and Wages

Wages are always distributed in direct proportion to the amount of total work completed by each individual, or directly according to their efficiency if they work for an equal number of days.

Pipes and Cisterns

Similar to the Time & Work concept, but an outlet or leakage pipe is considered to have negative efficiency as it empties the tank.

Q64. Answer: (c) 66^(−28)

Shortcut Trick

For operations on terms with the same base, exponents are combined directly according to BODMAS.

Power for division is subtracted and for multiplication is added: a^m ÷ a^n × a^p = a^(m − n + p).

Given base is 66, combining the exponents directly:

Resulting power = −5 − 11 + (−12) = −28.

Therefore The correct answer is 66^(−28).

Alternate Method

Given:

66^(−5) ÷ 66^{11} × 66^(−12)

Formula Used:

Quotient rule: a^m ÷ a^n = a^(m−n)

Product rule: a^m × a^n = a^(m+n)

Calculation:

=> According to the order of operations (BODMAS), division and multiplication are evaluated from left to right.

=> First, evaluate the division part: (66^(−5) ÷ 66^{11})

=> 66^(−5 − 11) × 66^(−12)

=> 66^(−16) × 66^(−12)

=> Now, apply the product rule for multiplication:

=> 66^(−16 + (−12))

=> 66^(−28)

Therefore The correct answer is 66^(−28).

Additional Information

Product Rule of Exponents

When multiplying expressions with the same base, add their exponents together: a^m × a^n = a^(m+n).

Quotient Rule of Exponents

When dividing expressions with the same base, subtract the exponent of the divisor from the exponent of the dividend: a^m ÷ a^n = a^(m−n).

Negative Exponent Rule

A negative exponent indicates the reciprocal of the base raised to the positive opposite of the power: a^(−n) = 1 ÷ a^n.

Power of a Power Rule

When an exponential expression is raised to another power, multiply the two exponents together: $(a^m)^n$ = a^(m×n).

Q65. Answer: (d) −112x + 140

Shortcut Trick

Multiply the outer constants directly into the brackets to expand the expression term by term.

x^2 terms: 3 × (7/3)x^2 − 7 × x^2 = 7x^2 − 7x^2 = 0

x terms: 3 × (−28x) − 7 × 4x = −84x − 28x = −112x

Constant terms: 3 × 14 − 7 × (−14) = 42 + 98 = 140

Therefore The correct answer is −112x + 140.

Alternate Method

Given:

3((7/3)x^2 − 28x + 14) − 7(x^2 + 4x − 14)

Calculation:

=> Expand the first bracket by multiplying each term by 3:

=> 3 × (7/3)x^2 − 3 × 28x + 3 × 14 = 7x^2 − 84x + 42

=> Expand the second bracket by multiplying each term by 7:

=> 7 × x^2 + 7 × 4x − 7 × 14 = 7x^2 + 28x − 98

=> Subtract the second expanded expression from the first:

=> (7x^2 − 84x + 42) − (7x^2 + 28x − 98)

=> Distribute the negative sign to all terms in the second bracket:

=> 7x^2 − 84x + 42 − 7x^2 − 28x + 98

=> Group the like terms together (x^2 terms, x terms, and constants):

=> (7x^2 − 7x^2) + (−84x − 28x) + (42 + 98)

=> 0 − 112x + 140

=> −112x + 140

Therefore The correct answer is −112x + 140.

Additional Information

Distributive Property

The distributive property states that a(b + c) = ab + ac. It allows you to multiply a sum by multiplying each addend separately and then add the products together.

Combining Like Terms

Terms with the exact same variables and exponents can be combined by adding or subtracting their coefficients (e.g., 5x + 3x = 8x, or 2y^2 − y^2 = y^2).

Sign Rules in Multiplication

Multiplying two numbers with the same sign gives a positive result (− × − = +), while multiplying two numbers with different signs gives a negative result (+ × − = −).

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Q66. Answer: (d) cosec A + cot A

Shortcut Trick

Put A = 60° in the given expression.

=> Expression = √[(1 + cos 60°) ÷ (1 − cos 60°)] = √[(1 + 1/2) ÷ (1 − 1/2)] = √[3/2 ÷ 1/2] = √3

Now, check the given options by substituting A = 60°.

=> Option 4: cosec 60° + cot 60° = 2/√3 + 1/√3 = 3/√3 = √3 (Matches exactly)

Therefore The correct answer is cosec A + cot A.

Alternate Method

Given:

Expression: √[(1 + cos A) ÷ (1 − cos A)]

Formula Used:

$\sin^2 A + \cos^2 A = 1$

Calculation:

To rationalize the denominator, multiply the numerator and the denominator by (1 + cos A) inside the square root.

=> √[((1 + cos A) × (1 + cos A)) ÷ ((1 − cos A) × (1 + cos A))]

=> √[(1 + cos A)² ÷ (1 − cos² A)]

Using the identity $1 - \cos^2 A = \sin^2 A$:

=> √[(1 + cos A)² ÷ sin² A]

Taking the square root on both numerator and denominator:

=> (1 + cos A) ÷ sin A

=> (1 ÷ sin A) + (cos A ÷ sin A)

=> cosec A + cot A

Therefore The correct answer is cosec A + cot A.

Additional Information

Rationalization in Trigonometry

Often used when dealing with square roots containing terms like 1 ± sin θ or 1 ± cos θ. Multiplying by the conjugate creates a perfect square in the denominator which makes it easier to remove the root.

Pythagorean Identities

$\sin^2\theta + \cos^2\theta = 1$ | $1 + \tan^2\theta = \sec^2\theta$ | $1 + \cot^2\theta = \text{cosec}^2\theta$

Value Substitution Method

To solve trigonometric expressions rapidly during exams, substitute standard angles (like 30°, 45°, 60°). Ensure the chosen angle does not make the denominator zero or the expression undefined.

Q67. Answer: (b) 30

Shortcut Trick

The mean proportional between two numbers a and b is given directly by the square root of their product.

=> Mean proportional = √(25 × 36)

=> Mean proportional = 5 × 6 = 30

Therefore The correct answer is 30.

Alternate Method

Given:

First number (a) = 25

Second number (b) = 36

Formula Used:

For two numbers a and b, if x is the mean proportional, then a : x :: x : b, which simplifies to $x = \sqrt{a \times b}$.

25

First (a)

x

Mean (x)

36

Third (b)

:

::

Continuous Proportion: 25 : x :: x : 36

Calculations:

=> Let the required mean proportional be x.

=> According to the continuous proportion rule: 25 : x = x : 36

=> Product of extremes = Product of means

=> x × x = 25 × 36

=> $x^2 = 900$

=> x = √900

=> x = 30

Therefore The correct answer is 30.

Additional Information

Mean Proportional

For any two numbers a and b, the mean proportional x is calculated using the formula x = √(ab).

Third Proportional

For two numbers a and b, the third proportional y satisfies a : b = b : y, resulting in the formula $y = b^2 \div a$.

Fourth Proportional

For three given numbers a, b, and c, the fourth proportional z satisfies a : b = c : z, giving the formula z = (b × c) ÷ a.

Q68. Answer: (d) 50

Shortcut Trick

Days between 10 Feb and 11 Apr 2024 = 19 (Feb) + 31 (Mar) + 11 (Apr) = 61 days.

2024 is a leap year (366 days), so Time (T) = 61 ÷ 366 = 1/6 year.

Simple Interest = (P × R × T) ÷ 100

SI = 4000 × 7.5 × (1/6) ÷ 100 = 30000 ÷ 600 = 50

Therefore The correct answer is Rs. 50.

Alternate Method

Given:

Principal (P) = Rs. 4,000

Rate of Interest (R) = 7.5% per annum

Date of deposit = 10 February 2024

Date of withdrawal = 11 April 2024

Principal = Rs. 4000 | Rate = 7.5% p.a.

10 Feb

29 Feb

31 Mar

11 Apr

19 days

31 days

11 days

Total Time = 61 days = 61 ÷ 366 = 1/6 year

Formula Used:

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

Calculations:

=> Total days = 19 days (Feb) + 31 days (Mar) + 11 days (Apr) = 61 days.

=> Year 2024 is a leap year, so the total number of days in the year = 366.

=> Time (T) in years = 61 ÷ 366 = 1/6

=> SI = (4000 × 7.5 × 1/6) ÷ 100

=> SI = (4000 × 7.5) ÷ 600

=> SI = 30000 ÷ 600

=> SI = 50

Therefore The correct answer is Rs. 50.

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Additional Information

Leap Year Calculation

A year is considered a leap year if it is exactly divisible by 4 (and by 400 for century years). A leap year contains 366 days instead of 365, with February having 29 days.

Day Counting Rule for Interest

When computing interest over a specific period of days, standard practice excludes the initial day of deposit but includes the day of withdrawal to calculate the exact duration of the sum kept in the bank.

Simple Interest Formula

Simple Interest = (Principal × Rate × Time) ÷ 100. Always ensure that the Time parameter is strictly expressed in years. For given days, divide the total days by 365 (or 366 for a leap year) before calculating.

Q69. Answer: (a) 3000

Shortcut Trick

Let the original number be 100%.

After a 7% decrease, the remaining value = 100% − 7% = 93%.

According to the question, 93% = 2790.

1% = 2790 ÷ 93 = 30.

100% = 30 × 100 = 3000.

Therefore The correct answer is 3000.

Alternate Method

Given:

The result after decreasing a number by 7% = 2790

Formula Used:

Final Value = Original Value × (1 − Percentage Decrease)

93% = 2790

−7%

Original Number (100%) = ?

100% = (2790 ÷ 93) × 100 = 3000

Calculations:

=> Let the original number be x.

=> Final Number = x − 7% of x

=> 2790 = x × (1 − 7/100)

=> 2790 = x × (93/100)

=> x = (2790 × 100) ÷ 93

=> x = 30 × 100

=> x = 3000

Therefore The correct answer is 3000.

Additional Information

Percentage Increase

If a number is increased by R%, the new value is calculated as: Original Value × (100 + R)/100.

Percentage Change

The formula to find the overall percentage change is: (Final Value − Original Value) ÷ Original Value × 100.

Successive Percentage Change

When a number is changed by a% and then b%, the net percentage change is given by: a + b + (a × b)/100 %.

Q70. Answer: (a) 1

Shortcut Trick

In the range 472 to 486, ignore even numbers and multiples of 5.

Possible prime candidates: 473, 477, 479, 481, 483.

Sum of digits for 477 is 18 and for 483 is 15 → Both are multiples of 3.

Checking remaining numbers: 473 = 11 × 43 and 481 = 13 × 37.

Only 479 has no prime factors ≤ √479 (≈ 21), making it the only prime number.

Therefore The correct answer is 1.

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Alternate Method

Given:

The range of numbers is from 472 to 486 (both inclusive).

Concept Used:

To check if a number N is prime, divide it by all prime numbers up to √N. If it is not divisible by any, it is a prime number.

Calculations:

=> All even numbers in the range (472, 474, 476, 478, 480, 482, 484, 486) are divisible by 2.

=> Numbers ending in 5 (475, 485) are divisible by 5.

=> We only need to check the remaining odd numbers: 473, 477, 479, 481, and 483.

=> 473 ÷ 11 = 43 → Divisible by 11, so it is not prime.

=> 477 ÷ 3 = 159 → Divisible by 3, so it is not prime.

=> 481 ÷ 13 = 37 → Divisible by 13, so it is not prime.

=> 483 ÷ 3 = 161 → Divisible by 3, so it is not prime.

=> 479 is not divisible by 2, 3, 5, 7, 11, 13, 17, or 19 (√479 ≈ 21.8). Thus, 479 is a prime number.

=> The only prime number in the given range is 479.

Therefore The correct answer is 1.

Additional Information

Prime Numbers

A prime number is a positive integer greater than 1 that has no positive divisors other than 1 and itself.

Primality Test

To check if a number N is prime, it is sufficient to test its divisibility by all prime numbers less than or equal to √N.

Twin Primes

Twin primes are pairs of prime numbers that have a difference of exactly 2 (e.g., 41 and 43).

Divisibility Rule for 3 and 9

A number is divisible by 3 (or 9) if the sum of its digits is a multiple of 3 (or 9).

Q71. Answer: (d) Neither conclusion (I) nor (II) follows.

The least possible Venn diagram is:

Conclusions:

(I): Some lions are cats. - False (As their is no direct relation between Lions and Cats may be it is possible but not definite. Hence, it is false)

(II): All cats are lions. - - False (As their is no direct relation between Lions and Cats may be it is possible but not definite. Hence, it is false)

Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 4"

Q72. Answer: (b) 32

• Pranali is 21^(st) from the left end

• Anuj is 23^(rd) from the left end

• from the left

• Anuj is exactly between Pranali and Harish.

Since Anuj is between them and lies 2 positions to the right of Pranali, he must also be 2 positions to the left of Harish:

So Harish is

from the left.

Harish is also

from the right.

Total number of people:

Hence, the correct answer is "Option 2"

Q73. Answer: (d) RYT

The logic followed here is:

Hence, the correct answer is "Option 4"

Q74. Answer: (a) NVD 383

The logic followed here is:

Hence, the correct answer is "Option 1"

Q75. Answer: (b) 118

The logic follows here,

Hence, the correct answer is "Option 2"

Q76. Answer: (b) None

Given number 31246978

Arranged in descending order from left to right.

Hence, the correct answer is "Option 2"

Q77. Answer: (d) Brother

As per the given information,

Hence, the correct answer is "Option 4"

Q78. Answer: (c) AAE -25

The logic followed here is:

Hence, the correct answer is "Option 3"

Q79. Answer: (a) Two

Six friends J, K, L, T, U, and V are sitting around a round table, facing the center.

• V sits second to the right of L, who is second to the right of U.

• J sits immediate right of U.

• T sits second to the left of K

The Final Arrangement is,

Hence, the correct answer is "Option 1"

Q80. Answer: (b) XMFUJ

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 2"

Q81. Answer: (c) One

Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.

• Only V is kept above E.

• Only W is kept between E and U.

• Only F is kept below X.

The Final Arrangement is,

V
E
W
U
G
X
F

Q82. Answer: (a) GK - QI

The logic followed here is:

Hence, the correct answer is "Option 1"

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Q83. Answer: (b) (29, 58, 48)

Logic : First Number x 2 = Second Number.

Third Number = Second Number - 10.

Similarly,

Hence, the correct answer is "Option 2"

Q84. Answer: (c) CTNB

The logic followed here is:

Hence, the correct answer is "Option 3"

Q85. Answer: (d) 15 km towards North

• Kishan starts from Point A and drives 15 km towards East.

• He then takes a right turn, drives 9 km, turns right and drives 8 km.

• He then takes a left turn and drives 6 km.

• He takes a final right turn, drives 7 km and stops at Point P.

The Final Diagram,

Hence, the correct answer is "Option 4"

Q86. Answer: (d) One

Given Series - (Left) 564 782 368 225 743 (Right)

2 is added to the first digit of every number

(Left) 764 982 568 425 943 (Right)

First digit be exactly divisible by the second digit.

425.

Hence, the correct answer is "Option 4"

Q87. Answer: (a) 9

'PANK' is coded as '1846' and 'KINA' is coded as '1689'.

'PANK' - '1846'

'KINA' - '1689'

The Code for I is 9.

Hence, the correct answer is "Option 1"

Q88. Answer: (c) 3

Given Series - (Left) © 7 # 6 $ 6 4 7 & % 4 % 2 7 € 6 5 8 * $ 4 4 (Right)

Required Conditions - Number - Number - Symbol

(Left) © 7 # 6 $ 6 4 7 & % 4 % 2 7 € 6 5 8 * $ 4 4 (Right)

Hence, the correct answer is "Option 3"

Q89. Answer: (b) 7

Given Equation: 4 − 5 ÷ 40 × 4 + 23 = ?

• means −, − means ×, × means ÷ and ÷ means +,

Using BODMAS rule,

4 × 5 + 40 ÷ 4 − 23 = ?

4 × 5 + 10 − 23 = ?

20 + 10 − 23 = ?

30 − 23 = ?

7.

Hence, the correct answer is "Option 2"

Q90. Answer: (b) 52

Given Equation- 35 × 5 ÷ 7 − 11 + 8 = ?

'+' and '−' are interchanged and '×' and '÷' are interchanged

35 ÷ 5 × 7 + 11 − 8 = ?

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7 × 7 + 11 − 8 = ?

49 + 11 − 8 = ?

60 − 8 = ?

52..

Hence, the correct answer is "Option 2"

Q91. Answer: (d) Three

• H, I, J, P, Q, R and S are sitting around a circular table facing the centre of the table.

• Only one person sits between H and Q when counted from the left of Q.

• S sits third to the right of R.

• J sits third to the left of P.

• S sits to the immediate right of J.

• I is not an immediate neighbour of J

The Final Arrangement is,

Hence, the correct answer is "Option 4"

Q92. Answer: (d) MOST - MTSO - TSOM

The logic follows here,

Similarly,

Hence, the correct answer is "Option 4"

Q93. Answer: (a) PL-IM

The logic followed here is:

Hence, the correct answer is "Option 1"

Q94. Answer: (c) Both conclusions (I) and (II) follow.

The least possible Venn diagram is:

Conclusions:

(I) Some cups are kettles.- True (All jars are cups.Some jars are kettles.Some cups are kettles is true.)

(II) Some kettles are jars.- True(All jars are cups.Some jars are kettles.Some kettles are jars. is True)

Both conclusions (I) and (II) follow.

Hence, the correct answer is "Option 3"

Q95. Answer: (d) Southeast

• Town A is to the east of Town B.

• Town C is to the south of Town A.

• Town D is to the east of Town C.

• Town E is to the south of Town D.

• own F is to the east of Town E

The Final Diagram,

Hence, the correct answer is "Option 4"

Q96. Answer: (b) 10

Given number 3417659

Arranged in the ascending order - 1 3 4 5 6 7 9

Left 1 3 4 5 6 7 9 Right

Sum of the digits that are second from the left and second from the right in the new number = 7 + 3 = 10.

Hence, the correct answer is "Option 2"

Q97. Answer: (b) 3

Seven boxes, A, B, C, D, E, F and G, are kept one over the other but not necessarily in the same order.

• Only G is kept above B.

• Only F is kept between B and C.

• Only E is kept below A.

The Final Arrangement is,

G
B
F
C
D
A
E

Hence, the correct answer is "Option 2"

Q98. Answer: (a) 180

The logic follows here,

Hence, the correct answer is "Option 1"

Q99. Answer: (b) 934

The logic follows here,

Hence, the correct answer is "Option 2"

Q100. Answer: (d) 6

‘OLEA’ is coded as ‘1542’ and ‘PEAL’ is coded as ‘4651’.

‘OLEA’ - ‘1542’

‘PEAL’ - ‘4651’

The Code for P is 6.

Hence, the correct answer is "Option 4"

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