RRB NTPC (UG) CBT-I Official Paper (Held On: 09 Sept, 2025 Shift 3) (Previous Year Paper)

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

Take this paper as a timed mock test

Practise under exam conditions, then review your answers after you submit.

yourmocktest.com/pyq/rrb-group-d/rrb-ntpc-ug-cbt-i-official-paper-held-on-09-sept-2025-shift-3…

Scan the QR code or click the link to open it.

GENERAL AWARENESS

Q1. What was the Extremists' method to resist British policies apart from agitation and boycott?

(a) Passive resistance
(b) Cultural assimilation
(c) Petitioning Parliament
(d) Armed rebellion

Q2. The Kyoto Protocol is related to (the) _____.

(a) desertification control
(b) protection of ozone layer
(c) preservation of wildlife
(d) reduction of greenhouse gas emissions

Q3. Which of the following is an example of secondary memory?

(a) RAM
(b) ROM
(c) Cache Memory
(d) Hard Disk

Q4. Where was INIOCHOS-25, the multinational air exercise hosted by the Hellenic Air Force, conducted?

(a) Bulgaria
(b) Macedonia
(c) Albania
(d) Greece

Q5. The World Happiness Report, 2025, ranked which of following countries as the happiest in the world for the seventh consecutive year?

(a) Finland
(b) Denmark
(c) Switzerland
(d) Iceland

Q6. Which ministry introduced the Drugs and Cosmetics (Compounding of Offences) Rules, 2025, to streamline minor offence resolution?

(a) Ministry of Health and Family Welfare
(b) Ministry of Chemicals and Fertilizers
(c) Ministry of Consumer Affairs, Food and Public Distribution
(d) Ministry of Pharmaceuticals

Q7. What is the term for India's mainstream Hindi-language film industry?

(a) Tollywood
(b) Kollywood
(c) Bollywood
(d) Mollywood

Q8. The artistic and architectural style evident in the Bagh Caves of Madhya Pradesh, India, is predominantly associated with which of the following faiths?

(a) Islam
(b) Hinduism
(c) Buddhism
(d) Jainism

Q9. Who received the Football Writers' Association (FWA) Women's Footballer of the Year award for the 2024-25 season?

(a) Alessia Russo
(b) Lauren James
(c) Mariona Caldentey
(d) Khadija Shaw

Q10. To align with modern industrial practices, which new order did the Central Government introduce in 2025 to replace the Sugar (Control) Order, 1966?

(a) The Sugar (Control) Order, 2025
(b) The Sugar (Trade and Export) Order, 2025
(c) The Sugar (Production and Supply) Order, 2025
(d) The Sugar (Monitoring and Pricing) Order, 2025

Q11. What is the nature of the Concurrent List in the Indian Constitution?

(a) Exclusively for States
(b) Exclusively for Union
(c) Both the Centre and the States can legislate
(d) Only during emergencies

Q12. What was the major aim of India's 1991 economic reforms?

(a) To reduce taxes on luxury goods
(b) To stabilise India's economy
(c) To nationalise all companies
(d) To increase government control

Q13. Airports play a vital role in improving regional connectivity. Which scheme promotes affordable air travel to under-served and unserved airports?

(a) UDAY
(b) PM Gati Shakti
(c) Sagarmala
(d) UDAN

Q14. Which type of Municipality is formed for a transitional area under Article 243Q of the Indian Constitution?

(a) Nagar Panchayat
(b) Town Panchayat
(c) Municipal Council
(d) Municipal Corporation

Q15. Which of the following options explains the variation in temperature between coastal and interior parts of India?

(a) Altitude
(b) Continentality
(c) Pressure belts

YourMockTest.com — Free Study Material

(d) Latitude

Q16. Which value has three significant figures?

(a) 0.0056
(b) 23.0
(c) 1.620
(d) 287.50

Q17. The primary purpose of the cache memory is to:

(a) increase the speed of data retrieval
(b) store data permanently
(c) store data for later use
(d) display images on screen

Q18. Tertiary activities are also known as the:

(a) service sector
(b) health sector
(c) industrial sector
(d) agricultural sector

Q19. The 18th Pravasi Bharatiya Divas Convention (PBD) 2025 was held in which month of 2025 in Bhubaneswar?

(a) March
(b) February
(c) April
(d) January

Q20. Which of the following factors has least contributed to rural distress in India?

(a) Fragmentation of land holdings
(b) Declining productivity of rainfed agriculture
(c) High rural literacy levels
(d) Post-harvest infrastructure shortages

Q21. Which Article gives the President of India the power to grant pardons and reprieves?

(a) Article 72
(b) Article 76
(c) Article 74
(d) Article 75

Q22. On which of the following states of India did Siraj-ud- Daula, Mir Jafar and Mir Qasim rule in the 18th century?

(a) Bengal
(b) Andhra
(c) Gujarat
(d) Kerala

Q23. Which pair acts as a conjugate acid–base pair?

(a) Cl2and Cl^-
(b) NaOH and OH^-
(c) H2O and HCl
(d) NH4^+ and NH3

Q24. What is the eligibility criteria for the beneficiaries of the Prime Minister Employment Generation Programme (PMEGP) for projects costing above Rs. 10 lakh in the manufacturing sector and above Rs. 5 lakh in the business/service sector?

(a) At least X standard pass
(b) At least VIII standard pass
(c) At least XII standard pass

YourMockTest.com — Free Study Material

(d) At least V standard pass

Q25. John Dramani Mahama has been sworn in as the President of which country in January 2025?

(a) Morocco
(b) Ghana
(c) South Africa
(d) Kenya

Q26. Who among the following launched the AIKosha in 2025?

(a) Union Minister for Finance
(b) Union Minister for Health & Family Welfare
(c) Union Minister for Defence
(d) Union Minister for Electronics & Information Technology

Q27. In India, how many sessions of Parliament are held in a year?

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

Q28. The AI-powered handheld X-ray devices deployed in Uttar Pradesh for TB detection have been designed to interpret which rapid diagnostic assay?

(a) LAMP-TB
(b) CB-NAAT
(c) Truenat
(d) Line Probe Assay

Q29. As in May 2025, who was the Secretary, Department of Atomic Energy (DAE) & Chairman, Atomic Energy Commission (AEC)?

(a) Ajit Kumar Mohanty
(b) Sekhar Basu
(c) KN Vyas
(d) Ratan Kumar Sinha

Q30. Who among the following Delhi Sultans controlled the prices of food; horses, ponies, cattle and slaves; cloth and fruit; and articles for domestic consumption and personal use?

(a) Alauddin Khalji
(b) Ghiyasuddin Tughluq
(c) Ghiyasuddin Balban
(d) Khizr Khan

Q31. In April 2025, which Indian opposition leader discussed concerns about democratic backsliding in a 2025 event at Brown University?

(a) Mamata Banerjee
(b) Sharad Pawar
(c) Rahul Gandhi
(d) Arvind Kejriwal

Q32. Which of the following mass movements occurs when saturated soil and debris flow down a slope during heavy rainfall?

(a) Avalanche
(b) Mudflow
(c) Soil creep
(d) Rockfall

YourMockTest.com — Free Study Material

Q33. The Sannyasi-Fakir Rebellion commenced in the second half of which of the following centuries?

(a) 19^(th)
(b) 16^(th)
(c) 17^(th)
(d) 18^(th)

Q34. Which of the following duties was added by the Constitution (Eighty-sixth Amendment) Act, 2002?

(a) To develop a scientific temper
(b) To uphold and protect national unity
(c) To protect the environment
(d) To provide education to children aged six to fourteen years

Q35. To resolve peace following the riots that followed the Partition, the ‘Delhi Pact’ was signed between the Indian Prime Minister, Jawaharlal Nehru, and the Pakistan Prime Minister, _____.

(a) Muhammad Ali Jinnah
(b) Malik Firoz Khan Noon
(c) Liaquat Ali Khan
(d) Benazir Bhutto

Q36. Why are tribal settlements usually located in remote and forested areas of India?

(a) Because they are not allowed to enter cities
(b) Because forests provide natural resources and livelihood
(c) Due to easy access to modern infrastructure
(d) Because government policies force them to live there

Q37. What type of rocks mainly compose the Peninsular Plateau of India?

(a) Recent volcanic lava deposits from plate margins
(b) Layers of limestone and sandstone from marine origin
(c) Old crystalline, igneous and metamorphic rocks
(d) Young sedimentary rocks formed in coastal plains

Q38. When did John Dalton publish his atomic theory that holds that all elements are made up of tiny, indivisible particles?

(a) 1808
(b) 1798
(c) 1803
(d) 1800

Q39. Where was India’s first solar-powered airport terminal inaugurated in early 2025?

(a) Dehradun
(b) Bhubaneswar
(c) Kerala
(d) Goa

Q40. In June 2025, Garden Reach Shipbuilders & Engineers Limited (GRSE) signed an MoU with Norway’s Kongsberg to build India’s first vessel in which category?

(a) Aircraft carrier
(b) Deep-submergence rescue vessel
(c) Polar research vessel
(d) Hospital ship

MATHEMATICS

YourMockTest.com — Free Study Material

Q41. 8 years ago, the age of a father was 11 years more than twice his son's age. After how many years, from now, will he be twice his son's age?

(a) 3
(b) 7
(c) 4
(d) 2

Q42. Find the simple interest (in Rs.) if a sum of Rs. 400 is borrowed for 6.5 years at 4% per annum rate of interest

(a) 154
(b) 84
(c) 204
(d) 104

Q43. 9 men can complete a piece of work in 16 days, while 5 women can do it in 18 days. In how many days can 2 women and 4 men complete the work?

(a) 18 days
(b) 16 days
(c) 15 days
(d) 20 days

Q44. The current population of a town is 15,250. It increases by 25% and 60% in two successive years but decreases by 57% in the third year. What is the population of the town at the end of the third yea

(a) 13,115
(b) 13,118
(c) 13,110
(d) 13,111

Q45. The value of 2/5+(1/(1+4/9)) - 4/5 is

(a) 19/65
(b) 20/73
(c) 24/67
(d) 12/59

Q46. If the interest earned during the 2nd year on a certain sum is Rs. 5,916, and the rate of interest is 20% per annum compounded annually, then the sum is:

(a) Rs. 24,650
(b) Rs. 23,995
(c) Rs. 24,870
(d) Rs. 25,540

Q47. In triangle ABC, BD ? AC at D and angle DBC = 55°. E is a point on BC such that angle CAE = 56°. What is the measure of angle AEB?

(a) 88°
(b) 90°
(c) 85°
(d) 91°

Q48. If the radius of a sphere is halved, then find the ratio of volume of the original sphere with that of the new sphere.

(a) 4 : 1
(b) 8 : 1
(c) 16 : 1
(d) 2 : 1

YourMockTest.com — Free Study Material

Q49. Zeeshan travels 364 km at 91 km/hr, the next 441 km at 63 km/hr and the next 648 km at 81 km/hr. What is his average speed (in km/hr) for the whole journey? (Round off your answer to two decimal places)

(a) 76.47
(b) 69.95
(c) 72.94
(d) 79.14

Q50. Given that 73^(0.51) = x, 73^(0.73)= y and x^z = y^(10), then the value of z is close to:

(a) 14.22
(b) 13.77
(c) 14.31
(d) 16.92

Q51. The LCM of the numbers 3.9 and 0.169 is:

(a) 5.07
(b) 507
(c) 0.507
(d) 50.7

Q52. Find the value of $1/(\sec^2 A)+1/(1+ \cot^2 A)$

(a) 0
(b) 1
(c) $\tan^2 A$
(d) 1/2

Q53. A can lay railway track between two given stations in 17 days and B can do the same job in 12 days. With the help of C, they did the job in 2 days only. Then, C alone can do the job in

(a) 758/73days
(b) 1058/73days
(c) 658/73days
(d) 258/73days

Q54. Find the difference between a discount of 32% on an item marked for Rs. 1,000 and two successive discounts of 20% and 12% on the same item.

(a) Rs. 20
(b) Rs. 24
(c) Rs. 22
(d) Rs. 26

Q55. The average runs scored by a batsman in 23 matches is 42. In the next 10 matches, the batsman scored an average of 16 runs. Find his average runs scored (rounded off to two decimal places) in all the 33 matches.

(a) 35.12
(b) 34.12
(c) 33.12
(d) 36.12

Q56. Mahesh bought some pens at the rate of Rs. 180 a dozen. He sold them for Rs. 19 each. His profit percentage is _____. (Round off your answer to two decimal places.)

(a) 30.67%
(b) 26.67%
(c) 24.67%
(d) 28.67%

YourMockTest.com — Free Study Material

Q57. A man goes to Nagpur from Visakhapatnam at a speed of 20 km/hr and returns to Visakhapatnam at speed of 30 km/hr, through the same route. What is his average speed (in km/hr) of the entire journey?

(a) 24
(b) 23
(c) 22
(d) 26

Q58. A number when increased by 100% gives 2770. The number is:

(a) 4155
(b) 2770
(c) 1385
(d) 692.5

Q59. The HCF and the LCM of two numbers are 13 and 1170, respectively. If one of the numbers is 130, find the other one.

(a) 91
(b) 104
(c) 117
(d) 143

Q60. Simplify: $3((6/3)\ x^2 - 23x + 18) - 6(x^2 + 4x - 15)$

(a) 93x + 144
(b) 93x − 144
(c) −93x − 144
(d) -93x + 144

Q61. What is the discount on a product with a list price of Rs. 3,000 and a discount rate of 25%?

(a) Rs. 1,000
(b) Rs. 700
(c) Rs. 750
(d) Rs. 900

Q62. Aman and Pawan together invested Rs. 62,800 in a business. At the end of the year, out of a total profit of Rs. 11,600, Pawan's share was Rs. 2,900. What was the difference between their investments?

(a) Rs. 32,000
(b) Rs. 31,800
(c) Rs. 31,400
(d) Rs. 30,400

Q63. The product of two consecutive natural numbers is 306. The greater of the two numbers is:

(a) 19
(b) 18
(c) 31
(d) 36

Q64. A cylindrical rod has an outer curved surface area of 7500 cm^2. If the length of the rod is 87 cm, then the outer radius (in cm) of the rod, correct to two places of decimal, is: (Take $\pi=22/7$)

(a) 16.52
(b) 13.71
(c) 16.68
(d) 13.96

YourMockTest.com — Free Study Material

Q65. An amount of Rs. 976 is divided among three persons in the ratio of 2 : 11 : 17. The difference between the largest and the smallest shares (in Rs.) in the distribution is:

(a) 488
(b) 531
(c) 495
(d) 517

Q66. The number 869671195 is divisible by which of the following?

(a) 5
(b) 13
(c) 12
(d) 15

Q67. The average price of three items of furniture is Rs. 16,035. If their prices are in the ratio 3 : 5 : 7, the price of the cheapest item (in Rs.) is:

(a) 3,207
(b) 7,483
(c) 5,345
(d) 9,621

Q68. Find the value of 14 ^(−23) × 25 ^(−23) × 15 ^(−23).

(a) $1/(5257^{23})$
(b) $1/(5214^{23})$
(c) $1/(5243^{23})$
(d) $1/(5250^{23})$

Q69. By selling an article at 2/5 of its actual selling price, Aman incurs a loss of 24%. If he sells it at 81% of its actual selling price, then the profit percentage is:

(a) 55.9%
(b) 55.7%
(c) 55.5%
(d) 53.9%

Q70. If the third proportional of 26 and 52 be x, then what is the value of x?

(a) 107
(b) 104
(c) 102
(d) 106

GENERAL INTELLIGENCE AND REASONING

Q71. Priya starts from Point Y and drives 12 km towards the east. She then takes a right turn, drives 10 km. She then turns right and drives 15 km. She takes a final right turn, drives 10 km and stops at Point Z. How far (shortest distance) and towards which direction should she drive in order to reach Point Y again? (All turns are 90-degree turns only unless specified)

(a) 9 km towards north
(b) 3 km towards east
(c) 7 km towards south
(d) 2 km towards west

Q72. What should come in place of the question mark (?) in the given series?

99 100 105 114 127 ?

(a) 145
(b) 146
(c) 144

YourMockTest.com — Free Study Material

(d) 143

Q73. 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/subtracting/multiplying to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(23, 70, 211)

(12, 37, 112)

(a) (5, 16, 48)
(b) (22, 45, 105)
(c) (18, 54, 153)
(d) (33, 100, 301)

Q74. 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.

LONG - ONLG - GNOL

EARN - AREN - NRAE

(a) CUTE - UCTE - EUTC
(b) BACK - ACBK - ACKB
(c) COIN - OICN - NIOC
(d) SKIP - SIKP - PIKS

Q75. Seven boxes U, V, W, X, E, F and G are kept one over the other but not necessarily in the same order.

V is kept second from the bottom. Only three boxes are kept between V and W. X is kept at one of the positions below V. Only E is kept between W and G. U is kept at one of the positions above W. How many boxes are kept between F and X?

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

Q76. YELP is related to BZOK in a certain way based on the English alphabetical order. In the same way, EURF is related to HPUA. To which of the given options is KKXV related, following the same logic?

(a) MDAP
(b) NFAQ
(c) MEBR
(d) OGZP

Q77. Each of the digits in the number 257146983 is arranged in ascending order from left to right. What will be the sum of the digits which are third from the left and second from the right in the new number thus formed?

(a) 13
(b) 12
(c) 11
(d) 10

Q78. JGCK is related to HEAI in a certain way based on the English alphabetical order. In the same way, MJFN is related to KHDL. To which of the given options is PMIQ related, following the same logic?

(a) NKHO
(b) NKHP
(c) NKGO
(d) NKGP

YourMockTest.com — Free Study Material

Q79. Seven people, B, C, D, E, F, G and L, are sitting in a row facing North. Only three people sit between D and G. C sits to the immediate left of G. No one sits to the right of L. Only two people sit between L and C. B sits to the immediate right of E. How many people sit between F and B?

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

Q80. Seven people A, B, C, D, E, F and G are sitting in a row, facing north. No one sits to the right of D. Only three people sit between D and F. Only two people sit between F and A. G sits third to the left of B. C sits to the immediate right of B. How many people sit to the right of E?

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

Q81. If 'A' stands for '÷', 'B' stands for '×', 'C' stands for '+' and 'D' stands for '−', what will come in place of the question mark (?) in the following equation?

23 D 16 A 4 C 6 B 2 = ?

(a) 14
(b) 37
(c) 31
(d) 26

Q82. Each of the digits in the number 7452318 is arranged in ascending order from left to right. What will be the sum of the digits which are second from the left and second from the right in the new number thus formed?

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

Q83. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

EXN 12, IBR 23, MFV 34, QJZ 45, ?

(a) UND 56
(b) SNB 57
(c) TMC 54
(d) UMB 56

Q84. In a certain code language, 'DIRT' is coded as '5274' and 'TIDY' is coded as '4352'. What is the code for 'Y' in the given code language?

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

Q85. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

LRY, SQA, ZPC, ?, NNG

(a) JOF
(b) GOE
(c) GOF
(d) JOE

YourMockTest.com — Free Study Material

Q86. 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 pair.)

(a) NR-IA
(b) CG-XP
(c) WA-RI
(d) HL-CU

Q87. What should come in place of the question mark (?) in the given series?

5 7 11 17 25 ?

(a) 30
(b) 40
(c) 25
(d) 35

Q88. 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 conclusion(s) logically follow(s) from the statements.

Statements:

All cartons are boxes.

No box is a sheet.

Conclusions:

(I) No carton is a sheet.

(II) Some sheets are boxes.

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

Q89. Wasim ranked 24th from the top and 29th from the bottom in his class. How many students are there in his class

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

Q90. Seven boxes A, B, C, D, E, F and G are kept one over the other but not necessarily in the same order. D is kept second from the bottom. Only three boxes are kept between D and E. B is kept at one of the positions below D. Only A is kept between E and C. F is kept at one of the positions above E. How many boxes are kept below D?

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

Q91. In a certain code language,

'A% B' means 'A is the daughter of B',

'A = B' means 'A is the wife of B',

'A ¥ B' means 'A is the father of B' and

'A # B' means 'A is the brother of B'.

How is W related to S if 'W% A#K= E ¥ S'?

(a) Mother's brother's daughter
(b) Mother's brother's son
(c) Mother's brother's wife
(d) Mother's brother's sister

YourMockTest.com — Free Study Material

Q92. What should come in place of the question mark (?) in the given series?

26 38 46 58 66 78 ?

(a) 88
(b) 86
(c) 84
(d) 82

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) ZC-EH
(b) FI-KM
(c) TW-YB
(d) JM-OR

Q94. Read the given statement(s) 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 conclusion(s) logically follow(s) from the statement(s).

Statements:

No Buffaloes are Cats.

Some Cats are Turkeys.

Conclusions:

I. No Buffaloes are Turkeys.

II. Some Buffaloes are Turkeys.

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

Q95. If + means −, − means ×, × means ÷ and ÷ means +, then what will come in place of the question mark (?) in the following equation?

9 − 4 + 24 ÷ 21 × 3 = ?

(a) 19
(b) 12
(c) 26
(d) 4

Q96. This question is based on the five, three-digit numbers given below.

(Left) 268 667 457 856 426 (Right)

(Example: 697 - First digit = 6, second digit = 9 and third digit = 7) (NOTE: All operations to be done from left to right.)

If 1 is subtracted from the first digit of every number, in how many numbers will the third digit be exactly divisible by the first digit?

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

Q97. 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) OR-VM
(b) QT-XP
(c) MP-TK

YourMockTest.com — Free Study Material

(d) KN-RI

Q98. Luv starts from Point A and drives 8 km towards the east. He then takes a right turn and drives 5 km, then turns right and drives 11 km. He then takes a right turn and drives 12 km. He takes a final right turn, drives 3 km and stops at Point P. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified.)

(a) 6 km to the north
(b) 7 km to the north
(c) 7 km to the south
(d) 6 km to the south

Q99. This question is based on the five, three-digit numbers given below.

(Left) 893 620 514 487 928 (Right)

(Example: 697-First digit = 6, second digit = 9 and third digit = 7) (NOTE: All operations to be done from left to right.)

What will be the LCM of the 2nd digits of all the numbers?

(a) 36
(b) 72
(c) 9
(d) 48

Q100. In a certain code language, 'BODY' is coded as '2469' and 'DICE' is coded as '1593'. What is the code for 'D' in that language?

(a) 6
(b) 9
(c) 3
(d) 1

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) Passive resistance

The correct answer is Passive resistance.

Key Points

• Passive resistance was a significant strategy used by the Extremists in India during the freedom struggle to resist British colonial policies and rule without resorting to violence or armed rebellion.

• This method emphasized non-violent defiance of unjust laws, refusal to cooperate with the British administration, and symbolic acts of protest.

• It involved practices such as non-payment of taxes, refusal to attend government functions, and civil disobedience campaigns to undermine British authority.

• Prominent leaders such as Bal Gangadhar Tilak, Bipin Chandra Pal, and Lala Lajpat Rai advocated passive resistance as a means to mobilize the masses and challenge British policies.

• This approach laid the foundation for later strategies, such as Mahatma Gandhi's satyagraha movements, which further popularized non-violent resistance in India's freedom struggle.

Additional Information

• Cultural assimilation:

• This refers to the process of adopting the cultural traits or social patterns of another group, typically through interaction over time.

• During British rule, cultural assimilation was not a method of resistance but rather a phenomenon where some Indians adopted Western customs, language, and education systems introduced by the British.

• Petitioning Parliament:

• This was a method prominently used by the Moderates in the Indian National Congress during the early phase of the freedom struggle.

• The Moderates believed in constitutional methods, such as submitting petitions and appeals to the British Parliament, to demand reforms and address grievances.

• Armed rebellion:

• Armed rebellion refers to the use of violence and armed uprisings to overthrow a regime or authority.

• While some revolutionary groups in India, such as the Ghadar Party and the Hindustan Socialist Republican Association (HSRA), pursued armed rebellion, it was not a method advocated by the Extremists in the Indian National Congress.

• Extremists like Bal Gangadhar Tilak and Bipin Chandra Pal focused on mass mobilization, self-reliance, and non-cooperation rather than violent methods.

Q2. Answer: (d) reduction of greenhouse gas emissions

The correct answer is reduction of greenhouse gas emissions.

Key Points

• The Kyoto Protocol is an international treaty that was adopted in Kyoto, Japan, in December 1997 and entered into force on February 16, 2005.

• Its primary aim is to combat climate change by reducing greenhouse gas (GHG) emissions globally.

• The protocol legally binds participating countries, especially developed nations, to meet specific emission reduction targets.

• It sets binding obligations on industrialized countries to reduce their collective GHG emissions by an average of 5.2% below 1990 levels over the commitment period (2008–2012).

• The Kyoto Protocol introduced mechanisms like the Clean Development Mechanism (CDM), Joint Implementation (JI), and Emissions Trading to help countries meet their targets cost-effectively.

Additional Information

• Desertification Control:

• Desertification refers to the degradation of land in arid, semi-arid, and dry sub-humid areas due to climatic variations and human activities.

• The United Nations Convention to Combat Desertification (UNCCD), adopted in 1994, is the key international agreement focused on preventing desertification and restoring degraded land.

• Protection of Ozone Layer:

• The protection of the ozone layer is addressed under the Montreal Protocol, adopted in 1987 to phase out ozone-depleting substances (ODS) like chlorofluorocarbons (CFCs) and halons.

• Preservation of Wildlife:

• Wildlife conservation is primarily addressed under initiatives such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Convention on Biological Diversity (CBD).

Q3. Answer: (d) Hard Disk

The correct answer is Hard Disk.

Key Points

• A Hard Disk is an example of secondary memory, used for storing data permanently in computers.

• It is a non-volatile storage medium, which means it retains data even when the computer is turned off.

• Hard disks provide large storage capacity, typically ranging from several hundred GB to multiple TB, making them suitable for storing operating systems, applications, and user data.

• Secondary memory, including hard disks, is slower than primary memory but offers persistent storage for files and programs.

• Hard disks operate based on magnetic storage technology, where data is written and read using a moving read/write head on spinning magnetic platters.

Additional Information

• RAM (Random Access Memory)

• RAM is a type of primary memory that temporarily stores data and instructions currently in use.

• It is volatile memory, meaning the data stored in RAM is lost when the computer is turned off.

• RAM allows faster access to data compared to secondary memory, enabling smooth operation of active processes.

• It is crucial for multitasking and running applications efficiently.

• ROM (Read-Only Memory)

• ROM is a type of primary memory used to store firmware and essential instructions required for booting the computer.

• It is non-volatile memory, meaning the data stored in ROM remains even after the computer is powered off.

• Data in ROM is pre-written and cannot be modified during normal operations.

• Examples of ROM include BIOS chips and embedded systems.

• Cache Memory

• Cache memory is a type of high-speed primary memory located close to the CPU.

• It stores frequently accessed data and instructions, reducing the time required for the CPU to fetch data from slower storage systems.

• Cache memory enhances the performance of the system but is limited in capacity compared to RAM.

• It is categorized into levels such as L1, L2, and L3 cache, based on proximity to the CPU and speed.

Q4. Answer: (d) Greece

The correct answer is Greece.

Key Points

• INIOCHOS-25 is a multinational air exercise hosted annually by the Hellenic Air Force in Greece.

• The exercise is conducted at the Andravida Air Base in Greece, which is known for its advanced infrastructure for air combat training.

• It aims to enhance interoperability among participating nations by practicing complex air operations in a simulated combat environment.

• Participants include air forces from several nations, such as the United States, Israel, France, and Italy, alongside Greece.

• INIOCHOS-25 incorporates advanced scenarios, including air-to-air combat, air-to-ground operations, and joint mission planning to increase tactical proficiency.

Additional Information

• Bulgaria

• Bulgaria is known for hosting joint military exercises with NATO forces, such as the "Platinum Lion" and "Thracian Sword," but it does not host INIOCHOS.

• The country's air force participates in regional and international collaborations to strengthen defense capabilities.

• Macedonia

• Now officially known as North Macedonia, the country primarily engages in NATO-related exercises after joining NATO in 2020.

• Albania

• Albania is a NATO member and hosts military exercises, such as "Defender Europe," in collaboration with allied forces.

Q5. Answer: (a) Finland

The correct answer is Finland.

Key Points

• Finland has been consistently ranked as the happiest country in the world by the World Happiness Report since 2018.

• The rankings are based on factors like social support, income, healthy life expectancy, freedom to make life choices, generosity, and perceptions of corruption.

• Finland excels in social welfare, equality, and access to education, healthcare, and a high standard of living, contributing to its happiness score.

• The Finnish government's focus on mental health and environmental sustainability has also played a key role in maintaining its position as the happiest country.

• Finland's strong sense of community and trust in institutions are critical elements that make it a global leader in happiness.

Additional Information

• World Happiness Report

• The World Happiness Report is an annual publication by the United Nations Sustainable Development Solutions Network.

• It uses survey data from the Gallup World Poll and evaluates happiness based on economic, social, and environmental factors.

• The report serves as a benchmark for policymakers to focus on improving the well-being of citizens worldwide.

Q6. Answer: (a) Ministry of Health and Family Welfare

The correct answer is Ministry of Health and Family Welfare.

Key Points

• The Ministry of Health and Family Welfare introduced the Drugs and Cosmetics (Compounding of Offences) Rules, 2025, to streamline the resolution of minor offences under the Drugs and Cosmetics Act, 1940.

• These rules aim to reduce litigation and encourage the compounding of minor offences, thereby ensuring quicker and more efficient justice delivery.

• The compounding mechanism offers an alternative to prosecution for certain offences, which helps decongest courts and enables better regulatory compliance.

• The initiative reflects the government's focus on modernizing drug regulatory frameworks to align with global standards.

• By implementing these rules, the Ministry intends to enhance transparency, efficiency, and accountability within the pharmaceutical and healthcare sectors.

Additional Information

• Ministry of Chemicals and Fertilizers:

• This ministry primarily oversees the production, distribution, and pricing of fertilizers and chemicals in India.

• It has three departments: Department of Chemicals and Petrochemicals, Department of Fertilizers, and Department of Pharmaceuticals.

• Ministry of Consumer Affairs, Food and Public Distribution:

• This ministry focuses on consumer rights, food security, and public distribution systems in India.

• It implements policies like the National Food Security Act and regulates essential commodities.

• Ministry of Pharmaceuticals:

• This ministry is a part of the Department of Chemicals and Fertilizers and focuses on the growth of the pharmaceutical sector.

• It promotes the availability of affordable medicines and oversees the development of the pharmaceutical industry.

Q7. Answer: (c) Bollywood

The correct answer is Bollywood.

Key Points

• Bollywood refers to the mainstream Hindi-language film industry based in Mumbai, India.

• It is one of the largest centers of film production in the world, producing hundreds of films annually.

• The term "Bollywood" is a blend of "Bombay" (former name of Mumbai) and "Hollywood," signifying its prominence in the global film industry.

• Bollywood films are known for their elaborate song-and-dance sequences, dramatic storytelling, and diverse genres.

• It has a massive global audience, with Indian expatriates and international viewers enjoying Bollywood movies.

Additional Information

• Tollywood

• Tollywood refers to the Telugu-language film industry based in Hyderabad, Telangana.

• It is one of the major regional film industries in India and is known for producing films with high-budget action sequences and compelling storytelling.

• Films like "Baahubali" and "RRR" have gained international acclaim and spotlighted Tollywood on the global stage.

• Kollywood

• Kollywood represents the Tamil-language film industry based in Chennai, Tamil Nadu.

• Renowned for its artistic and socially relevant films, Kollywood has a rich history in Indian cinema.

• It is home to legendary filmmakers and actors like Mani Ratnam, Rajinikanth, and Kamal Haasan.

• Mollywood

• Mollywood refers to the Malayalam-language film industry based in Kerala.

• Known for its realistic storytelling and high-quality content, Mollywood has produced critically acclaimed films like "Drishyam" and "Bangalore Days."

• It has a reputation for addressing socially relevant themes and showcasing cultural diversity.

Q8. Answer: (c) Buddhism

The correct answer is Buddhism.

Key Points

YourMockTest.com — Free Study Material

• The Bagh Caves are a group of nine rock-cut monuments located in the Dhar district of Madhya Pradesh, India.

• These caves are primarily associated with Buddhism and were constructed during the late 4th to 6th centuries CE.

• The caves served as viharas (monastic residences) for Buddhist monks and contain beautiful mural paintings, showcasing the fusion of Buddhist art and Indian culture.

• The artistic style of the Bagh Caves is influenced by the Gupta period and exhibits advanced techniques of mural art and rock-cut architecture.

• The murals in the caves are renowned for their vibrant colors and themes depicting Jataka tales, which are stories of Buddha's previous lives.

Additional Information

• Islam:

• Islamic art and architecture are characterized by features such as domes, minarets, intricate geometric patterns, and calligraphy.

• Famous examples include the Taj Mahal, Qutub Minar, and Charminar in India.

• Hinduism:

• Hindu architectural styles are evident in temple designs such as Nagara (North Indian style) and Dravidian (South Indian style).

• They often feature elaborate carvings of deities, mythological scenes, and intricate sculptures.

• Famous examples include the Khajuraho Temples and Brihadeeswarar Temple.

• Jainism:

• Jain architecture is known for its beautifully carved temples such as the Dilwara Temples in Mount Abu and the Gomateshwara statue in Shravanabelagola.

• The focus is often on themes of asceticism and spirituality.

Q9. Answer: (a) Alessia Russo

The correct answer is Alessia Russo.

Key Points

• Alessia Russo, a prominent English footballer, received the Football Writers' Association (FWA) Women's Footballer of the Year award for the 2024-25 season.

• She plays as a forward for Arsenal Women in the Women's Super League (WSL) and is an integral part of the England national team.

• Russo's outstanding performances during the 2024-25 season, including her goal-scoring consistency and ability to deliver in crucial matches, earned her this prestigious award.

• She has been instrumental in Arsenal's success, contributing to their victories in domestic and international competitions.

• Her achievements also include her stellar role in England's campaigns, further solidifying her reputation as one of the top footballers in the world.

Additional Information

• Lauren James

• Lauren James is an English footballer who plays as a forward for Chelsea in the Women's Super League (WSL) and the England national team.

• She is known for her exceptional dribbling skills, creativity, and ability to score crucial goals.

• James played a key role in England's campaign during the 2023 FIFA Women's World Cup, showcasing her immense talent.

• Mariona Caldentey

• Mariona Caldentey is a Spanish professional footballer who plays as a forward for FC Barcelona and the Spain national team.

• She is known for her versatility, technical ability, and vision on the field.

• Caldentey was a crucial part of Spain's victory in the 2023 FIFA Women's World Cup and contributed significantly to Barcelona's success in domestic and European competitions.

• Khadija Shaw

• Khadija "Bunny" Shaw is a Jamaican footballer who plays as a forward for Manchester City in the Women's Super League (WSL) and the Jamaica national team.

• She is recognized for her physicality, goal-scoring prowess, and leadership on the field.

• Shaw was a standout performer for Jamaica during the 2023 FIFA Women's World Cup, helping her team reach the knockout stages for the first time.

Q10. Answer: (a) The Sugar (Control) Order, 2025

The correct answer is The Sugar (Control) Order, 2025.

Key Points

• The Central Government introduced The Sugar (Control) Order, 2025, replacing the outdated Sugar (Control) Order of 1966.

• This reform aimed to modernize the sugar industry and align its practices with contemporary industrial and economic needs.

• It focuses on streamlining the production, supply, pricing, and distribution of sugar to ensure market stability and fair practices.

• The new order promotes greater transparency in the sugar trade and aims to address challenges like hoarding, price manipulation, and inefficiencies in the supply chain.

• The government also sought to enhance efficiency and competitiveness in the sugar sector, which is a key contributor to India's economy and rural employment.

Additional Information

• Sugar Industry in India

• The sugar industry is crucial to India's agricultural economy, with millions of farmers dependent on sugarcane cultivation.

• India is the second-largest producer of sugar globally, and the sector contributes significantly to rural employment and GDP.

• Government regulations like The Sugar (Control) Order aim to ensure fair pricing for farmers, stable supply for consumers, and competitiveness in the global market.

Q11. Answer: (c) Both the Centre and the States can legislate

The correct answer is Both the Centre and the States can legislate.

Key Points

• The Concurrent List in the Indian Constitution contains subjects on which both the Centre and the States can legislate.

• It is one of the three lists mentioned in the Seventh Schedule of the Constitution, alongside the Union List and State List.

• Under Article 246, the Concurrent List allows both levels of government to legislate on matters such as education, marriage, adoption, forests, and criminal law.

• If there is a conflict between the laws made by the Centre and the States on any subject in the Concurrent List, the law enacted by Parliament prevails, as per Article 254.

• The Concurrent List ensures cooperative federalism, allowing shared responsibility between the Union and State governments for certain matters.

Additional Information

• Exclusively for States

• The subjects under the State List in the Seventh Schedule are exclusively under the legislative jurisdiction of State governments.

• Examples include police, public health, agriculture, and local governance.

• States have autonomy in these areas, ensuring decentralized decision-making and governance.

• Exclusively for Union

• The Union List consists of subjects exclusively under the legislative jurisdiction of the Central Government.

• Examples include defense, foreign affairs, atomic energy, banking, and currency.

• This ensures centralized control over matters of national importance.

• Only during emergencies

• During a National Emergency, the legislative powers of the States can be temporarily overridden by the Central Government.

• Under Articles 352, 356, and 360, Parliament can legislate on subjects in the State List during emergencies.

• Such provisions ensure effective governance during crises but are limited to the emergency period.

Q12. Answer: (b) To stabilise India’s economy

The correct answer is To stabilise India's economy.

Key Points

• The 1991 economic reforms in India were introduced to address the severe balance of payments crisis faced by the country during the late 1980s and early 1990s.

• The primary aim was to stabilize the economy, reduce fiscal deficits, and restore macroeconomic balance to ensure sustainable growth.

• Key measures included liberalization, privatization, and globalization to reduce government controls and promote private sector participation.

• The reforms focused on removing trade barriers, deregulating industries, and opening up the economy to foreign investments and technology.

• The policies were designed to shift India from a closed and controlled economy to a market-oriented one, thereby enhancing competitiveness and productivity.

Additional Information

• Background of the 1991 Economic Reforms

• The reforms were initiated under the leadership of Prime Minister P.V. Narasimha Rao and Finance Minister Dr. Manmohan Singh.

• They marked a major shift in India's economic policy, moving away from protectionism and state-led development.

• The measures included fiscal discipline, trade liberalization, industrial policy reforms, financial sector reforms, and public sector restructuring.

• These reforms laid the foundation for India's rapid economic growth in the subsequent decades.

Q13. Answer: (d) UDAN

The correct answer is UDAN.

Key Points

• UDAN (Ude Desh ka Aam Nagrik) is a flagship regional connectivity scheme launched by the Ministry of Civil Aviation, Government of India, in April 2017.

• The primary goal of UDAN is to make air travel affordable and accessible to the common citizens, especially in remote and regional areas, by connecting unserved and under-served airports.

• The scheme is part of the National Civil Aviation Policy (NCAP), 2016, and provides incentives to airlines to operate flights on regional routes.

• UDAN is implemented through a Viability Gap Funding (VGF) mechanism to financially support airlines in maintaining operations on unprofitable routes.

• As of 2023, UDAN has successfully connected numerous airports across India, significantly boosting regional connectivity and contributing to economic growth in smaller towns and cities.

Additional Information

• UDAY (Ujwal DISCOM Assurance Yojana):

• UDAY is a government scheme launched in November 2015 to improve the financial health and operational efficiency of state-owned power distribution companies (DISCOMs).

• It aims to reduce the financial losses of DISCOMs by restructuring their debts and implementing operational improvements like reducing Aggregate Technical & Commercial (AT&C) losses.

• It does not relate to air travel or regional connectivity.

• PM Gati Shakti:

• PM Gati Shakti is a National Master Plan for multi-modal connectivity launched in 2021 by the Government of India.

• Its objective is to integrate infrastructure development across various sectors, including railways, roads, ports, and logistics, to reduce logistics costs and improve efficiency.

• While it encompasses aviation infrastructure, its scope is broader and not specifically focused on affordable air travel.

• Sagarmala:

• The Sagarmala Programme, launched in 2015, focuses on port-led development and modernization of ports to enhance maritime logistics and coastal community development in India.

• It aims to harness India’s coastline and waterways for economic growth but is unrelated to air travel or airport connectivity.

Q14. Answer: (a) Nagar Panchayat

The correct answer is Nagar Panchayat.

Key Points

• Under Article 243Q of the Indian Constitution, a Nagar Panchayat is constituted for an area in transition from a rural to urban state.

• A Nagar Panchayat is a type of urban local body created for smaller towns that are in the process of urbanization.

• The purpose of forming a Nagar Panchayat is to provide administrative support and development for areas undergoing urban transformation.

• It consists of members elected by the people of the transitional area and functions as a statutory body with powers defined by the state government.

• Nagar Panchayats are governed by provisions outlined in the 73rd and 74th Constitutional Amendments, which emphasize decentralized governance and local development.

Additional Information

• Town Panchayat:

• Town Panchayats are not explicitly mentioned in the Indian Constitution but are often used in some states as administrative units for small towns.

• Municipal Council:

• Municipal Councils are constituted for larger urban areas compared to Nagar Panchayats.

YourMockTest.com — Free Study Material

• Municipal Councils have elected representatives and function under state government supervision.

• Municipal Corporation:

• Municipal Corporations are formed for large metropolitan cities with significant population and infrastructure needs.

• Examples include Municipal Corporations in Delhi, Mumbai, Bengaluru, etc.

• Article 243Q:

• Article 243Q of the Indian Constitution provides for the formation of three types of municipalities: Nagar Panchayat, Municipal Council, and Municipal Corporation.

• The classification depends on the size of the population, the degree of urbanization, and the state government's discretion.

• This article aims to ensure proper governance and development tailored to the needs of urban and transitional areas.

Q15. Answer: (b) Continentality

The correct answer is Continentality.

Key Points

• Continentality refers to the climatic condition influenced by the distance from the sea or ocean, with interior regions experiencing greater temperature variations compared to coastal areas.

• Coastal areas have a moderate climate due to the regulating effect of large water bodies, while interior regions face extreme temperature conditions due to limited water influence.

• India's coastal cities, such as Mumbai and Chennai, experience smaller temperature variations due to proximity to the Indian Ocean, which acts as a heat reservoir and cools surrounding areas.

• In contrast, interior regions like Delhi and Jaipur exhibit greater temperature fluctuations due to their distance from water bodies, resulting in hotter summers and colder winters.

• Continentality plays a significant role in determining the local climate, as water bodies absorb and release heat more slowly than land, thereby moderating temperatures.

Additional Information

• Altitude:

• Altitude refers to the height above sea level, which directly impacts temperature and climate.

• Higher altitudes experience cooler temperatures due to decreased atmospheric pressure and thinner air that cannot hold heat efficiently.

• Regions like the Himalayas in India exhibit cold conditions throughout the year due to their high elevation.

• Pressure Belts:

• Pressure belts are regions of high or low atmospheric pressure formed due to Earth's rotation and solar radiation distribution.

• They influence global wind patterns, precipitation, and weather systems rather than temperature variations between coastal and interior regions.

• In India, pressure belts contribute to phenomena like monsoons.

• Latitude:

• Latitude measures the distance north or south of the equator and plays a crucial role in determining the amount of solar radiation a region receives.

• Regions closer to the equator, such as southern India, experience warmer climates due to direct sunlight, while northern regions are cooler.

Q16. Answer: (b) 23.0

The correct answer is 23.

Key Points

• Significant figures are the digits in a number that carry meaningful contributions to its measurement precision.

• The number 23 consists of two non-zero digits, which are always considered significant figures.

• Since the question asks for three significant figures, option 2 (23) is the only value that naturally satisfies this requirement when expressed as 23.0 (adding a decimal point and one trailing zero).

• The interpretation of significant figures depends on the context, and trailing zeros in a decimal number (e.g., 23.0) are counted as significant.

• Therefore, option 2 (23) is the correct answer as it has exactly three significant figures when expressed properly.

Additional Information

• Significant Figures Concept:

• Significant figures indicate the precision of a measurement or calculation.

• Non-zero digits are always significant.

YourMockTest.com — Free Study Material

• Zeros between non-zero digits are significant.
• Leading zeros are not significant, while trailing zeros in a decimal number are significant.

Q17. Answer: (a) increase the speed of data retrieval

The correct answer is increase the speed of data retrieval.

Key Points

• Cache memory is a small, high-speed memory located closer to the CPU than main memory (RAM), which stores frequently accessed data and instructions.
• Its primary function is to reduce the time taken to access data from the main memory, thereby improving the overall processing speed of the system.
• Cache memory operates at a higher speed than RAM, enabling the CPU to access data more quickly.
• Modern processors use multiple levels of cache memory (L1, L2, L3), where L1 is the fastest and closest to the CPU.
• By temporarily storing frequently used data, cache memory minimizes latency and enhances the efficiency of the CPU.

Additional Information

• Cache Memory
• Cache memory is critical in modern computer systems for reducing bottlenecks between the CPU and main memory.
• It forms an essential part of memory hierarchy, bridging the speed gap between the processor and slower memory components.
• Primary Memory
• Volatile: Data is lost when power is off (e.g., RAM).
• Fast: Directly and quickly accessible by the CPU.
• Temporary: Holds data and programs currently in use.
• Examples: RAM (Random Access Memory), Cache.
• Secondary Memory
• Non-Volatile: Data persists even without power (e.g., SSDs, HDDs).
• Slower: Accessed indirectly (data first loaded to RAM).
• Permanent: Stores operating system, applications, and files long-term.
• Examples: Hard Disk Drives (HDDs), Solid State Drives (SSDs), USB drives, Optical Disks.

Q18. Answer: (a) service sector

The correct answer is service sector.

Key Points

• The tertiary sector is commonly referred to as the service sector because it provides services rather than goods.
• It includes activities such as retail, education, healthcare, banking, IT services, transportation, and entertainment.
• This sector does not involve the production or manufacturing of goods but rather focuses on the distribution and support of goods and services.
• In modern economies, the service sector often contributes the largest share to the Gross Domestic Product (GDP).
• The growth of the service sector is driven by factors such as urbanization, globalization, technological advancements, and rising consumer demand for specialized services.

Additional Information

• Health Sector
• The health sector is a part of the service sector but focuses specifically on healthcare services, including hospitals, clinics, diagnostics, and pharmaceuticals.
• It plays a crucial role in improving the health and well-being of individuals and communities.
• While it overlaps with the service sector, it is not synonymous with the term "tertiary activities."
• Industrial Sector
• The industrial sector is also known as the secondary sector and involves activities related to the manufacturing, processing, and construction of goods.
• This sector converts raw materials from the primary sector into finished products through industrial processes.
• Examples include factories, steel production, and automobile manufacturing.
• Agricultural Sector
• The agricultural sector, also referred to as the primary sector, involves activities related to farming, fishing, forestry, and mining.
• It focuses on the extraction of natural resources and raw materials that serve as the foundation for other sectors.
• This sector is essential for food production and resource availability.

YourMockTest.com — Free Study Material

Q19. Answer: (d) January

The correct answer is January.

Key Points

• The 18th Pravasi Bharatiya Divas (PBD) Convention was held in January 2025 in Bhubaneswar, Odisha.

• Pravasi Bharatiya Divas is celebrated every two years to strengthen the engagement of the overseas Indian community with India.

• The event provides a platform for the Indian diaspora to network, exchange ideas, and contribute to India's development.

• January 9 was chosen for this occasion as it marks the return of Mahatma Gandhi from South Africa to India in 1915, which is a significant milestone in India's freedom struggle.

• The convention is organized by the Ministry of External Affairs in collaboration with a partner state, and it includes plenary sessions, cultural programs, and awards for notable overseas Indians.

Additional Information

• Pravasi Bharatiya Divas (PBD):

• The first Pravasi Bharatiya Divas was held in 2003 to mark the significant contribution of the Indian diaspora in various fields.

• The PBD Convention serves as an effective platform to connect overseas Indians with the development priorities of India.

• Major activities include discussions on government policies, diaspora contributions, and awards like the Pravasi Bharatiya Samman Award.

Q20. Answer: (c) High rural literacy levels

The correct answer is High rural literacy levels.

Key Points

• High rural literacy levels have not significantly contributed to rural distress in India, as literacy is generally considered a positive factor aiding rural development.

• Literacy equips individuals with skills necessary for employment, entrepreneurship, and informed decision-making, reducing dependency on traditional agricultural practices.

• Rural literacy programs, such as Sarva Shiksha Abhiyan, have been crucial in improving education and empowering rural communities to access government schemes and technological advancements.

• Increasing literacy rates in rural areas have encouraged diversification of income sources and a shift towards non-agricultural employment, reducing vulnerability to agricultural challenges.

• Thus, unlike other factors mentioned in the options, rural literacy levels contribute to alleviating distress rather than exacerbating it.

Additional Information

• Fragmentation of land holdings

• Land fragmentation refers to the division of agricultural land into smaller, uneconomical plots due to inheritance laws and population growth.

• Smaller land holdings make farming less viable, reduce economies of scale, and increase the cost of production.

• Fragmentation leads to reduced crop yields and limits the ability to adopt modern agricultural practices.

• This is a major contributor to rural distress as farmers struggle with inefficiency and lower income.

• Declining productivity of rainfed agriculture

• Rainfed agriculture depends on monsoon rains and constitutes approximately 60% of India's cultivated land.

• Erratic rainfall patterns and climate change have led to declining productivity in rainfed areas, severely impacting farmers' incomes.

• Rainfed regions often lack proper irrigation facilities, making them vulnerable to droughts and floods.

• This factor contributes significantly to rural distress, as a majority of small and marginal farmers rely on rainfed farming.

• Post-harvest infrastructure shortages

• India faces significant gaps in post-harvest infrastructure such as storage facilities, cold chains, and transportation networks.

• The lack of adequate infrastructure leads to high post-harvest losses, reducing farmers' income and profitability.

• It also prevents farmers from accessing distant markets, forcing them to sell their produce at lower prices in local markets.

• Improving post-harvest infrastructure is crucial to reducing rural distress and enhancing farmers' livelihoods.

Q21. Answer: (a) Article 72

The correct answer is Article 72.

Key Points

• Article 72 of the Indian Constitution empowers the President of India to grant pardons, reprieves, respites, or remissions of

punishment, or to suspend, remit or commute the sentence of any person convicted of any offense.

• This power applies to cases where the punishment or sentence is by a court-martial, offenses under laws relating to the Union's executive power, or death sentences.

• The President exercises this power on the advice of the Council of Ministers, as per Article 74 of the Constitution.

• This provision provides the President the ability to show mercy in exceptional cases and ensures justice through executive intervention.

• The clemency power under Article 72 is distinct from judicial powers and acts as a constitutional remedy against miscarriage of justice or in cases of special circumstances.

Additional Information

• Article 76:

• Article 76 of the Indian Constitution pertains to the Attorney General of India.

• The Attorney General is the chief legal advisor to the Government of India and holds the highest law office in the country.

• He/she is appointed by the President of India and must be qualified to be a Supreme Court judge.

• The Attorney General assists the government in legal matters and represents the Union in cases where the government is a party.

• Article 74:

• Article 74 establishes the Council of Ministers headed by the Prime Minister to aid and advise the President of India.

• The President is bound to act in accordance with the advice provided by the Council of Ministers.

• This article ensures that the President's powers are exercised in accordance with the principles of parliamentary democracy.

• Article 75:

• Article 75 deals with the appointment and tenure of the Prime Minister and other Ministers.

• The Prime Minister is appointed by the President, and the other Ministers are appointed by the President on the advice of the Prime Minister.

• The Ministers hold office during the pleasure of the President and are collectively responsible to the Lok Sabha.

Q22. Answer: (a) Bengal

The correct answer is Bengal.

Key Points

• Siraj-ud-Daula, Mir Jafar, and Mir Qasim were Nawabs (rulers) of Bengal during the 18th century, a region that was economically and politically significant during that era.

• Siraj-ud-Daula was the last independent Nawab of Bengal, known for his resistance against the British East India Company, leading to the famous Battle of Plassey in 1757.

• Mir Jafar succeeded Siraj-ud-Daula after the Battle of Plassey, supported by the British, and is infamous for betraying Siraj-ud-Daula in the battle.

• Mir Qasim, who succeeded Mir Jafar, sought to assert his independence from the British, which led to the Battle of Buxar in 1764, marking a significant shift in British dominance in India.

• The rule of these Nawabs in Bengal played a crucial role in shaping the colonial history of India as it marked the beginning of British political control.

Additional Information

• Andhra Pradesh

• During the 18th century, Andhra Pradesh was under the control of the Nizams of Hyderabad, a princely state established by Nizam-ul-Mulk Asaf Jah in 1724.

• The region was not directly involved with the Nawabs of Bengal but was part of the Deccan region with its own unique history and rulers.

• Kerala

• Kerala in the 18th century was divided among small kingdoms such as Travancore, Cochin, and Calicut (ruled by the Zamorins).

• The region was involved in trade with European powers like the Portuguese, Dutch, and later the British.

Q23. Answer: (d) NH4^+ and NH3

The correct answer is NH4^+ and NH3.

Key Points

• A conjugate acid-base pair consists of two species that differ by a single proton (H^+).

• In this case, NH4^+ (ammonium ion) acts as the conjugate acid, and NH3 (ammonia) acts as the conjugate base.

• The relationship is established when NH4^+ loses a proton to form NH3, or NH3 gains a proton to form NH4^+.

YourMockTest.com — Free Study Material

• This proton transfer process is central to Brønsted-Lowry acid-base theory, which defines acids as proton donors and bases as proton acceptors.

• Ammonium ion (NH4^+) is commonly encountered in aqueous solutions, where it can release a proton, demonstrating its acidic nature.

Additional Information

• Cl2 and Cl^-

• Cl2 (chlorine) is a neutral molecule, while Cl^- (chloride ion) is the conjugate base of hydrochloric acid (HCl).

• Cl2 is a diatomic molecule that acts as an oxidizing agent.

• NaOH and OH^-

• NaOH (sodium hydroxide) is a strong base that dissociates completely in water to release Na^+ and OH^- ions.

• H2O and HCl

• H2O (water) is a neutral molecule, while HCl (hydrogen chloride) is a strong acid.

• Instead, HCl donates a proton to water in aqueous solutions, resulting in H3O^+ and Cl^-.

• Concept of Conjugate Acid-Base Pairs:

• According to the Brønsted-Lowry theory, acids and bases exist in pairs, where the acid donates a proton and becomes its conjugate base.

• For example, HCl (acid) donates a proton to form Cl^- (conjugate base), and NH3 (base) accepts a proton to form NH4^+ (conjugate acid).

• This concept is fundamental to understanding acid-base reactions and equilibrium in chemistry.

Q24. Answer: (b) At least VIII standard pass

The correct answer is At least VIII standard pass.

Key Points

• The eligibility criteria for the Prime Minister Employment Generation Programme (PMEGP) requires beneficiaries to have passed at least VIII standard for projects costing above Rs. 10 lakh in the manufacturing sector and above Rs. 5 lakh in the business/service sector.

• qais a credit-linked subsidy scheme launched by the Ministry of Micro, Small, and Medium Enterprises (MSME) to promote self-employment by setting up micro-enterprises in non-farm sectors.

• Under the scheme, the government provides a subsidy of 15% to 35% of the project cost, depending on the beneficiary's category and location.

• Eligibility extends to individuals above the age of 18 years, self-help groups, cooperative societies, institutions registered under the Societies Registration Act, and charitable trusts.

• PMEGP is implemented by the Khadi and Village Industries Commission (KVIC) at the national level, along with State KVIBs, District Industries Centers, and banks at the state level.

Additional Information

• Prime Minister Employment Generation Programme (PMEGP):

• The scheme aims to generate employment opportunities in rural and urban areas by establishing new micro-enterprises or projects.

• It promotes entrepreneurship and self-reliance by financially supporting individuals with project ideas.

• The financial assistance includes a mix of bank loans and government subsidies.

• Special provisions exist for Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs), minorities, women, and physically challenged individuals, who receive higher subsidies under the scheme.

Q25. Answer: (b) Ghana

The correct answer is Ghana.

Key Points

• John Dramani Mahama served as the President of Ghana from 2012 to 2017 and was re-elected as President in January 2025.

• Ghana is a West African country known for its stable democracy and rich cultural heritage.

• John Dramani Mahama is a member of the National Democratic Congress (NDC), a major political party in Ghana.

• He previously held the position of Vice President from 2009 to 2012 and became President following the death of former President John Atta Mills.

• Mahama has been credited with infrastructural development in Ghana during his tenure and is recognized for his contributions to education and economic growth.

Additional Information

• Morocco:

YourMockTest.com — Free Study Material

• Morocco is located in North Africa and is known for its historic cities like Marrakesh, Casablanca, and Fes.
• The country operates as a constitutional monarchy with King Mohammed VI as the head of state.
• Morocco has been working on renewable energy projects and is a leader in solar energy development in the region.
• South Africa:
• South Africa is located at the southern tip of Africa and is known for its diverse cultures, languages, and landscapes.
• The country has three capitals: Pretoria (administrative), Cape Town (legislative), and Bloemfontein (judicial).
• South Africa is a major player in the mining industry, being one of the largest producers of gold and platinum.
• Kenya:
• Kenya is an East African country famous for its wildlife safaris and the Great Rift Valley.
• The country operates as a presidential republic, with Nairobi as its capital and largest city.
• Kenya is a significant exporter of tea and coffee and is working on economic diversification through technology and manufacturing.

Q26. Answer: (d) Union Minister for Electronics & Information Technology

The correct answer is Union Minister for Electronics & Information Technology.

Key Points

• AIKosha, an artificial intelligence-powered platform, was launched in 2025 by the Union Minister for Electronics & Information Technology to enhance government-citizen interaction and improve public service delivery.
• The platform leverages AI to provide real-time solutions to citizens' queries and support various government initiatives.
• AIKosha aims to improve transparency, accountability, and efficiency in governance by integrating advanced machine learning and natural language processing technologies.
• The initiative is part of India’s Digital India mission and emphasizes the use of cutting-edge technology to empower citizens and streamline government services.
• AIKosha was conceptualized to ensure seamless communication between the government and citizens, making information more accessible and reducing bureaucratic delays.

Additional Information

• Digital India Initiative:
• Launched by the Government of India to transform India into a digitally empowered society and knowledge economy.
• Focus areas include e-Governance, digital infrastructure, and citizen-centric services.
• AIKosha aligns with the goals of Digital India by leveraging AI to simplify governance and enhance service delivery.

Q27. Answer: (a) Three

The correct answer is Three.

Key Points

• In India, the Parliament typically holds three sessions in a year—Budget Session, Monsoon Session, and Winter Session.
• The Budget Session is the longest session and usually begins in January or February and concludes in April.
• The Monsoon Session is held around July to August, focusing on legislative and policy discussions.
• The Winter Session is conducted in November or December and is generally shorter than the Budget and Monsoon sessions.
• The sessions are planned to ensure regular scrutiny, debate, and passage of laws, as well as discussion on key national and international issues.

Additional Information

• Question Hour (First Hour)
• Purpose: Ministers are held accountable for their ministries through questions from MPs.
• Types of Questions: Starred (oral answer) & Unstarred (written answer).
• Significance: Promotes transparency, brings info to the public, and identifies policy loopholes.
• Zero Hour (Starts ~12:00 PM)
• Nature: Informal, unique to India, not in the Constitution or rules.
• Timing: Immediately after Question Hour, before the day's agenda.
• Purpose: MPs raise urgent, important issues without prior notice, holding government attention.
• Half-an-Hour Discussion (Last Half-Hour)
• Timing: Last half-hour of a sitting.
• Purpose: Discussion on a matter of public importance or a question needing clarification.
• Process: Requires advance notice (e.g., 3 days).

Q28. Answer: (c) Truenat

The correct answer is Truenat.

Key Points

• Truenat is a chip-based molecular diagnostic test developed for the rapid detection of tuberculosis (TB) and rifampicin resistance.

• It is endorsed by the World Health Organization (WHO) as a frontline screening and diagnostic tool for TB in resource-limited settings.

• Truenat uses real-time polymerase chain reaction (PCR) technology for the detection of Mycobacterium tuberculosis, providing results within 60-90 minutes.

• This portable and battery-operated device is particularly suitable for remote areas due to its ease of use and minimal infrastructure requirements.

• Truenat is included in India's National Tuberculosis Elimination Program (NTEP) for early and accurate TB diagnosis to support the goal of eliminating TB by 2025.

Additional Information

• LAMP-TB:

• LAMP-TB stands for Loop-Mediated Isothermal Amplification for Tuberculosis detection.

• It is a molecular test used to detect TB DNA in clinical samples under isothermal conditions.

• Unlike PCR-based methods, LAMP-TB does not require sophisticated equipment, making it suitable for low-resource settings.

• While LAMP-TB is effective for TB detection, it is not as widely used or endorsed as Truenat for large-scale TB screening programs.

• CB-NAAT:

• CB-NAAT stands for Cartridge-Based Nucleic Acid Amplification Test (commonly known as GeneXpert).

• It is a rapid molecular test for TB detection and rifampicin resistance, providing results within 2 hours.

• CB-NAAT is highly sensitive and widely used globally, including in India, under the NTEP framework.

• While CB-NAAT is a reliable diagnostic tool, its higher cost and infrastructure requirements limit its use in remote areas compared to Truenat.

• Line Probe Assay (LPA):

• Line Probe Assay is a molecular diagnostic test used to detect TB and drug-resistant TB strains.

• It involves hybridization of DNA fragments to probes, which can identify mutations associated with drug resistance.

• LPA is primarily used for second-line drug susceptibility testing in specialized laboratories.

• Due to its complexity and laboratory dependency, LPA is not suitable for rapid or point-of-care TB detection.

Q29. Answer: (a) Ajit Kumar Mohanty

The correct answer is Ajit Kumar Mohanty.

Key Points

• Ajit Kumar Mohanty was appointed as the Secretary of the Department of Atomic Energy (DAE) and Chairman of the Atomic Energy Commission (AEC) in May 2023.

• He succeeded K N Vyas, who served as the Secretary of the DAE and Chairman of the AEC prior to Mohanty’s appointment.

• Ajit Kumar Mohanty previously served as the Director of the Bhabha Atomic Research Centre (BARC), one of India’s premier nuclear research facilities.

• His appointment reflects the Indian government’s trust in his experience and expertise in the nuclear science field, which is critical for driving advancements in India's nuclear energy program.

• Under his leadership, the Department of Atomic Energy focuses on the peaceful use of nuclear energy, including electricity generation, agriculture, and medical applications.

Additional Information

• K N Vyas:

• He served as the Secretary of the Department of Atomic Energy and Chairman of the Atomic Energy Commission until May 2023.

• K N Vyas played a vital role in steering India’s nuclear energy program during his tenure.

• He is a noted nuclear scientist known for his contributions to reactor design and development in India.

• Sekhar Basu:

• Sekhar Basu held the position of Secretary, Department of Atomic Energy, and Chairman of the Atomic Energy Commission from October 2015 to September 2018.

• He is recognized for his contributions to nuclear fuel cycle technology and reactor development.

YourMockTest.com — Free Study Material

• Under his leadership, India made significant progress in nuclear technology, including the development of advanced reactors.

• Ratan Kumar Sinha:

• Ratan Kumar Sinha served as the Secretary of the Department of Atomic Energy and Chairman of the Atomic Energy Commission from 2012 to 2015.

• He is known for his expertise in nuclear reactor design and his contributions to India's advanced heavy water reactor (AHWR) program.

• His tenure emphasized the peaceful uses of nuclear energy, including applications in healthcare and agriculture.

Q30. Answer: (a) Alauddin Khalji

The correct answer is Alauddin Khalji.

Key Points

• Alauddin Khalji, the second ruler of the Khalji dynasty, was renowned for his administrative reforms and economic policies.

• He implemented a market control policy to regulate the prices of essential commodities such as food grains, horses, slaves, and clothing.

• His market reforms included setting fixed prices, establishing markets (controlled by officials), and appointing market controllers (Shahna-i-Mandi) to prevent hoarding and black marketing.

• Alauddin's price control measures were enforced through strict penalties and surveillance by spies to ensure compliance by traders and merchants.

• The aim of these policies was to maintain the stability of the economy, ensure a steady supply of goods, and support his military campaigns by providing resources at affordable prices.

Additional Information

• Ghiyasuddin Tughluq:

• He was the founder of the Tughluq dynasty and ruled from 1320 to 1325.

• Ghiyasuddin Tughluq is known for his administrative reforms and efforts to restore law and order after the decline of the Khalji dynasty.

• However, he did not implement significant market control policies like Alauddin Khalji.

• Ghiyasuddin Balban:

• Balban was a ruler of the Slave dynasty and ruled from 1266 to 1287.

• He is known for his strong centralized administration and emphasis on the divine right of kingship.

• Balban focused on maintaining law and order rather than regulating markets or controlling prices.

• Khizr Khan:

• Khizr Khan was the founder of the Sayyid dynasty and ruled from 1414 to 1421.

• He primarily focused on consolidating power and dealing with political instability after the decline of the Tughluq dynasty.

Q31. Answer: (c) Rahul Gandhi

The correct answer is Rahul Gandhi.

Key Points

• Rahul Gandhi, a prominent Indian opposition leader and member of the Indian National Congress, attended an event at Brown University in April 2025 to discuss concerns about democratic backsliding in India.

• He has been vocal in highlighting issues related to the erosion of democratic institutions, press freedom, and the independence of the judiciary in India.

• Rahul Gandhi has consistently raised concerns about the state of democracy in India, particularly under the leadership of the ruling Bharatiya Janata Party (BJP).

• During his international interactions, he often emphasizes the importance of preserving democratic values, pluralism, and inclusivity in governance.

• The discussion at Brown University was part of his broader effort to engage with global audiences on matters related to governance, democracy, and human rights.

Additional Information

• Mamata Banerjee

• Mamata Banerjee is the Chief Minister of West Bengal and the leader of the All India Trinamool Congress (AITC).

• She has been a vocal critic of the BJP-led government at the national level and has raised concerns about federalism and democratic governance.

• Her focus has primarily been on state-level issues and her governance model in West Bengal, rather than engaging in international forums like Brown University.

• Sharad Pawar

• Sharad Pawar is the founder of the Nationalist Congress Party (NCP) and a senior statesman in Indian politics.

• He has played a significant role in coalition politics and has been an advocate for farmer rights and economic policies.

• While a critical voice against the BJP, his political engagements are typically centered around domestic policy issues and Maharashtra politics.

• Arvind Kejriwal

• Arvind Kejriwal is the Chief Minister of Delhi and the leader of the Aam Aadmi Party (AAP).

• His political narrative revolves around governance reforms, anti-corruption measures, and urban development, particularly in Delhi.

• He has not been prominently involved in international discussions about democratic backsliding as compared to Rahul Gandhi.

Important Points

• Democratic Backsliding

• Democratic backsliding refers to the gradual decline in the quality of democracy and erosion of democratic institutions, often leading to authoritarianism.

• Concerns about democratic backsliding in India have been raised globally, citing issues like reduced press freedom, weakened judiciary, and challenges to civil liberties.

Q32. Answer: (b) Mudflow

The correct answer is Mudflow.

Key Points

• Mudflow is a type of rapid mass movement where saturated soil, debris, and water flow down a slope due to heavy rainfall or volcanic activity.

• It occurs in areas with loose, unconsolidated soil and steep slopes, often triggered by intense precipitation that oversaturates the ground.

• Mudflows can travel at high speeds, causing significant destruction to infrastructure, agricultural land, and human settlements in their path.

• These flows are typically composed of a mixture of water, soil, and rock particles, creating a slurry-like consistency.

• Mudflows are distinct from other mass movements due to their liquid-like behavior, facilitated by the high water content, which reduces friction and enables rapid movement.

Additional Information

• Avalanche

• An avalanche is a rapid flow of snow down a slope, often mixed with ice, rocks, and other debris.

• It is triggered by factors such as heavy snowfall, rapid temperature changes, or human activities like skiing.

• Avalanches are common in mountainous regions and are categorized into loose snow avalanches or slab avalanches depending on their formation.

• Unlike mudflows, avalanches involve frozen materials and lack the liquid-like consistency seen in mudflows.

• Soil Creep

• Soil creep refers to the slow, imperceptible movement of soil and rock downslope caused by gravity.

• It is a gradual process that occurs over years or decades, influenced by freeze-thaw cycles, soil expansion, and contraction.

• Unlike mudflows, soil creep does not involve sudden movement or a high water content.

• It can be identified through tilted trees, fences, or poles on a slope.

• Rockfall

• A rockfall is the sudden detachment and free fall of rock fragments from a steep slope or cliff.

• It is caused by factors such as weathering, erosion, earthquakes, or human activities like excavation.

• Rockfalls differ from mudflows as they involve solid rock particles rather than saturated soil and debris.

• They are common in mountainous and rocky terrains and pose significant hazards to infrastructure and transportation routes.

Q33. Answer: (d) 18^(th)

The correct answer is 18th Century.

Key Points

• The Sannyasi-Fakir Rebellion took place during the second half of the 18th century (1760s to 1800).

• This rebellion was primarily led by Hindu Sannyasis (ascetics) and Muslim Fakirs (mendicants) against the oppressive policies of the British East India Company.

• The rebellion was caused by excessive taxation policies, exploitation, and restrictions imposed by the British on religious mendicants who traditionally moved freely across the Bengal region.

YourMockTest.com — Free Study Material

• The region most impacted by the rebellion included Bengal and Bihar, which were under the British East India Company's control during this period.

• Key leaders of the movement included Majnu Shah and other Fakir and Sannyasi leaders, who mobilized local peasants, tribals, and other marginalized communities.

Additional Information

• Sannyasi-Fakir Rebellion

• The rebellion is often considered one of the earliest forms of resistance against British colonial rule in India.

• It set a precedent for future uprisings and revolts against the East India Company's exploitative policies.

• The cultural and religious unity displayed by Hindus and Muslims during the rebellion is a significant aspect of this historical event.

Q34. Answer: (d) To provide education to children aged six to fourteen years

The correct answer is To provide education to children aged six to fourteen years.

Key Points

• The Constitution (Eighty-sixth Amendment) Act, 2002, inserted Article 21A into the Indian Constitution, making the right to education a fundamental right for children aged six to fourteen years.

• It also amended Article 45, which directs the state to provide early childhood care and education for children below six years.

• Clause (k) was added to Article 51A (Fundamental Duties), making it the duty of every parent or guardian to provide opportunities for education to their child or ward aged six to fourteen years.

• This amendment paved the way for the enactment of the Right of Children to Free and Compulsory Education Act, 2009, which operationalizes Article 21A.

• The amendment reflects India's commitment to achieving universal elementary education and reducing dropout rates among children.

Additional Information

• Fundamental Duties

• Fundamental Duties were added to the Indian Constitution by the 42nd Amendment Act, 1976, upon the recommendations of the Swaran Singh Committee.

• These duties are enshrined in Article 51A and aim to promote patriotism, discipline, and moral values among citizens.

• Currently, there are 11 Fundamental Duties listed in the Constitution.

Q35. Answer: (c) Liaquat Ali Khan

The correct answer is Liaquat Ali Khan.

Key Points

• The 'Delhi Pact,' also known as the Nehru-Liaquat Pact, was signed on 8th April 1950 by Jawaharlal Nehru, the Prime Minister of India, and Liaquat Ali Khan, the Prime Minister of Pakistan.

• The pact aimed to address the concerns of minorities in both countries following the violence and displacement caused by the Partition of India in 1947.

• It was designed to ensure the safety and security of religious minorities in both nations and promised measures to protect their rights, properties, and cultural freedom.

• The agreement also aimed to curb the migration of people across borders and create an environment of peace and trust between the two newly created nations.

• Liaquat Ali Khan, the first Prime Minister of Pakistan, played a crucial role in the implementation of this pact and in shaping early Pakistan's domestic and foreign policies.

Additional Information

• Muhammad Ali Jinnah

• Jinnah was the founder of Pakistan and served as its first Governor-General until his death in 1948.

• He was the leader of the All-India Muslim League and played a pivotal role in the creation of Pakistan as a separate homeland for Muslims.

• While Jinnah was instrumental in the Partition of India, he passed away before the Nehru-Liaquat Pact was signed.

• Malik Firoz Khan Noon

• He served as the seventh Prime Minister of Pakistan from December 1957 to October 1958.

• He is also known for his efforts in incorporating Gwadar into Pakistan during his tenure as Prime Minister.

• Benazir Bhutto

• Benazir Bhutto was the first woman to head the government of a Muslim-majority country, serving as Prime Minister of Pakistan in the late 1980s and 1990s.

YourMockTest.com – Free Study Material

Q36. Answer: (b) Because forests provide natural resources and livelihood

The correct answer is Because forests provide natural resources and livelihood.

Key Points

• Tribal settlements are often located in remote and forested areas because forests provide essential natural resources, such as food, water, and materials for shelter, which are integral to their lifestyle.

• Forests are a source of livelihood for many tribal communities, as they engage in activities like hunting, gathering, and farming that are suited to their environment.

• Remote and forested areas also provide a sense of security and cultural preservation, as these locations are often less influenced by urbanization and modernization.

• Tribes have lived in harmony with nature for centuries, and their traditional knowledge of forest ecosystems is a crucial part of their identity and survival.

Additional Information

• Option 1: "Because they are not allowed to enter cities" - This is incorrect. While tribal communities face challenges in urban areas, such as discrimination and lack of opportunities, there are no laws or policies that explicitly prevent them from entering or living in cities.

• Option 3: "Due to easy access to modern infrastructure" - This is incorrect because tribal settlements are typically located in areas with limited infrastructure. Modern amenities like schools, healthcare centers, and transportation are often lacking in these regions.

• Option 4: "Because government policies force them to live there" - This is incorrect. Government policies aim to protect tribal lands and rights, but they do not force tribal communities to live in forests. Many tribes choose to live in these areas due to cultural and historical connections to the land.

• Tribal communities and their rights: The Indian Constitution provides special provisions for the protection and development of Scheduled Tribes under Articles 244 and 275. These provisions ensure that their cultural identity, resources, and autonomy are preserved.

• Forests as a natural habitat: Forests have been home to tribal communities for generations, allowing them to practice sustainable living and maintain their traditional ways of life.

Q37. Answer: (c) Old crystalline, igneous and metamorphic rocks

The correct answer is Old crystalline, igneous and metamorphic rocks.

Key Points

• The Peninsular Plateau of India is primarily composed of old crystalline, igneous, and metamorphic rocks that are among the oldest geological formations in the world.

• It is a part of the Gondwana landmass and represents one of the most stable landforms, with its rocks dating back to the Precambrian era (about 4 billion years ago).

• This plateau includes granites, gneisses, schists, and quartzites, which are resistant to erosion, making it geologically stable.

• The region is rich in mineral resources such as iron ore, manganese, gold, copper, and bauxite, which have contributed significantly to India's industrial development.

• The Deccan Plateau, a major sub-region of the Peninsular Plateau, is characterized by vast expanses of basalt due to ancient volcanic activity, but the underlying structure remains dominated by crystalline rocks.

Additional Information

• Geological significance of the Peninsular Plateau:

• The Peninsular Plateau is divided into two major regions: the Central Highlands and the Deccan Plateau.

• It is bounded by the Vindhya and Satpura ranges in the north and the Western and Eastern Ghats in the west and east, respectively.

• This region plays a vital role in shaping India's geography, climate, and economy due to its elevation, stability, and mineral wealth.

Q38. Answer: (a) 1808

The correct answer is 1808.

Key Points

• John Dalton, an English chemist, physicist, and meteorologist, formulated the first detailed atomic theory of matter in 1808.

• Dalton's atomic theory was published in his book titled "A New System of Chemical Philosophy."

• The theory proposed that all matter is composed of small, indivisible particles called atoms, which cannot be created or destroyed.

• Dalton stated that atoms of the same element are identical in mass and properties, and atoms of different elements have distinct weights and characteristics.

• His work laid the foundation for modern chemistry and helped explain chemical reactions as the rearrangement of atoms in definite proportions.

Additional Information

• Thomson's Discovery (Late 1800s):

• Discovered the electron (negative particle), proposing the "plum pudding" model with electrons embedded in a positive sphere.

• Rutherford's Model (Early 1900s):

• Gold foil experiment revealed a dense, positive nucleus with electrons orbiting it, creating the nuclear model.

• Bohr Model (1913):

• Electrons exist in specific, quantized orbits or energy levels, jumping between them by absorbing/releasing energy.

• Quantum Mechanical Model (1926 onwards):

• Electrons exist in probabilistic "clouds" or orbitals, not fixed paths; this is the basis of the modern understanding.

Q39. Answer: (c) Kerala

The correct answer is Kerala.

Key Points

• The Cochin International Airport in Kerala became the first fully solar-powered airport terminal in India and the world.

• This milestone achievement was inaugurated in August 2015, and the airport now runs entirely on solar energy.

• The solar power plant at Cochin International Airport has a capacity of 12 MWp (megawatts peak), which makes it capable of meeting all the energy requirements of the airport.

• This project is considered a key step towards sustainable development and reducing carbon emissions in India.

• The initiative reflects India’s commitment to clean energy and aligns with the country’s goal to increase the use of renewable energy sources.

Additional Information

• Solar-Powered Airport Concept

• A solar-powered airport is an airport whose energy requirements are met entirely or partially by solar energy.

• This reduces the airport’s carbon footprint and dependence on non-renewable energy resources.

• India has been a pioneer in adopting solar energy for its airports, with Cochin setting an example for others to follow.

Q40. Answer: (c) Polar research vessel

The correct answer is Polar research vessel.

Key Points

• In June 2025, Garden Reach Shipbuilders & Engineers Limited (GRSE) signed an MoU with Norway's Kongsberg to build India's first Polar Research Vessel (PRV).

• A Polar Research Vessel is designed for conducting scientific research, exploration, and logistical support in polar regions, including the Arctic and Antarctic.

• India has been actively conducting research in the polar regions through its Antarctic expeditions under the National Centre for Polar and Ocean Research (NCPOR).

• The collaboration with Norway’s Kongsberg, a world leader in advanced maritime technology, will help India leverage cutting-edge solutions for building the PRV.

• This initiative will bolster India's scientific capabilities in polar research and enhance its presence in the global scientific community.

Additional Information

• Aircraft Carrier

• An aircraft carrier is a warship designed to carry, deploy, and recover aircraft, serving as a mobile airbase.

• India currently operates INS Vikramaditya and INS Vikrant as its aircraft carriers.

• These ships play a crucial role in projecting air power and ensuring maritime security.

• Aircraft carriers are not used for polar research, but they are essential assets for naval defense and operations.

• Deep-Submergence Rescue Vessel

• A Deep-Submergence Rescue Vessel (DSRV) is used for rescuing submarines and crews stranded underwater.

• India inducted its first DSRVs into service in 2018 to enhance its submarine rescue capabilities.

• These vessels are equipped with advanced sonar systems and remotely operated underwater vehicles (ROVs).

• While crucial for naval rescue missions, DSRVs are not related to polar research activities.

• Hospital Ship

• A hospital ship is a vessel equipped to serve as a floating medical facility, providing care during humanitarian crises or conflicts.

• Such ships are primarily used for medical treatment and disaster relief rather than scientific research.
• India currently does not operate dedicated hospital ships but has utilized naval vessels for medical missions during emergencies.
• Although important for healthcare, hospital ships are not relevant to polar research or the context of this MoU.

Q41. Answer: (a) 3

Shortcut Trick

Difference between Father's age and twice the Son's age 8 years ago = 11.

Each year, this difference decreases by 1 (since father ages by 1, but twice the son's age increases by 2).

In 8 years (to reach present), the difference becomes 11 − 8 = 3.

To make the father exactly twice the son's age, this difference must become 0.

It will take exactly 3 more years for the difference to reduce from 3 to 0.

Therefore The correct answer is 3 years.

Alternate Method

8 Years AgoSon = SFather = 2S + 11PresentSon = S + 8Father = 2S + 19After x YearsSon = S + 8 + xFather = 2S + 19 + x+ 8+ xCondition: Future Father = 2 × Future Son

Let the son's age 8 years ago be S years.

8 years ago:

=> Father's age = 2S + 11

Present Ages:

=> Son's present age = S + 8

=> Father's present age = (2S + 11) + 8 = 2S + 19

After x years from now:

=> Son's age = S + 8 + x

=> Father's age = 2S + 19 + x

According to the given condition, the father will be twice his son's age:

=> Father's age = 2 × (Son's age)

=> 2S + 19 + x = 2 × (S + 8 + x)

=> 2S + 19 + x = 2S + 16 + 2x

=> 19 + x = 16 + 2x

=> 2x − x = 19 − 16

=> x = 3

Therefore The correct answer is 3 years.

Additional Information

Absolute Age Difference

The absolute difference between the ages of two persons is a universally constant value. It remains exactly the same whether checked 10 years ago or 10 years in the future.

Linear Equations in Age Problems

Age problems often involve forming linear equations across timelines. If the current age is x, the age n years ago is (x − n) and the age after n years is (x + n).

Relative Age Difference Trick

If Person A = k × Person B + c, the difference between Person A's age and k × Person B's age decreases by exactly (k − 1) each passing year. This helps in solving complex relative age multipliers purely using logic.

Q42. Answer: (d) 104

Shortcut Trick

Total interest percentage = Rate × Time

=> Total % = 4% × 6.5 = 26%

Simple Interest = 26% of Principal

=> SI = 26% of 400 = 104

Therefore The correct answer is Rs. 104.

Alternate Method

Principal

Rs. 400

t = 0

Interest

SI = ?

t = 6.5 years

Rate = 4% per annum

SI = (P × R × T) ÷ 100

Given:

Principal (P) = Rs. 400

Rate of Interest (R) = 4% per annum

Time Period (T) = 6.5 years

Formula Used:

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

Calculation:

=> SI = (400 × 4 × 6.5) ÷ 100

=> SI = 4 × 4 × 6.5

=> SI = 16 × 6.5

=> SI = 104

Therefore The correct answer is Rs. 104.

Additional Information

Total Amount Formula

Amount (A) = Principal + Simple Interest = P(1 + RT ÷ 100).

Simple Interest vs Compound Interest

For the first year (if compounded annually), SI and CI are strictly equal. The difference arises from the second year onwards because CI applies interest on the accumulated past interest.

Difference between CI and SI for 2 years

Difference = P × (R ÷ 100)²

Q43. Answer: (d) 20 days

Shortcut Trick

Total work is constant, equating work done by men and women:

9M × 16 = 5W × 18 => 144M = 90W => M ÷ W = 5 ÷ 8

Let efficiency of 1 Man = 5 units/day, 1 Woman = 8 units/day.

Total work = 9 × 5 × 16 = 720 units.

Required time = 720 ÷ (4M + 2W) = 720 ÷ (20 + 16) = 720 ÷ 36 = 20 days.

Therefore The correct answer is 20 days.

Alternate Method

Given:

9 men complete the work in 16 days.

5 women complete the work in 18 days.

Person	Days	Total Work	Efficiency
9 Men	16	144	9
5 Women	18	8	

Calculations:

=> Efficiency of 9 men = 9 units/day

=> Efficiency of 1 man = 9 ÷ 9 = 1 unit/day

=> Efficiency of 5 women = 8 units/day

=> Efficiency of 1 woman = 8 ÷ 5 = 1.6 units/day

=> Combined efficiency of 4 men and 2 women = (4 × 1) + (2 × 1.6) = 4 + 3.2 = 7.2 units/day

=> Time required = Total Work ÷ Combined efficiency

=> Time required = 144 ÷ 7.2 = 20 days

Therefore The correct answer is 20 days.

YourMockTest.com — Free Study Material

Additional Information

Chain Rule (MDH Concept)

If M1 persons can do W1 work in D1 days working H1 hours a day, then M1 × D1 × H1 ÷ W1 = M2 × D2 × H2 ÷ W2.

Work and Efficiency Relation

Efficiency is inversely proportional to the time taken. If the ratio of time taken by A and B is x:y, then the ratio of their individual efficiencies is y:x.

Wages and Work

Wages are always distributed in direct proportion to the work done. If the time spent by all workers is the same, wages are distributed in the exact ratio of their individual efficiencies.

Q44. Answer: (a) 13,115

Shortcut Trick

Convert the percentage changes into multiplying factors: +25% → 5/4, +60% → 8/5, and −57% → 43/100.

Effective combined multiplier = (5/4) × (8/5) × (43/100) = 86/100 = 0.86

Final population = Initial population × Effective multiplier

Final population = 15250 × 0.86 = 13115

Therefore The correct answer is 13,115.

Alternate Method

Given:

Initial population = 15,250

Increase in 1^(st) year = 25%

Increase in 2^(nd) year = 60%

Decrease in 3^(rd) year = 57%

Formula Used:

Final Value = Initial Value × (1 ± R1/100) × (1 ± R2/100) × (1 ± R3/100)

Successive Percentage Change

15,250

19,062.5

30,500

13,115

+25%

× 5/4

+60%

× 8/5

−57%

× 43/100

Initial

Year 1

Year 2

Year 3

Calculations:

=> Final Population = 15250 × (1 + 25/100) × (1 + 60/100) × (1 − 57/100)

=> Final Population = 15250 × (125/100) × (160/100) × (43/100)

=> Final Population = 15250 × (5/4) × (8/5) × (43/100)

=> Final Population = 15250 × (40/20) × (43/100)

=> Final Population = 15250 × 2 × (43/100)

=> Final Population = 15250 × 86/100

=> Final Population = 152.5 × 86

=> Final Population = 13,115

Therefore The correct answer is 13,115.

Additional Information

Successive Percentage Change Formula

If a value changes successively by a% and b%, the effective percentage change is calculated using the formula: Net Change = (a + b + ab/100)%.

Multiplying Factor Method

When a value increases by r%, it becomes (1 + r/100) times the original. For a decrease, it becomes (1 − r/100) times. Multiple successive changes are evaluated by multiplying all these factors directly with the base value.

Fractional Equivalents

Memorising percentage to fraction conversions significantly speeds up calculations. For example, 25% = 1/4 (which gives a multiplier of 5/4 for an increase) and 60% = 3/5 (which gives a multiplier of 8/5 for an increase).

Q45. Answer: (a) 19/65

Shortcut Trick

Solve the complex fraction part directly: 1 / (1 + 4/9) = 1 / (13/9) = 9/13

Group and combine the remaining simple fractions: 2/5 − 4/5 = −2/5

Add the two results together: 9/13 − 2/5 = (45 − 26) / 65 = 19/65

Therefore The correct answer is 19/65.

Alternate Method

Given:

2/5 + [1 / (1 + 4/9)] − 4/5

Concept Used:

BODMAS Rule: Brackets, Orders, Division, Multiplication, Addition, Subtraction.

Calculation:

=> 2/5 + [1 / ((9 + 4) / 9)] − 4/5

=> 2/5 + [1 / (13/9)] − 4/5

=> 2/5 + 9/13 − 4/5

=> (2/5 − 4/5) + 9/13

=> −2/5 + 9/13

=> (−26 + 45) / 65

=> 19/65

Therefore The correct answer is 19/65.

Additional Information

Simplification Rules (BODMAS)

Always simplify the innermost brackets first, followed by orders or exponents, then perform division and multiplication, and finish with addition and subtraction.

Fraction Reciprocal Property

When 1 is divided by a fraction a/b, the result is its reciprocal b/a. This allows complex fractions to be converted into simple fractions quickly.

Q46. Answer: (a) Rs. 24,650

Shortcut Trick

Let the principal be 100 units.

Interest for the 1st year = 20% of 100 = 20 units.

Interest for the 2nd year = 20 units + (20% of 20 units) = 24 units.

=> 24 units = Rs. 5,916

=> 100 units = (5916 ÷ 24) × 100 = 246.5 × 100 = Rs. 24,650

Therefore The correct answer is Rs. 24,650.

Alternate Method

Given:

Interest earned during the 2nd year = Rs. 5,916

Rate of interest (R) = 20% per annum

Formula Used:

Amount after 1st year = P × (1 + R ÷ 100)

Interest for 2nd year = Amount after 1st year × (R ÷ 100)

Principal (P)Amountafter 1 yr2nd yr CIRs. 5,916+20%20% of ATotal CI for 2nd year = 20% of (P + 20% of P) = 24% of P

Calculations:

=> Amount after 1st year = P + (20 ÷ 100) × P = 1.2P

=> Interest for 2nd year = 20% of Amount after 1st year

=> Interest for 2nd year = (20 ÷ 100) × 1.2P = 0.24P

=> Given, 0.24P = 5916

=> P = 5916 ÷ 0.24

=> P = 591600 ÷ 24

=> P = 24650

Therefore The correct answer is Rs. 24,650.

Additional Information

Effective Compound Interest Rate

For 2 years at R% per annum, the effective CI rate is given by (R + R + R² ÷ 100)%.

Compound Interest for n^(th) Year

The compound interest earned exactly in the n^(th) year is calculated as: CI_n = P × (R ÷ 100) × (1 + R ÷ 100)^(n−1).

SI vs CI Difference

The difference between Compound Interest and Simple Interest for 2 years on a principal P is calculated as P × (R ÷ 100)².

Q47. Answer: (d) 91°

Shortcut Trick

In the right-angled triangle BDC, angle C = 90° − angle DBC = 90° − 55° = 35°.

In triangle AEC, the exterior angle at E is angle AEB.

By the exterior angle theorem, angle AEB = angle CAE + angle C.

=> angle AEB = 56° + 35° = 91°.

Therefore The correct answer is 91°.

Alternate Method

55°

56°

?

35°

A

D

C

B

E

Given:

=> BD perpendicular to AC at D

=> angle DBC = 55°

=> angle CAE = 56°

Formula Used:

=> Sum of angles in a right triangle = 180°

=> Exterior angle of a triangle = Sum of interior opposite angles

Calculations:

=> In right-angled triangle BDC, the sum of the acute angles is 90°.

=> angle C = 90° − angle DBC

=> angle C = 90° − 55° = 35°

=> Now, consider triangle AEC. The points C, E, and B lie on a straight line because E is on BC.

=> angle AEB acts as the exterior angle to triangle AEC at vertex E.

=> According to the exterior angle theorem, the exterior angle is equal to the sum of the two opposite interior angles (angle CAE and angle C).

=> angle AEB = angle CAE + angle C

=> angle AEB = 56° + 35° = 91°

Therefore The correct answer is 91°.

YourMockTest.com — Free Study Material

Additional Information

Exterior Angle Theorem

The measure of an exterior angle of a triangle is exactly equal to the sum of the measures of its two remote interior angles. Formula: angle Ext = angle Int1 + angle Int2.

Angle Sum Property of a Triangle

The sum of all three interior angles in any planar triangle is strictly always 180°.

Right-Angled Triangle Rules

In a right-angled triangle, one angle is exactly 90°. Therefore, the other two acute angles are complementary, meaning they always sum up to exactly 90°.

Q48. Answer: (b) 8 : 1

Shortcut Trick

The volume of a sphere is directly proportional to the cube of its radius (Volume prop. to r^3).

If the radius is halved (multiplied by 1/2), the volume scales by a factor of $(1/2)^3 = 1/8$.

This means the new volume becomes 1/8th of the original volume.

Ratio of Original Volume to New Volume = 1 : (1/8) = 8 : 1.

Therefore The correct answer is 8 : 1.

Alternate Method

Given:

New radius of the sphere = 1/2 × Original radius

Formula Used:

Volume of a sphere, $V = (4/3) \times \pi \times r^3$

r

r/2

Original Sphere

New Sphere

Calculations:

Let the original radius of the sphere be r.

=> Original volume, $V1 = (4/3) \times \pi \times r^3$

=> The new radius is halved, so New radius = r/2

=> New volume, $V2 = (4/3) \times \pi \times (r/2)^3$

=> $V2 = (4/3) \times \pi \times (r^3 / 8)$

=> $V2 = (1/8) \times [(4/3) \times \pi \times r^3]$

=> V2 = V1 / 8

=> Ratio of Original Volume to New Volume = V1 / V2 = 8 / 1

=> The required ratio is 8 : 1

Therefore The correct answer is 8 : 1.

Additional Information

Scaling Principle for 3D Shapes

When any linear dimension (like radius or side length) of a 3D solid is scaled by a factor 'k', its total surface area scales by a factor of k^2 and its total volume scales by a factor of k^3.

Surface Area of a Sphere

The total surface area of a sphere is given by $4\pi r^2$. If the radius is halved, the new surface area becomes $(1/2)^2 = 1/4$th of the original surface area.

Volume of a Hemisphere

A hemisphere is exactly half of a full sphere. Its volume is calculated as $(2/3)\pi r^3$ and its total surface area is $3\pi r^2$.

Q49. Answer: (a) 76.47

Shortcut Trick

Average speed is the ratio of total distance to total time.

Total Distance = 364 + 441 + 648 = 1453 km

Total Time = (364 ÷ 91) + (441 ÷ 63) + (648 ÷ 81)

Total Time = 4 + 7 + 8 = 19 hours

YourMockTest.com — Free Study Material

Average Speed = 1453 ÷ 19 ≈ 76.47 km/hr

Therefore The correct answer is 76.47 km/hr.

Alternate Method

Given:

Distance 1 (D1) = 364 km, Speed 1 (S1) = 91 km/hr

Distance 2 (D2) = 441 km, Speed 2 (S2) = 63 km/hr

Distance 3 (D3) = 648 km, Speed 3 (S3) = 81 km/hr

Formula Used:

Average Speed = Total Distance ÷ Total Time

Time = Distance ÷ Speed

364 km

441 km

648 km

91 km/hr

63 km/hr

81 km/hr

4 hrs

7 hrs

8 hrs

Total Distance = 1453 km | Total Time = 19 hrs

Zeeshan's Journey Map

Calculations:

=> Total Distance = D1 + D2 + D3

=> Total Distance = 364 + 441 + 648 = 1453 km

=> Time for part 1 (T1) = 364 ÷ 91 = 4 hours

=> Time for part 2 (T2) = 441 ÷ 63 = 7 hours

=> Time for part 3 (T3) = 648 ÷ 81 = 8 hours

=> Total Time = T1 + T2 + T3

=> Total Time = 4 + 7 + 8 = 19 hours

=> Average Speed = Total Distance ÷ Total Time

=> Average Speed = 1453 ÷ 19

=> Average Speed = 76.4736... km/hr

=> Rounding off to two decimal places, we get 76.47 km/hr

Therefore The correct answer is 76.47 km/hr.

Additional Information

Average Speed

It is defined as the total distance travelled divided by the total time taken. Average Speed = Total Distance ÷ Total Time.

Average Speed for Equal Distances

If a person covers two equal distances at speeds x and y, then the average speed is directly given by the formula: (2 × x × y) ÷ (x + y).

Conversion of Speed Units

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

Q50. Answer: (c) 14.31

Shortcut Trick

Given the base 73 is the same for both x and y, we can directly substitute and equate the powers.

From x^z = y^(10), replace x and y with their given powers of 73:

0.51 × z = 0.73 × 10

z = 7.3 ÷ 0.51

z ≈ 14.31

Therefore The correct answer is 14.31.

Alternate Method

YourMockTest.com — Free Study Material

Given:

x = 73^(0.51)

y = 73^(0.73)

x^z = y^(10)

Formula Used:

$(a^m)^n = a^{(m \times n)}$

If $a^m = a^n$, then m = n (for a > 0, a ≠ 1)

Calculations:

=> Substitute the given values of x and y into the equation x^z = y^(10).

=> $(73^{(0.51)})^z = (73^{(0.73)})^{(10)}$

=> $73^{(0.51 \times z)} = 73^{(0.73 \times 10)}$

=> $73^{(0.51z)} = 73^{(7.3)}$

=> Since the bases on both sides are equal, we can equate their exponents:

=> 0.51z = 7.3

=> z = 7.3 ÷ 0.51

=> z = 730 ÷ 51

=> z ≈ 14.3137

Therefore The correct answer is 14.31.

Additional Information

Product Rule of Indices

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

Quotient Rule of Indices

When dividing expressions with the same base, subtract their exponents: $a^m \div a^n = a^{(m-n)}$

Power of a Power Rule

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

Q51. Answer: (d) 50.7

Shortcut Trick

Convert the decimals into fractions in their simplest form: 3.9 = 39/10 and 0.169 = 169/1000

LCM of fractions = LCM of numerators ÷ HCF of denominators

LCM(39, 169) = 507

HCF(10, 1000) = 10

Required LCM = 507 ÷ 10 = 50.7

Therefore The correct answer is 50.7.

Alternate Method

Given:

Numbers: 3.9 and 0.169

Formula Used:

To find the LCM of decimals, equate their decimal places, find the LCM treating them as integers, and then put the decimal point back.

Calculation:

=> The maximum number of decimal places is 3 (in 0.169).

=> Equating decimal places by multiplying both numbers by 1000: 3900 and 169.

=> Prime factorization of $3900 = 2^2 \times 3 \times 5^2 \times 13$

=> Prime factorization of $169 = 13^2$

=> LCM(3900, 169) = $2^2 \times 3 \times 5^2 \times 13^2 = 50700$

=> Since we multiplied by 1000 initially, divide the integer LCM by 1000.

=> Required LCM = 50700 ÷ 1000 = 50.7

Therefore The correct answer is 50.7.

Additional Information

HCF of Fractions

HCF of fractions = HCF of Numerators ÷ LCM of Denominators.

LCM of Fractions

LCM of fractions = LCM of Numerators ÷ HCF of Denominators. Always ensure the fractions are reduced to their simplest form before applying this rule.

HCF and LCM Relation

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

Q52. Answer: (b) 1

Shortcut Trick

Put A = 45° to quickly find the value of the expression.

=> sec 45° = √2 and cot 45° = 1

=> Expression = $1/(\sqrt{2})^2 + 1/(1 + 1^2)$

=> 1/2 + 1/2 = 1

Therefore The correct answer is 1.

Alternate Method

Given:

Expression = $1/\sec^2A + 1/(1 + \cot^2A)$

Formula Used:

=> $1 + \cot^2A = \text{cosec}^2A$

=> 1/secA = cosA

=> 1/cosecA = sinA

=> $\sin^2A + \cos^2A = 1$

Calculations:

=> $1/\sec^2A + 1/(1 + \cot^2A)$

=> $\cos^2A + 1/\text{cosec}^2A$

=> $\cos^2A + \sin^2A$

=> 1

Therefore The correct answer is 1.

Additional Information

Trigonometric Identities

The fundamental Pythagorean identities are: $\sin^2\theta + \cos^2\theta = 1$, $1 + \tan^2\theta = \sec^2\theta$, and $1 + \cot^2\theta = \text{cosec}^2\theta$.

Reciprocal Relations

The reciprocal of sine is cosecant ($\sin\theta = 1/\text{cosec}\theta$), cosine is secant ($\cos\theta = 1/\sec\theta$), and tangent is cotangent ($\tan\theta = 1/\cot\theta$).

Quotient Relations

Tangent and cotangent can be expressed as: $\tan\theta = \sin\theta / \cos\theta$ and $\cot\theta = \cos\theta / \sin\theta$.

Q53. Answer: (d) 258/73days

Shortcut Trick

Total work = LCM of 17, 12, and 2 = 204 units.

Efficiency of A = 204 ÷ 17 = 12 units/day.

Efficiency of B = 204 ÷ 12 = 17 units/day.

Combined efficiency of A + B + C = 204 ÷ 2 = 102 units/day.

Efficiency of C = 102 − (12 + 17) = 73 units/day.

Time taken by C alone = 204 ÷ 73 = 2 ^(58)/73 days.

Therefore The correct answer is 2 ^(58)/73 days.

Alternate Method

Given:

=> Time taken by A = 17 days

=> Time taken by B = 12 days

=> Time taken by A, B, and C together = 2 days

Person	Days	Total Work	Efficiency
A	17	204	12

B	12	17	
A + B + C	2	102	

Calculations:

=> Efficiency of C = Efficiency of (A + B + C) − Efficiency of A − Efficiency of B

=> Efficiency of C = 102 − 12 − 17

=> Efficiency of C = 73 units/day

=> Time taken by C alone = Total Work ÷ Efficiency of C

=> Time taken by C alone = 204 ÷ 73 = 2 ^(58)/73 days

Therefore The correct answer is 2 ^(58)/73 days.

Additional Information

Work & Efficiency

Total Work = Time × Efficiency. Efficiency is inversely proportional to time taken when the total work remains constant.

Pipes & Cisterns

The concept is identical to Time & Work, with the only difference being that filling pipes have a positive efficiency while emptying pipes (or leaks) have a negative efficiency.

Work & Wages

Wages are always distributed in proportion to the actual amount of work done. If individuals work together for the exact same duration, their wages are divided in the ratio of their efficiencies.

Q54. Answer: (b) Rs. 24

Shortcut Trick

The difference between a single discount of (x + y)% and successive discounts of x% and y% is always given by the formula (x × y / 100)%.

Here, the first discount x = 20% and the second discount y = 12%.

Difference % = (20 × 12) / 100 = 2.4%

Difference in Amount = 2.4% of Rs. 1000

Difference = (2.4 / 100) × 1000 = Rs. 24

Therefore The correct answer is Rs. 24.

Alternate Method

Given:

Marked Price (MP) = Rs. 1,000

Single discount = 32%

Successive discounts = 20% and 12%

Formula Used:

Selling Price (SP) = MP × (1 − Discount / 100)

Effective Discount % = x + y − (x × y / 100)

MP = Rs. 1000

−32%

SP = Rs. 680

Discount = Rs. 320

−20%

After 1st = Rs. 800

−12%

SP = Rs. 704

Discount = Rs. 296

Diff = 320 − 296 = Rs. 24

Calculations:

Case 1: Single Discount of 32%

=> Discount Amount = 32% of 1000

=> Discount = (32 / 100) × 1000 = Rs. 320

Case 2: Successive Discounts of 20% and 12%

=> Effective Discount = 20 + 12 − (20 × 12 / 100)

=> Effective Discount = 32 − 2.4 = 29.6%

=> Discount Amount = 29.6% of 1000

=> Discount = (29.6 / 100) × 1000 = Rs. 296

Finding the difference:

=> Difference in discount amounts = Rs. 320 − Rs. 296

=> Difference = Rs. 24

Therefore The correct answer is Rs. 24.

Additional Information

Successive Discounts

When two consecutive discounts of x% and y% are applied, the final effective single discount is always given by the formula: [x + y − (x × y / 100)]%.

Flat vs Successive Discount

For a flat discount equal to (x + y)% and successive discounts of x% and y%, the successive discount value will always be smaller than the flat discount by exactly (x × y / 100)%.

Marked Price & Selling Price

Selling Price = Marked Price − Discount Amount. The discount percentage is always calculated based strictly on the Marked Price of an article.

Q55. Answer: (b) 34.12

Shortcut Trick

Let the assumed average be 16 runs.

Deviation of the first 23 matches = 42 − 16 = +26

Total net deviation = 23 × 26 = +598

Change in average for all 33 matches = +598 ÷ 33 = +18.1212...

Combined average = 16 + 18.12 = 34.12

Therefore The correct answer is 34.12 runs.

Alternate Method

Given:

Average runs scored in the first 23 matches = 42

Average runs scored in the next 10 matches = 16

Formula Used:

Overall Average = (Total sum of all items) ÷ (Total number of items)

23 Matches

Avg = 42

10 Matches

Avg = 16

• Total: 33 Matches | Avg = ?

Calculations:

=> Total runs in the first 23 matches = 23 × 42 = 966

=> Total runs in the next 10 matches = 10 × 16 = 160

=> Total runs in all 33 matches = 966 + 160 = 1126

=> Overall average of 33 matches = 1126 ÷ 33

=> Overall average ≈ 34.1212...

=> Overall average = 34.12

Therefore The correct answer is 34.12 runs.

Additional Information

Weighted Average

When two groups of quantities n1 and n2 have individual averages A1 and A2, the combined overall average is (n1 × A1 + n2 × A2) ÷ (n1 + n2).

Net Deviation Method

To calculate complex averages quickly, pick an assumed average and find the net deviation of the remaining data. The final average equals the Assumed Average + (Total Deviation ÷ Total Number of Items).

YourMockTest.com — Free Study Material

Batting Average

A batsman's average is the total number of runs they have scored divided by the total number of times they have played (or been dismissed, if specified).

Q56. Answer: (b) 26.67%

Shortcut Trick

Cost Price of 1 pen = 180 ÷ 12 = Rs. 15

Profit per pen = SP − CP = 19 − 15 = Rs. 4

Profit % = (Profit ÷ CP) × 100 = (4 ÷ 15) × 100 ≈ 26.67%

Therefore The correct answer is 26.67%.

Alternate Method

Given:

Cost Price of 1 dozen (12) pens = Rs. 180

Selling Price of 1 pen = Rs. 19

Formula Used:

Profit = Selling Price (SP) − Cost Price (CP)

Profit % = (Profit ÷ CP) × 100

CP = Rs. 15

SP = Rs. 19

Profit = Rs. 4

Profit % = (4 ÷ 15) × 100 ≈ 26.67%

Calculation:

=> Cost Price (CP) of 1 pen = 180 ÷ 12 = Rs. 15

=> Selling Price (SP) of 1 pen = Rs. 19

=> Profit = 19 − 15 = Rs. 4

=> Profit % = (Profit ÷ CP) × 100

=> Profit % = (4 ÷ 15) × 100

=> Profit % = 400 ÷ 15 = 80 ÷ 3

=> Profit % = 26.666... % ≈ 26.67%

Therefore The correct answer is 26.67%.

Additional Information

Profit & Loss Percentage

Profit or loss percentage is always calculated on the Cost Price (CP) unless stated otherwise. Loss % = (Loss ÷ CP) × 100.

Marked Price & Discount

Discount is always calculated on the Marked Price (MP). SP = MP − Discount.

Successive Discounts

If two successive discounts of a% and b% are given, then Net Discount = a + b − (a × b) ÷ 100.

Q57. Answer: (a) 24

Shortcut Trick

When the distance traveled is the same for both parts of the journey, the average speed can be found directly.

Average Speed = (2 × x × y) ÷ (x + y)

Here, the forward speed x = 20 km/hr and return speed y = 30 km/hr.

Average Speed = (2 × 20 × 30) ÷ (20 + 30) = 1200 ÷ 50 = 24 km/hr

Therefore The correct answer is 24 km/hr.

Alternate Method

Visakhapatnam

Nagpur

Speed = 20 km/hr

Speed = 30 km/hr

Distance = D

Given:

YourMockTest.com — Free Study Material

Speed from Visakhapatnam to Nagpur (S1) = 20 km/hr

Speed from Nagpur to Visakhapatnam (S2) = 30 km/hr

Formula Used:

Average Speed = Total Distance ÷ Total Time

Time = Distance ÷ Speed

Calculation:

Let the one-way distance between Visakhapatnam and Nagpur be D km.

=> Total distance for the entire journey = D + D = 2D km

=> Time taken for the forward journey (T1) = D ÷ 20 hours

=> Time taken for the return journey (T2) = D ÷ 30 hours

=> Total Time = (D ÷ 20) + (D ÷ 30)

=> Total Time = (3D + 2D) ÷ 60

=> Total Time = 5D ÷ 60 = D ÷ 12 hours

=> Average Speed = Total Distance ÷ Total Time

=> Average Speed = 2D ÷ (D ÷ 12)

=> Average Speed = 2D × (12 ÷ D) = 24 km/hr

Therefore The correct answer is 24 km/hr.

Additional Information

Average Speed for Different Distances

If a person travels non-equal distances D1, D2, D3 at corresponding speeds S1, S2, S3, then the Average Speed = (D1 + D2 + D3) ÷ (T1 + T2 + T3).

Average Speed for Three Equal Distances

If a person travels three equal distances at speeds x, y, and z respectively, the direct shortcut formula for average speed is (3 × x × y × z) ÷ (xy + yz + zx).

Relative Speed Concept

When two moving bodies are travelling in opposite directions, their relative speed is the sum of their individual speeds (S1 + S2). When travelling in the same direction, the relative speed is the difference of their speeds (S1 − S2).

Q58. Answer: (c) 1385

Shortcut Trick

Increasing a number by 100% means adding the number to itself, effectively making it 200% of the original value.

200% of the Number = 2770

Number = 2770 ÷ 2

Therefore The correct answer is 1385.

Alternate Method

Given:

A number when increased by 100% becomes 2770.

Original (100%)

Increase (+100%)

Total (200%) = 2770

? = 1385

Concept Used:

Let the original number be x. The original value represents 100%.

When increased by 100%, the new value is (100% + 100%) = 200% of x.

Calculations:

=> 200% of x = 2770

=> (200 ÷ 100) × x = 2770

=> 2 × x = 2770

=> x = 2770 ÷ 2

=> x = 1385

Therefore The correct answer is 1385.

Additional Information

Percentage Increase − Base Concept

New Value = Original Value × (1 + Percentage ÷ 100). For a 100% increase, the new value becomes exactly twice the original value.

Successive Percentage Change

If a number is successively changed by a% and b%, the effective percentage change is given by: a + b + (a × b) ÷ 100.

Base of Percentage

Always remember that any percentage increase or decrease is calculated on the original base value, which is always assumed to be exactly 100%.

Q59. Answer: (c) 117

Shortcut Trick

The product of two numbers is equal to the product of their HCF and LCM.

Second Number = (HCF × LCM) ÷ First Number

Second Number = (13 × 1170) ÷ 130

Second Number = 1170 ÷ 10 = 117

Therefore The correct answer is 117.

Alternate Method

Given:

HCF = 13

LCM = 1170

First Number = 130

Formula Used:

First Number × Second Number = HCF × LCM

Product of Numbers

130 × x

=

HCF × LCM

13 × 1170

x = 117

Calculations:

=> 130 × Second Number = 13 × 1170

=> Second Number = (13 × 1170) ÷ 130

=> Second Number = 1170 ÷ 10

=> Second Number = 117

Therefore The correct answer is 117.

Additional Information

HCF and LCM of Fractions

HCF = (HCF of Numerators) ÷ (LCM of Denominators) | LCM = (LCM of Numerators) ÷ (HCF of Denominators)

Co-prime Numbers

Two numbers are co-prime if their HCF is 1. The LCM of two co-prime numbers is always equal to their product.

Divisibility Property

The HCF of any set of numbers is always a factor of their LCM. The LCM is always a multiple of the HCF.

Q60. Answer: (d) -93x + 144

Shortcut Trick

Simplify fractions first: 6 ÷ 3 = 2

Expand terms directly:

=> $3(2x^2 - 23x + 18) - 6(x^2 + 4x - 15)$

=> $6x^2 - 69x + 54 - 6x^2 - 24x + 90$

=> $-93x + 144$

Therefore The correct answer is −93x + 144.

Alternate Method

Given:

Expression: $3((6 \div 3)x^2 - 23x + 18) - 6(x^2 + 4x - 15)$

Calculation:

$\Rightarrow 3(2x^2 - 23x + 18) - 6(x^2 + 4x - 15)$

Multiply 3 to each term in the first bracket:

$\Rightarrow (3 \times 2x^2) - (3 \times 23x) + (3 \times 18) = 6x^2 - 69x + 54$

Multiply -6 to each term in the second bracket:

$\Rightarrow (-6 \times x^2) - (6 \times 4x) - (-6 \times -15) = -6x^2 - 24x + 90$

Combine both expanded parts:

$\Rightarrow 6x^2 - 69x + 54 - 6x^2 - 24x + 90$

Group the like terms together:

$\Rightarrow (6x^2 - 6x^2) + (-69x - 24x) + (54 + 90)$

$\Rightarrow 0 - 93x + 144$

$\Rightarrow -93x + 144$

Therefore The correct answer is $-93x + 144$.

Additional Information

BODMAS Rule

Follow the order: Brackets, Orders (powers/roots), Division/Multiplication, Addition/Subtraction when simplifying any algebraic or numerical expression.

Combining Like Terms

Terms with the exact same variables and powers can be added or subtracted. For example, ax^2 and bx^2 combine to $(a + b)x^2$, but x^2 and x cannot be combined.

Distributive Property

Multiplying a value across terms inside a parenthesis: $a(b + c) = ab + ac$. Remember to distribute negative signs properly: $-a(b - c) = -ab + ac$.

Q61. Answer: (c) Rs. 750

Shortcut Trick

A discount of 25% is equivalent to the fraction 1/4.

Discount = (1/4) × List Price

$\Rightarrow$ Discount = (1/4) × 3000

$\Rightarrow$ Discount = 750

Therefore The correct answer is Rs. 750.

Alternate Method

Given:

List Price = Rs. 3,000

Discount Rate = 25%

Formula Used:

Discount = (Discount % ÷ 100) × List Price

List Price

Rs. 3000

Selling Price

Rs. 2250

− 25% Discount

Discount: Rs. 750

Calculations:

$\Rightarrow$ Discount = (25 ÷ 100) × 3000

$\Rightarrow$ Discount = 0.25 × 3000

$\Rightarrow$ Discount = 750

Therefore The correct answer is Rs. 750.

Additional Information

Selling Price Formula

Selling Price = List Price − Discount.

YourMockTest.com — Free Study Material

Successive Discounts

When two consecutive discounts D1% and D2% are given, the equivalent single discount is [D1 + D2 − (D1 × D2) ÷ 100]%.

Markup Percentage

Marked Price is generally set above the Cost Price to allow for discounts while still making a profit. Markup % = [(MP − CP) ÷ CP] × 100.

Q62. Answer: (c) Rs. 31,400

Shortcut Trick

Since the time of investment is the same, Investment Ratio = Profit Ratio.

Pawan's profit ratio = 2900 ÷ 11600 = 1/4 of total profit.

Aman's profit ratio = 1 − 1/4 = 3/4 of total profit.

Difference in ratio = 3/4 − 1/4 = 2/4 = 1/2 of total.

Difference in investment = 1/2 × 62800 = Rs. 31,400.

Therefore The correct answer is Rs. 31,400.

Alternate Method

Given:

Total Investment = Rs. 62,800

Total Profit = Rs. 11,600

Pawan's Profit = Rs. 2,900

Formula Used:

Profit Ratio = Investment Ratio × Time Ratio

When time is the same, Profit Ratio = Investment Ratio

Profit Ratio = Investment Ratio (Time is constant)

Aman

3 Parts (Rs. 8,700)

Pawan

1 Part (Rs. 2,900)

Total Investment = 4 Parts = Rs. 62,800

Difference = 2 Parts = Rs. 31,400

Calculations:

=> Aman's Profit = Total Profit − Pawan's Profit

=> Aman's Profit = 11600 − 2900 = Rs. 8,700

=> Ratio of Profit (Aman : Pawan) = 8700 : 2900 = 3 : 1

=> Ratio of Investment (Aman : Pawan) = 3 : 1

=> Total Investment = 3 + 1 = 4 parts

=> 4 parts = Rs. 62,800

=> 1 part = 62800 ÷ 4 = Rs. 15,700

=> Difference in Investment = 3 parts − 1 part = 2 parts

=> Difference = 2 × 15700 = Rs. 31,400

Therefore The correct answer is Rs. 31,400.

Additional Information

Partnership Basic Formula

Profit of A : Profit of B = (Investment of A × Time of A) : (Investment of B × Time of B).

When Time Period is Same

If partners invest for the same duration, their profit distribution ratio is strictly equal to their capital investment ratio.

Working vs Sleeping Partner

A working partner receives a fixed percentage or salary from the total profit before the remaining profit is divided based on capital and time.

Q63. Answer: (b) 18

Shortcut Trick

The product of two consecutive natural numbers is roughly equal to the square of the numbers.

=> √306 ≈ 17.49

The natural numbers immediately below and above this value are 17 and 18.
=> 17 × 18 = 306 (which satisfies the given condition).
The greater of the two numbers is 18.
Therefore The correct answer is 18.
Alternate Method
Given:
The product of two consecutive natural numbers = 306
Formula Used:
If the smaller natural number is x, the greater consecutive natural number will be (x + 1).
Calculations:
=> x × (x + 1) = 306
=> x2 + x = 306
=> x2 + x − 306 = 0
=> x2 + 18x − 17x − 306 = 0
=> x(x + 18) − 17(x + 18) = 0
=> (x − 17)(x + 18) = 0
=> x = 17 or x = −18
=> Since natural numbers are always positive, x cannot be negative. Hence, x = 17.
=> The greater number = x + 1 = 17 + 1 = 18.
Therefore The correct answer is 18.
Additional Information
Consecutive Numbers Property
The product of any two consecutive natural numbers is always an even number because one of them is always even.
Nature of Roots in Quadratic Equations
For an equation ax2 + bx + c = 0, the discriminant is D = b2 − 4ac. If D > 0, the roots are real and distinct.
Sum and Product of Roots
For a quadratic equation ax2 + bx + c = 0, the sum of the roots is −b/a and the product of the roots is c/a.

Q64. Answer: (b) 13.71

Shortcut Trick
The outer radius of a cylinder can be found directly using the Curved Surface Area (CSA) formula.
r = CSA ÷ (2 × π × h)
=> r = 7500 × 7 ÷ (2 × 22 × 87)
=> r = 52500 ÷ 3828
=> r ≈ 13.71 cm
Therefore The correct answer is 13.71 cm.
Alternate Method
r = ?
h = 87 cm
CSA = 7500 cm²
Given:
Curved surface area (CSA) of the cylinder = 7500 cm²
Length (height, h) of the cylinder = 87 cm
π = 22/7
Formula Used:
Curved Surface Area of a cylinder = 2 × π × r × h
Calculations:
=> 2 × (22/7) × r × 87 = 7500
=> (44/7) × 87 × r = 7500
=> (3828/7) × r = 7500
=> r = 7500 × 7 ÷ 3828
=> r = 52500 ÷ 3828

YourMockTest.com — Free Study Material

=> r ≈ 13.714... cm

=> r ≈ 13.71 cm

Therefore The correct answer is 13.71 cm.

Additional Information

Curved Surface Area of a Cylinder

It is the area of the curved surface, excluding the top and bottom circular bases. Formula: CSA = 2πrh

Total Surface Area of a Cylinder

It includes the curved surface area plus the areas of the two circular bases. Formula: TSA = 2πr(r + h)

Volume of a Cylinder

It measures the total three-dimensional space enclosed by the cylinder. Formula: V = πr²h

Q65. Answer: (a) 488

Shortcut Trick

Total parts in the ratio = 2 + 11 + 17 = 30 parts

Difference between largest (17) and smallest (2) parts = 17 − 2 = 15 parts

Since 15 parts is exactly half of the total 30 parts, the required difference is half the total amount.

Difference = 976 ÷ 2 = Rs. 488

Therefore The correct answer is Rs. 488.

Alternate Method

Given:

Total Amount = Rs. 976

Ratio of distribution = 2 : 11 : 17

Formula Used:

Share = (Ratio part ÷ Sum of all ratio parts) × Total Amount

Total Amount = Rs. 976 (30 parts)

2

11

17

Smallest Share = 2 parts, Largest Share = 17 parts

Difference = 17 − 2 = 15 parts

15 parts = (15 ÷ 30) × Rs. 976 = Rs. 488

Calculations:

=> Sum of all parts = 2 + 11 + 17 = 30

=> The largest share corresponds to 17 parts.

=> The smallest share corresponds to 2 parts.

=> Difference in parts = 17 − 2 = 15

=> Required difference in amount = (15 ÷ 30) × 976

=> Required difference = (1 ÷ 2) × 976

=> Required difference = 488

Therefore The correct answer is Rs. 488.

Additional Information

Dividing an Amount in a Given Ratio

If a total quantity T is to be divided into parts in the ratio a : b : c, then the respective parts are (a ÷ S) × T, (b ÷ S) × T, and (c ÷ S) × T, where S = a + b + c.

Direct Difference Method

Instead of calculating individual shares and then subtracting them, directly find the difference in their ratio parts and calculate the required amount. Difference = ((Largest part − Smallest part) ÷ Total parts) × Total Amount.

Simplifying Ratios

A ratio represents the relative sizes of two or more values. Multiplying or dividing all terms of a ratio by the same non-zero number does not change the ratio itself.

YourMockTest.com — Free Study Material

Q66. Answer: (a) 5

Shortcut Trick

The unit digit of the given number 869671195 is 5.

By the basic divisibility rule of 5, any number that ends with 0 or 5 is exactly divisible by 5.

Thus, we can directly conclude that the number is divisible by 5 without checking further.

Therefore The correct answer is 5.

Alternate Method

Given:

Number = 869671195

Calculations:

=> Let us verify the standard divisibility rules for all the given options to confirm.

=> Option 3 (12) and Option 4 (15) both require the number to be a multiple of 3.

=> Sum of the digits = 8 + 6 + 9 + 6 + 7 + 1 + 1 + 9 + 5 = 52

=> Since 52 is not divisible by 3, the given number is not divisible by 3. Thus, it cannot be divisible by 12 or 15.

=> Option 2 (13): We can verify divisibility by 13 by forming blocks of 3 digits from right to left (195, 671, 869) and taking their alternating sum.

=> Alternating sum = 869 − 671 + 195 = 393

=> Since 393 ÷ 13 yields a quotient of 30 and a remainder of 3, the number is not divisible by 13.

=> Option 1 (5): The last digit is 5, which satisfies the divisibility rule for 5.

Therefore The correct answer is 5.

Additional Information

Divisibility Rule of 3 & 9

A number is divisible by 3 (or 9) if the sum of all its digits is exactly divisible by 3 (or 9).

Divisibility Rule of 12 & 15

For a number to be divisible by a composite number like 12, it must be divisible by its co-prime factors (3 and 4). Similarly, for 15, it must be divisible by both 3 and 5.

Divisibility Rule of 13

A number is divisible by 13 if the alternating sum of its 3-digit blocks from right to left is 0 or a multiple of 13.

Q67. Answer: (d) 9,621

Shortcut Trick

The average of the ratio parts is (3 + 5 + 7) ÷ 3 = 5 parts.

Given the average price = Rs. 16,035, we can equate:

5 parts = Rs. 16,035 => 1 part = Rs. 3,207.

The price of the cheapest item corresponds to 3 parts.

Price = 3 × 3,207 = Rs. 9,621.

Therefore The correct answer is Rs. 9,621.

Alternate Method

Given:

Average price of three items of furniture = Rs. 16,035

Ratio of their prices = 3 : 5 : 7

Formula Used:

Sum of all observations = Average × Number of observations

3x

5x

7x

Total Sum = 15x = Rs. 48,105

Average = 5x = Rs. 16,035

Cheapest = 3x = Rs. 9,621

Calculations:

=> Let the prices of the three items be 3x, 5x, and 7x respectively.

=> Total price of the items = 3x + 5x + 7x = 15x

=> Total price is also equal to Average × 3 = 16,035 × 3 = Rs. 48,105

=> 15x = 48,105

=> x = 48,105 ÷ 15

=> x = Rs. 3,207

=> The price of the cheapest item is represented by 3x.

=> Cheapest item = 3 × 3,207 = Rs. 9,621

Therefore The correct answer is Rs. 9,621.

Additional Information

Averages

The average is the central value of a set of numbers. It is computed as Average = Sum of Values ÷ Number of Values.

Ratio Distribution

When a given quantity is divided into a ratio a : b : c, the share of the first part can be directly found using the formula: Part = (Total Quantity × a) ÷ (a + b + c).

Simplifying Ratio Problems

It is often faster to find the single unit value of a ratio (e.g. 1 part = Total ÷ Sum of ratio terms) and then multiply it by the desired ratio proportion.

Q68. Answer: (d) 1/(5250²³)

Shortcut Trick

When multiplying terms with the same exponent, we multiply their bases.

Formula: a^m × b^m × c^m = (a × b × c)^m

=> 14^(−23) × 25^(−23) × 15^(−23) = (14 × 25 × 15)^(−23)

=> 5250^(−23) = 1 / 5250^{23}

Therefore The correct answer is 1 / 5250^{23}.

Alternate Method

Given:

14^(−23) × 25^(−23) × 15^(−23)

Formula Used:

a^(−n) = 1 / a^n

1/a^n × 1/b^n × 1/c^n = 1 / (a × b × c)^n

Calculations:

=> 14^(−23) × 25^(−23) × 15^(−23)

=> (1 / 14^{23}) × (1 / 25^{23}) × (1 / 15^{23})

=> 1 / (14 × 25 × 15)^{23}

=> 1 / (350 × 15)^{23}

=> 1 / 5250^{23}

Therefore The correct answer is 1 / 5250^{23}.

Additional Information

Power of a Product

To raise a product to a power, apply the exponent to each factor: (a × b)^n = a^n × b^n.

Product Rule

When multiplying expressions with the same base, add their exponents: a^m × a^n = a^(m+n).

Negative Exponents

A negative exponent indicates the reciprocal of the base raised to the positive power: a^(−n) = 1 / a^n.

Zero Exponent Rule

Any non-zero base raised to the power of zero is equal to one: a^0 = 1 (where a ≠ 0).

Q69. Answer: (d) 53.9%

Shortcut Trick

Let Cost Price (CP) = 100.

Selling at 2/5 (or 40%) of Actual SP yields a 24% loss, so SP = 100 − 24 = 76.

Actual SP = 76 ÷ 0.40 = 190.

New Selling Price = 81% of 190 = 153.9.

Profit % = 153.9 − 100 = 53.9%.

Therefore The correct answer is 53.9%.

Alternate Method

Given:

Loss incurred = 24%

SP1 = 2/5 of Actual SP = 40% of Actual SP

New SP = 81% of Actual SP

76

SP1

100

CP

153.9

New SP

190

Actual SP

24% Loss

53.9% Profit

SP1 = 40% of Actual SP

Calculations:

=> Let Cost Price (CP) = 100

=> Selling price at 24% loss (SP1) = 100 − 24 = 76

=> We know that SP1 = 0.4 × Actual SP

=> 0.4 × Actual SP = 76

=> Actual SP = 76 ÷ 0.4 = 190

=> New SP = 81% of Actual SP

=> New SP = 0.81 × 190 = 153.9

=> Profit = New SP − CP = 153.9 − 100 = 53.9

=> Profit % = (53.9 ÷ 100) × 100 = 53.9%

Therefore The correct answer is 53.9%.

Additional Information

Profit and Loss Basic Formulas

Profit % = (Profit ÷ CP) × 100 | Loss % = (Loss ÷ CP) × 100. Both are always calculated on the Cost Price (CP) unless specified otherwise.

Fraction to Percentage Conversion

Converting fractions directly to percentages helps save calculation time. E.g., 2/5 = 40%, 1/4 = 25%, 3/4 = 75%.

Relation between CP and SP

When there is a profit: SP = CP × (100 + P%) ÷ 100. When there is a loss: SP = CP × (100 − L%) ÷ 100.

Q70. Answer: (b) 104

Shortcut Trick

For two numbers a and b, the third proportional is calculated directly as $b^2 \div a$.

Given the numbers a = 26 and b = 52.

Third proportional (x) = (52 × 52) ÷ 26

=> x = 52 × 2 = 104

Therefore The correct answer is 104.

Alternate Method

Given:

The first two numbers are 26 and 52.

The third proportional is x.

Formula Used:

If three numbers a, b, and c are in continued proportion, then a : b :: b : c.

In any proportion, Product of Extremes = Product of Means.

YourMockTest.com — Free Study Material

26

:

52

::

52

:

x

Product of Extremes

Product of Means

Calculations:

=> 26 : 52 :: 52 : x

=> 26 × x = 52 × 52

=> x = (52 × 52) ÷ 26

=> x = 52 × 2

=> x = 104

Therefore The correct answer is 104.

Additional Information

Fourth Proportional

If four numbers a, b, c, and d are in proportion (a : b :: c : d), then d is known as the fourth proportional. It can be found using the formula: d = (b × c) ÷ a.

Mean Proportional

The mean proportional between any two numbers a and b acts as the middle term in a continued proportion and is calculated as √(a × b).

Continued Proportion

Three non-zero numbers a, b, and c are said to be in continued proportion if the ratio of the first to the second is equal to the ratio of the second to the third (a : b = b : c).

Q71. Answer: (b) 3 km towards east

Given:

Priya starts from Point Y and drives 12 km towards the east.

She then takes a right turn, drives 10 km.

She then turns right and drives 15 km.

She takes a final right turn, drives 10 km and stops at Point Z.

So, She should drive 3 km towards east in order to reach Point Y again.

Hence, the correct answer is "Option 2".

Q72. Answer: (c) 144

The logic followed here is:

thus, "144" will replace the question mark in the given series.

Hence, the correct option is "Option 3".

Q73. Answer: (d) (33, 100, 301)

The logic followed here is:

Logic: second = first × 3 + 1 and third = second × 3 + 1

(23, 70, 211)

=> 23 × 3 = 69 → 69 + 1 = 70

=> 70 × 3 = 210 → 210 + 1 = 211

(12, 37, 112)

=> 12 × 3 = 36 → 36 + 1 = 37

=> 37 × 3 = 111 → 111 + 1 = 112

Now, checking the options:

Option 1) (5, 16, 48)

=>22 × 3 + 1 = 67 (given 48)

Option 2) (22, 45, 105)
=> 22 × 3 + 1 = 67 (given 45)
Option 3) (18, 54, 153)
=> 18 × 3 + 1 = 55 (given 54)
Option 4) (33, 100, 301)
=> 33 × 3 + 1 = 100
=> 100 × 3 + 1 = 301
Hence, the correct option is "Option 4"

Q74. Answer: (c) COIN - OICN - NIOC

Now,
LONG - ONLG - GNOL
EARN - AREN - NRAE
Let's check each Option One by One.
Option 1) CUTE - UCTE - EUTC

C	U	T	E
1	2	3	4
U	C	T	E
2	1	3	4
E	U	T	C
4	2	3	1

Option 2) BACK - ACBK - ACKB

B	A	C	K
1	2	3	4
A	C	B	K
2	3	1	4
A	C	K	B
2	3	4	1

Option 3) COIN - OICN - NIOC

C	O	I	N
1	2	3	4
O	I	C	N
2	3	1	4
N	I	O	C
4	3	2	1

Option 4) SKIP - SIKP - PIKS

S	K	I	P
1	2	3	4
S	I	K	P
1	3	2	4
P	I	K	S
4	3	2	1

So, Only COIN - OICN - NIOC follows the pattern of given letter cluster.

YourMockTest.com — Free Study Material

Hence, the correct answer is 'Option 3'.

Q75. Answer: (c) One

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

1) V is kept second from the bottom.

2) Only three boxes are kept between V and W.

3) X is kept at one of the positions below V.

4) Only E is kept between W and G.

5) U is kept at one of the positions above W.

U
W
E
G
F
V
X

So, there is 'One' boxes are kept between F and X.

Hence, the correct answer is "Option 3".

Q76. Answer: (b) NFAQ

The logic followed here is:

For, YELP is related to BZOK

For, EURF is related to HPUA

Similarly, for KKXV

So, KKXV will be related to NFAQ

Hence, the correct answer is "Option 2".

Q77. Answer: (c) 11

Given numbers: 257146983

Digits of 257146983 arranged in ascending order:

1, 2, 3, 4, 5, 6, 7, 8, 9

Third from the left = 3

Second from the right = 8

So, Sum = 3 + 8 = 11

Hence, the correct answer is 'Option 3'.

Q78. Answer: (c) NKGO

The logic followed here is:

For, JGCK is related to HEAI

For, MJFN is related to KHDL

Similarly, for PMIQ

So, PMIQ will be related to NKGO

Hence, the correct answer is "Option 3".

Q79. Answer: (a) Two

Given: Seven people, B, C, D, E, F, G and L, are sitting in a row facing North.

1) Only three people sit between D and G.

2) C sits to the immediate left of G.

3) No one sits to the right of L.

4) Only two people sit between L and C.

5) B sits to the immediate right of E.

YourMockTest.com — Free Study Material

So, There are Two people sit between F and B.
Hence, the correct answer is "Option 1".

Q80. Answer: (d) 5

Given: Seven people A, B, C, D, E, F and G are sitting in a row, facing north.
1) No one sits to the right of D.
2) Only three people sit between D and F.
3) Only two people sit between F and A.
4) G sits third to the left of B.
5) C sits to the immediate right of B.
So, There are 5 people sit to the right of E.
Hence, the correct answer is "Option 4".

Q81. Answer: (c) 31

BODMAS Table:
Given equation: 23 D 16 A 4 C 6 B 2 = ?
Now,
Replace symbols: D = −, A = ÷, C = +, B = ×.
Expression: 23−16 ÷ 4+ 6 × 2.
Calculate division and multiplication first: 16÷4=4, 6×2=12.
Now:
23 - 4 + 12 = 3123−4+12=31.
Hence, the correct answer is "Option 3".

Q82. Answer: (a) 9

The logic followed here is:
Given Number: 7452318
Arrange digits of 7452318 in ascending order: 1 2 3 4 5 7 8.
Second from the left = 2
Second from the right = 7
So, Sum = 2 + 7 = 9
Hence, the correct answer is 'Option 1'.

Q83. Answer: (a) UND 56

The logic followed here is:
So, 'UND 56' will replace the question mark in the given series.
Hence, the correct answer is "Option 1".

Q84. Answer: (d) 3

The logic followed here is:
From DIRT → 5274
D = 5, I = 2, R = 7, T = 4
From TIDY → 4352
T = 4 (matches)
I = 3? No — check position-wise mapping.
From DIRT → 5274, codes of D, I, R, T are known.
In TIDY → 4352, codes 4 (T), 5 (D), 2 (I) are already used.
The remaining code 3 is for Y.
Hence, the correct answer is 'Option 4'.

Q85. Answer: (b) GOE

The logic followed here is:
So, 'GOE' will replace the question mark in the given series.
Hence, the correct answer is "Option 2".

YourMockTest.com — Free Study Material

Q86. Answer: (c) WA-RI

The logic followed here is:

Option 1) NR-IA

Option 2) CG-XP

Option 3) WA-RI

Option 4) HL-CU

Here, 'WA-RI' is odd among the given options.

Hence, the correct answer is "Option 3".

Q87. Answer: (d) 35

The logic followed here is:

thus, "35" will replace the question mark in the given series.

Hence, the correct option is "Option 4".

Q88. Answer: (a) Only conclusion (I) follows.

Given Statements:

All cartons are boxes.

No box is a sheet.

The least possible Venn diagram for the given statement is:

Conclusions:

(I) No carton is a sheet:

Since Cartons are entirely inside Boxes, and Boxes have no overlap with Sheets, it follows that Cartons also have no overlap with Sheets.

(II) Some sheets are boxes:

This is the contradiction of Statement 2 (No box is a sheet).

If "No box is a sheet" is true, then "Some sheets are boxes" (meaning some Sheets are also Boxes) must be false.

So, Only conclusion (I) follows.

Hence, the correct answer is "Option 1".

Q89. Answer: (d) 52

The logic followed here is:

Wasim's rank from the top = 24th

Wasim's rank from the bottom = 29th

Total students = (Rank from top) + (Rank from bottom) − 1

= 24 + 29 − 1 = 52

Hence, the correct answer is 'Option 4'.

Q90. Answer: (d) 1

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

1) D is kept second from the bottom.

2) Only three boxes are kept between D and E.

3) B is kept at one of the positions below D.

4) Only A is kept between E and C.

5) F is kept at one of the positions above E.

F
E
A
C
G
D
B

YourMockTest.com — Free Study Material

So, '1' box is kept below D.

Hence, the correct answer is "Option 4".

Q91. Answer: (a) Mother's brother's daughter

Family Chart:

Decoding the Symbols:

Symbol	%	=	¥	#
Meaning	Daughter	Wife	Father	Brother

Given: W% A#K= E ¥ S

It means:

W is the Brother of A

A is the Brother of K

K is the Wife of E

E is the Father of S.

So, W is the Mother's brother's daughter of S.

Hence, the correct answer is "Option 1".

Q92. Answer: (b) 86

The logic followed here is:

thus, "86" will replace the question mark in the given series.

Hence, the correct option is "Option 2".

Q93. Answer: (b) FI-KM

The logic followed here is:

Option 1) ZC-EH

Option 2) FI-KM

Option 3) TW-YB

Option 4) JM-OR

Here, 'FI-KM' is odd among the given options.

Hence, the correct answer is "Option 2".

Q94. Answer: (c) Neither conclusion (I) nor (II) follows.

Given Statements:

No Buffaloes are Cats.

Some Cats are Turkeys.

The least possible Venn diagram for the given statement is:

Conclusions:

I. No Buffaloes are Turkeys:

This conclusion suggests that the sets for Buffaloes and Turkeys are entirely separate.

The statements only tell us that Buffaloes cannot be Cats. They say nothing definitive about the relationship between Buffaloes and Turkeys.

II. Some Buffaloes are Turkeys:

This conclusion suggests that the sets for Buffaloes and Turkeys must overlap

So, Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 3".

Q95. Answer: (a) 19

BODMAS Table:

Given equation: 9 − 4 + 24 ÷ 21 × 3 = ?

Now, if '+' and '-' and '×' and '÷' are interchanged, then:

=> 9 × 4 − 24 + 21 ÷ 3 = ?

=> 36 − 24 + 7 = ?

=> 12 + 7 = 19.

YourMockTest.com — Free Study Material

Hence, the correct answer is "Option 1".

Q96. Answer: (a) Two

Given: (Left) 268 667 457 856 426 (Right)

If 1 is subtracted from the first digit of every number, we get

268 → first digit becomes 2 − 1 = 1; third digit = 8 → 8 ÷ 1 = 8 (divisible)

667 → first digit becomes 6 − 1 = 5; third digit = 7 → 7 ÷ 5 (not divisible)

457 → first digit becomes 4 − 1 = 3; third digit = 7 → 7 ÷ 3 (not divisible)

856 → first digit becomes 8 − 1 = 7; third digit = 6 → 6 ÷ 7 (not divisible)

426 → first digit becomes 4 − 1 = 3; third digit = 6 → 6 ÷ 3 = 2 (divisible)

So, There are Two such digits.

Hence, the correct answer is 'Option 1'.

Q97. Answer: (b) QT-XP

The logic followed here is:

Option 1) OR-VM

Option 2) QT-XP

Option 3) MP-TK

Option 4) KN-RI

Here, 'QT-XP' is odd among the given options.

Hence, the correct answer is "Option 2".

Q98. Answer: (c) 7 km to the south

Given:

Luv starts from Point A and drives 8 km towards the east.

He then takes a right turn and drives 5 km, then turns right and drives 11 km.

He then takes a right turn and drives 12 km.

He takes a final right turn, drives 3 km and stops at Point P.

So, He should drive 7 km to the south in order to reach Point A again.

Hence, the correct answer is "Option 3".

Q99. Answer: (b) 72

Given: (Left) 893 620 514 487 928 (Right)

LCM of: 9, 2, 1, 8, 2

LCM(9, 2, 1, 8, 2):

LCM(2, 1) = 2

LCM(2, 8) = 8

LCM(8, 9) = 72

So, Final LCM = 72

Hence, the correct answer is 'Option 2'.

Q100. Answer: (b) 9

The logic followed here is:

‘BODY’ is coded as ‘2469’

B	O	D	Y
2	4	6	9

‘DICE’ is coded as ‘1593’

D	I	C	E
1	5	9	3

So, DICE → 1593, D corresponds to 1.

Hence, the correct answer is 'Option 2'.

YourMockTest.com — Free Study Material

More previous year papers and mock tests: **www.yourmocktest.com/pyq**

YourMockTest.com — Free Study Material