RRB NTPC (UG) CBT-I Official Paper (Held On: 04 Sept, 2025 Shift 2) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. Durgapur Steel Plant of West Bengal is situated on the banks of which river?

(a) Damodar
(b) Teesta
(c) Mahananda
(d) Hooghly

Q2. What is the primary purpose of Judicial Review in India?

(a) To examine the constitutionality of laws
(b) To amend the Constitution
(c) To appoint ministers
(d) To elect judges

Q3. Within how many days must information be provided under the RTI Act for general requests?

(a) 30 days
(b) 20 days
(c) 60 days
(d) 15 days

Q4. On which of the following dates did Mahatma Gandhi begin a 21-day fast of selfpurification to support the Harijan movement?

(a) 9 March 1930
(b) 7 May 1923
(c) 8 September 1927
(d) 8 May 1933

Q5. Which of the following was NOT a part of the New Economic Policy reforms introduced in 1991?

(a) Liberalisation
(b) Globalisation
(c) Privatisation
(d) Nationalisation of banks

Q6. The Indian Army celebrated its 77th Army Day at Pune on which date, which marked the third occasion that the Army Day Parade was held outside Delhi?

(a) 5 March 2025
(b) 5 February 2025
(c) 15 February 2025
(d) 15 January 2025

Q7. Who headed the Diwan-i-Arz and was responsible for managing soldiers, branding horses, and administering war provisions?

(a) Naib
(b) Amir-i-Dad
(c) Ariz-i-Mumalik
(d) Dabir-i-Khas

Q8. How did globalisation impact Indian industries?

(a) Made them weaker
(b) Banned private companies
(c) Gave more competition and modern technology
(d) Closed them down

Q9. Which one of the following statements correctly explains the cause of volcanism?

(a) It results from molten rock rising from the Earth's interior.
(b) It is caused by excessive surface erosion.
(c) It happens because of atmospheric disturbances.
(d) It is due to the movement of glaciers.

Q10. Social life in the Vedic period was divided into how many ashramas?

(a) Four
(b) Three
(c) Six
(d) Ten

Q11. Which statement best differentiates ROM from RAM in terms of volatility and usage?

(a) RAM is volatile and stores temporary data; ROM is non-volatile and stores boot instructions
(b) ROM is used for multitasking; RAM is used for storing BIOS.
(c) ROM is volatile and used for running programs; RAM is non-volatile and stores firmware.
(d) RAM is permanent; ROM is temporary.

Q12. The first session of the Indian National Congress was presided by _____.

(a) Gopal Krishna Gokhale
(b) Dadabhai Naoroji
(c) Mahadev Govind Ranade
(d) Womesh Chandra Bonnerjee

Q13. Which of the following could be regarded as the only positive outcome of the British reforms in India?

(a) Deindustrialisation
(b) Ruralisation
(c) One-way free trade
(d) Social reform laws

Q14. In February 2025, which Indian agency launched a Rs. 500-crore Technology Adoption Fund to support early-stage space startups and reduce import dependency?

(a) Antrix Corporation
(b) ISRO
(c) DRDO
(d) IN-SPACe

Q15. The Eleventh Schedule of the Constitution was introduced through the 73rd Amendment. What is its significance in the context of Panchayati Raj?

(a) It outlines administrative powers of the Gram Sabha.
(b) It lists subjects to be legislated by the Union government
(c) It specifies 29 functional subjects to be devolved to Panchayats by States.

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(d) It specifies 44 functional subjects to be devolved to Panchayats by States.

Q16. Who became the Chief Minister of Delhi after the February 2025 Legislative Assembly elections?

(a) Arvind Kejriwal
(b) Parvesh Verma
(c) Atishi Marlena
(d) Rekha Gupta

Q17. According to a March 2025 PIB report, India's defence production reached Rs. 1.27 trillion in FY 2023-24, showing an increase of what percentage from FY 2014-15?

(a) 200%
(b) 174%
(c) 130%
(d) 151%

Q18. The Appropriation Bill 2025, was introduced in the Lok Sabha by which Ministry?

(a) Ministry of External Affairs
(b) Ministry of Defence
(c) Ministry of Finance
(d) Ministry of Home Affairs

Q19. In which of the following years was Amazon.in launched in India?

(a) 2013
(b) 2008
(c) 2015
(d) 2010

Q20. Where was the 12th International Tourism Mart (ITM) held in November 2024 to promote Northeast India's tourism potential?

(a) Imphal, Manipur
(b) Kaziranga, Assam
(c) Aizawl, Mizoram
(d) Shillong, Meghalaya

Q21. What is the known equation that connects the concentration of a buffer solution's constituents, weak acid/salt or weak base/salt, and its pH?

(a) Arrhenius equation
(b) Nernst - Boyle equation
(c) Henderson-Hasselbalch equation
(d) Van't Hoff equation

Q22. Which of the following is not a function of biosphere reserves?

(a) Cultural heritage preservation
(b) Promotion of monoculture farming
(c) Sustainable development of local communities
(d) Conservation of biodiversity

Q23. Which sector was the largest contributor to India's GDP between 1947 and 1991?

(a) Service sector
(b) Agriculture sector
(c) Industrial sector
(d) Financial sector

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Q24. Which of the following is considered a non-renewable natural resource?

(a) Wind energy
(b) Forests
(c) Solar energy
(d) Natural gas

Q25. In which of the following years was Sanskrit declared a Classical Language in India?

(a) 2005
(b) 2003
(c) 2010
(d) 2002

Q26. Which of the following cities hosted the 2025 Conferences of the Parties for the Basel, Rotterdam and Stockholm Conventions (BRS COPs)?

(a) Geneva
(b) Rotterdam
(c) Stockholm
(d) Hong Kong

Q27. The Banking Laws (Amendment) Bill passed in the Rajya Sabha in March 2025 extended the tenure of Directors of co-operative banks to how many years?

(a) 10 years
(b) 6 years
(c) 9 years
(d) 8 years

Q28. Which of the following organisations unveiled the country's first five Carbon Capture and Utilisation (CCU) testbeds in the cement sector in May 2025?

(a) Indian Space Research Organisation (ISRO)
(b) Union Ministry of Environment, Forest and Climate Change (MoEFCC)
(c) Department of Science and Technology (DST), Government of India
(d) Defence Research and Development Organisation (DRDO)

Q29. The retreating monsoon causes rainfall mainly in _____.

(a) Assam
(b) Tamil Nadu
(c) Maharashtra
(d) Punjab

Q30. In an optical fibre, the core is made of a _____.

(a) material with higher refractive index
(b) material with lower refractive index
(c) material with higher density
(d) material with lower density

Q31. Which Indian actress was honoured at Cannes 2025 as part of the 'Women in Cinema' initiative?

(a) Deepika Padukone
(b) Jacqueline Fernandez
(c) Priyanka Chopra
(d) Alia Bhatt

Q32. Which Constitutional Amendment has most recently extended the reservation of seats for Scheduled Castes (SCs) and Scheduled Tribes (STs) in the Lok Sabha and State Legislative Assemblies for another ten years?

(a) 15th Amendment
(b) 42nd Amendment

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(c) 104th Amendment
(d) 61st Amendment

Q33. A person who migrated from Pakistan after 19 July 1948 could become an Indian citizen, only if:
(a) he was registered by an officer of the Dominion of India
(b) he was a resident of Pakistan in 1948
(c) he took an oath of allegiance
(d) he was born in India before 1947

Q34. Shambhu Maharaj, awarded the Sangeet Natak Akademi Fellowship in 1967, was renowned for his contribution to which of the following Indian art forms?
(a) Carnatic music
(b) Bharatanatyam dance
(c) Hindustani classical music
(d) Kathak dance

Q35. What is the industrial name for calcium sulphate hemihydrate?
(a) Gypsum
(b) Quick lime
(c) Plaster of Paris
(d) Slaked lime

Q36. Which of the following is the highest Himalayan peak located in India (excluding POK)?
(a) Dhaulagiri
(b) Kanchenjunga
(c) Mount Everest
(d) Nanga Parbat

Q37. Which of the following is a good way to organise files in Windows?
(a) Store all files on the desktop
(b) Create separate folders for different types of files
(c) Keep files with different subjects in one folder
(d) Rename all files with random numbers

Q38. Who was awarded the Major Dhyan Chand Khel Ratna Award 2024 for becoming the youngest World Chess Champion in January 2025?
(a) Arjun Erigaisi
(b) Nihal Sarin
(c) R Praggnanandhaa
(d) Gukesh D

Q39. Who was elected as the President of Lebanon in January 2025, ending a two-year vacancy?
(a) Hassan Diab
(b) Michel Aoun
(c) Joseph Aoun
(d) Saad Harir

Q40. In May 2024, the World Health Organization (WHO) prequalified the QDENGA vaccine developed by Takeda Pharmaceuticals. This vaccine is designed to protect against which disease?
(a) Dengue
(b) Malaria
(c) Chikungunya
(d) Zika

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MATHEMATICS

Q41. 4 years ago, the age of a father was 33 years more than twice his son's age. After how many years, from now, will he be twice his son's age?

(a) 29
(b) 28
(c) 34
(d) 25

Q42. One diagonal and perimeter of a rhombus are 16 cm and 40 cm, respectively. Find the other diagonal.

(a) 10 cm
(b) 12 cm
(c) 11 cm
(d) 14 cm

Q43. A woman travels 432 km at 72 km/hr, a second distance of 275 km at 55 km/hr and a third distance of 680 km at 85 km/hr. Find her average speed for the whole journey (in km/hr).

(a) 76
(b) 80
(c) 66
(d) 73

Q44. The value of √169+√0.0324-√7.29 is _____

(a) 16.76
(b) 4.97
(c) 7.76
(d) 10.48

Q45. The marks scored by 10 students are given below.

10, 13, 17, 11, 11, 13, 14, 16, 13, 13

The mode of the data is:

(a) 13
(b) 11
(c) 17
(d) 10

Q46. In triangle ABC, BD ? AC at D and angle DBC = 63°. E is a point on BC such that angle CAE = 76°. What is the measure of angle AEB?

(a) 91°
(b) 103°
(c) 105°
(d) 96°

Q47. Ayushi bought a toy for Rs. 461, decorated it at a cost of Rs. 15, and sold the toy for Rs. 918. Find the loss or gain percentage.

(a) 660/7% loss
(b) 650/7% loss
(c) 650/7% profit
(d) 650% profit

Q48. The simple interest on a certain sum for 45/9 years at the rate of 3.6% per annum is Rs. 5,453. What will be the amount payable on the same sum at the rate of 2.7% per annum simple interest in 62/9 years?

(a) Rs. 38,841
(b) Rs. 38,819

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(c) Rs. 38,828
(d) Rs. 38,836

Q49. Find the simple interest (in Rs.) if a sum of Rs. 400 is borrowed for 5.5 years at 8% per annum rate of interest.
(a) 176
(b) 276
(c) 156
(d) 226

Q50. The H.C.F. and the L.C.M. of two numbers are 2 and 410, respectively. If one of the numbers is 82, find the other one.
(a) 54
(b) 93
(c) 10
(d) 11

Q51. The income of Raman is Rs. 34,000. He saves 28% of his income. If his income increases by 11% and expenditure increases by 30%, then his savings will:
(a) decrease by Rs. 3,604
(b) decrease by Rs. 5,649
(c) increase by Rs. 3,644
(d) increase by Rs. 5,639

Q52. The value of $\sqrt{169}+\sqrt{0.04}-\sqrt{6.76}$ is _____.
(a) 9.88
(b) 10.57
(c) 10.6
(d) 14.94

Q53. By selling an article at 3/8 of its actual selling price, Nirbhay incurs a loss of 13%. If he sells it at 70% of its actual selling price, then the profit percentage is:
(a) 60.5%
(b) 63.3%
(c) 63.5%
(d) 62.4%

Q54. The sides of a triangle are 72 cm, 97 cm, and 65 cm. What is its area? (in cm^2)
(a) 2323
(b) 2355
(c) 2340
(d) 2378

Q55. A wholesaler increases the cost price of an item by 90% while marking it. He then offers a 60% discount on this marked price but finds that he incurs a loss. If the wholesaler wants to achieve no profit and no loss, by what percentage should he change the selling price of the item? (Rounded to one decimal place.)
(a) 32.1% decrease
(b) 35.7% decrease
(c) 31.6% increase
(d) 34.5% increase

Q56. The average of first 157 even numbers is
(a) 158.5
(b) 157.5
(c) 159
(d) 158

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Q57. The H.C.F. and the L.C.M. of two numbers are 28 and 840, respectively. If one of the numbers is 168, find the other one.

(a) 140
(b) 196
(c) 84
(d) 112

Q58. An amount of Rs. 432 is divided among three persons in the ratio of 5 : 14 : 17. The difference between the largest and the smallest shares (in Rs.) in the distribution is:

(a) 144
(b) 62
(c) 178
(d) 132

Q59. A kurta is marked for Rs. 750 and sold for Rs. 660. The rate of discount is:

(a) 14%
(b) 15%
(c) 12%
(d) 20%

Q60. Find the mean proportional between 15 and 240.

(a) 60
(b) 58
(c) 63
(d) 57

Q61. If $P = \sec\theta + \tan\theta$, then the value of $(P^2+1)/2P$ is

(a) 1
(b) $\tan\theta$
(c) 0
(d) $\sec\theta$

Q62. The product of two consecutive natural numbers is 272. The greater of the two numbers is:

(a) 9
(b) 36
(c) 28
(d) 17

Q63. Pipe A can fill a tank in 17 hours, pipe B can fill the same tank in 27 hours and pipe C can fill the same tank in 12 hours. The time taken by them to fill the same tank if they operate together is::

(a) 14191/329 hours
(b) 13191/329 hours
(c) 5191/329 hours
(d) 10191/329 hours

Q64. Simplify: $x(3x - 6) + 4(x^2 - 5) + 15$

(a) $-7x^2 - 6x + 5$
(b) -7x2 -6x - 5
(c) 7x2 -6x + 5
(d) 7x2 -6x - 5

Q65. Pipe P can fill 5/9 part of a tank in 25 hours, and pipe Q can fill 3/7 part of the same tank in 27 hours. Both P and Q were kept open for 3 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in 4 hours. Pipes P, Q and R together can fill the empty tank in:

(a) 108 hours

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(b) 93 hours
(c) 105 hours
(d) 112 hours

Q66. Rs. 13,700 were divided among A, B and C such that 4 times the share of A = 7 times the share of B = 2 times the share of C. Find the share of A.
(a) Rs. 3,921
(b) Rs. 3,836
(c) Rs. 3,988
(d) Rs. 3,664

Q67. A man walks to a viewpoint and returns to the starting point by his car maintaining constant speed and thus takes a total time of 7 hours 45 minutes. He would have gained 6 hours by driving both ways. How long would it have taken for him to walk both ways with same walking speed?
(a) 13 hours 45 minutes
(b) 14 hours 15 minutes
(c) 13 hours 30 minutes
(d) 12 hours 45 minutes

Q68. The LCM of the numbers 2.8 and 0.217 is:
(a) 86.8
(b) 8.68
(c) 0.868
(d) 868

Q69. Evaluate 34^2
(a) 1166
(b) 1186
(c) 1156
(d) 1176

Q70. By how much is 65% of 65 greater than 3/5 of 45?
(a) 9.25
(b) 15.25
(c) 13.25
(d) 12.25

GENERAL INTELLIGENCE AND REASONING

Q71. FJEC is related to LPKI in a certain way based on the English alphabetical order. In the same way, IMHF is related to OSNL. To which of the following is LPKI related, following the same logic?
(a) VROQ
(b) RVOQ
(c) RVQO
(d) VRQO

Q72. In a certain code language, ‘TEAR’ is coded as ‘7165’ and ‘SEAT’ is coded as ‘5678’. What is the code for ‘S’ in the given code language?
(a) 8
(b) 5
(c) 7
(d) 6

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Q73. Samad starts from Point A and drives 15 km towards East. He then takes a left turn, drives 6 km, turns left and drives 12 km. He then takes a left turn and drives 8 km. He takes a final right turn, drives 3 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 2 km towards North
(b) 4 km towards South
(c) 2 km towards West
(d) 4 km towards North

Q74. Seven boxes V, W, X, Y, Z, Q and R are kept one over the other but not necessarily in the same order. No box is kept above Z. Only three boxes are kept between Z and W. Only one box is kept between V and R. R is kept immediately above W. Only four boxes are kept between V and X. Q is kept at some place above Y. Which box is kept second below Q?

(a) Y
(b) R
(c) X
(d) W

Q75. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only. (Note: All numbers are single digit numbers only).

(Left) 4 7 + $ £ 3 & 8 5 @ 1 Ω # * % 6 2 9 (Right)

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

(a) 0
(b) 2
(c) 1
(d) 3

Q76. Mayank ranked 39th from the top and 11th from the bottom in his class. How many students are there in his class?

(a) 49
(b) 48
(c) 47
(d) 50

Q77. What should come in place of the question mark (?) in the given series?

550 555 565 570 580 585 ? 600

(a) 610
(b) 595
(c) 590
(d) 605

Q78. Seven boxes P, Q, R, S, X, Y and Z are kept one over the other, but not necessarily in the same order. Only S is kept above X. Only two boxes are kept between X and Z. Only P is kept below R. Q is not kept immediately above Z. How many boxes are kept between Y and P?

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

Q79. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

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

(a) EHC
(b) NQK
(c) YBW

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(d) SVQ

Q80. 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) LQ-NJ
(b) NS-PK
(c) JO-LH
(d) HM-JF

Q81. Sumit, Jatin, Ramesh, Priya, Kavita and Manoj are sitting in a straight line, facing north. Sumit sits third from the left end. Manoj sits second to the right of Sumit. Jatin sits to the immediate left of Kavita. Priya does not sit at the end. Who sits second to the left of Priya?

(a) Ramesh
(b) Manoj
(c) Kavita
(d) Sumit

Q82. What should come in place of the question mark (?) in the given series?

16 28 50 82 124 ?

(a) 162
(b) 176
(c) 194
(d) 185

Q83. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

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

(a) RXT
(b) MSO
(c) FLG
(d) IOK

Q84. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

All mugs are cups.

Some mugs are forks.

Conclusions:

(I): Some cups are forks.

(II): Some forks are mugs.

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

Q85. 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.

BOAD - OBAD - BADO

DUCK - UDCK - DCKU

(a) CAME - ACME - AMEC
(b) HEAP - EHAP - PEAH
(c) FEAN - EFAN - FANE

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(d) RUSK - RSUK - KSUR

Q86. A is the sister of H. H is the mother of R. R is the son of M. G is the mother of M. How is A related to M?

(a) Son's daughter
(b) Son's wife's mother
(c) Wife's sister
(d) Son's wife's sister

Q87. Each of the digits in the number 4796583 is arranged in the ascending order from left to right. What will be the sum of the digits that are first from the left and first from the right in the new number thus formed?

(a) 9
(b) 10
(c) 7
(d) 12

Q88. What should come in place of the question mark (?) in the given series?

24 ? 45 66 94 129

(a) 44
(b) 41
(c) 31
(d) 38

Q89. Refer to the following number and symbol series and answer the question that follows. All numbers are single-digit. Counting to be done from left to right.

(Left) + # 5 3 $ Ω 4 ? 9 1 & % 7 * @ 2 £ 6 8 (Right)

How many such symbols are there, each of which is immediately preceded by a symbol and also immediately followed by an even number?

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

Q90. Amit started from Point A and travelled 9 km east. He then turned right and travelled 6 km. He then turned right and travelled 7 km. He finally turned right and travelled 6 km to stop at Point E. What is the shortest distance between Point E and Point A? (All turns are 90-degree turns only.)

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

Q91. In a certain code language, ‘EXAM’ is coded as ‘3579’ and ‘HAME’ is coded as ‘5327’. What is the code for ‘H’ in the given code language?

(a) 2
(b) 7
(c) 5
(d) 3

Q92. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

(46, 2208, 24)

(4, 192, 24)

(a) (37, 451, 6)
(b) (7, 245, 17)

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(c) (39, 546, 7)
(d) (24, 967, 20)

Q93. Each of the digits in the number 7231456 is arranged in ascending order from left to right. The position(s) of how many digits will remain unchanged as compared to that in the original number?
(a) Four
(b) One
(c) Two
(d) Three

Q94. What will come in the place of the question mark (?) in the following equation, if '÷' and '−' are interchanged and '×' and '+' are interchanged?
78 × 2 − 2 + 12 ÷ 6 × 5 + 4 ÷ 4 × 24 = ?
(a) 124
(b) 148
(c) 154
(d) 136

Q95. Seven people, I, J, K, L, P, Q and R are sitting in a row, facing north. Only two people sit to the left of R. Only three people sit between R and L. I sits second to the right of R. Only two people sit between I and Q. K sits at some place to the right of J but at some place to the left of P.
How many people sit to the right of K?
(a) Three
(b) Two
(c) Four
(d) One

Q96. Select the pair which follows the same pattern as that followed by the two set of pairs given below. Both pairs follow the same pattern.
JUN : HRP
QWJ : OTL
(a) JTE : HQH
(b) UTM : SRO
(c) HXB : FUE
(d) GSK : EPM

Q97. What will come in the place of the question mark (?) in the following equation, if '+' and '÷' are interchanged, and '−' and '×' are interchanged?
27 × 11 − 3 ÷ 56 + 2 = ?
(a) 22
(b) 41
(c) 34
(d) 26

Q98. Which of the following letter-clusters will replace the question mark (?) in the given series to make it logically complete?
OIX 28 MLT 17 ? IRL -5 GUH -16
(a) KOP 6
(b) KOQ 8
(c) KNP 8
(d) KNO 6

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Q99. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

ZXW 21 USR 20 PNM 18 KIH 15 ?

(a) FEC 11
(b) FDC 11
(c) GDC 10
(d) FED 10

Q100. 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 pins are bugs.

All pins are lamps.

Conclusions:

(I): Some bugs are lamps.

(II): All lamps are pins.

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

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) Damodar

The correct answer is Damodar.

Key Points

• Durgapur Steel Plant is located in Durgapur, West Bengal, and is one of the integrated steel plants of Steel Authority of India Limited (SAIL).

• The plant is situated on the banks of the Damodar River, which is also known as the "Sorrow of Bengal" due to its history of flooding.

• Damodar River flows through the states of Jharkhand and West Bengal and is a significant water source for industrial operations, including steel production.

• The Durgapur Steel Plant was established in the late 1950s with assistance from the United Kingdom and has played a critical role in India's steel production sector.

• The Damodar Valley Corporation (DVC), a multipurpose river project, manages the water resources of the river to support industrial and irrigation needs.

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Additional Information

• Teesta River:

• The Teesta River flows through the Indian states of Sikkim and West Bengal and also enters Bangladesh.

• It originates from the Pahunri Glacier in the Himalayas and is known for its hydropower potential.

• Teesta is primarily used for irrigation and water supply in North Bengal but is not associated with steel plants like Durgapur.

• Mahananda River:

• Mahananda River flows through Bihar and West Bengal in India and enters Bangladesh.

• It is an important tributary of the Ganges River and supports agricultural activities in its basin.

• Mahananda does not play a role in industrial operations like steel production.

• Hooghly River:

• The Hooghly River is a distributary of the Ganges River and flows through West Bengal.

• It is significant for transportation, trade, and the operation of the Kolkata port, but it is not linked to Durgapur Steel Plant.

• Damodar River and Steel Plants:

• The Damodar River basin is rich in coal reserves, making it a hub for industrial activities, especially steel and thermal power production.

• Important steel plants such as Durgapur Steel Plant and Bokaro Steel Plant rely on the Damodar River for water resources.

• The river's basin has been extensively developed for industrial and irrigation purposes under the Damodar Valley Corporation.

Q2. Answer: (a) To examine the constitutionality of laws

The correct answer is To examine the constitutionality of laws.

Key Points

• Judicial Review in India refers to the power of the judiciary to examine the constitutionality of legislative enactments and executive orders.

• This power is derived from Articles 13, 32, and 226 of the Indian Constitution, ensuring that laws and actions do not violate fundamental rights or the Constitution.

• The judiciary, particularly the Supreme Court and High Courts, have the authority to declare any law or act null and void if it is found to be unconstitutional.

• Judicial Review is a key feature of the basic structure doctrine, which was established by the Supreme Court in the Keshavananda Bharati case (1973).

• It acts as a system of checks and balances, ensuring that the legislative and executive branches function within their constitutional limits and uphold the rule of law.

Additional Information

• To amend the Constitution (Option 2):

• The power to amend the Constitution is provided under Article 368 of the Indian Constitution.

• The Parliament has the authority to amend the Constitution, but this process requires a special majority in both houses and, in some cases, ratification by half of the state legislatures.

• Judicial Review cannot amend the Constitution; it is limited to ensuring the constitutionality of laws and actions.

• To appoint ministers (Option 3):

• The appointment of ministers is the responsibility of the President of India, as per Article 75 of the Constitution.

• The President appoints the Prime Minister and, on the advice of the Prime Minister, other ministers are appointed.

• This function does not fall under the scope of Judicial Review.

• To elect judges (Option 4):

• Judges in India are not elected but are appointed by the President under Articles 124 and 217 for the Supreme Court and High Courts, respectively.

• The appointment process involves consultation with the judiciary as per the collegium system.

• Judicial Review does not involve the election or appointment of judges.

Q3. Answer: (a) 30 days

The correct answer is 30 days.

Key Points

• Under the Right to Information (RTI) Act, 2005, public authorities are required to respond to RTI requests within 30 days for general information.

• The RTI Act empowers citizens to request information from public authorities, ensuring transparency and accountability in government functioning.

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• The timeline for providing information is strictly enforced, and failure to comply can lead to penalties for the Public Information Officer (PIO).

• If the information requested concerns the life or liberty of a person, the response time is reduced to 48 hours.

• The RTI Act covers all constitutional authorities, including ministries, departments, and public sector undertakings, except intelligence and security organizations listed in the Second Schedule.

Additional Information

• RTI Act Overview:

• The RTI Act, enacted in 2005, aims to promote transparency and empower citizens to hold the government accountable.

• The Act defines processes for requesting information, appoints Public Information Officers (PIOs), and establishes penalties for non-compliance.

• Citizens can appeal to the Central Information Commission (CIC) or State Information Commission if their requests are denied or delayed.

Q4. Answer: (d) 8 May 1933

The correct answer is May 08 1933.

Key Points

• Mahatma Gandhi began his 21-day fast of self-purification on May 8, 1933, as part of his commitment to the Harijan movement.

• The fast aimed at promoting social reform and the upliftment of Harijans (Dalits), advocating for the eradication of untouchability in India.

• This fast was a part of Gandhi's broader vision of achieving social equality and justice as an integral element of India's freedom struggle.

• Gandhi believed that self-purification and personal penance were essential to inspire societal change and emphasize the moral foundation of his campaigns.

• The 21-day fast was one of the longest fasts undertaken by Mahatma Gandhi and demonstrated his unwavering commitment to nonviolence and social harmony.

Additional Information

• Harijan Movement

• The Harijan movement, launched by Gandhi, aimed to abolish untouchability and integrate Dalits (Harijans) into mainstream society.

• He coined the term "Harijan," meaning "children of God," to address Dalits with dignity and respect.

• The movement emphasized access to education, public places, and temple entry for Harijans, challenging deeply entrenched social norms.

• It was a crucial part of Gandhi's efforts to create a just and equitable society in pre-independent India.

Q5. Answer: (d) Nationalisation of banks

The correct answer is Nationalisation of banks.

Key Points

• Nationalisation of banks was not a part of the New Economic Policy (NEP) reforms introduced in 1991. Instead, nationalisation of banks occurred much earlier in India during 1969 and 1980.

• The NEP of 1991 focused on structural reforms aimed at liberalisation, globalisation, and privatisation to resolve the economic crisis.

• Unlike nationalisation, the NEP reforms sought to reduce government intervention in the economy and promote private sector participation.

• Under NEP, efforts were made to deregulate industries, reduce barriers to foreign investment, and promote competition instead of state-controlled monopolies.

• Nationalisation was primarily aimed at achieving socialistic goals like equitable distribution of resources, whereas NEP emphasised market-driven growth strategies.

Additional Information

• Liberalisation:

• Liberalisation refers to the relaxation of government restrictions and regulations in areas like trade, industry, and investment.

• The NEP introduced significant liberalisation measures, such as abolishing the License Raj, reducing import tariffs, and encouraging foreign direct investment (FDI).

• The aim was to make the economy more efficient and competitive by allowing market forces to determine the allocation of resources.

• Globalisation:

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• Globalisation involves integrating the domestic economy with the global economy by encouraging international trade and investment.

• The NEP facilitated globalisation by reducing trade barriers, allowing multinational corporations to operate in India, and adopting policies to attract foreign capital.

• This integration paved the way for technological advancements, improved infrastructure, and increased foreign exchange reserves.

• Privatisation:

• Privatisation refers to transferring ownership and control of state-owned enterprises to private entities.

• The NEP promoted privatisation by disinvesting in public sector undertakings (PSUs) and encouraging private sector participation in industries previously reserved for the public sector.

• Privatisation was aimed at improving efficiency, reducing fiscal burden, and stimulating economic growth.

• Theme of New Economic Policy (NEP) 1991:

• The NEP was introduced to address the balance of payments crisis and stagnation in economic growth.

• It marked a shift from a state-controlled economy to a market-driven economy.

• The three pillars of the NEP were liberalisation, privatisation, and globalisation, collectively known as LPG reforms.

• The NEP laid the foundation for India's rapid economic growth in the subsequent decades.

Q6. Answer: (d) 15 January 2025

The correct answer is Jan 15 2025.

Key Points

• The Indian Army celebrated its 77th Army Day on 15th January 2025, marking the third occasion that the Army Day Parade was held outside Delhi.

• Army Day is observed annually on January 15 to commemorate the day when Field Marshal K. M. Cariappa took over as the first Indian Commander-in-Chief of the Indian Army in 1949.

• The 77th Army Day Parade was held in Pune, Maharashtra, highlighting the tradition of shifting Army Day celebrations to different locations since 2023.

• This event showcased the operational capabilities of the Indian Army, including advanced weaponry, equipment, and military prowess.

• The Army Day celebrations included cultural programs, military parades, and events to honor the contributions of soldiers and veterans.

Additional Information

• Indian Navy Day: December 4

• Significance: Commemorates the successful Operation Trident against Pakistan in the 1971 war.

• Indian Air Force Day: October 8

• Significance: Celebrates the establishment of the Indian Air Force (then Royal Indian Air Force) in 1932.

Q7. Answer: (c) Ariz-i-Mumalik

The correct answer is Ariz-i-Mumalik.

Key Points

• The Ariz-i-Mumalik was the head of the Diwan-i-Arz, the military department, during the Delhi Sultanate period.

• The main responsibilities of the Ariz-i-Mumalik included the recruitment of soldiers, ensuring the proper branding of horses, and maintaining war provisions.

• He was responsible for maintaining discipline and order within the military forces.

• He ensured the proper functioning of the army by organizing salaries, inspecting troops, and ensuring they were battle-ready.

• The Ariz-i-Mumalik was not involved in military strategy or commanding troops during war; his role was purely administrative and logistical.

Additional Information

• Naib:

• The Naib was the deputy or assistant to the Sultan and often acted as the second-in-command in the administrative hierarchy.

• In the absence of the Sultan, the Naib acted as the regent and handled the day-to-day functioning of the administration.

• The Naib often held significant power, sometimes even overshadowing the Sultan.

• Amir-i-Dad:

• The Amir-i-Dad was responsible for the administration of justice in the Sultanate.

• He ensured that the laws were implemented fairly and resolved disputes among the citizens.

• The Amir-i-Dad worked closely with the Qazi, the judicial officer, to uphold the legal system.

• Dabir-i-Khas:

• The Dabir-i-Khas was a special secretary to the Sultan, responsible for handling confidential and important correspondence.

• He played a crucial role in maintaining communication between the Sultan and other departments or foreign entities.

• Diwan-i-Arz:

• The Diwan-i-Arz was the military department of the Delhi Sultanate, tasked with managing the army and ensuring its preparedness.

• This department played a vital role in the administration of the Sultanate by ensuring efficient logistics, recruitment, and maintenance of military forces.

Q8. Answer: (c) Gave more competition and modern technology

The correct answer is Gave more competition and modern technology.

Key Points

• Globalisation introduced Indian industries to international markets, increasing competition and encouraging them to adopt modern technologies to stay competitive.

• It facilitated access to advanced technologies, better production methods, and innovative practices, leading to improved efficiency and productivity.

• Indian industries were exposed to global standards, pushing them to improve the quality of their products and services, thus making them globally competitive.

• Globalisation opened up foreign direct investment (FDI) opportunities, enabling Indian industries to collaborate with multinational companies for technology transfer and capital infusion.

• It also expanded the export potential of Indian industries, allowing them to tap into international markets and diversify their customer base.

Additional Information

• Impact of Globalisation on Indian Industries

• Globalisation refers to the integration of economies, societies, and cultures through international trade, investment, and technology.

• It brought both opportunities and challenges for Indian industries, compelling them to adapt and modernise.

• The sectors that benefited the most include IT, telecommunications, pharmaceuticals, and automotive industries.

• However, the unorganised sector and small-scale industries faced difficulties due to increased competition.

Q9. Answer: (a) It results from molten rock rising from the Earth’s interior.

The correct answer is It results from molten rock rising from the Earth's interior..

Key Points

• Volcanism occurs when molten rock, known as magma, rises from the Earth's mantle to the surface, driven by pressure differences and tectonic activity.

• At tectonic plate boundaries, such as divergent and convergent zones, magma can escape and form volcanic eruptions.

• The molten rock that reaches the surface is called lava, and it solidifies to create various landforms like volcanoes, lava domes, and plateaus.

• Volcanism is often associated with hotspots, where mantle plumes push magma to the surface, as seen in regions like Hawaii and Yellowstone.

• Volcanic eruptions contribute to the Earth's geological processes, including the formation of new crust, landforms, and mineral deposits.

Additional Information

• Excessive surface erosion

• Surface erosion refers to the wearing away of the Earth’s surface due to wind, water, ice, or human activities.

• While erosion contributes to landscape changes, it does not cause volcanism, as volcanism is driven by processes within the Earth’s mantle and crust.

• Examples of erosion include river valleys, coastal cliffs, and desert landscapes, which are shaped by external forces rather than internal geological processes.

• Atmospheric disturbances

• Atmospheric disturbances refer to weather phenomena such as storms, cyclones, or changes in air pressure.

• These events impact the atmosphere but do not influence volcanism, which originates from internal geological processes.

• Volcanic eruptions can affect the atmosphere, releasing gases like sulfur dioxide and ash clouds, but atmospheric phenomena cannot initiate volcanism.

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• Movement of glaciers

• Glaciers are massive ice bodies that move slowly over land, shaping landscapes through processes like erosion and deposition.

• Glacial activity does not cause volcanism, as it is unrelated to the movement of magma or tectonic processes.

• However, glacial melting can sometimes interact with volcanic activity in regions like Iceland, where ice caps cover volcanic systems.

Q10. Answer: (a) Four

The correct answer is Four.

Key Points

• The concept of Ashramas was a fundamental part of social life during the Vedic period and was based on the division of an individual's life into four stages.

• The four Ashramas were Brahmacharya (student life), Grihastha (householder life), Vanaprastha (forest-dweller or hermit life), and Sannyasa (renunciation).

• Each Ashrama represented a particular phase of life where an individual had specific duties and responsibilities to fulfill.

• The Ashrama system aimed at achieving individual spiritual growth while contributing to the betterment of society.

• It was primarily detailed in the Dharmashastras and other ancient texts like the Manusmriti, which provided guidelines for living a disciplined and virtuous life.

Additional Information

• The Vedic Age (c. 1500-500 BCE) in ancient India, following the Indus Valley Civilization, is defined by the composition of the sacred Vedas and the Indo-Aryan culture, split into

• Early (1500-1000 BCE) and Later (1000-600 BCE) periods, transitioning from semi-nomadic pastoralism to settled agriculture, establishing foundational social structures (Varnas), and developing Vedic religion centered on rituals, soma, and fire sacrifices, with the Rigveda being the oldest text.

Q11. Answer: (a) RAM is volatile and stores temporary data; ROM is non-volatile and stores boot instructions

The correct answer is RAM is volatile and stores temporary data; ROM is non-volatile and stores boot instructions.

Key Points

• RAM (Random Access Memory) is a volatile memory that temporarily stores data being used by the CPU during system operation.

• ROM (Read-Only Memory) is non-volatile and retains data even when the computer is turned off.

• RAM is designed for high-speed data access and enables the smooth functioning of active applications and tasks.

• ROM stores critical data like the computer's firmware or boot instructions, which are essential for initiating the system.

• RAM is writable and erasable, whereas ROM contains pre-written data that cannot be modified easily.

Additional Information

• Volatile Memory (e.g., RAM)

• Power: Needs continuous power to hold data.

• Speed: Very fast.

• Use: Temporary storage for running applications and active data.

• Examples: RAM (Random Access Memory), CPU Cache.

• Non-Volatile Memory (e.g., SSD, HDD)

• Power: Retains data even without power.

• Speed: Slower than volatile memory.

• Use: Long-term storage for files, OS, software.

• Examples: SSDs, HDDs, USB drives, ROM (Read-Only Memory).

Q12. Answer: (d) Womesh Chandra Bonnerjee

The correct answer is Womesh Chandra Bonnerjee.

Key Points

• Womesh Chandra Bonnerjee was the first president of the Indian National Congress (INC), which was established in 1885.

• The first session of the INC was held in Bombay (now Mumbai) from December 28 to December 31, 1885.

• He was a prominent lawyer and an influential political leader of his time.

• The first session was attended by 72 delegates, marking the beginning of organized Indian political activism.

• Bonnerjee was instrumental in laying the foundation for the Congress, which later played a key role in India's struggle for independence.

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Additional Information

• Gopal Krishna Gokhale:

• He was an Indian political leader and social reformer during the late 19th and early 20th centuries.

• Gokhale was a senior leader of the Indian National Congress and a mentor to Mahatma Gandhi.

• He founded the Servants of India Society in 1905 to promote education and social reform.

• Dadabhai Naoroji:

• Known as the “Grand Old Man of India,” he was the first Indian to be elected to the British Parliament.

• He was also a prominent leader of the INC and served as its president three times.

• Naoroji is well-known for his Drain Theory, which explained how Britain was exploiting India’s wealth.

• Mahadev Govind Ranade:

• He was a social reformer, scholar, and one of the early leaders of the Indian National Congress.

• Ranade advocated for modern education, women’s empowerment, and social reforms like the abolition of child marriage and caste discrimination.

• He was also a founding member of the Prarthana Samaj, a reformist movement in western India.

Q13. Answer: (d) Social reform laws

The correct answer is Social reform laws.

Key Points

• The British reforms in India brought several social reform laws that aimed to eradicate regressive practices and promote progressive societal changes.

• These reforms included abolition of practices like Sati (widow immolation) through the Bengal Sati Regulation Act of 1829 under Lord William Bentinck.

• The British introduced laws to prohibit child marriage, such as the Child Marriage Restraint Act of 1929, which marked a significant step toward improving women's status.

• Efforts were made to ensure gender equality by passing legislation like the Widow Remarriage Act of 1856, which allowed widows to remarry and uplift their social condition.

• These social reforms laid the foundation for modern Indian society by addressing key issues like caste-based discrimination, untouchability, and improving education for women and marginalized groups.

Additional Information

• Deindustrialisation:

• Deindustrialisation refers to the decline of traditional industries and handicrafts in India during British rule due to the influx of machine-made British goods.

• The British policies favored imports from Britain and heavily taxed Indian-made goods, leading to the destruction of local industries like textiles, especially in Bengal.

• This process caused massive unemployment and pushed artisans and craftsmen into poverty.

• Ruralisation:

• Ruralisation under British rule was characterized by the weakening of urban centers and the forced migration of skilled workers to villages due to the collapse of industries.

• The focus of British policies on agrarian revenue collection further contributed to ruralization, reducing the opportunities for urban economic development.

• It led to stagnation in rural areas and increased dependency on agriculture, often under exploitative systems like the zamindari system.

• One-way free trade:

• The British introduced policies promoting one-way free trade, allowing unrestricted import of British goods into India while restricting Indian exports.

• This led to a trade imbalance where Indian raw materials were exported to Britain, processed there, and sold back to India at higher prices.

• It was a strategy to make India a supplier of raw materials and a market for finished goods, which severely impacted India's economic structure.

Q14. Answer: (d) IN-SPACe

The correct answer is IN-SPACe.

Key Points

• In February 2025, IN-SPACe (Indian National Space Promotion and Authorization Center) launched a Rs. 500-crore Technology Adoption Fund.

• The fund aims to support early-stage space startups in India by providing them with financial assistance and resources.

• It focuses on encouraging indigenization by reducing India's import dependency in the space sector.

• IN-SPACe, established under the Department of Space, is responsible for promoting private participation in India's space activities.

• This initiative aligns with the broader objective of making India a global hub for space technology and innovation.

Additional Information

• Antrix Corporation

• Antrix Corporation is the commercial arm of ISRO (Indian Space Research Organisation).

• It was established in 1992 and focuses on promoting and commercially exploiting products, technical consultancy services, and transfer of technologies developed by ISRO.

• Its core activities include satellite launches, transponder leasing, and satellite data sales.

• ISRO (Indian Space Research Organisation)

• ISRO is the space agency of the Government of India and was founded in 1969.

• It is responsible for India's space exploration and satellite development programs.

• ISRO has achieved milestones such as the Chandrayaan missions, Mars Orbiter Mission (Mangalyaan), and Gaganyaan (India's first human spaceflight program).

• DRDO (Defence Research and Development Organisation)

• DRDO is the R&D wing of the Ministry of Defence, established in 1958.

• It works on developing indigenous defense technologies like missiles, radars, and electronic warfare systems.

• While it plays a critical role in defense, it does not oversee space-related activities.

Q15. Answer: (c) It specifies 29 functional subjects to be devolved to Panchayats by States.

The correct answer is It specifies 29 functional subjects to be devolved to Panchayats by States.

Key Points

• The Eleventh Schedule was introduced by the 73rd Constitutional Amendment Act of 1992, which aimed to strengthen the Panchayati Raj system in India.

• It contains a list of 29 subjects on which states can devolve powers and responsibilities to Panchayats for decentralized governance.

• The subjects include agriculture, irrigation, education, health, sanitation, social welfare, rural development, and others, emphasizing local self-governance.

• The Eleventh Schedule ensures that Panchayats have a defined role in the planning, implementation, and monitoring of development programs and schemes.

• The amendment established Panchayati Raj institutions as the third tier of government, empowering them to function as institutions of self-government.

Additional Information

• Panchayati Raj and Decentralized Governance

• The Panchayati Raj system is enshrined in Part IX of the Constitution, covering Articles 243 to 243O.

• The 73rd Amendment aimed to institutionalize Panchayati Raj to bring governance closer to the people and empower local self-government.

• The Eleventh Schedule plays a pivotal role in ensuring that Panchayats have adequate responsibilities for grassroots-level planning and implementation.

Q16. Answer: (d) Rekha Gupta

The correct answer is Rekha Gupta.

Key Points

• Rekha Gupta became the Chief Minister of Delhi following the results of the February 2025 Legislative Assembly elections.

• She is associated with the Bharatiya Janata Party (BJP), which emerged victorious in the elections, securing a majority in the Delhi Assembly.

• Rekha Gupta is known for her leadership skills and active engagement in policymaking and grassroots-level governance.

• The February 2025 elections were marked by significant political shifts, with BJP capitalizing on issues of development, governance, and local concerns to win over the electorate.

• Her tenure is expected to focus on improving civic amenities, infrastructure, and addressing environmental concerns in Delhi.

Additional Information

• Arvind Kejriwal

• Arvind Kejriwal served as the Chief Minister of Delhi before the February 2025 elections.

• He is the national convenor of the Aam Aadmi Party (AAP), which focused on delivering public services like education, healthcare, and water supply during its governance.

• Under his leadership, AAP introduced initiatives such as the Mohalla Clinics and reforms in government schools.

• Despite his popularity, AAP faced challenges in the 2025 elections, losing its majority to the BJP.

• Parvesh Verma

• Parvesh Verma is a Member of Parliament from the BJP and known for his contributions to public welfare and development projects.

• He has represented the West Delhi constituency and is recognized for his active participation in parliamentary debates.

• Although a prominent BJP leader, he did not contest for the Chief Minister's position in the 2025 elections.

• Atishi Marlena

• Atishi Marlena is an influential leader of the Aam Aadmi Party (AAP) and has been instrumental in shaping education policies in Delhi.

• She played a key role in introducing reforms in government schools and improving educational infrastructure.

• Despite her achievements, AAP faced setbacks in the 2025 elections, and she did not secure the Chief Minister's position.

• Main Theme

• The Delhi Legislative Assembly elections are held every five years to elect the Chief Minister and the ruling party in the National Capital Territory of Delhi.

• These elections are crucial as they determine the governance and policy direction for Delhi, one of India's most significant metropolitan cities.

• Political parties focus on local issues such as infrastructure development, pollution control, and public services to appeal to the voters.

Q17. Answer: (b) 174%

The correct answer is 174%.

Key Points

• India's defence production in the financial year 2023-24 reached Rs. 1.27 trillion, showcasing a significant rise in the sector.

• According to reports, this marks a 1.74 times increase in defence production compared to the financial year 2014-15.

• The growth is attributed to the government's initiatives such as the 'Make in India' campaign, aimed at promoting domestic manufacturing in the defence sector.

• The Ministry of Defence has consistently pushed for indigenization of defence equipment, reducing dependence on imports, and boosting domestic production.

• Between FY 2014-15 and FY 2023-24, the Indian government has introduced several reforms, including providing incentives to private players, increasing defence budgets, and establishing defence corridors.

Additional Information

• Defence Production in India

• India has been focusing on becoming a global defence manufacturing hub, with an emphasis on indigenization and self-reliance.

• Key policies such as the Defence Acquisition Procedure (DAP) 2020 and the establishment of Defence Industrial Corridors (DICs) have been instrumental in achieving this growth.

• The government has also increased Foreign Direct Investment (FDI) limits in the defence sector to 74% through the automatic route and 100% via government approval.

• Major defence PSUs such as Hindustan Aeronautics Limited (HAL) and Bharat Electronics Limited (BEL) have significantly contributed to this growth.

• Make in India Initiative

• Launched in September 2014, this initiative aims to transform India into a global manufacturing hub.

• Under this initiative, the defence sector has been identified as a priority sector for boosting domestic manufacturing.

• It has encouraged private sector participation and partnerships with global Original Equipment Manufacturers (OEMs) for technology transfer and co-production.

Q18. Answer: (c) Ministry of Finance

The correct answer is Ministry of Finance.

Key Points

• The Appropriation Bill is introduced by the Ministry of Finance in the Lok Sabha to provide approval for the withdrawal of funds from the Consolidated Fund of India for meeting the expenses during a financial year.

• It is introduced after the presentation and discussion of the Union Budget, which is also presented by the Ministry of Finance.

• The Appropriation Bill is a key legislative step in India's budgetary process, as it ensures that the government has the legal authority to allocate resources for various programs and schemes.

• Once the Appropriation Bill is passed in both Houses of Parliament and receives the President's assent, it becomes the Appropriation Act, enabling the government to withdraw funds.

• This legislative procedure is in accordance with Article 114 of the Indian Constitution, which mandates parliamentary approval for the appropriation of funds.

Additional Information

• Ministry of External Affairs

• The Ministry of External Affairs (MEA) is responsible for India's foreign relations and diplomacy.

• It manages India's diplomatic missions, represents the nation in international organizations, and oversees treaties, agreements, and international collaborations.

• Ministry of Defence

• The Ministry of Defence (MoD) oversees the national defense and the armed forces of India.

• It is responsible for defense policy, military operations, and the procurement of defense equipment.

• While it has a significant budgetary allocation, the Ministry of Finance is responsible for introducing the Appropriation Bill.

• Ministry of Home Affairs

• The Ministry of Home Affairs (MHA) manages internal security, border management, and disaster management in India.

• It oversees the functioning of central armed police forces, internal law and order, and policy implementation related to internal security.

Q19. Answer: (a) 2013

The correct answer is 2013.

Key Points

• Amazon.in was officially launched in India in June 2013, marking Amazon's entry into the Indian e-commerce market.

• Initially, Amazon.in started by offering books, movies, and TV shows for sale and gradually expanded its product categories.

• India was a significant market for Amazon due to its growing internet penetration and the rise of online shopping.

• The company faced stiff competition from local e-commerce platforms like Flipkart and Snapdeal, but it quickly gained traction.

• Amazon.in introduced services like Amazon Prime in 2016 and Amazon Pay to strengthen its position in the Indian market.

Additional Information

• Category-Specific Alternatives

• Fashion: Myntra, Ajio, Tata CLiQ, and specialized sites like Bewakoof.

• Beauty: Nykaa (beauty & wellness).

• Electronics: Croma and Newegg.

• Groceries: BigBasket and JioMart.

Q20. Answer: (b) Kaziranga, Assam

The correct answer is Kaziranga, Assam.

Key Points

• The 12th International Tourism Mart (ITM) was held at Kaziranga, Assam, in November 2024 to promote the tourism potential of Northeast India.

• The event is organized by the Ministry of Tourism, Government of India, and focuses on showcasing the rich culture, heritage, and biodiversity of the Northeast region.

• Kaziranga is a UNESCO World Heritage Site and a prominent tourist destination, renowned for its one-horned rhinoceroses and diverse ecosystem.

• The ITM serves as a platform for stakeholders from the travel and tourism industry to network, promote, and discuss the development of tourism in the Northeast.

• This edition of ITM aimed to highlight sustainable tourism practices and the unique cultural diversity of the Northeast region, which is home to various indigenous tribes and traditions.

Additional Information

• Imphal, Manipur

• Imphal is the capital city of Manipur, known for its lush green landscapes, historical monuments, and vibrant culture.

• It is home to the Kangla Fort, an important historical and cultural landmark.

• The city is known for its handloom and handicraft products, which are integral to the state's economy.

• Aizawl, Mizoram

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• Aizawl is the capital of Mizoram and is known for its picturesque landscapes and serene environment.

• The city reflects Mizoram's distinct tribal culture, which includes traditional dances, festivals, and handicrafts.

• Shillong, Meghalaya

• Shillong, the capital city of Meghalaya, is often referred to as the "Scotland of the East" due to its scenic beauty and colonial-era charm.

• It is a major tourist destination, known for its waterfalls, caves, and lush green hills.

Q21. Answer: (c) Henderson-Hasselbalch equation

The correct answer is Henderson-Hasselbalch equation.

Key Points

• The Henderson-Hasselbalch equation is a mathematical representation used to calculate the pH of a buffer solution.

• The formula is: pH = pKa + log([A^-]/[HA]), where [A^-] represents the concentration of the conjugate base, and [HA] is the concentration of the weak acid.

• This equation demonstrates the relationship between the pH of a solution, the pKa (acid dissociation constant) of the weak acid, and the ratio of the concentrations of the conjugate base to the weak acid.

• The Henderson-Hasselbalch equation is commonly used in biochemistry and medicine to understand the behavior of buffer systems, such as maintaining blood pH levels.

• It is applicable for both acidic and basic buffer systems, making it a versatile tool in analytical chemistry.

Additional Information

• Arrhenius Equation

• This equation describes the temperature dependence of reaction rates.

• The formula is: k = Ae^(-Ea/RT), where k is the rate constant, A is the frequency factor, Ea is the activation energy, R is the gas constant, and T is the temperature in Kelvin.

• It is widely used in physical chemistry to study reaction kinetics and the effect of temperature on chemical processes.

• Nernst-Boyle Equation

• This term is not recognized in scientific literature as a standard equation. The Nernst equation, however, is an important equation in electrochemistry.

• The Nernst equation calculates the electrochemical potential of a cell: E = E° - (RT/nF) * ln(Q), where E is the cell potential, E° is the standard cell potential, R is the gas constant, T is temperature, n is the number of moles of electrons, F is the Faraday constant, and Q is the reaction quotient.

• Van't Hoff Equation

• The Van't Hoff equation relates the change in equilibrium constant with temperature.

• The formula is: ln(K2/K1) = -ΔH/R * (1/T2 - 1/T1), where K1 and K2 are equilibrium constants at temperatures T1 and T2, ΔH is the enthalpy change, and R is the gas constant.

• This equation is used in thermodynamics to understand how temperature influences chemical equilibrium.

Important Points

• Buffer Solutions

• A buffer solution is a system that resists changes in pH upon the addition of small amounts of acid or base.

• It typically consists of a weak acid and its conjugate base or a weak base and its conjugate acid.

• Buffer solutions are critical in maintaining the pH balance in biological systems, industrial applications, and chemical experiments.

Q22. Answer: (b) Promotion of monoculture farming

The correct answer is Promotion of monoculture farming.

Key Points

• Biosphere reserves are primarily established to protect and conserve biodiversity, including ecosystems, species, and genetic resources.

• The goal of biosphere reserves is to promote sustainable development by integrating conservation efforts with the needs and activities of local communities.

• Monoculture farming is not aligned with the objectives of biosphere reserves as it often leads to soil degradation, loss of biodiversity, and ecological imbalances.

• Instead of promoting monoculture farming, biosphere reserves encourage sustainable agricultural practices that maintain ecological balance and biodiversity.

• Biosphere reserves are divided into core, buffer, and transition zones to ensure the harmonious coexistence of conservation and sustainable human activities.

Additional Information

• Cultural heritage preservation

• Biosphere reserves play a significant role in preserving the cultural heritage of local and indigenous communities.

• They provide a platform for maintaining traditional knowledge, practices, and customs while promoting sustainable living.

• Programs in biosphere reserves often include cultural education and support for traditional ways of life.

• Sustainable development of local communities

• Biosphere reserves aim to improve the socio-economic conditions of local communities by promoting sustainable livelihoods.

• They encourage eco-tourism, sustainable agriculture, and the use of renewable resources, which benefit both nature and the people living in the area.

• Community involvement and participation are critical aspects of biosphere reserve management.

• Conservation of biodiversity

• One of the primary objectives of biosphere reserves is to conserve biodiversity, including ecosystems, species, and genetic resources.

• The core area of biosphere reserves is dedicated to the protection of natural habitats and wildlife, ensuring minimal human interference.

• Efforts are made to protect endangered species and restore degraded ecosystems within the reserve.

Q23. Answer: (b) Agriculture sector

The correct answer is Agriculture sector.

Key Points

• During the period between 1947 and 1991, the Agriculture sector was the largest contributor to India's GDP.

• At the time of India's independence in 1947, agriculture contributed over 50% of the GDP and was the backbone of the Indian economy.

• The majority of India's population during this time was engaged in agriculture, with nearly 70-75% of the workforce dependent on it for livelihood.

• Agriculture remained the dominant sector due to the lack of industrialization and limited development in the service sector during this period.

• The Green Revolution in the 1960s boosted agricultural productivity, further solidifying its role as a key driver of India's economic growth during this time.

Additional Information

• Service sector

• The service sector became a dominant contributor to India's GDP only after the 1990s, following the economic liberalization reforms.

• Before 1991, the service sector was limited to basic services like transportation, communication, and public administration.

• Post-liberalization, the service sector grew rapidly, especially in IT, finance, and telecommunications, which made it the largest GDP contributor in later years.

• Industrial sector

• The industrial sector saw moderate growth during the 1947–1991 period due to efforts like the Five-Year Plans and public sector investments.

• Key industries, such as steel, coal, and textiles, were developed, but the sector's contribution to GDP remained lower than agriculture.

• The lack of foreign investments and a focus on import substitution restricted the industrial sector's growth during this era.

• Financial sector

• The financial sector, which includes banking, insurance, and other financial services, was relatively underdeveloped and contributed minimally to India's GDP before 1991.

• Government interventions, such as the nationalization of banks in 1969, aimed to improve financial inclusion, but its full impact was realized much later.

Q24. Answer: (d) Natural gas

The correct answer is Natural gas.

Key Points

• Natural gas is considered a non-renewable resource because it is formed over millions of years from the remains of plants and animals buried under layers of sediment and rock.

• Once extracted and consumed, natural gas cannot be replenished in a human timeframe, making it a finite resource.

• It is primarily composed of methane (CH4) and is used as a fuel for heating, electricity generation, and as an industrial feedstock.

• Natural gas contributes to greenhouse gas emissions when burned, although it is considered cleaner than other fossil fuels like coal and oil.

• Major reserves of natural gas are found in countries like the United States, Russia, Iran, and Qatar, which dominate global production.

Additional Information

• Wind energy (Option 1):

• Wind energy is a renewable resource generated by harnessing the kinetic energy of moving air to produce electricity.

• Wind turbines convert wind energy into mechanical power, which is then used to generate electricity.

• It is sustainable, non-polluting, and widely used in countries like the USA, China, and Germany.

• However, the generation of wind energy depends on the availability of wind and is location-specific.

• Forests (Option 2):

• Forests are renewable natural resources if managed sustainably. They regenerate naturally or through human intervention.

• They provide a wide range of ecosystem services, including carbon sequestration, biodiversity conservation, and timber production.

• Deforestation and poor management can threaten their renewability and lead to environmental degradation.

• Solar energy (Option 3):

• Solar energy is a renewable resource derived from sunlight and captured using photovoltaic (PV) cells or solar thermal systems.

• It is abundant, sustainable, and environmentally friendly, with applications in electricity generation, heating, and desalination.

• Solar energy systems are increasingly being adopted worldwide as a key solution for reducing dependence on fossil fuels.

Q25. Answer: (a) 2005

The correct answer is 2005.

Key Points

• The Government of India declared Sanskrit as a Classical Language in 2005, recognizing its rich heritage and historical significance.

• A language is categorized as "Classical" in India based on its rich literary tradition and antiquity of more than 1500-2000 years.

• Sanskrit is one of the oldest languages in the world and forms the foundation of many Indian languages, as well as the Vedas and ancient Indian scriptures.

• The status of a "Classical Language" provides funding for its promotion, including the establishment of institutes and the development of language resources.

Additional Information

• Sanskrit as a Classical Language

• Sanskrit is considered the "mother of all Indian languages" and has an immense influence on South Asian languages and cultures.

• The Classical Language status promotes the study, preservation, and propagation of Sanskrit, ensuring its place in modern education and research.

• Other languages that have been declared Classical Languages in India include Tamil (2004), Kannada (2008), Telugu (2008), Malayalam (2013), and Odia (2014).

Q26. Answer: (a) Geneva

The correct answer is Geneva.

Key Points

• The 2025 Conferences of the Parties (COPs) for the Basel, Rotterdam, and Stockholm Conventions (BRS COPs) will be hosted in Geneva, Switzerland.

• The Basel, Rotterdam, and Stockholm Conventions address issues related to hazardous chemicals and waste management, promoting environmental and human health protection.

• Geneva is a significant hub for international organizations, hosting numerous UN agencies and global environmental conventions.

• Previous BRS COPs have also been held in Geneva, showcasing the city’s critical role in fostering international environmental cooperation.

• The conventions promote the safe handling, reduction, and elimination of hazardous substances, focusing on sustainable development goals.

Additional Information

• Rotterdam Convention

• The Rotterdam Convention focuses on facilitating informed decision-making regarding the import and export of hazardous

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chemicals and pesticides.

• It promotes shared responsibility and cooperative efforts among nations in managing hazardous chemicals for sustainable use.

• The convention uses the Prior Informed Consent (PIC) procedure to ensure transparency in international chemical trade.

• Stockholm Convention

• The Stockholm Convention aims to eliminate or restrict the production and use of persistent organic pollutants (POPs).

• It protects human health and the environment from chemicals that remain intact in the environment for long periods and accumulate in living organisms.

• The convention requires parties to develop National Implementation Plans (NIPs) for managing POPs.

• Basel Convention

• The Basel Convention regulates the transboundary movement of hazardous wastes and their disposal.

• It aims to minimize waste generation, ensure environmentally sound management, and reduce the movement of hazardous wastes across borders.

• The convention emphasizes the principles of proximity, prevention, and precaution in waste management.

• Hong Kong Convention

• The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, adopted in 2009, is not directly related to the BRS conventions.

• It focuses on ensuring safe and environmentally sound recycling of ships, addressing issues like hazardous materials onboard ships.

• The convention has not yet entered into force as it requires ratification by a sufficient number of countries meeting specific criteria.

Q27. Answer: (a) 10 years

The correct answer is 10 years.

Key Points

• The Banking Laws (Amendment) Bill passed in the Rajya Sabha in March 2025 aims to strengthen governance and regulation in co-operative banks.

• The bill extended the tenure of directors of co-operative banks to 10 years for improved accountability and continuity.

• This amendment is aligned with the government's focus on ensuring better management and operational efficiency in co-operative banks.

• The change is expected to bring stability in leadership and reduce frequent changes in management that can disrupt the functioning of co-operative banks.

• Co-operative banks in India play a significant role in rural and semi-urban financial inclusion, and this reform aims to enhance their governance mechanisms.

Additional Information

• Governance in Co-operative Banks

• Co-operative banks are financial institutions owned and operated by their members, primarily serving rural and semi-urban areas.

• Governance reforms in co-operative banks aim to improve transparency, accountability, and operational efficiency.

• The Banking Laws (Amendment) Bill provides a legislative framework to strengthen the functioning of these banks while protecting the interests of depositors.

• It is part of the broader effort to ensure financial stability and inclusion in India's banking system.

Q28. Answer: (c) Department of Science and Technology (DST), Government of India

The correct answer is Department of Science and Technology (DST), Government of India.

Key Points

• The Department of Science and Technology (DST), Government of India, unveiled the first five Carbon Capture and Utilisation (CCU) testbeds in the cement sector in May 2025.

• These testbeds are aimed at reducing the carbon footprint of the cement industry, which is one of the largest emitters of CO2 worldwide.

• CCU technology involves capturing carbon dioxide emitted during industrial processes and reusing it for other applications, contributing to a sustainable environment and circular economy.

• This initiative aligns with India’s commitment to achieving net-zero carbon emissions by 2070, as declared at the COP26 Summit in Glasgow.

• The establishment of CCU testbeds is a collaborative effort involving academic institutions, industry leaders, and government agencies.

Additional Information

• Indian Space Research Organisation (ISRO)

• ISRO is India’s space agency responsible for space research and exploration.

• It focuses on satellite launches, space exploration missions, and developing indigenous technology in the space sector.

• Union Ministry of Environment, Forest and Climate Change (MoEFCC)

• The MoEFCC is responsible for formulating and implementing policies related to the environment, forests, and climate change in India.

• While it plays a crucial role in regulating carbon emissions and environmental conservation.

• Defence Research and Development Organisation (DRDO)

• DRDO primarily focuses on research and development in defense technologies, including missile systems, electronics, and armaments.

• Carbon Capture and Utilisation (CCU)

• CCU is a technology that captures carbon dioxide emissions from industrial processes and repurposes it for applications like enhanced oil recovery, chemical production, or construction materials.

• It is a vital tool in mitigating climate change by reducing greenhouse gas emissions and promoting sustainable development.

Q29. Answer: (b) Tamil Nadu

The correct answer is Tamil Nadu.

Key Points

• The retreating monsoon, also known as the northeast monsoon, is responsible for bringing rainfall to Tamil Nadu and parts of the southeastern coast of India.

• This phenomenon occurs when the southwest monsoon winds retreat and are replaced by the dry, cool northeast winds.

• The period of retreating monsoon generally spans from October to December, which is also known as the "post-monsoon season."

• Tamil Nadu receives about 48% of its annual rainfall during the northeast monsoon season, making it a critical period for agriculture and water resources in the state.

• Coastal areas of Tamil Nadu, such as Chennai, experience significant rainfall due to the moisture-laden winds from the Bay of Bengal.

Additional Information

• Assam

• Assam primarily receives rainfall during the southwest monsoon season (June to September).

• It is located in the northeastern part of India and receives heavy rainfall due to the southwest monsoon winds that travel over the Bay of Bengal.

• Floods are a common occurrence in Assam during the monsoon season, especially in the Brahmaputra River basin.

• Maharashtra

• Maharashtra experiences rainfall mainly during the southwest monsoon (June to September).

• Regions like the Konkan coast, including Mumbai, receive heavy rainfall due to the orographic effect caused by the Western Ghats.

• The retreating monsoon does not contribute significantly to rainfall in Maharashtra.

• Punjab

• Punjab receives most of its rainfall during the southwest monsoon (July to September).

• The region also experiences occasional winter rainfall due to western disturbances originating from the Mediterranean region.

• The retreating monsoon has minimal impact on Punjab's rainfall patterns.

Important Points

• Retreating Monsoon

• The retreating monsoon is characterized by the withdrawal of the southwest monsoon winds and the establishment of dry northeast trade winds.

• It marks the transition period between the wet monsoon season and the dry winter season.

• During this phase, the southern peninsula, particularly Tamil Nadu and parts of Andhra Pradesh, receives rainfall from the moisture-laden winds over the Bay of Bengal.

• Coastal cyclones are also common during this period, which can lead to heavy rainfall in southeastern India.

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Q30. Answer: (a) material with higher refractive index

The correct answer is material with higher refractive index.

Key Points

• In an optical fibre, the core is made of a material with a higher refractive index than the cladding.

• This difference in refractive indices enables total internal reflection, which allows the light to propagate through the core without escaping.

• The core's higher refractive index ensures that light entering at certain angles undergoes continuous internal reflection, making optical fibres highly efficient for transmitting light signals over long distances.

• The refractive index contrast between the core and cladding is crucial for maintaining signal integrity and minimizing loss.

• Materials like silica (doped with germanium or other elements) are typically used for the core to achieve the desired refractive index.

Additional Information

• Key Points on Refractive Index:

• Definition: A measure of light bending; the ratio of light's speed in a vacuum (cccc

) to its speed in a medium (vvvv

).

• Formula: n=c/vn=c/vn=c/vn=c/v

.

• Range: Always ≥1≥1≥1≥1

. Air is ~1.0003; vacuum is exactly 1.

• Optical Density: Higher 'n' means higher optical density, slowing light more.

• Bending: Light bends towards the normal (perpendicular) when entering a denser medium (higher 'n') and away from it in a rarer medium (lower 'n').

• Factors Affecting 'n': Wavelength, temperature, pressure, and chemical composition.

• Applications: Lens design (thinner lenses for higher 'n'), material identification, and understanding optical phenomena like rainbows.

Q31. Answer: (b) Jacqueline Fernandez

The correct answer is Jacqueline Fernandez.

Key Points

• Jacqueline Fernandez, a prominent Indian actress, was honoured at the Cannes Film Festival 2025 under the 'Women in Cinema' initiative.

• This initiative is aimed at celebrating and recognizing the significant contributions of women in the global film industry.

• Jacqueline Fernandez is known for her extensive work in Bollywood as well as her active participation in philanthropic and social causes, which added to her recognition.

• She has been an advocate for women empowerment and has used her influence to address issues related to gender equality in the film industry.

• This accolade reflects her contribution to cinema and her efforts to inspire and pave the way for women in the entertainment sector worldwide.

Additional Information

• Deepika Padukone

• Deepika Padukone is a celebrated Indian actress and producer known for her impactful performances in films like "Padmaavat" and "Chennai Express."

• She has represented India at several international platforms, including being a jury member at the Cannes Film Festival 2022.

• Deepika is also an advocate for mental health awareness and the founder of the Live Love Laugh Foundation, focusing on mental health issues.

• Priyanka Chopra

• Priyanka Chopra is an internationally acclaimed actress, producer, and former Miss World 2000.

• She has worked in both Bollywood and Hollywood, starring in films like "The White Tiger" and "Baywatch."

• Priyanka is also a UNICEF Goodwill Ambassador and has been actively involved in humanitarian causes, including child rights and education.

• Alia Bhatt

• Alia Bhatt is an award-winning Indian actress known for her versatile performances in films such as "Raazi" and "Gangubai Kathiawadi."

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• She made her debut at the Met Gala 2023, representing Indian fashion and culture on an international platform.

• Alia has also ventured into production with her banner Eternal Sunshine Productions.

Q32. Answer: (c) 104th Amendment

The correct answer is 104th Amendment.

Key Points

• The 104th Constitutional Amendment Act, passed in January 2020, extended the reservation of seats for Scheduled Castes (SCs) and Scheduled Tribes (STs) in the Lok Sabha and State Legislative Assemblies for another ten years, until January 2030.

• The original provision for reservation was introduced under Article 334 of the Indian Constitution and was set to expire after 70 years in January 2020. The 104th Amendment Act ensured its continuation.

• This amendment also abolished the reservation of seats for the Anglo-Indian community in the Lok Sabha and State Legislative Assemblies.

• The reservation for SCs and STs is aimed at ensuring adequate representation for historically marginalized communities in India's political decision-making process.

• The 104th Constitutional Amendment highlights the government's commitment to social justice and equitable representation.

Additional Information

• 15th Amendment:

• The 15th Constitutional Amendment Act of 1963 was aimed at increasing the retirement age of High Court judges from 60 to 62 years.

• This amendment also provided provisions for compensatory allowances for judges transferring from one High Court to another.

• 42nd Amendment:

• The 42nd Constitutional Amendment Act of 1976 is also known as the "Mini Constitution" due to its extensive changes to the Constitution.

• It introduced the words "Socialist" and "Secular" in the Preamble and emphasized the Directive Principles of State Policy.

• 61st Amendment:

• The 61st Constitutional Amendment Act of 1988 reduced the voting age for elections to the Lok Sabha and State Legislative Assemblies from 21 years to 18 years under Article 326.

Q33. Answer: (d) he was born in India before 1947

The correct answer is he was born in India before 1947.

Key Points

• Under Article 6 of the Constitution of India, individuals who migrated from Pakistan to India after July 19, 1948, could become Indian citizens if they were born in India before 1947.

• This provision was specifically designed to address the citizenship concerns of those who were displaced during the partition of India in 1947.

• People born in India before 1947 and migrating from Pakistan were required to have resided in India for at least six months and registered by an officer appointed by the Government of India.

• The law sought to provide Indian citizenship to those who had a strong historical and territorial connection to the country.

• These provisions highlight India's approach to dealing with migration during the period immediately following partition and independence.

Additional Information

• Citizenship Provisions in the Indian Constitution

• The citizenship provisions in Articles 5 to 11 of the Indian Constitution define who could be considered a citizen of India at the time of the commencement of the Constitution.

• They dealt with various categories of people, such as those residing in India, migrating from Pakistan, and individuals born outside India to Indian parents.

• The provisions were designed to address the unique challenges posed by partition and the creation of two separate nations, India and Pakistan, in 1947.

Q34. Answer: (d) Kathak dance

The correct answer is Kathak dance.

Key Points

• Shambhu Maharaj was a legendary Kathak dancer and teacher, recognized as one of the greatest exponents of the Lucknow gharana of Kathak.

• He was awarded the prestigious Sangeet Natak Akademi Fellowship in 1967 for his outstanding contribution to Indian classical dance.

• Kathak is a classical dance form from North India, characterized by intricate footwork, graceful movements, and storytelling through dance.

• Shambhu Maharaj's mastery of abhinaya (expression) and his nuanced understanding of rhythm made him a prominent figure in the revival of Kathak in the 20th century.

• He trained many students and performed globally, ensuring the preservation and promotion of Kathak as a vital part of Indian cultural heritage.

Additional Information

• Carnatic music:

• Carnatic music is a classical music tradition from South India, known for its complex ragas (melodic frameworks) and talas (rhythmic cycles).

• It primarily involves vocal compositions accompanied by instruments like the veena, mridangam, and violin.

• Famous Carnatic musicians include Tyagaraja, Muthuswami Dikshitar, and Shyama Shastri, who are collectively known as the Trinity of Carnatic music.

• Bharatanatyam dance:

• Bharatanatyam is one of the oldest classical dance forms of India, originating in Tamil Nadu.

• It is deeply rooted in religious and spiritual themes, often depicting stories from Hindu mythology.

• The dance form is characterized by intricate hand gestures (mudras), facial expressions, and rhythmic footwork.

• Famous Bharatanatyam dancers include Rukmini Devi Arundale and Yamini Krishnamurthy.

• Hindustani classical music:

• Hindustani classical music is the traditional music of North India, distinct from Carnatic music of the South.

• It is based on ragas and talas, with instruments like the sitar, tabla, and sarod accompanying vocal performances.

• Prominent exponents include Ravi Shankar, Bismillah Khan, and Bhimsen Joshi.

• Kathak dance:

• Kathak is one of the eight classical dance forms of India, originating in the temples of North India.

• The dance form combines storytelling, intricate footwork, and spins, accompanied by classical music.

• Kathak is divided into three gharanas: Lucknow, Jaipur, and Banaras, each with its distinct style.

• Shambhu Maharaj belonged to the Lucknow gharana, which is known for its emphasis on grace and expression.

Q35. Answer: (c) Plaster of Paris

The correct answer is Plaster of Paris.

Key Points

• The industrial name for calcium sulphate hemihydrate is Plaster of Paris (POP).

• It is chemically represented as $CaSO_4 \cdot \frac{1}{2}H_2O$, indicating that it contains half a molecule of water of crystallization.

• Plaster of Paris is produced by heating gypsum (calcium sulphate dihydrate) to about 150°C, which removes 75% of the water of hydration.

• It is widely used in construction, sculpture, and medical applications such as making molds, casts, and orthopedic supports due to its quick-setting property.

• When mixed with water, Plaster of Paris sets into a hard mass by reabsorbing water to form gypsum again, making it ideal for various applications.

Additional Information

• Gypsum

• Gypsum is a naturally occurring mineral composed of calcium sulphate dihydrate ($CaSO_4 \cdot 2H_2O$).

• It is the raw material used in the production of Plaster of Paris.

• Gypsum is primarily used in the construction industry to make drywall and plaster, as well as in agriculture as a soil conditioner.

• Unlike Plaster of Paris, gypsum contains two water molecules and does not harden quickly.

• Quick Lime

• Quick lime, also known as calcium oxide (CaO), is a white, caustic, and alkaline substance.

• It is produced by heating limestone (calcium carbonate) in a lime kiln to drive off carbon dioxide.

• Quick lime is used in the production of cement, steel, and paper and for water treatment and soil stabilization.

• It is not related to calcium sulphate or its derivatives such as Plaster of Paris.

• Slaked Lime

• Slaked lime, also known as calcium hydroxide ($Ca(OH)_2$), is obtained by adding water to quick lime.

• It is widely used in construction for making mortar, whitewashing, and water purification.

• Slaked lime is chemically different from calcium sulphate hemihydrate and serves entirely different purposes.

Q36. Answer: (b) Kanchenjunga

The correct answer is Kanchenjunga.

Key Points

• Kanchenjunga is the highest Himalayan peak located in India (excluding POK) and is the third highest mountain in the world.

• Its elevation is approximately 8,586 meters (28,169 feet), and it is located in the northeastern state of Sikkim, along the border between India and Nepal.

• The Kanchenjunga mountain range consists of five peaks, and its name translates to “The Five Treasures of Snow,” representing gold, silver, gems, grains, and holy scriptures.

• Kanchenjunga is considered sacred by the people of Sikkim, and climbing expeditions often observe rituals honoring its spiritual significance.

• The mountain was first climbed on May 25, 1955, by British climbers George Band and Joe Brown, who respected local traditions by stopping short of the summit.

Additional Information

• Dhaulagiri:

• Dhaulagiri is the seventh highest mountain in the world, with an elevation of 8,167 meters (26,795 feet).

• It is located in Nepal, making it outside Indian territory.

• The name Dhaulagiri comes from Sanskrit, meaning “White Mountain,” due to its snow-covered peak.

• It was first climbed on May 13, 1960, by a Swiss-Austrian expedition.

• Mount Everest:

• Mount Everest, with an elevation of 8,848.86 meters (29,031.7 feet), is the world’s tallest peak.

• It is situated on the border between Nepal and Tibet (China), and does not lie within Indian territory.

• The peak was first summited in 1953 by Sir Edmund Hillary and Tenzing Norgay.

• Everest is known locally as “Sagarmatha” in Nepal and “Chomolungma” in Tibet.

• Nanga Parbat:

• Nanga Parbat is the ninth highest mountain in the world, with an elevation of 8,126 meters (26,660 feet).

• It is located in Pakistan-administered Kashmir (POK), making it outside Indian territory.

• Known as the “Killer Mountain” due to its high fatality rate among climbers, it was first summited by Austrian climber Hermann Buhl in 1953.

• The name “Nanga Parbat” translates to “Naked Mountain” in Urdu, referring to its bare rock and ice faces.

Q37. Answer: (b) Create separate folders for different types of files

The correct answer is Create separate folders for different types of files.

Key Points

• Organizing files into separate folders for different types of files helps maintain clarity and makes it easier to locate specific files when needed.

• This method enhances productivity by reducing the time spent searching for files.

• Separating files by type (e.g., documents, images, videos, or projects) ensures systematic file storage and prevents clutter.

• Proper organization reduces the risk of file duplication and accidental deletion of important files.

• Using descriptive folder names adds context and makes it intuitive to identify the content of each folder.

Additional Information

• To organize files in Windows:

• create a clear folder hierarchy (e.g., Work, Personal, Media) with descriptive subfolders,

• use consistent naming (dates, keywords),

• sort and move files using File Explorer's drag-and-drop or cut/paste,

• pin important folders to Quick Access, and

• regularly delete or archive unneeded files to maintain a clean system.

Q38. Answer: (d) Gukesh D

The correct answer is Gukesh D.

Key Points

• Gukesh D, an Indian chess prodigy, became the youngest World Chess Champion in January 2025.

• He is the youngest Indian player to achieve a FIDE rating of 2700+, a milestone in chess excellence.

• In recognition of his extraordinary achievements, Gukesh D was awarded the Major Dhyan Chand Khel Ratna Award 2024, India's highest sporting honor.

• Gukesh D's consistent performances have placed him among the elite players in the chess world, surpassing several experienced grandmasters.

• He succeeded in breaking records previously held by other Indian chess legends like Vishwanathan Anand and R. Praggnanandhaa.

Additional Information

• Arjun Erigaisi

• Arjun Erigaisi is an Indian chess grandmaster known for his rapid rise in the chess world.

• He won the Tata Steel Chess India Rapid tournament in 2021 and is considered one of the promising chess players from India.

• Nihal Sarin

• Nihal Sarin is another exceptional Indian chess prodigy, known for his expertise in blitz and rapid formats.

• He has won several international tournaments, showcasing his tactical brilliance in shorter time controls.

• R Praggnanandhaa

• R Praggnanandhaa is an Indian chess prodigy who gained fame by defeating Magnus Carlsen, the reigning World Chess Champion, in multiple matches.

• He became the youngest Indian Grandmaster at the age of 12 years and 10 months.

Important Points

• Major Dhyan Chand Khel Ratna Award

• It is India's highest sporting honor, awarded annually by the Ministry of Youth Affairs and Sports.

• The award recognizes outstanding achievements by Indian athletes in their respective sports disciplines.

• Several renowned athletes, including Sachin Tendulkar, PV Sindhu, and Vishwanathan Anand, have been recipients of this prestigious award.

• The award is named after Major Dhyan Chand, India's legendary hockey player, who is considered one of the greatest athletes in the history of Indian sports.

Q39. Answer: (c) Joseph Aoun

The correct answer is Joseph Aoun.

Key Points

• Joseph Aoun, a highly respected general and Commander of the Lebanese Armed Forces, was elected as the President of Lebanon in January 2025.

• His appointment ended a two-year vacancy in the presidential position, caused by political gridlock in Lebanon's parliament.

• Joseph Aoun is known for his impartial approach and dedication to maintaining stability, which made him a widely supported candidate in a deeply divided political system.

• Lebanon's constitution mandates that the President must be a Maronite Christian, and Joseph Aoun fits this constitutional requirement.

• His presidency is seen as a move toward strengthening Lebanon's defense and addressing the country's socio-economic crisis, including political reforms and security enhancements.

Additional Information

• Hassan Diab

• Hassan Diab served as the Prime Minister of Lebanon from January 2020 to September 2021.

• His tenure was marked by the country's severe economic crisis and the tragic Beirut port explosion in August 2020.

• Diab resigned following public outrage over the explosion but stayed on as caretaker PM until a new government was formed.

• Michel Aoun

• Michel Aoun was the President of Lebanon from October 2016 to October 2022.

• He is a former military general and the founder of the Free Patriotic Movement (FPM), a prominent political party in Lebanon.

• His presidency faced criticism due to the political and economic crises that unfolded during his tenure.

• Saad Hariri

• Saad Hariri is a prominent Lebanese politician who has served as Prime Minister multiple times, most recently from December 2016 to January 2020.

• He is the leader of the Future Movement, a Sunni political party, and has played a key role in Lebanon's political landscape.

• Hariri stepped down amid anti-government protests and public demands for political reform in 2019.

• The Lebanese Presidency

• According to Lebanon's National Pact, the President must be a Maronite Christian, the Prime Minister a Sunni Muslim, and the

Speaker of Parliament a Shia Muslim.

• The presidency holds a symbolic yet pivotal role in maintaining Lebanon's sectarian balance and political stability.

• Presidential elections in Lebanon often face delays due to political rivalries and external influences.

Q40. Answer: (a) Dengue

The correct answer is Dengue.

Key Points

• QDENGA is a tetravalent dengue vaccine developed by Takeda Pharmaceuticals and approved by the World Health Organization (WHO) in May 2024.

• The vaccine is effective against all four serotypes of the dengue virus (DEN-1, DEN-2, DEN-3, and DEN-4).

• Dengue is a mosquito-borne viral disease primarily transmitted through the bite of infected Aedes aegypti and Aedes albopictus mosquitoes.

• QDENGA is targeted at reducing the global burden of dengue, which infects approximately 390 million people annually, with severe cases potentially leading to death.

• The vaccine is particularly beneficial for endemic regions, where dengue outbreaks cause significant morbidity and strain on healthcare systems.

Additional Information

• Malaria:

• Malaria is caused by Plasmodium parasites and transmitted through the bites of infected female Anopheles mosquitoes.

• The WHO-recommended malaria vaccine is RTS,S/AS01 (brand name: Mosquirix), which targets Plasmodium falciparum, the deadliest malaria parasite.

• Efforts to combat malaria also include insecticide-treated bed nets, indoor spraying, and anti-malarial medicines.

• Chikungunya:

• Chikungunya is a viral disease transmitted through Aedes mosquitoes, the same vectors responsible for dengue transmission.

• The disease is characterized by fever and severe joint pain, which can persist for months or years in some cases.

• There is currently no specific vaccine or antiviral treatment for chikungunya; management focuses on symptom relief.

• Zika:

• Zika virus is another mosquito-borne disease transmitted by Aedes mosquitoes, with symptoms including mild fever, rash, and conjunctivitis.

• It is particularly concerning for pregnant women, as it can lead to microcephaly and other congenital abnormalities in newborns.

• No vaccine is currently available for Zika, and prevention focuses on mosquito control and personal protection.

Q41. Answer: (a) 29

Shortcut Trick

Let the son's age 4 years ago be x. Then the father's age was 2x + 33.

The difference between their ages is (2x + 33) − x = x + 33.

The age difference between two people always remains constant.

When the father becomes twice his son's age, the difference between them is exactly equal to the son's age at that time.

So, the son's age at that future time must be x + 33.

Current age of son = x + 4. Years from now = (x + 33) − (x + 4) = 29 years.

Therefore The correct answer is 29 years.

Alternate Method

Given: 4 years ago, Father = 2 × Son + 33. Required: Years (T) after which Father = 2 × Son.

=> Let son's age 4 years ago = S

=> Father's age 4 years ago (F) = 2S + 33

=> Present ages: Son = S + 4, Father = (2S + 33) + 4 = 2S + 37

=> Let the required time be T years from now.

=> Future Age: Father + T = 2 × (Son + T)

=> (2S + 37) + T = 2 × (S + 4 + T)

=> 2S + 37 + T = 2S + 8 + 2T

=> 37 − 8 = 2T − T

=> T = 29

Therefore The correct answer is 29 years.

Additional Information

Constant Age Difference

The numerical difference between the ages of two persons remains the same regardless of the number of years passed.

Ratio of Ages

If the current ratio of ages is a:b, then after 'n' years, the ratio becomes (a+n):(b+n), which is not equal to the original ratio.

Double Age Property

When one person is twice as old as another, their age difference is exactly equal to the younger person's age at that point in time.

Q42. Answer: (b) 12 cm

Shortcut Trick

The side of a rhombus is calculated as: Side = Perimeter ÷ 4 = 40 ÷ 4 = 10 cm.

The semi-diagonals and the side of a rhombus form a right-angled triangle with a Pythagorean triplet (6, 8, 10).

Since one semi-diagonal is 16 ÷ 2 = 8 cm, the other semi-diagonal must be 6 cm.

Therefore, the other diagonal = 2 × 6 = 12 cm.

Therefore The correct answer is 12 cm.

Alternate Method

Given:

Perimeter of the rhombus = 40 cm

One diagonal (d1) = 16 cm

Formula Used:

Perimeter of a rhombus = 4 × side (a)

Relation between side and diagonals of a rhombus: $4a^2 = d1^2 + d2^2$

Calculations:

=> Perimeter of the rhombus = 40 cm

=> 4 × side (a) = 40

=> side (a) = 10 cm

=> Using the relation: $4a^2 = d1^2 + d2^2$

=> $4 \times 10^2 = 16^2 + d2^2$

=> $4 \times 100 = 256 + d2^2$

=> $400 = 256 + d2^2$

=> $d2^2 = 400 - 256$

=> $d2^2 = 144$

=> $d2 = \sqrt{144}$

=> d2 = 12 cm

Option Analysis:

=> Option (1) 10 cm: If the other diagonal were 10 cm, the side would be $\sqrt{(8^2 + 5^2)} = \sqrt{89} \approx 9.43$ cm, which gives a perimeter of 37.7 cm, not 40 cm.

=> Option (3) 11 cm: If the other diagonal were 11 cm, the side would be $\sqrt{(8^2 + 5.5^2)} = \sqrt{94.25} \approx 9.71$ cm, which gives a perimeter of 38.8 cm, not 40 cm.

=> Option (4) 14 cm: If the other diagonal were 14 cm, the side would be $\sqrt{(8^2 + 7^2)} = \sqrt{113} \approx 10.63$ cm, which gives a perimeter of 42.5 cm, not 40 cm.

Therefore The correct answer is 12 cm.

Additional Information

Properties of a Rhombus

All four sides of a rhombus are equal in length, and opposite sides are parallel. The diagonals bisect each other at right angles (90°).

Area of a Rhombus

The area of a rhombus can be calculated using the formula: Area = (1 ÷ 2) × d1 × d2, where d1 and d2 are the lengths of the diagonals.

Pythagorean Triplets

Common right-angled triangle side ratios like (3, 4, 5), (5, 12, 13), and (8, 15, 17) are extremely useful in solving geometry problems quickly when scaled up (e.g., 6, 8, 10).

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Q43. Answer: (d) 73

Shortcut Trick

Total Distance = 432 + 275 + 680 = 1387 km

Total Time = (432 ÷ 72) + (275 ÷ 55) + (680 ÷ 85) = 6 + 5 + 8 = 19 hours

Average Speed = 1387 ÷ 19 = 73 km/hr

Therefore The correct answer is 73 km/hr.

Alternate Method

Given:

D1 = 432 km, S1 = 72 km/hr

D2 = 275 km, S2 = 55 km/hr

D3 = 680 km, S3 = 85 km/hr

Formula Used:

Average Speed = Total Distance ÷ Total Time

Time = Distance ÷ Speed

Calculations:

=> Time T1 = 432 ÷ 72 = 6 hours

=> Time T2 = 275 ÷ 55 = 5 hours

=> Time T3 = 680 ÷ 85 = 8 hours

=> Total Time = 6 + 5 + 8 = 19 hours

=> Total Distance = 432 + 275 + 680 = 1387 km

=> Average Speed = 1387 ÷ 19 = 73 km/hr

Therefore The correct answer is 73 km/hr.

Additional Information

Average Speed for Equal Distances

If a person covers two equal distances at speeds x and y, then the average speed is (2xy) ÷ (x + y).

Relative Speed

When two objects move in the same direction, relative speed is the difference of their speeds. In opposite directions, it is the sum.

Unit Conversion

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

Q44. Answer: (d) 10.48

Given:

√169 + √0.0324 − √7.29

Formula Used:

√a × √a = a

Calculation:

=> √169 = 13

=> √0.0324 = 0.18

=> √7.29 = 2.7

=> 13 + 0.18 − 2.7

=> 10.48

Therefore The correct answer is 10.48.

Q45. Answer: (a) 13

Shortcut Trick

Mode is the value that appears most frequently in a data set.

Given data: 10, 13, 17, 11, 11, 13, 14, 16, 13, 13

Counting the occurrences: 10 (1), 11 (2), 13 (4), 14 (1), 16 (1), 17 (1).

The number 13 occurs 4 times, which is the maximum frequency.

Therefore The correct answer is 13.

Alternate Method

Given: Marks of 10 students = 10, 13, 17, 11, 11, 13, 14, 16, 13, 13

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Formula: Mode = Value with the maximum frequency.
Arranging the data in ascending order to count frequencies:
10, 11, 11, 13, 13, 13, 13, 14,

Q46. Answer: (b) 103°

Shortcut Trick
In right-angled triangle BDC, angle C = 90° − 63° = 27°.
Using the exterior angle property for triangle AEC, where angle AEB is the exterior angle at vertex E:
angle AEB = angle CAE + angle C
=> angle AEB = 76° + 27° = 103°.
Therefore The correct answer is 103 °.
Alternate Method
Given: BD perpendicular to AC at D, angle DBC = 63°, and angle CAE = 76°.
Formula Used: Sum of angles in a triangle = 180°; Exterior Angle Theorem (Exterior angle = sum of two opposite interior angles).
In triangle BDC:
=> angle BDC = 90° (Since BD perpendicular to AC)
=> angle C + angle DBC + angle BDC = 180°
=> angle C + 63° + 90° = 180°
=> angle C = 180° − 153° = 27°
In triangle AEC, angle AEB is the exterior angle at vertex E because B, E, C are collinear:
=> angle AEB = angle CAE + angle ACE
=> angle AEB = 76° + 27° = 103°
Therefore The correct answer is 103 °.
Additional Information
Exterior Angle Theorem
The measure of an exterior angle of a triangle is equal to the sum of the measures of its two remote interior angles.
Angle Sum Property
The sum of all interior angles of any triangle is always 180°.
Complementary Angles
In a right-angled triangle, the two acute angles are complementary, meaning their sum is exactly 90°.

Q47. Answer: (c) 650/7% profit

Shortcut Trick
Total Cost Price (CP) = 461 + 15 = 476.
Selling Price (SP) = 918.
Profit = 918 − 476 = 442.
Profit% = (442 ÷ 476) × 100.
Profit% = (221 ÷ 238) × 100 = (13 × 17 ÷ 14 × 17) × 100 = (13 ÷ 14) × 100 = 650/7%.
Therefore The correct answer is 650/7% profit.
Alternate Method
Given: Purchase Price = 461, Overhead Expenses = 15, Selling Price (SP) = 918.
Formulas: Total CP = Purchase Price + Overhead Expenses | Profit = SP − CP | Profit% = (Profit ÷ CP) × 100
=> Total Cost Price (CP) = 461 + 15 = 476
=> Selling Price (SP) = 918
=> Since SP > CP, it is a Gain.
=> Profit = 918 − 476 = 442
=> Profit% = (442 ÷ 476) × 100
=> Profit% = (13/14) × 100 = 650/7%
Therefore The correct answer is 650/7% profit.
Additional Information
Total Cost Price
The Total Cost Price includes the buying price plus any additional costs like transportation, repairs, or decoration.

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Profit and Loss Condition

If SP > CP, there is a profit. If CP > SP, there is a loss. Percentage is always calculated on the Total CP.

Q48. Answer: (d) Rs. 38,836

Shortcut Trick

Effective Simple Interest % (1) = 3.6% × 41/9 = 16.4%

Effective Simple Interest % (2) = 2.7% × 56/9 = 16.8%

Since 16.4% of Sum = Rs. 5453, then 1% = 5453 ÷ 16.4 = 332.5

Total Amount payable = (100% + 16.8%) = 116.8% of Sum

Amount = 116.8 × 332.5 = Rs. 38836

Therefore The correct answer is Rs. 38,836.

Alternate Method

Given:

Case 1: SI1 = Rs. 5453, Time (T1) = 41/9 years, Rate (R1) = 3.6%

Case 2: Time (T2) = 56/9 years, Rate (R2) = 2.7%

Formula Used:

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

Amount (A) = P + SI

Calculations:

=> 5453 = (P × 3.6 × 41/9) ÷ 100

=> 5453 = (P × 0.4 × 41) ÷ 100

=> 5453 = (P × 16.4) ÷ 100

=> P = (5453 × 100) ÷ 16.4 = 33250

=> SI2 = (33250 × 2.7 × 56/9) ÷ 100

=> SI2 = 332.5 × 0.3 × 56

=> SI2 = 332.5 × 16.8 = 5586

=> Amount (A2) = P + SI2 = 33250 + 5586 = 38836

Therefore The correct answer is Rs. 38,836.

Additional Information

Simple Interest Properties

Simple interest remains constant for every year if the principal and rate of interest are fixed. It is calculated only on the initial Principal amount.

Effective Rate Method

Total Interest % = Rate × Time. This allows direct comparison between different scenarios without calculating the Principal first.

Amount in SI

The total amount at the end of the period is the sum of the principal and interest: A = P(1 + RT/100).

Q49. Answer: (a) 176

Shortcut Trick

Net Rate of Interest for the given period = Rate × Time

=> Net % Interest = 8% × 5.5 = 44%

Simple Interest (SI) = 44% of Principal = 44% of Rs. 400

=> SI = 44 × 4 = Rs. 176

Therefore The correct answer is Rs. 176.

Alternate Method

Given:

Principal (P) = Rs. 400

Rate (R) = 8% per annum

Time (T) = 5.5 years

Formula Used:

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

Calculations:

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=> SI = (400 × 8 × 5.5) ÷ 100

=> SI = 4 × 8 × 5.5

=> SI = 32 × 5.5

=> SI = 32 × (11 ÷ 2)

=> SI = 16 × 11

=> SI = 176

Therefore The correct answer is Rs. 176.

Additional Information

Amount Formula

The total Amount (A) to be paid back is the sum of the Principal and the Simple Interest: A = P + SI.

Formula for Rate and Time

Rate R = (SI × 100) ÷ (P × T) and Time T = (SI × 100) ÷ (P × R).

Compound Interest vs Simple Interest

In Simple Interest, the interest is calculated only on the initial Principal, whereas in Compound Interest, interest is calculated on the Principal plus the accumulated interest of previous periods.

Q50. Answer: (c) 10

Shortcut Trick

Product of H.C.F. and L.C.M. = Product of the two numbers.

2 × 410 = 82 × Other Number

820 = 82 × 10

Therefore The correct answer is 10.

Alternate Method

Given:

H.C.F. = 2

L.C.M. = 410

First Number (a) = 82

Formula Used:

H.C.F. × L.C.M. = a × b

Calculations:

=> 2 × 410 = 82 × b

=> 820 = 82 × b

=> b = 820 ÷ 82

=> b = 10

Therefore The correct answer is 10.

Additional Information

H.C.F. (Highest Common Factor)

The greatest number that divides two or more numbers without leaving a remainder.

L.C.M. (Least Common Multiple)

The smallest non-zero common multiple of two or more numbers.

Co-prime Numbers

Two numbers are co-prime if their H.C.F. is 1. For any two co-prime numbers, L.C.M. = Product of the numbers.

Q51. Answer: (a) decrease by Rs. 3,604

Shortcut Trick

Let Income = 100, Savings = 28, Expenditure = 72.

New Income = 111 | New Expenditure = 72 × 1.3 = 93.6

New Savings = 111 − 93.6 = 17.4

Change in Savings = 17.4 − 28 = −10.6 units

Value = (34000 ÷ 100) × (−10.6) = −3604

Therefore The correct answer is decrease by Rs. 3,604.

Alternate Method

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Given: Initial Income = Rs. 34,000, Saving% = 28%, Income Increase = 11%, Expenditure Increase = 30%

Formula Used: Income = Expenditure + Savings

=> Initial Savings = 28% of 34,000 = 0.28 × 34,000 = Rs. 9,520

=> Initial Expenditure = 34,000 − 9,520 = Rs. 24,480

=> New Income = 34,000 × 111/100 = Rs. 37,740

=> New Expenditure = 24,480 × 130/100 = Rs. 31,824

=> New Savings = 37,740 − 31,824 = Rs. 5,916

=> Change in Savings = 5,916 − 9,520 = −Rs. 3,604

Therefore The correct answer is decrease by Rs. 3,604.

Additional Information

Percentage Change in Savings

The percentage change in savings can also be found using the weighted average of percentage changes in expenditure and savings to equal the percentage change in income.

Successive Percentage Change

If a value changes by a% and then by b%, the net change is given by (a + b + ab/100)%.

Base Change Property

When income and expenditure change at different rates, the savings change is highly sensitive to the initial savings-to-expenditure ratio.

Q52. Answer: (c) 10.6

Given:

Expression = √169 + √0.04 − √6.76

Formula Used:

√a × √a = a

Calculation:

=> √169 = 13

=> √0.04 = 0.2

=> √6.76 = 2.6

=> Value = 13 + 0.2 − 2.6

=> Value = 10.6

Therefore The correct answer is 10.6.

Q53. Answer: (d) 62.4%

Shortcut Trick

Let the actual selling price (SP_(actual)) be 8 units.

New SP = 3 units, which corresponds to a loss of 13% => 87% of CP.

Unitary method: 3 units => 87% Therefore 1 unit => 29%.

If he sells at 70% of 8 units = 5.6 units.

New SP in percentage = 5.6 × 29% = 162.4% of CP.

Profit% = 162.4% − 100% = 62.4%.

Therefore The correct answer is 62.4%.

Alternate Method

Given → Case 1: SP1 = 3/8 × SP_(actual), Loss = 13%. Case 2: SP2 = 0.70 × SP_(actual).

Formulas: SP = CP × (100 ± P/L)% | Profit% = (SP/CP − 1) × 100.

=> Let SP_(actual) = S. Then 3/8 × S = CP × 0.87.

=> S = (CP × 0.87 × 8) ÷ 3 = CP × 0.29 × 8 = 2.32 × CP.

=> New selling price SP2 = 70% of S = 0.70 × 2.32 × CP.

=> SP2 = 1.624 × CP.

=> Profit% = (1.624 − 1) × 100 = 62.4%.

Therefore The correct answer is 62.4%.

Additional Information

Relation between SP and CP

When there is a loss of L%, SP = CP × (100 − L)/100. When there is a profit of P%, SP = CP × (100 + P)/100.

Unitary Method in Percentage

Comparing different selling prices to a fixed Cost Price (100%) allows for direct ratio calculations to find unknown profit or loss percentages.

Q54. Answer: (c) 2340

Shortcut Trick

Check for Pythagorean triplet: $65^2 + 72^2 = 4225 + 5184 = 9409 = 97^2$.

Since it is a Right-angled triangle, Area = 1/2 × Base × Height.

Area = 1/2 × 65 × 72 = 65 × 36 = 2340 cm².

Therefore The correct answer is 2340 cm².

Alternate Method

Given: Sides of triangle a = 72 cm, b = 97 cm, c = 65 cm.

Formula Used: Heron's Formula Area = √(s(s−a)(s−b)(s−c)) where s = (a+b+c)/2.

=> Semi-perimeter (s) = (72 + 97 + 65) / 2 = 234 / 2 = 117 cm.

=> Area = √(117 × (117−72) × (117−97) × (117−65))

=> Area = √(117 × 45 × 20 × 52)

=> Area = √((9 × 13) × (9 × 5) × (5 × 4) × (4 × 13))

=> Area = 9 × 13 × 5 × 4 = 2340 cm².

Therefore The correct answer is 2340 cm².

Additional Information

Heron's Formula

Used for any triangle with sides a, b, and c: Area = √(s(s−a)(s−b)(s−c)) where s is the semi-perimeter.

Pythagorean Triplets

A set of three positive integers a, b, and c such that $a^2 + b^2 = c^2$. Common examples include (3, 4, 5), (5, 12, 13), and (65, 72, 97).

Area of Right Triangle

Area = 1/2 × product of legs. The hypotenuse is always the longest side and is not used as base or height in this basic formula.

Q55. Answer: (c) 31.6% increase

Shortcut Trick

Let Cost Price (CP) = 100.

Marked Price (MP) = 100 × (1 + 90%) = 190.

Selling Price (SP) = 190 × (1 − 60%) = 190 × 0.4 = 76.

For No Profit No Loss, the new SP must equal CP = 100.

Required Increase in SP = (100 − 76) ÷ 76 × 100 = 24 ÷ 76 × 100 ≈ 31.6%.

Therefore The correct answer is 31.6% increase.

Alternate Method

Given → MP is 90% above CP, Discount = 60%, Target = No Profit No Loss.

Formulas: MP = CP × (100 + Mark-up%) ÷ 100 | SP = MP × (100 − D%) ÷ 100 | % Change = (New − Old) ÷ Old × 100.

=> Assume CP = 100.

=> Marked Price (MP) = 100 + 90% of 100 = 190.

=> Selling Price (SP) = 190 − 60% of 190 = 190 − 114 = 76.

=> To achieve No Profit No Loss, the wholesaler must sell at CP, so Target SP = 100.

=> Required increase in SP = Target SP − Current SP = 100 − 76 = 24.

=> Percentage Increase = (24 ÷ 76) × 100 = 31.578...% ≈ 31.6%.

Therefore The correct answer is 31.6% increase.

Additional Information

Marked Price and Discount

MP is the price listed by the seller, and Discount is always calculated on the MP to arrive at the SP. Formula: SP = MP × (100 − Discount%) ÷ 100.

No Profit No Loss Condition

This state occurs when the Selling Price is exactly equal to the Cost Price (SP = CP). In this case, the gain or loss is zero.

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Q56. Answer: (d) 158

Shortcut Trick

The Average of the first n even numbers is simply given by the formula (n + 1).

Given n = 157.

Average = 157 + 1 = 158.

Therefore The correct answer is 158.

Alternate Method

Given: Total even numbers (n) = 157.

Formula Used: Average of an Arithmetic Progression (AP) = (First term + Last term) ÷ 2

=> First even number (a) = 2

=> 157^(th) even number (l) = 2 × 157 = 314

=> Average = (2 + 314) ÷ 2

=> Average = 316 ÷ 2

=> Average = 158

Therefore The correct answer is 158.

Additional Information

Sum of first n even numbers

The total sum is calculated as $S_n = n \times (n + 1)$.

Average of first n odd numbers

The average of the first n odd numbers is simply equal to n.

Average of first n natural numbers

The average of the first n natural numbers (1, 2, 3...) is (n + 1) ÷ 2.

Q57. Answer: (a) 140

Shortcut Trick

Product of H.C.F. and L.C.M. = Product of the two numbers.

Other number = (H.C.F. × L.C.M.) ÷ Given number

Other number = (28 × 840) ÷ 168 = 840 ÷ 6 = 140.

Therefore The correct answer is 140.

Alternate Method

Given:

H.C.F. = 28

L.C.M. = 840

First Number (n1) = 168

Formula Used:

n1 × n2 = H.C.F. × L.C.M.

Calculations:

=> 168 × n2 = 28 × 840

=> n2 = (28 × 840) ÷ 168

=> n2 = 23520 ÷ 168

=> n2 = 140

Therefore The correct answer is 140.

Additional Information

H.C.F. (Highest Common Factor)

It is the greatest number which divides each of the two or more given numbers exactly.

L.C.M. (Least Common Multiple)

It is the smallest number which is exactly divisible by each of the given numbers.

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

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

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Q58. Answer: (a) 144

Shortcut Trick

Total Ratio parts = 5 + 14 + 17 = 36 units

Total amount = Rs. 432 → 1 unit = 432 ÷ 36 = Rs. 12

Difference between Largest (17) and Smallest (5) = 17 − 5 = 12 units

Difference in Rs. = 12 units × Rs. 12 = Rs. 144

Therefore The correct answer is Rs. 144.

Alternate Method

Given: Total amount = Rs. 432, Ratio = 5 : 14 : 17

=> Let the shares be 5x, 14x, and 17x.

=> Sum = 5x + 14x + 17x = 36x

=> 36x = 432

=> x = 432 ÷ 36 = 12

=> Largest share = 17 × 12 = Rs. 204

=> Smallest share = 5 × 12 = Rs. 60

=> Difference = 204 − 60 = Rs. 144

Therefore The correct answer is Rs. 144.

Additional Information

Ratio Division Rule

To divide a quantity A into ratio a:b:c, the shares are [a/(a+b+c)]×A, [b/(a+b+c)]×A, and [c/(a+b+c)]×A.

Ratio Difference Shortcut

Difference between two parts = [(Difference between ratio terms) ÷ (Sum of ratio terms)] × Total Amount.

Invertendo and Dividendo

Properties used in complex ratio problems to simplify comparisons between numerator and denominator values.

Q59. Answer: (c) 12%

Shortcut Trick

Identify the Marked Price (MP) as Rs. 750 and Selling Price (SP) as Rs. 660.

Discount Amount = MP − SP = 750 − 660 = Rs. 90.

Discount % = (Discount ÷ MP) × 100.

Discount % = (90 ÷ 750) × 100 = 12%.

Therefore The correct answer is 12%.

Alternate Method

Given:

Marked Price (MP) = Rs. 750, Selling Price (SP) = Rs. 660.

Formula:

Discount% = ((MP − SP) ÷ MP) × 100

=> Discount Amount = 750 − 660 = 90.

=> Discount Rate = (90 ÷ 750) × 100.

=> Discount Rate = (9 ÷ 75) × 100 = (3 ÷ 25) × 100.

=> Discount Rate = 3 × 4 = 12%.

Therefore The correct answer is 12%.

Additional Information

Marked Price & Discount

The Marked Price (List Price) is the price printed on the article. Discount is always calculated on the Marked Price unless otherwise specified.

Selling Price Calculation

SP = MP × (100 − Discount%) ÷ 100. This formula helps find the final price after applying a percentage reduction.

Q60. Answer: (a) 60

Shortcut Trick

Mean Proportional (MP) = √(a × b)

MP = √(15 × 240)
MP = √(15 × 15 × 16) = 15 × 4 = 60
Therefore The correct answer is 60.
Alternate Method
Given:
First number (a) = 15
Second number (b) = 240
Formula Used:
If x is the mean proportional between a and b, then a/x = x/b => $x^2 = ab$
Calculations:
=> $x^2 = 15 \times 240$
=> $x^2 = 3600$
=> $x = \sqrt{3600}$
=> x = 60
Therefore The correct answer is 60.
Additional Information
Third Proportional
The third proportional of two numbers a and b is a value c such that a : b = b : c, calculated as $c = b^2/a$.
Fourth Proportional
The fourth proportional of three numbers a, b, and c is a value d such that a : b = c : d, calculated as d = (b × c)/a.
Compound Ratio
The compound ratio of (a : b) and (c : d) is calculated as (a × c) : (b × d).

Q61. Answer: (d) sec θ

Shortcut Trick
Put θ = 0°
=> P = sec 0° + tan 0° = 1 + 0 = 1
=> Expression = $(P^2 + 1) \div 2P = (1^2 + 1) \div (2 \times 1) = 2 \div 2 = 1$
=> Check options for θ = 0°: Option (4) sec 0° = 1 matches.
Therefore The correct answer is sec θ.
Alternate Method
Given: P = sec θ + tan θ
Formula: $\sec^2\theta - \tan^2\theta = 1$ => (sec θ + tan θ)(sec θ − tan θ) = 1
=> 1/P = sec θ − tan θ
=> P + 1/P = (sec θ + tan θ) + (sec θ − tan θ)
=> $(P^2 + 1) / P = 2 \sec\theta$
=> $(P^2 + 1) / 2P = \sec\theta$
Therefore The correct answer is sec θ.
Additional Information
Trigonometric Identities
Fundamental identities include $\sin^2\theta + \cos^2\theta = 1$ and $1 + \tan^2\theta = \sec^2\theta$.
Reciprocal Relation
If sec θ + tan θ = P, then sec θ − tan θ = 1/P. Adding these gives 2 sec θ = P + 1/P.
Value of tan θ
By subtracting the equations, 2 tan θ = P − 1/P => $\tan\theta = (P^2 - 1) / 2P$.

Q62. Answer: (d) 17

Shortcut Trick
To find consecutive natural numbers whose product is 272, check the nearest perfect square.
We know that $16^2 = 256$ and $17^2 = 289$.
Since 256 < 272 < 289, the numbers must be 16 and 17.
Calculation: 16 × 17 = 272.

The greater number is 17.

Therefore The correct answer is 17.

Alternate Method

Given: Product of two consecutive natural numbers = 272.

Formula Used: Quadratic Equation: x(x + 1) = Product.

Let the smaller number be x and the larger number be (x + 1).

=> x(x + 1) = 272

=> $x^2 + x - 272 = 0$

=> $x^2 + 17x - 16x - 272 = 0$

=> x(x + 17) − 16(x + 17) = 0

=> (x − 16)(x + 17) = 0

=> x = 16 or x = −17

=> Since x is a natural number, x = 16.

=> Greater number = x + 1 = 16 + 1 = 17.

Therefore The correct answer is 17.

Additional Information

Consecutive Natural Numbers

Natural numbers that follow each other in order, with a common difference of 1 (e.g., n, n+1, n+2).

Nature of Roots

For $ax^2 + bx + c = 0$, roots depend on the discriminant $D = b^2 - 4ac$. Here D > 0, so roots are real and distinct.

Sum and Product of Roots

Sum = −b/a and Product = c/a. Useful for verifying factors in quadratic equations.

Q63. Answer: (c) 5191/329 hours

Shortcut Trick

Total time to fill the tank together = 1 / (1/A + 1/B + 1/C)

Total time = 1 / (1/17 + 1/27 + 1/12)

Calculating the reciprocal of sum of efficiencies: 1836 / (108 + 68 + 153) = 1836 / 329

1836 ÷ 329 = 5(191/329) hours.

Therefore The correct answer is 5(191)/(329) hr.

Alternate Method

Person	Days	Total Work	Efficiency
Pipe A	17	5508	324
Pipe B	27	204	
Pipe C	12	459	

=> Total Work (LCM of 17, 27, 12) = 17 × 27 × 4 = 1836 units.

=> Efficiency of A = 1836 ÷ 17 = 108 units/hr.

=> Efficiency of B = 1836 ÷ 27 = 68 units/hr.

=> Efficiency of C = 1836 ÷ 12 = 153 units/hr.

=> Combined Efficiency = 108 + 68 + 153 = 329 units/hr.

=> Time taken = 1836 ÷ 329 = 5(191/329) hr.

Therefore The correct answer is 5(191)/(329) hr.

Additional Information

Pipes and Cisterns Basics

Efficiency of an inlet pipe is positive, whereas efficiency of an outlet (leak) pipe is considered negative. Total work = Time × Efficiency.

Combined Work Formula

If pipe A fills in x hours and pipe B fills in y hours, they together fill in (xy)/(x + y) hours.

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Q64. Answer: (d) 7x2 -6x - 5

Shortcut Trick

Combine like terms: $(3x^2 + 4x^2) + (-6x) + (-20 + 15)$

=> $7x^2 - 6x - 5$

Therefore The correct answer is $7x^2 - 6x - 5$.

Alternate Method

Given Expression: $x(3x - 6) + 4(x^2 - 5) + 15$

Method: Apply the Distributive Law $a(b + c) = ab + ac$ to expand the brackets and simplify by combining like terms.

=> $x \times 3x - x \times 6 + 4 \times x^2 - 4 \times 5 + 15$

=> $3x^2 - 6x + 4x^2 - 20 + 15$

=> $(3x^2 + 4x^2) - 6x + (-20 + 15)$

=> $7x^2 - 6x - 5$

Therefore The correct answer is $7x^2 - 6x - 5$.

Additional Information

Distributive Property

The property states that $a(b + c) = ab + ac$, which is used to remove parentheses in algebraic expressions.

Like Terms

Terms having the same variable and the same exponent (e.g., $3x^2$ and $4x^2$) can be added or subtracted together.

BODMAS Rule

Always follow the order: Brackets, Orders (powers), Division, Multiplication, Addition, and Subtraction.

Q65. Answer: (c) 105 hours

Shortcut Trick

Full time for P = 25 × (9/5) = 45 hours and Q = 27 × (7/3) = 63 hours.

LCM of 45 and 63 is 315 units (Total Work). Efficiency: P = 7, Q = 5.

Work done in 3 hours = (7 + 5) × 3 = 36 units. Efficiency of R = 36 ÷ 4 = 9 (Emptying).

Net efficiency (P + Q − R) = 7 + 5 − 9 = 3 units/hr.

Time taken = 315 ÷ 3 = 105 hours.

Therefore The correct answer is 105 hr.

Alternate Method

Given: Pipe P fills 5/9 part in 25 hr, Pipe Q fills 3/7 part in 27 hr. R empties the filled part in 4 hr.

Formula Used: Total Work = Time × Efficiency; Time = Total Work ÷ Net Efficiency.

Person	Days (hr)	Total Work	Efficiency
P	45	315	7
Q	63	5	

=> Total capacity of tank = 315 units.

=> Amount filled by P and Q in 3 hours = (7 + 5) × 3 = 36 units.

=> Pipe R empties 36 units in 4 hours.

=> Efficiency of R = 36 ÷ 4 = 9 units/hr (Negative as it is an outlet pipe).

=> Combined efficiency of P, Q, and R = 7 + 5 − 9 = 3 units/hr.

=> Time required to fill the tank together = 315 ÷ 3 = 105 hours.

Therefore The correct answer is 105 hr.

Additional Information

Pipes and Cisterns Efficiency

Inlet pipes have positive efficiency while outlet pipes (leaks) have negative efficiency.

Total Work via LCM

Always calculate the time taken to fill the whole tank (1 unit) before taking the LCM to find total capacity.

Work and Time Relation

If a pipe fills a tank in 'x' hours, its 1-hour work is 1/x of the total capacity.

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Q66. Answer: (b) Rs. 3,836

Shortcut Trick

Ratio of shares A : B : C = 1/4 : 1/7 : 1/2

Multiply by LCM(4, 7, 2) = 28 → 7 : 4 : 14

Total units = 7 + 4 + 14 = 25 units

Share of A = (7 ÷ 25) × Rs. 13,700 = 7 × Rs. 548 = Rs. 3,836

Therefore The correct answer is Rs. 3,836.

Alternate Method

Given: Total amount = Rs. 13,700, Condition: 4A = 7B = 2C

Formula Used: Ratio & Proportion Share Calculation

=> Let 4A = 7B = 2C = k

=> A = k/4, B = k/7, C = k/2

=> A : B : C = (k/4) : (k/7) : (k/2)

=> To simplify, multiply by 28: A : B : C = 7 : 4 : 14

=> Total Ratio = 7 + 4 + 14 = 25

=> Value of 1 unit = 13,700 ÷ 25 = 548

=> Share of A = 7 × 548 = 3,836

Therefore The correct answer is Rs. 3,836.

Additional Information

Combined Ratio Rule

If aA = bB = cC, then A : B : C = (1/a) : (1/b) : (1/c). Multiply by LCM of denominators to get integers.

Unitary Method in Ratios

Total Value = Sum of Ratios × Value of 1 Unit. Always find the value of 1 unit first to simplify calculations.

Q67. Answer: (a) 13 hours 45 minutes

Shortcut Trick

Let W be the time to walk one way and D be the time to drive one way.

Given: W + D = 7 hr 45 min

Given: 2D = (W + D) − 6 hr = 1 hr 45 min (Time gained by driving both ways).

Time to walk both ways (2W) = 2 × (W + D) − 2D

=> 2W = 2 × (7 hr 45 min) − (1 hr 45 min) = 15 hr 30 min − 1 hr 45 min = 13 hr 45 min.

Therefore The correct answer is 13 hr 45 min.

Alternate Method

Given:

Time for Walk + Drive = 7 hours 45 minutes

Time for Drive + Drive = (7 hours 45 minutes) − 6 hours = 1 hour 45 minutes

Calculations:

=> Let 1 Walk be W and 1 Drive be D.

=> W + D = 7 hr 45 min

=> 2D = 1 hr 45 min

=> D = (1 hr 45 min) ÷ 2 = 105 min ÷ 2 = 52.5 minutes

=> W = (7 hr 45 min) − 52.5 min = 465 min − 52.5 min = 412.5 minutes

=> Time for Walk + Walk (2W) = 2 × 412.5 min = 825 minutes

=> 825 min = 825 ÷ 60 = 13 hours 45 minutes

Therefore The correct answer is 13 hr 45 min.

Additional Information

Time and Speed Relation

For a fixed distance, time taken is inversely proportional to speed (T prop. to 1/V). If speed is constant, time remains constant for the same distance.

Linear Time Equations

Problems involving two modes of transport can be solved using linear equations where T_(total) = T_(mode1) + T_(mode2).

Time Conversion

Always convert mixed units (hours and minutes) into a single unit (total minutes) for easier calculation: Total min = (Hours × 60) + Minutes.

Q68. Answer: (a) 86.8

Shortcut Trick

Make the number of decimal places equal by adding zeros: 2.800 and 0.217.

Consider them as integers: 2800 and 217.

LCM(2800, 217) → 2800 is 7 × 400 and 217 is 7 × 31.

LCM = 7 × 400 × 31 = 86800.

Shift decimal back 3 places: 86.800.

Therefore The correct answer is 86.8.

Alternate Method

Given: Numbers are 2.8 and 0.217.

Formula Used: LCM of Fractions = (LCM of Numerators) ÷ (HCF of Denominators)

=> Convert decimals to fractions: 2.8 = 28/10 and 0.217 = 217/1000.

=> To find LCM, make denominators equal: 2800/1000 and 217/1000.

=> LCM = LCM(2800, 217) ÷ 1000.

=> Prime factorization: 2800 = 2^4 × 5^2 × 7 and 217 = 7 × 31.

=> LCM(2800, 217) = 2^4 × 5^2 × 7 × 31 = 16 × 25 × 7 × 31 = 86800.

=> Final LCM = 86800 ÷ 1000 = 86.8.

Therefore The correct answer is 86.8.

Additional Information

LCM of Decimals

Always convert decimals into like decimals (same number of digits after the decimal point) before calculating LCM or HCF as integers.

HCF of Fractions

The HCF of a set of fractions is calculated as (HCF of Numerators) ÷ (LCM of Denominators).

Relationship Property

For any two numbers A and B: Product of numbers (A × B) = LCM(A, B) × HCF(A, B).

Q69. Answer: (c) 1156

Shortcut Trick

To find the square of 34, use the $(a+b)^2$ method where a=3 and b=4.

Step 1: Square of 4 = 16 (Write 6, Carry 1)

Step 2: 2 × 3 × 4 = 24 + 1 (carry) = 25 (Write 5, Carry 2)

Step 3: Square of 3 = 9 + 2 (carry) = 11

Result = 1156

Therefore The correct answer is 1156.

Alternate Method

Given: Number = 34

Formula Used: Square of a number x = x × x

=> 34^2 = 34 × 34

=> 34 × (30 + 4)

=> (34 × 30) + (34 × 4)

=> 1020 + 136

=> 1156

Therefore The correct answer is 1156.

Additional Information

Square of numbers ending in 5

For a number n5, the square is [n × (n+1)] followed by 25. Example: 35^2 = (3×4)25 = 1225.

BODMAS Rule

Always follow the order: Brackets, Orders (powers/roots), Division, Multiplication, Addition, Subtraction.

Algebraic Identity

$(a + b)^2 = a^2 + 2ab + b^2$ can be used to calculate squares of any two-digit number.

Q70. Answer: (b) 15.25

Given:

First value = 65% of 65

Second value = 3/5 of 45

Formula Used:

Percentage value = (Percentage ÷ 100) × Number

Fractional value = Fraction × Number

Difference = Larger value − Smaller value

Calculation:

=> 65% of 65 = 65 ÷ 100 × 65

=> 65% of 65 = 42.25

=> 3/5 of 45 = 3 ÷ 5 × 45

=> 3/5 of 45 = 27

=> Difference = 42.25 − 27

=> Difference = 15.25

Therefore The correct answer is 15.25.

Q71. Answer: (c) RVQO

The logic followed here is:

Hence, the correct answer is "Option 3"

Q72. Answer: (a) 8

‘TEAR’ is coded as ‘7165’ and ‘SEAT’ is coded as ‘5678’.

‘TEAR’ - ‘7165’

‘SEAT’ - ‘5678’

The Code for S is 8.

Hence, the correct answer is "Option 1"

Q73. Answer: (a) 2 km towards North

Samad starts from Point A and drives 15 km towards East.

• He then takes a left turn, drives 6 km, turns left and drives 12 km.

• He then takes a left turn and drives 8 km.

• He takes a final right turn, drives 3 km and stops at Point P.

The Final Arrangement is,

Hence, the correct answer is "Option 1"

Q74. Answer: (d) W

Seven boxes V, W, X, Y, Z, Q and R are kept one over the other but not necessarily in the same order.

• No box is kept above Z.

• Only three boxes are kept between Z and W.

• Only one box is kept between V and R.

• R is kept immediately above W.

• Only four boxes are kept between V and X.

• Q is kept at some place above Y.

The Final Arrangement is,

Z
V
Q
R
W

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Y
X

Hence, the correct answer is "Option 4"

Q75. Answer: (c) 1

Given Series - (Left) 4 7 + $ £ 3 & 8 5 @ 1 Ω # * % 6 2 9 (Right)

Required Conditions: another number - number- another number

(Left) 4 7 + $ £ 3 & 8 5 @ 1 Ω # * % 6 2 9 (Right)

Hence, the correct answer is "Option 3"

Q76. Answer: (a) 49

Given:

Mayank rank from the top = 39th

Mayank rank from the bottom = 11th

Total persons = (Rank from one end) + (Rank from other end) - 1

= 39+ 11 - 1

= 50- 1

= 49 students.

Hence, the correct answer is "Option 1"

Q77. Answer: (b) 595

The logic follows here,

Hence, the correct answer is "Option 2"

Q78. Answer: (a) Two

Seven boxes P, Q, R, S, X, Y and Z are kept one over the other, but not necessarily in the same order.

• Only S is kept above X.

• Only two boxes are kept between X and Z.

• Only P is kept below R.

• Q is not kept immediately above Z.

The Final Arrangement is,

S
X
Q
Y
Z
R
P

Hence, the correct answer is "Option 1"

Q79. Answer: (b) NQK

The logic followed here is:

Hence, the correct answer is "Option 2"

Q80. Answer: (b) NS-PK

The logic followed here is:

Hence, the correct answer is "Option 2"

Q81. Answer: (c) Kavita

Sumit, Jatin, Ramesh, Priya, Kavita and Manoj are sitting in a straight line, facing north.

• Sumit sits third from the left end.

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• Manoj sits second to the right of Sumit.
• Jatin sits to the immediate left of Kavita.
• Priya does not sit at the end.
The Final Arrangement,

Q82. Answer: (b) 176

The logic follows here,
Hence, the correct answer is "Option 2"

Q83. Answer: (c) FLG

The logic followed here is:
Hence, the correct answer is "Option 3".

Q84. Answer: (b) Both conclusions I and II follow.

The least possible Venn diagram for the given statements is as shown below :
Conclusions:
(I): Some cups are forks.- True (All mugs are cups.Some mugs are forks.Some cups are forks is a true)
(II): Some forks are mugs. - True (All Mugs are Cups. Some Mugs are Forks. Some forks are mugs is a true)
Both conclusions I and II follow.
Hence, the correct answer is "Option 2"

Q85. Answer: (c) FEAN - EFAN - FANE

Similarly,
Hence, the correct answer is "Option 3"

Q86. Answer: (c) Wife's sister

Preparing the family tree diagram by using the following symbols:
As per the given information:
Hence, the correct answer is "Option 3"

Q87. Answer: (d) 12

Given number 4796583
Arranged in the ascending order from left to right.
Left 4 7 9 6 5 8 3 Right
Left 3 4 5 6 7 8 9 Right
Sum of the digits that are first from the left and first from the right in the new number thus formed = 9 +3 = 12.
Hence, the correct answer is "Option 4"

Q88. Answer: (c) 31

The logic follows here,
Hence, the correct answer is "Option 3"

Q89. Answer: (d) Two

Given - (Left) + # 5 3 $ Ω 4 ? 9 1 & % 7 * @ 2 £ 6 8 (Right)
Required Conditions: Symbol - Symbol - Even Number
(Left) + # 5 3 $ Ω 4 ? 9 1 & % 7 * @ 2 £ 6 8 (Right)
Hence, the correct answer is "Option 4"

Q90. Answer: (c) 2 km

• Amit started from Point A and travelled 9 km east.
• He then turned right and travelled 6 km.
• He then turned right and travelled 7 km.
• He finally turned right and travelled 6 km to stop at Point E
The Final Diagram,
Hence, the correct answer is "Option 3"

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Q91. Answer: (a) 2

'EXAM' is coded as '3579' and 'HAME' is coded as '5327'.

'EXAM'- '3579'

'HAME'- '5327'

The Code for H is 2.

Hence, the correct answer is "Option 1"

Q92. Answer: (c) (39, 546, 7)

Logic: Second number = (First number × Third number) × 2.

Similarly,

Hence, the correct answer is "Option 3"

Q93. Answer: (c) Two

Given number 7231456

Ascending order from left to right.

Hence, the correct answer is "Option 3"

Q94. Answer: (a) 124

Given Series- 78 × 2 − 2 + 12 ÷ 6 × 5 + 4 ÷ 4 × 24 = ?

if '÷' and '−' are interchanged and '×' and '+' are interchanged

BODMAS Rule:

78 + 2 ÷ 2 × 12 − 6 + 5 × 4 − 4 + 24 = ?

78 + 1 × 12 − 6 + 5 × 4 − 4 + 24 = ?

78 + 12 + 20 + 24 − 6 − 4 = ?

134 − 10 = ?

124.

Hence, the correct answer is "Option 1"

Q95. Answer: (a) Three

Seven people, I, J, K, L, P, Q, and R, are sitting in a row, facing north.

• Only two people sit to the left of R.

• Only three people sit between R and L.

• I sits second to the right of R.

• Only two people sit between I and Q.

• K sits at some place to the right of J but at some place to the left of P

The Final Arrangement is,

Hence, the correct answer is "Option 1"

Q96. Answer: (d) GSK : EPM

The logic followed here is:

Similarly,

Hence, the correct answer is "Option 4"

Q97. Answer: (a) 22

Given Equation- 27 × 11 − 3 ÷ 56 + 2 = ?

if '+' and '÷' are interchanged, and '−' and '×' are interchanged.

BODMAS Rule:

27 − 11 × 3 + 56 ÷ 2 = ?

27 − 11 × 3 + 28 = ?

27 + 28 − 33 = ?

55 − 33 = ?

22.

Hence, the correct answer is "Option 1"

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Q98. Answer: (a) KOP 6

The logic followed here is:

Hence, the correct answer is "Option 1".

Q99. Answer: (b) FDC 11

The logic followed here is:

Hence, the correct answer is "Option 2"

Q100. Answer: (d) Only conclusion (I) follows.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

(I): Some bugs are lamps.- True (All Lamps are Bugs and Some lamps are bugs and Some bags are lamps is true.)

(II): All lamps are pins. - False (All Pins are Lamps but All lamps are pins is may be possible but not definite. Hence it is false)

Only conclusion (I) follows.

Hence, the correct answer is "Option 4"

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