RRB NTPC (UG) CBT-I Official Paper (Held On 16 Jun, 2026 Shift 1) (Previous Year Paper)

RRB NTPC • 2026 • 100 questions • 90 minutes • Answer key and solutions

Take this paper as a timed mock test

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

yourmocktest.com/pyq/rrb-ntpc/rrb-ntpc-ug-cbt-i-official-paper-held-on-16-jun-2026-shift-1-prev…

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

YourMockTest.com — Free Study Material

MATHEMATICS

Q1. The diagonals of a rhombus are 19 cm and 29 cm. Find its area.

(a) 275.5 cm²
(b) 265.5 cm²
(c) 255.5 cm²
(d) 285.5 cm²

Q2. How many sides does a regular polygon have if each interior angle measures 150°?

(a) 12 sides
(b) 15 sides
(c) 8 sides
(d) 10 sides

Q3. A shopkeeper buys two types of rice costing Rs. 32 per kg and Rs. 40 per kg. He buys a total of 45 kg of rice for Rs. 1600. The ratio of the quantity (in kg) of rice costing Rs. 32 per kg to that costing Rs. 40 per kg is

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

Q4. A swimming pool is fitted with three pipes. The first two pipes working simultaneously, fill the pool in the same time as the third pipe alone. The second pipe alone fills the pool 5 hours faster than the first pipe and 4 hours slower than the third pipe. In what time will the second and third pipes together fill the pool?

(a) 3 3/4 hours
(b) 6 hours
(c) 4 hours
(d) 7 1/2 hours

Q5. A car travels from City A to City B at a speed of 60 km/h. After reaching City B, the driver increases the speed by 20 km/h for the return journey. Due to road repairs on the way back, the car is forced to slow down for 30 minutes, during which it travels at only 30 km/h instead of the increased speed. If the total time for the round trip is 7 hours, find the distance between City A and City B.

(a) 229 2/5 km
(b) 229 2/7 km
(c) 227 2/5 km
(d) 219 2/7 km

Q6. A shopkeeper offers the following schemes on toys of the same marked price.

(A) Successive discounts of 50% and 16% on any number of toys bought.
(B) Successive discounts of 49%, 8% and 13% on any number of toys bought.
(C) 35% discount on the first 6 toys and 45% discount on each toy thereon.

(D) On buying eight items, the customer is billed for only four items.

A customer wants to buy 8 toys. Which of the above schemes is the least beneficial to her?

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

Q7. Evaluate $24^3 + (-5)^3 + (-19)^3$

(a) 6763
(b) 6840
(c) 6572
(d) 6783

Q8. If a:b = 12:13 and b:c = 4:5, what is a:c?

(a) 4:13
(b) 12:5
(c) 48:65
(d) 4:5

Q9. The price of a jacket is first increased by 20% and then decreased by 25%. If the original price was Rs. 600, what is the final price of the jacket?

(a) Rs. 570
(b) Rs. 540
(c) Rs. 600
(d) Rs. 480

Q10. The arithmetic mean of 10 observations is 42. Three of the observations are 30, 38, and 50. The remaining six observations have an average of 45. Find the missing observation.

(a) 31
(b) 34
(c) 32
(d) 33

Q11. The value of the expression $0.125 \times 4\text{^}4 \times 2\text{^}(-5) \times 0.25^2 \times 8^2$ is _____.

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

Q12. Two taps can fill a cistern in 4 hours and 12 hours, respectively. A third tap can empty it in 12 hours. How long (in hours) will it take to fill one-fourth of the empty cistern if all the taps are opened together?

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

Q13. The HCF and LCM of two positive integers are 36 and 7,560, respectively. If one of the numbers is 540, what is the other number?

(a) 504
(b) 432
(c) 396
(d) 468

YourMockTest.com — Free Study Material

Q14. A sum of Rs. 8,000 is borrowed at a simple interest rate of 5% per annum for 3 years. What is the simple interest payable?

(a) Rs. 1,000
(b) Rs. 1,200
(c) Rs. 1,400
(d) Rs. 1,600

Q15. A cyclist travels 40 meters in 8 seconds. What is his speed?

(a) 21 km/hr
(b) 16 km/hr
(c) 18 km/hr
(d) 24 km/hr

Q16. The angle of elevation of the top of a building from a point 40 m away is 45°. What is the height of the building?

(a) 36 m
(b) 30 m
(c) 20 m
(d) 40 m

Q17. Find the mean proportional between $(x + y)^2$ and $(x - y)^2$, (x and y are natural number and x > y).

(a) $x^2 + y^2$
(b) $x^2 – y^2$
(c) $xy + y^2$
(d) $xy + x^2$

Q18. If $\sqrt{x} = 5$, what is the value of $\sqrt{(x+25)}$?

(a) $5\sqrt{2}$
(b) $3\sqrt{5}$
(c) $5\sqrt{3}$
(d) $2\sqrt{5}$

Q19. Ritu gets a discount of 40% on an oven whose marked price is Rs. 1000. Since she pays by credit card, she gets an additional 22% discount. How much does she pay (in Rs.)?

(a) 469
(b) 467
(c) 465
(d) 468

Q20. The largest four-digit number which when divided by 12, 13 and 7 leaves remainder 3 in each case is:

(a) 9831
(b) 9618
(c) 9934
(d) 9438

Q21. The marked price of a sweater is Rs. 600. The wholesaler offers a 20% discount to a retailer for up to 20 sweaters and a 25% discount if the order exceeds 20 sweaters. Find the amount paid by the retailer if he orders 22 such sweaters.

(a) Rs. 9,900
(b) Rs. 9,850
(c) Rs. 9,250
(d) Rs. 9,500

YourMockTest.com — Free Study Material

Q22. A smart city metro line had an average of 4,500 daily riders last month. This month, it averaged 4,860 riders per day. What is the percentage growth in ridership?

(a) 8%
(b) 6.4%
(c) 4.5%
(d) 10.2%

Q23. A closed cylindrical reservoir features a radius of 14 cm and a height of 10 cm. If 20% of the total surface area of this reservoir is coated in blue paint and the remaining surface is coated in red, determine the total area in square centimeters that is painted red. [Use π = 22/7]

(a) 424.4 cm²
(b) 422.4 cm²
(c) 1687.6 cm²
(d) 1689.6 cm²

Q24. A shopkeeper purchases rice at Rs. 60 per kg. While selling, he uses a weighing scale that shows 1 kg when only 900 g is actually weighed. He marks the price 20% above the cost price. Later, he gives a 10% discount on the marked price but continues using the same faulty scale. Find his profit (in Rs.) on each transaction where the buyer pays for 1 kg.

(a) Rs. 9.80
(b) Rs. 10.20
(c) Rs. 9.20
(d) Rs. 10.80

Q25. Mary is 3 years older than her sister. If their combined age is 27 years, what is Mary's age (in years)?

(a) 14
(b) 12
(c) 13
(d) 15

Q26. Simplify √(1624+√(3225+√(419+157))).

(a) 41
(b) 43
(c) 47
(d) 45

Q27. A company has 10 officers and 30 clerks. The average monthly salary of an officer is Rs. 45,000 and that of a clerk is Rs. 25,000. What is the average salary of the entire staff?

(a) Rs. 35,000
(b) Rs. 32,000
(c) Rs. 28,000
(d) Rs. 30,000

Q28. A total of money is split among E, F, G and H in the ratio 9:7:5:3. If G gets Rs. 4000 less than F, how much does E receive?

(a) Rs. 18000
(b) Rs. 16000
(c) Rs. 17000
(d) Rs. 20000

Q29. Find the value of {3.46 + 31/4 - 51/8 + 4.25 + 0.165}

(a) 7
(b) 6
(c) 7.4
(d) 6.8

YourMockTest.com — Free Study Material

Q30. A sum of Rs. 20,000 amounts to Rs. 21,218 in 2 years under compound interest, compounded annually. Find the rate of interest per annum.

(a) 3%
(b) 5%
(c) 8%
(d) 4%

GENERAL AWARENESS

Q31. In the Windows operating system, _____ is the first user-mode process that initializes system sessions and starts essential background services.

(a) Control Panel
(b) Session Manager
(c) Windows Explorer
(d) Task Manager

Q32. Which of the following cases for the first time held the Preamble to be part of the Constitution?

(a) Golaknath Case, 1967
(b) Kesavananda Bharati Case, 1973
(c) S.R. Bommai Case, 1994
(d) Berubari Case, 1960

Q33. The deficiency of which vitamin can lead to night blindness?

(a) Vitamin A
(b) Vitamin C
(c) Vitamin B12
(d) Vitamin D

Q34. Which of the following vehicles was used to launch the SpaDex mission by the Indian Space Research Organisation?

(a) GSLV Mk III
(b) GSLV Mk II
(c) PSLV-C60
(d) SSLV-D2

Q35. Susumu Kitagawa, Richard Robson and Omar M. Yaghi were awarded with Nobel Prize in 2025 for their contributions in which field?

(a) Medicine
(b) Physics
(c) Economic Sciences
(d) Chemistry

Q36. Which of the following is a physical change only?

(a) Crystallization
(b) Oxidation
(c) Combustion
(d) Reduction

Q37. The Union Territories Laws (Amendment) Bill, 2024, does NOT propose to amend which of the following Acts?

(a) Government of National Capital Territory of Delhi Act, 1991
(b) Jammu and Kashmir Reorganisation Act, 2019
(c) Government of Union Territories Act, 1963
(d) Representation of the People Act, 1951

YourMockTest.com — Free Study Material

Q38. Which of the following has NOT aided in Globalisation of the Indian economy?

(a) E-commerce
(b) Farm subsidies
(c) Reduction of trade barriers
(d) Emergence of multinational companies in India

Q39. Which river forms a fertile region within parts of the Great Indian Desert?

(a) Ghaggar River
(b) Beas River
(c) Narmada River
(d) Sabarmati River

Q40. According to the Sustainable Development Report, 2025, what was India's standing in the SDG Index?

(a) 120th
(b) 85th
(c) 110th
(d) 99th

Q41. Which Article of the Indian Constitution empowers Parliament to form new states or alter their boundaries?

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

Q42. The Vernacular Press Act (1878) targeted _____.

(a) Indian-language newspapers critical of British rule
(b) Trade publications against British rule
(c) Hindi educational journals during British rule
(d) English newspapers only

Q43. Which period is associated with the Extremist phase of the Indian National Congress?

(a) 1885–1905
(b) 1947–1950
(c) 1920–1947
(d) 1905–1919

Q44. Which feature correctly describes the extremists' use of religious symbolism?

(a) Festivals were reorganised to discourage participation from non-Hindu groups
(b) Ritual worship was introduced into political meetings to replace speeches.
(c) Cultural symbols like Shivaji and Ganapati were used for political mobilisation.
(d) All movements were confined exclusively to Hindu religious gatherings.

Q45. Which human species is associated with the Upper Paleolithic cultural phase?

(a) Homo neanderthalensis in European and Asian regions
(b) Homo erectus populations moving out of Africa
(c) Anatomically Modern Homo sapiens across the Old World
(d) Denisovan groups settled in mountain environments

Q46. Which of the following Harappan sites is famous for its dockyard?

(a) Nal
(b) Lothal
(c) Kalibangan
(d) Rakhigarhi

YourMockTest.com — Free Study Material

Q47. Which advanced Task Manager function allows users to analyze process dependencies to identify which background services a program relies on?

(a) Open File Location
(b) Go to Details
(c) Analyze Wait Chain
(d) End Task

Q48. According to the Women, Peace and Security (WPS) Index 2025/26, what is India's rank out of 181 countries?

(a) 121st
(b) 141st
(c) 131st
(d) 111th

Q49. Kudremukh in Karnataka is famous for the mining of:

(a) Limestone
(b) Manganese
(c) Copper
(d) Iron Ore

Q50. In 2025, which Danish autonomous territory drew global attention due to strategic interest by major powers, echoing Trump’s 2019 acquisition bid?

(a) Iceland
(b) Svalbard
(c) Greenland
(d) Faroe Islands

Q51. The Preamble declares India to be a Secular State. What is the meaning of this?

(a) Citizens must not practise any religion
(b) State promotes majority religion
(c) Religion is banned by the State
(d) State protects all religions equally

Q52. Saang dance is a ritualistic popular traditional folk dance of _____, reflecting its culture in the true sense.

(a) Kerala
(b) Sikkim
(c) Punjab
(d) Haryana

Q53. Which of the following countries won the highest number of medals at the Summer Olympics 2024?

(a) China
(b) Australia
(c) United States of America
(d) India

Q54. The historical chronicle Rajatarangini, which presents a detailed account of the kings of Kashmir, was composed by:

(a) Bilhana
(b) Kalhana
(c) Kshemendra
(d) Somadeva

Q55. Who among the following was awarded the Col. CK Nayudu Lifetime Achievement Award in the men’s category at the BCCI Naman Awards 2025?

(a) Rohit Sharma
(b) Rahul Dravid
(c) Sachin Tendulkar

YourMockTest.com — Free Study Material

(d) Sourav Ganguly

Q56. What is the main characteristic of cells in the meristematic phase of growth in plants?

(a) Active cell division
(b) Maximum cell size
(c) Thick cell walls
(d) Large vacuoles

Q57. Which user interface requires users to type instructions using the keyboard to perform tasks?

(a) Voice-based Interface
(b) Graphical User Interface
(c) Touch-based Interface
(d) Command-based Interface

Q58. Which Indian non-profit organization became the first Indian to win the Ramon Magsaysay Award in 2025?

(a) Teach For India
(b) Pratham
(c) Educate Girls
(d) Akshaya Patra

Q59. Wasteland refers to:

(a) River valley fertile land
(b) Land covered by forests
(c) Urban green areas
(d) Land not suitable for cultivation due to natural or human causes

Q60. Which archaeological site revealed the earliest known public water tank of the ancient world, famously referred to as the Great Bath?

(a) Surkotada
(b) Lothal
(c) Mohenjo-daro
(d) Dholavira

Directions

Q61. In which of the following Indian states does the maximum portion of the Upper Ganga Plain extend?

(a) Uttar Pradesh
(b) West Bengal
(c) Bihar
(d) Haryana

Q62. In which kind of forest do the plants remain leafless for most of the year?

(a) Montane forest
(b) Littoral and swamp forest
(c) Tropical thorn forest
(d) Evergreen forests

Q63. The NITI Aayog, created in 2015, replaced the Planning Commission as part of India's development restructuring. What is the correct full form of NITI?

(a) National Initiative for Traditional Industries
(b) National Interface for Technological Innovation
(c) National Independent Think-tank of India
(d) National Institution for Transforming India

YourMockTest.com — Free Study Material

Q64. What minimum distance should the reflecting surface be for an echo to be heard?

(a) 17.2 m
(b) 5 m
(c) 34.2 m
(d) 10 m

Q65. Which of the following Government of India schemes was launched in 2017 to achieve universal household electrification by providing electricity connections to all un-electrified households in rural areas and all poor households in urban areas in the country?

(a) Pradhan Mantri Ghar Ghar Bijili Yojana (PMGGBY)
(b) Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY)
(c) Saubhagya Scheme (Pradhan Mantri Sahaj Bijli Har Ghar Yojana)
(d) Power for All Scheme

Q66. Which rewritable optical disc format allows users to erase and update data multiple times?

(a) Computer Disc-ReadWrite
(b) Central Directory-ReWritable
(c) Controlled Disc-ReWriter
(d) Compact Disc-ReWritable

Q67. Which of the following makes the Judiciary, the guardian of the Constitution?

(a) Service conditions
(b) Judicial review
(c) Judicial overreach
(d) Independence

Q68. Who were referred to as Uzhavar in Sangam literature?

(a) Large landowners
(b) Ploughmen
(c) Slaves
(d) Priests

Q69. According to the Constitution of India, the ‘Right to Freedom’ is specifically guaranteed under which exact set of Articles?

(a) Articles 23, 24, 25 and 26
(b) Articles 32, 33, 34 and 35
(c) Articles 19, 20, 21 and 22
(d) Articles 14, 15, 16 and 17

Q70. The primary focus of tertiary activities is:

(a) Extraction of natural resources
(b) Wealth creation through agriculture
(c) Transformation of raw materials
(d) Production of intangible goods

GENERAL INTELLIGENCE AND REASONING

Q71. Based on the alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) GEF
(b) IEH
(c) XTW
(d) NJM

YourMockTest.com — Free Study Material

Q72. If 'A' stands for '+', 'B' stands for '−', 'C' stands for '×' and 'D' stands for '÷', then what will come in place of the question mark (?) in the following equation?

40 D 5 A 8 C 2 B 12 = ?

(a) 10
(b) 14
(c) 16
(d) 12

Q73. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) XD - UB
(b) UC -RA
(c) ZI - WF
(d) TG - QE

Q74. Based on the English alphabetical order, three of the following four are alike in a certain way and thus form a group. Which is the one that does not belong to that group?

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

(a) YAD
(b) MOR
(c) SUX
(d) EHJ

Q75. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

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

19, 229

22, 265

(a) 23, 278
(b) 24, 252
(c) 28, 337
(d) 26, 314

Q76. Seven people, Manu, Neha, Ojas, Pooja, Shina, Tina and Upendra, are sitting around a circular table, facing the centre. Neha sits second to the left of Ojas. Upendra sits second to the left of Neha. Tina sits to the immediate left of Shina. Manu is not an immediate neighbour of Upendra.

How many people sit between Manu and Upendra, when counted from the left of Manu?

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

Q77. What should come in place of the '?' in the given series?

8 22 64 134 232 ?

(a) 345
(b) 358
(c) 354
(d) 385

YourMockTest.com — Free Study Material

Q78. Select the pair that follows the same pattern as that followed by the two pairs given below. Both pairs follow the same pattern.

CFG : GJK ;

KMP : OQT

(a) ACH : BDI
(b) GNP : KRT
(c) LMI : NOK
(d) DJL : AGI

Q79. In a certain code language, ‘watch bow third’ is coded as 'ft gb vs' and ‘canoe watch art’ is coded as ‘vs rp hr’. How is ‘watch’ coded in the given language?

(a) vs
(b) gb
(c) ft
(d) rp

Q80. Refer to the following letter series and answer the question. (Counting to be done from left to right only)

(Left) D F T B M E Q Y O W G U S I K A R C X Z H (Right)

How many such vowels are there, each of which is immediately preceded by a consonant and also immediately followed by a consonant?

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

Q81. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements: Some wings are toys. No toys are pens.

Conclusion (I): No pens are wings.

Conclusion (II): Some wings are not pens.

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

Q82. Seven boxes, M, N, O, P, Q, R and S, are kept one over the other, but not necessarily in the same order.

Only four boxes are kept between Q and O. Only P is kept above Q. Only two boxes are kept between N and R. S is kept immediately above M. R is not kept immediately above S.

Which box is kept fourth from the top?

(a) P
(b) S
(c) O
(d) M

Q83. Each of the digits in the number 5421389 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) NONE
(b) THREE
(c) ONE
(d) TWO

YourMockTest.com — Free Study Material

Q84. Seven boxes M, N, O, P, Q, R and S are kept one over the other but not necessarily in the same order. No box is kept above O. Only three boxes are kept between O and S. Only one box is kept between Q and M. M is kept immediately above S. Only four boxes are kept between Q and P. R is kept at some place above N.

Which box is kept second below R?

(a) N
(b) Q
(c) O
(d) S

Q85. In a certain code language,

A @ B means ‘A is the mother of B’,

A × B means ‘A is the wife of B’,

A + B means ‘A is the brother of B’ and

A ÷ B means ‘A is the father of B’.

How is S related to H if ‘S × D ÷ R + Y @ H’?

(a) Mother
(b) Sister
(c) Mother's mother
(d) Mother's sister

Q86. In a row of 46 people facing the north, Batul sits 33^(rd) from the right end. If Jaya sits 31^(st) from the left end of the row, how many people sit between Batul and Jaya?

(a) 13
(b) 18
(c) 16
(d) 14

Q87. KEGJ is related to RLNQ in a certain way based on the English alphabetical order. In the same way, NHJM is related to UOQT.

To which of the following is QKMP related, following the same logic?

(a) RXWT
(b) XRWT
(c) RXTW
(d) XRTW

Q88. Each vowel in the word LIMEADE is changed to the letter immediately following it in the English alphabetical order, and each consonant is changed to the letter immediately preceding it in the English alphabetical order. How many letters will appear exactly twice in the new group of letters thus formed?

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

Q89. Select the pair which follows the same pattern as that followed by the two sets of pairs given below. Both pairs follow the same pattern.

JTT : OQS

NQS : SNR

(a) EOR : JLQ
(b) TUJ : ORK
(c) SGD : NDB
(d) VMK : QKJ

YourMockTest.com — Free Study Material

Q90. If ‘A’ stands for ‘÷’, ‘B’ stands for ‘x’, ‘C’ stands for ‘+’ and ‘D’ stands for ‘-‘, what will be come in place of the question mark ‘?’ in the following equation?

2 B 32 A 1 D 1 C 45 = ?

(a) 110
(b) 109
(c) 106
(d) 108

Q91. What should come in place of '?' in the given series based on the English alphabetical order?

KFS GBO CXK YTG ?

(a) UPC
(b) WDG
(c) VSF
(d) VWD

Q92. In a certain code language, ‘know city routes’ is coded as ‘ha mi ko’ and ‘city lights beautiful’ is coded as ‘ly ha jh’. How is ‘city’ coded in the given language?

(a) ha
(b) ly
(c) ko
(d) jh

Q93. Refer to the given number series and answer the question that follows. All numbers are single-digit numbers only. Counting to be done from left to right only.

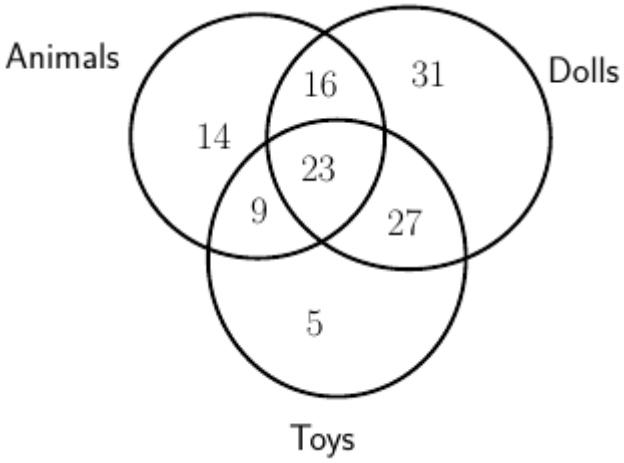
(Left) 4 9 6 5 9 9 7 7 9 7 9 3 6 2 1 2 1 6 9 1 7 4 7 (Right)

How many such even digits are there, each of which is immediately preceded by an even digit and also immediately followed by an odd digit?

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

Q94. Study the given diagram carefully and answer the question. The numbers in different sections indicate the number of persons. (NOTE: You have to take the given data to be true even if it seems to be at variance from commonly known facts.)

How many such Animals are there which are also Toys but are not Dolls?



(a) 31
(b) 5
(c) 9
(d) 16

YourMockTest.com — Free Study Material

Q95. Seven people, U, T, E, N, S, I and L, are sitting in a row, facing the north.

Only five people sit between I and L. S sits to the immediate left of L. Only one person sits between S and N. U sits at some place to the left of E but at some place to the right of T.

Who sits third from the left end of the line?

(a) E
(b) U
(c) N
(d) T

Q96. Town J is to the west of Town T. Town R is to the east of Town T. Town K is to the south of Town R. Town M is to the west of Town K. Town M is to the south-west of Town T. Town J is to the north of Town M. What is the position of Town J with respect to Town K?

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

Q97. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

EAW 87 ZVR 75 UQM 63 PLH 51 ?

(a) KGC 39
(b) KHB 39
(c) KFB 38
(d) KSB 38

Q98. What should come in place of '?' in the given series?

41 53 66 80 95 111 ?

(a) 128
(b) 123
(c) 134
(d) 131

Q99. In a certain code language,

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

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

A × B means 'A is the father of B', and

A ÷ B means 'A is the mother of B'.

Based on the above, how is U related to Y if 'U - V × W + X ÷ Y'?

(a) Father's sister
(b) Mother's mother
(c) Mother's sister
(d) Father's mother

Q100. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

JKA KNF LQK MTP ?

(a) OIU
(b) MKJ
(c) NWU
(d) MNG

YourMockTest.com — Free Study Material

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) 275.5 cm²

Shortcut Trick

For a Rhombus, the area is always half the product of its diagonals.

Area = 1/2 × (d1 × d2)

Area = 1/2 × 19 × 29 = 551 ÷ 2 = 275.5

Therefore The correct answer is 275.5 cm².

Alternate Method

Given:

Length of first diagonal (d1) = 19 cm

Length of second diagonal (d2) = 29 cm

Formula Used:

Area of Rhombus = (d1 × d2) ÷ 2

Calculations:

=> Area = (19 × 29) ÷ 2

=> Area = 551 ÷ 2

=> Area = 275.5 cm²

Therefore The correct answer is 275.5 cm².

Additional Information

Perpendicular Bisectors

The diagonals of a rhombus always bisect each other at a 90° angle (perpendicularly).

Relation between Side and Diagonals

The side length s is related to the diagonals by: $4s^2 = d1^2 + d2^2$ or $s = 1/2 \times \sqrt{(d1^2 + d2^2)}$.

Perimeter of Rhombus

Since all four sides of a rhombus are equal, the Perimeter = 4 × side.

Area with Base and Height

The area can also be calculated as Base × Height, similar to a parallelogram.

Q2. Answer: (a) 12 sides

Shortcut Trick

For any regular polygon, the sum of an interior angle and its corresponding exterior angle is always 180°.

Exterior Angle = 180° − 150° = 30°

The sum of all exterior angles of any polygon is always 360°.

Number of sides (n) = 360° ÷ Exterior Angle

n = 360° ÷ 30° = 12

YourMockTest.com — Free Study Material

Therefore The correct answer is 12 sides.

Alternate Method

Given: Each interior angle of a regular polygon = 150°

Formula Used: Interior angle of a regular polygon with n sides = [(n − 2) × 180°] ÷ n

Calculations:

=> 150 = [(n − 2) × 180] ÷ n

=> 150n = (n − 2) × 180

=> 150n = 180n − 360

=> 180n − 150n = 360

=> 30n = 360

=> n = 360 ÷ 30

=> n = 12

Therefore The correct answer is 12 sides.

Additional Information

Sum of Interior Angles

For any polygon with n sides, the sum of all interior angles is given by (n − 2) × 180°.

Exterior Angle Property

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

Regular Polygons

In a regular polygon, all sides are equal and all interior angles are equal. A polygon with 12 sides is specifically called a dodecagon.

Q3. Answer: (d) 5:4

Shortcut Trick

Mean Price of the mixture = 1600 ÷ 45 = Rs. 320/9 per kg.

Apply Alligation between Rs. 32 and Rs. 40 with mean price Rs. 320/9.

Ratio = (40 − 320/9) : (320/9 − 32) = 40/9 : 32/9 = 40 : 32.

Simplifying the ratio: 40 : 32 → 5 : 4.

Therefore The correct answer is 5:4.

Alternate Method

Given: Cost of Type 1 rice = Rs. 32/kg, Cost of Type 2 rice = Rs. 40/kg, Total Quantity = 45 kg, Total Cost = Rs. 1600.

Step 1: Calculate Mean Price (M) of the mixture.

=> M = Total Cost ÷ Total Quantity

=> M = 1600 ÷ 45 = 320/9

Step 2: Let Quantity 1 be Q1 and Quantity 2 be Q2.

=> Q1 : Q2 = (Price2 − M) : (M − Price1)

=> Q1 : Q2 = (40 − 320/9) : (320/9 − 32)

=> Q1 : Q2 = (360 − 320)/9 : (320 − 288)/9

=> Q1 : Q2 = 40/9 : 32/9

=> Q1 : Q2 = 40 : 32 = 5 : 4

Therefore The correct answer is 5:4.

Additional Information

Alligation Rule

It states that (Quantity of Cheaper / Quantity of Dearer) = (Rate of Dearer − Mean Rate) / (Mean Rate − Rate of Cheaper).

Mean Price

The Mean Price is the cost price of a unit quantity of the mixture obtained by mixing two or more ingredients.

Mixture Calculations

If two ingredients of concentrations C1 and C2 are mixed in ratio n1:n2, the resulting concentration C_(avg) = (n1C1 + n2C2) ÷ (n1 + n2).

Q4. Answer: (a) 3 3/4 hours

Shortcut Trick

Let Time3 = x, then Time1 = x + 9 and Time2 = x + 4.

Apply the rule: If 1/A + 1/B = 1/C, then C = √(a × b) where A = C+a and B = C+b.
Time3 = √(9 × 4) = 6 hr; therefore Time2 = 6 + 4 = 10 hr.
Together (2 & 3) = (10 × 6) ÷ (10 + 6) = 60/16 = 3 3/4 hr.
Therefore The correct answer is 3 3/4 hr.
Alternate Method
Given:
Let the time taken by Pipe 3 alone be t3 hr.
=> Pipe 2 time (t2) = t3 + 4 hr
=> Pipe 1 time (t1) = t2 + 5 = (t3 + 4) + 5 = t3 + 9 hr
Formula Used:
Efficiency(1) + Efficiency(2) = Efficiency(3) => 1/t1 + 1/t2 = 1/t3
Calculations:
=> 1/(t3 + 9) + 1/(t3 + 4) = 1/t3
=> (t3 + 4 + t3 + 9) / ((t3 + 9)(t3 + 4)) = 1/t3
=> (2t3 + 13) / ($t3^2$ + 13t3 + 36) = 1/t3
=> 2$t3^2$ + 13t3 = $t3^2$ + 13t3 + 36
=> $t3^2$ = 36 => t3 = 6 hr
=> t2 = 6 + 4 = 10 hr

Person	Time (hr)	Total Work	Efficiency
Pipe 2	10	30 units	3
Pipe 3	6	5	

=> Total Efficiency (2 & 3) = 3 + 5 = 8 units/hr
=> Time taken together = Total Work ÷ Total Efficiency = 30 ÷ 8
=> Time = 15/4 = 3 3/4 hr
Therefore The correct answer is 3 3/4 hr.
Additional Information
Root Rule for Combined Work
If A takes 'a' days more and B takes 'b' days more than (A+B) together, then the time taken by (A+B) is √(a × b).
Pipes and Cisterns Basics
If a pipe fills a tank in 'h' hours, the part filled in 1 hour is 1/h. For inlet pipes, efficiency is positive; for outlet pipes, it is negative.
Efficiency and Capacity
Capacity of the tank = Total Time × Combined Efficiency of the filling pipes.

Q5. Answer: (b) 229 2/7 km

Shortcut Trick
Let the Distance between City A and City B be D.
Forward time = D ÷ 60; Return speed = 60 + 20 = 80 km/h.
Return journey includes 15 km (30 km/h × 0.5 hr) at 30 km/h and (D − 15) km at 80 km/h.
Total time equation: (D/60) + 0.5 + (D − 15)/80 = 7 => (D/60) + (D − 15)/80 = 6.5.
Multiplying by LCM 240: 4D + 3D − 45 = 1560 => 7D = 1605 => D = 229 2/7 km.
Therefore The correct answer is 229 2/7 km.
Alternate Method
Given:
Speed (A to B) = 60 km/h
Speed (B to A, normal) = 60 + 20 = 80 km/h
Repair Speed = 30 km/h | Repair Duration = 30 min = 0.5 hr
Total Round Trip Time = 7 hr
Calculations:
=> Let Distance between A and B be D km.
=> Distance covered during repair = Speed × Time = 30 × 0.5 = 15 km.

YourMockTest.com — Free Study Material

=> Remaining distance for return journey = D − 15 km.
=> Time for forward journey = D/60 hr.
=> Time for return journey = 0.5 + (D − 15)/80 hr.
=> Total Time = D/60 + 0.5 + (D − 15)/80 = 7
=> D/60 + (D − 15)/80 = 6.5
=> (4D + 3(D − 15)) ÷ 240 = 6.5
=> 4D + 3D − 45 = 6.5 × 240
=> 7D − 45 = 1560
=> 7D = 1605
=> D = 1605 ÷ 7 = 229 2/7 km.
Therefore The correct answer is 229 2/7 km.
Additional Information
Average Speed
It is defined as the total distance traveled divided by the total time taken. Average Speed = Total Distance ÷ Total Time.
Speed-Time-Distance Relationship
Distance = Speed × Time. If distance is constant, speed is inversely proportional to time (S prop. to 1/T).
Unit Conversion
To convert km/h to m/s, multiply by 5/18. To convert m/s to km/h, multiply by 18/5.

Q6. Answer: (c) C

Shortcut Trick
Scheme A: Successive 50% and 16% => 50 + 16 − (50 × 16 ÷ 100) = 58%.
Scheme B: Successive 49%, 8%, and 13% ≈ 59.18% (Multiple successive drops).
Scheme C: 8 toys => (6 × 35% + 2 × 45%) ÷ 8 = (210% + 90%) ÷ 8 = 37.5%.
Scheme D: Buy 8, pay for 4 => 4 free ÷ 8 total × 100 = 50%.
The least beneficial scheme is the one with the minimum total discount (37.5%).
Therefore The correct answer is Scheme C.
Alternate Method
Assume the Marked Price (MP) of each toy is Rs. 100. For 8 toys, total MP = 8 × 100 = Rs. 800.
Formula Used: Selling Price (SP) = MP × [(100 − d1)/100] × [(100 − d2)/100] ...
Calculation of Total Selling Price (SP) for 8 toys:
=> Scheme A: SP = 8 × [100 × 0.50 × 0.84] = 8 × 42 = Rs. 336.
=> Scheme B: SP = 8 × [100 × 0.51 × 0.92 × 0.87] ≈ 8 × 40.82 = Rs. 326.56.
=> Scheme C: SP = (6 × 65) + (2 × 55) = 390 + 110 = Rs. 500.
=> Scheme D: SP = Customer billed for 4 toys = 4 × 100 = Rs. 400.
Comparing the total Selling Prices: Rs. 326.56 (B) < Rs. 336 (A) < Rs. 400 (D) < Rs. 500 (C).
Since the customer pays the maximum amount in Scheme C, it is the least beneficial.
Therefore The correct answer is Scheme C.
Additional Information
Successive Discount Formula
For two successive discounts x% and y%, the single equivalent discount is [x + y − (xy ÷ 100)]%.
Buy X Get Y Free
The effective discount percentage is calculated as: [Free items (Y) ÷ Total items (X + Y)] × 100.
Least vs Most Beneficial
From a customer's perspective, the least beneficial scheme is the one that offers the lowest discount or the highest final price.

Q7. Answer: (b) 6840

Shortcut Trick
Use the Algebraic Identity: If a + b + c = 0, then $a^3 + b^3 + c^3 = 3abc$.
Here, a = 24, b = −5, and c = −19.
Checking the sum: 24 + (−5) + (−19) = 24 − 24 = 0.
Result = 3 × 24 × (−5) × (−19) = 72 × 95 = 6840.

Therefore The correct answer is 6840.

Alternate Method

Given: The expression is $24^3 + (-5)^3 + (-19)^3$.

Formula Used: $a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$.

=> Let a = 24, b = −5, and c = −19.

=> Calculate the sum (a + b + c): 24 + (−5) + (−19) = 24 − 5 − 19 = 0.

=> Since (a + b + c) = 0, the expression $(a + b + c)(a^2 + b^2 + c^2 - ab - bc - ca)$ becomes 0.

=> $a^3 + b^3 + c^3 - 3abc = 0$

=> $a^3 + b^3 + c^3 = 3abc$

=> Substituting the values: 3 × 24 × (−5) × (−19)

=> 72 × 95

=> 72 × (100 − 5) = 7200 − 360 = 6840.

Therefore The correct answer is 6840.

Additional Information

General Cubic Identity

The expression $a^3 + b^3 + c^3 - 3abc$ is always equal to $(a + b + c) \times 0.5 \times [(a-b)^2 + (b-c)^2 + (c-a)^2]$.

Conditional Identity

If $a^3 + b^3 + c^3 = 3abc$, it implies that either a + b + c = 0 or a = b = c.

Square of Trinomial

The square of a sum of three terms is given by $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$.

Q8. Answer: (c) 48:65

Shortcut Trick

To find the ratio between the first term (a) and the last term (c), directly multiply the given ratios.

a/c = (a/b) × (b/c)

a/c = (12/13) × (4/5) = 48/65

Therefore The correct answer is 48:65.

Alternate Method

Given: The ratio a:b is 12:13 and b:c is 4:5.

To find a:c, we can express the ratios as fractions:

=> a/b = 12/13

=> b/c = 4/5

=> Multiply the two equations: (a/b) × (b/c) = (12/13) × (4/5)

=> The common term 'b' cancels out: a/c = (12 × 4) / (13 × 5)

=> a/c = 48/65

This result matches Option 3 provided in the question.

Therefore The correct answer is 48:65.

Additional Information

Compound Ratio

When two or more ratios are multiplied together, the result is called a compound ratio. For ratios a:b and c:d, the compound ratio is (a × c) : (b × d).

Continued Proportion

To find the combined ratio a:b:c, make the common term 'b' equal by multiplying the ratios by suitable constants. Here, a:b:c = (12×4) : (13×4) : (13×5) = 48:52:65.

Duplicate Ratio

The duplicate ratio of a:b is simply the ratio of their squares, i.e., $a^2 : b^2$.

Q9. Answer: (b) Rs. 540

Shortcut Trick

Net percentage change formula = x + y + (xy / 100)

Net % change = 20 − 25 − (20 × 25 / 100) = −5 − 5 = −10%

Final Price = 90% of 600 = 0.9 × 600 = 540

Therefore The correct answer is Rs. 540.

Alternate Method

Given: Original price of the jacket = Rs. 600, First increase = 20%, Second decrease = 25%.

=> First price increase = 20% of 600 = (20/100) × 600 = Rs. 120

=> Price after increase = 600 + 120 = Rs. 720

=> Price decrease = 25% of 720 = (25/100) × 720 = Rs. 180

=> Final price of the jacket = 720 − 180 = Rs. 540

Therefore The correct answer is Rs. 540.

Additional Information

Successive Percentage Change

When a value is changed by x% and then y%, the net change is given by (x + y + xy/100)%. Use positive values for increase and negative for decrease.

Fractional Multiplier Method

For a 20% increase, multiply by 1.2 or 6/5. For a 25% decrease, multiply by 0.75 or 3/4. Final Value = Initial Value × Multiplier1 × Multiplier2.

Base Change Property

A change of +20% followed by −20% does not return the value to its original state; the net change would be a 4% decrease (loss).

Q10. Answer: (c) 32

Shortcut Trick

Net deviation from the overall mean (42) must be zero.

Sum of deviations = (30 − 42) + (38 − 42) + (50 − 42) + 6 × (45 − 42)

=> −12 − 4 + 8 + (6 × 3) = −16 + 8 + 18 = +10.

Since the existing 9 numbers are +10 above the mean, the 10^(th) number must be 10 below the mean.

=> Missing observation = 42 − 10 = 32.

Therefore The correct answer is 32.

Alternate Method

Given:

Total observations = 10 | Total Arithmetic Mean = 42

First 3 observations = 30, 38, 50 | Average of next 6 = 45

Calculations:

=> Total Sum = Mean × Number of observations

=> Total Sum = 42 × 10 = 420

=> Sum of 3 known observations = 30 + 38 + 50 = 118

=> Sum of next 6 observations = 45 × 6 = 270

=> Sum of 9 observations = 118 + 270 = 388

=> Missing observation = Total Sum − Sum of 9 observations

=> Missing observation = 420 − 388

=> Missing observation = 32.

Therefore The correct answer is 32.

Additional Information

Arithmetic Mean Formula

Mean = (Sum of all observations) ÷ (Number of observations). To find a missing value, subtract the sum of known values from the total sum.

Sum of Deviations

The algebraic sum of the deviations of a set of values from their arithmetic mean is always zero. ∑(x_i − mean) = 0.

Weighted Mean

When different groups have different averages, the combined mean is (n1 × x1 + n2 × x2 + ...) ÷ (n1 + n2 + ...).

Q11. Answer: (c) 4

Given:

The expression: $0.125 \times 4^4 \times 2^{(-5)} \times 0.25^2 \times 8^2$

Formula used:

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

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

Calculation:

Convert each term into base 2:

$0.125 = 1/8 = 1/2^3 = 2^{-3}$

$4^4 = (2^2)^4 = 2^8$

$2^{-5} = 2^{-5}$

$0.25^2 = (1/4)^2 = (1/2^2)^2 = 2^{-4}$

$8^2 = (2^3)^2 = 2^6$

Substitute these values back into the expression:

Expression =

Q12. Answer: (c) 1

Shortcut Trick

Assume total capacity of cistern = 12 units (LCM of 4 and 12).

Efficiency of Tap 1 = 3, Tap 2 = 1, and Tap 3 (emptying) = −1.

Combined efficiency when all opened = 3 + 1 − 1 = 3 units/hr.

Target work = 1/4 of total capacity = 12 ÷ 4 = 3 units.

Time required = Target units ÷ Combined efficiency = 3 ÷ 3 = 1 hr.

Therefore The correct answer is 1 hr.

Alternate Method

Given:

Time taken by Tap A to fill = 4 hr

Time taken by Tap B to fill = 12 hr

Time taken by Tap C to empty = 12 hr

Formula Used:

Efficiency = Total Work ÷ Time

Total Efficiency = Efficiency_A + Efficiency_B − Efficiency_C

Tap	Time (hr)	Total Work (LCM)	Efficiency
Tap A	4	12 units	3
Tap B	12	1	
Tap C	12 (Empty)	−1	

=> Net efficiency of all taps = 3 + 1 − 1 = 3 units/hr

=> Target to fill = 1/4 of cistern = 1/4 × 12 = 3 units

=> Time required = 3 units ÷ 3 units/hr = 1 hr

Therefore The correct answer is 1 hr.

Additional Information

Pipes and Cisterns Basics

Filling pipes have positive efficiency, while emptying pipes (leakage) have negative efficiency.

Capacity Relation

Total capacity = Time taken to fill/empty × Efficiency of the pipe.

Time and Work Analogy

The concept is identical to men and work, where an emptying pipe acts like a person destroying the work.

Q13. Answer: (a) 504

Shortcut Trick

The product of two numbers is always equal to the product of their HCF and LCM.

Other number = (HCF × LCM) ÷ Given number

Other number = (36 × 7,560) ÷ 540

Other number = 7,560 ÷ 15 = 504

Therefore The correct answer is 504.

Alternate Method

YourMockTest.com — Free Study Material

Given:

HCF = 36

LCM = 7,560

First Number (a) = 540

Formula Used:

a × b = HCF × LCM

Calculations:

=> 540 × b = 36 × 7,560

=> b = (36 × 7,560) ÷ 540

=> b = 272,160 ÷ 540

=> b = 504

Therefore The correct answer is 504.

Additional Information

HCF and LCM Relation

For any two positive integers x and y, the product of the numbers is always equal to the product of their HCF and LCM: x × y = HCF(x, y) × LCM(x, y).

HCF Property

The Highest Common Factor (HCF) of a group of numbers is always a factor of their Least Common Multiple (LCM). Thus, LCM ÷ HCF is always an integer.

Co-prime Numbers

If the HCF of two numbers is 1, they are called co-prime or relatively prime. In this case, their LCM is simply the product of the two numbers.

Q14. Answer: (b) Rs. 1,200

Shortcut Trick

Total interest percentage = Rate × Time = 5% × 3 = 15%.

Simple Interest = 15% of Rs. 8,000.

SI = (15 ÷ 100) × 8,000 = 15 × 80 = 1,200.

Therefore The correct answer is Rs. 1,200.

Alternate Method

Given:

Principal (P) = Rs. 8,000

Rate of Interest (R) = 5% per annum

Time (T) = 3 years

Formula Used:

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

Calculations:

=> SI = (8000 × 5 × 3) ÷ 100

=> SI = 80 × 15

=> SI = 1,200

Therefore The correct answer is Rs. 1,200.

Additional Information

Amount in Simple Interest

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

SI vs CI for Year 1

For the first year, if the interest is compounded annually, the Simple Interest and Compound Interest are always equal.

Finding Principal from SI

If SI, Rate, and Time are known, the Principal can be calculated as: P = (SI × 100) ÷ (R × T).

Q15. Answer: (c) 18 km/hr

Shortcut Trick

Speed in m/s = 40 ÷ 8 = 5 m/s

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

Speed = 5 × (18/5) = 18 km/hr
Therefore The correct answer is 18 km/hr.
Alternate Method
Given:
Distance traveled by the cyclist = 40 m
Time taken = 8 sec
Formula Used:
Speed = Distance ÷ Time
To convert speed from m/s to km/hr: Speed (m/s) × (18/5)
Calculations:
=> Speed = 40 ÷ 8
=> Speed = 5 m/s
=> Speed in km/hr = 5 × (18/5)
=> Speed = 18 km/hr
Therefore The correct answer is 18 km/hr.
Additional Information
Unit Conversion (km/hr to m/s)
To convert speed from km/hr to m/s, multiply the value by 5/18.
Average Speed
Average Speed is defined as the Total Distance divided by the Total Time taken for the entire journey.
Relative Speed
When two objects move in the opposite direction, their Relative Speed is the sum of their individual speeds (u + v).

Q16. Answer: (d) 40 m

Shortcut Trick
In any right-angled triangle, if the angle of elevation is 45°, the Height (Perpendicular) is always equal to the Distance (Base).
Given Distance = 40 m.
Therefore Height = 40 m.
Therefore The correct answer is 40 m.
Alternate Method
Given:
Distance from the point to the building (Base) = 40 m
Angle of elevation (θ) = 45°
Formula Used:
tan θ = Perpendicular / Base
Let the height of the building be h.
=> tan 45° = h / 40
=> 1 = h / 40 (Since tan 45° = 1)
=> h = 40 × 1
=> h = 40 m
Therefore The correct answer is 40 m.
Additional Information
Trigonometric Ratios Table
Key values for tan: tan 30° = 1/√3, tan 45° = 1, tan 60° = √3.
45-45-90 Triangle Property
In a triangle with angles 45°, 45°, and 90°, the sides are in the ratio 1 : 1 : √2.
Angle of Elevation vs Depression
The angle of elevation from an observer to an object is always equal to the angle of depression from the object to the observer.

Q17. Answer: (b) $x^2 – y^2$

Shortcut Trick
The mean proportional between any two numbers a and b is defined as √(a × b).

Given values: a = $(x + y)^2$ and b = $(x - y)^2$.
Mean Proportional = $\sqrt{[(x + y)^2 \times (x - y)^2]} = (x + y) \times (x - y)$.
Using the algebraic identity $(a + b)(a - b) = a^2 - b^2$, we get $x^2 - y^2$.
Therefore The correct answer is $x^2 - y^2$.
Alternate Method
Given:
First term (a) = $(x + y)^2$
Third term (c) = $(x - y)^2$
Formula Used:
If b is the mean proportional between a and c, then a : b = b : c or $b^2 = ac$ => $b = \sqrt{ac}$.
Calculations:
=> Let the mean proportional be M.
=> $M = \sqrt{[(x + y)^2 \times (x - y)^2]}$
=> $M = \sqrt{[(x + y)(x - y)]^2}$
=> M = (x + y)(x − y)
=> Applying identity: $(a + b)(a - b) = a^2 - b^2$
=> $M = x^2 - y^2$
Therefore The correct answer is $x^2 - y^2$.
Additional Information
Mean Proportional
The mean proportional between two numbers a and b is x such that a/x = x/b, giving $x = \sqrt{ab}$.
Third Proportional
If a, b, c are in continued proportion, then c is the third proportional and $c = b^2/a$.
Fourth Proportional
For a, b, c, d in proportion (a:b :: c:d), d is the fourth proportional and $d = (b \times c)/a$.
Algebraic Identity
Difference of squares: $a^2 - b^2 = (a + b)(a - b)$.

Q18. Answer: (a) 5 √2

Shortcut Trick
Given √x = 5, by squaring both sides we directly find x = 25.
The required value is √(x + 25).
Substituting x = 25: √(25 + 25) = √50.
Since 50 = 25 × 2, the value is 5√2.
Therefore The correct answer is 5√2.
Alternate Method
Given:
The equation √x = 5.
Formula Used:
If √a = b, then $a = b^2$. Also, √(m × n) = √m × √n.
Calculations:
=> √x = 5
=> Squaring both sides: $x = 5^2 = 25$
=> Required expression = √(x + 25)
=> Substitute x = 25 into the expression: √(25 + 25)
=> Expression = √50
=> Expression = √(25 × 2)
=> 5√2
Therefore The correct answer is 5√2.
Additional Information
Square Root Properties
For any non-negative numbers, the property √a × √b = √(ab) allows for the simplification of surds by factoring out perfect squares.

Solving Radical Equations

To solve for a variable under a radical, isolate the radical term and apply the inverse operation (squaring for square roots).

Perfect Squares

Memorizing perfect squares like 25, 36, 49, and 64 helps in quickly identifying factors that can be moved outside the √ symbol.

Q19. Answer: (d) 468

Shortcut Trick

The final price is calculated using successive multipliers.

Net Multiplier = (100 − 40)% × (100 − 22)% = 0.60 × 0.78 = 0.468

Amount paid = Marked Price × Net Multiplier = 1000 × 0.468 = 468

Therefore The correct answer is Rs. 468.

Alternate Method

Given:

Marked Price (MP) of the oven = Rs. 1000

First Discount (d1) = 40%

Additional Discount for credit card (d2) = 22%

Formula Used:

Final Price = MP × (100 − d1)/100 × (100 − d2)/100

Calculations:

=> Price after the first 40% discount = 1000 − (40/100 × 1000)

=> Price after first discount = 1000 − 400 = Rs. 600

=> Additional 22% discount is applied on Rs. 600

=> Additional discount amount = 22/100 × 600 = Rs. 132

=> Final amount paid by Ritu = 600 − 132

=> Final amount paid = Rs. 468

Therefore The correct answer is Rs. 468.

Additional Information

Single Equivalent Discount

For two successive discounts of x% and y%, the single equivalent discount is given by (x + y − xy/100)%.

Marked Price and Selling Price

The Selling Price (SP) is always Marked Price (MP) minus the Discount. Discount is always calculated on the Marked Price unless otherwise stated.

Successive Percentage Change

This concept is used when a value is changed multiple times consecutively. The order of discounts does not change the final selling price.

Q20. Answer: (a) 9831

Shortcut Trick

Find the LCM of the divisors: LCM(12, 13, 7) = 1092.

Identify the largest multiple of 1092 below 9999: 1092 × 9 = 9828.

Add the common remainder to the multiple: 9828 + 3 = 9831.

Therefore The correct answer is 9831.

Alternate Method

Given:

Divisors = 12, 13, 7

Remainder in each case = 3

Target = Largest 4-digit number

Calculations:

=> First, find the LCM of 12, 13, and 7.

=> 12 = 2^2 × 3

=> 13 = 13 (prime)

=> 7 = 7 (prime)

=> LCM = 12 × 13 × 7 = 1092

=> The largest 4-digit number is 9999.

=> Divide 9999 by the LCM: 9999 ÷ 1092

=> 9999 = (1092 × 9) + 171

=> The largest 4-digit multiple of 1092 = 9999 − 171 = 9828

=> Required number = Multiple + Remainder

=> Required number = 9828 + 3 = 9831

Therefore The correct answer is 9831.

Additional Information

General Form for Constant Remainder

Any number that leaves a remainder 'r' when divided by x, y, and z can be expressed as: Number = [LCM(x, y, z) × k] + r, where k is an integer.

LCM of Prime Numbers

The LCM of a set of numbers that are co-prime (like 7, 13, and 12 in this case) is simply the product of those numbers.

Smallest n-digit Number

To find the smallest n-digit number satisfying a condition, divide the smallest n-digit base (like 1000 for 4-digits) by the LCM and find the next higher multiple.

Q21. Answer: (a) Rs. 9,900

Shortcut Trick

Order quantity 22 exceeds the 20 sweater limit, so the 25% discount is applicable.

Net Selling Price (SP) of one sweater = 75% of Rs. 600 = Rs. 450.

Total amount paid for 22 sweaters = 22 × 450 = Rs. 9,900.

Therefore The correct answer is Rs. 9,900.

Alternate Method

Given:

Marked Price (MP) of 1 sweater = Rs. 600

Quantity ordered = 22 sweaters

Discount for > 20 sweaters = 25%

Formula Used:

Selling Price (SP) = MP − Discount

Total Amount = SP per unit × Quantity

Calculations:

=> Total MP of 22 sweaters = 22 × 600 = Rs. 13,200

=> Since 22 > 20, Discount rate = 25%

=> Total Discount amount = 25% of Rs. 13,200

=> Total Discount = (25 ÷ 100) × 13,200 = Rs. 3,300

=> Amount paid by retailer = Total MP − Total Discount

=> Amount paid = 13,200 − 3,300 = Rs. 9,900

Therefore The correct answer is Rs. 9,900.

Additional Information

Marked Price (List Price)

The price mentioned on the product tag. Discount is always calculated on this value: SP = MP × (100 − D%)/100.

Successive Discount

If two discounts d1% and d2% are given, the effective discount is [d1 + d2 − (d1 × d2)/100]%.

Profit and Loss Relation

The relationship between MP and CP is given by: MP/CP = (100 + P%) / (100 − D%), where P is profit % and D is discount %.

Q22. Answer: (a) 8%

Shortcut Trick

Net increase in daily riders = 4,860 − 4,500 = 360.

Percentage growth = (Change ÷ Initial Value) × 100.

Growth % = (360 ÷ 4,500) × 100 = 360 ÷ 45 = 8%.

Therefore The correct answer is 8%.

YourMockTest.com — Free Study Material

Alternate Method
Given:
Average riders last month (Initial Value) = 4,500
Average riders this month (Final Value) = 4,860
Formula Used:
Percentage Increase = [(Final Value − Initial Value) ÷ Initial Value] × 100
Calculations:
=> Absolute increase = 4,860 − 4,500 = 360
=> Percentage growth = (360 ÷ 4,500) × 100
=> Percentage growth = (360 ÷ 45)
=> Percentage growth = 8%
Therefore The correct answer is 8%.
Additional Information
Percentage Change Rule
Always use the initial or original value as the denominator (base) when calculating percentage growth or percentage reduction.
Multiplying Factor
An 8% increase is equivalent to multiplying the original value by (1 + 8/100) = 1.08. Thus, 4,500 × 1.08 = 4,860.
Fraction to Percentage
The ratio 360/4,500 simplifies to 36/450 = 4/50 = 2/25. Since 1/25 = 4%, then 2/25 = 8%.

Q23. Answer: (d) 1689.6 cm²

Shortcut Trick
Total Surface Area (TSA) = 2 × 22/7 × 14 × (14 + 10) = 2112 cm².
Since 20% is blue, the remaining red portion is 80%.
Red Area = 80% of 2112 = 0.8 × 2112 = 1689.6 cm².
Therefore The correct answer is 1689.6 cm².
Alternate Method
Given:
Radius (r) = 14 cm
Height (h) = 10 cm
Formula Used:
Total Surface Area (TSA) of a closed cylindrical reservoir = 2πr(r + h)
Calculations:
=> Total Surface Area = 2 × (22/7) × 14 × (14 + 10)
=> TSA = 2 × 22 × 2 × 24
=> TSA = 44 × 48 = 2112 cm²
=> Area coated in blue paint = 20% of 2112 = 422.4 cm²
=> Area coated in red paint = Total Area − Blue Area
=> Red Area = 2112 − 422.4 = 1689.6 cm²
Therefore The correct answer is 1689.6 cm².
Additional Information
Curved Surface Area (CSA)
The lateral area of a cylinder excluding the top and bottom circles is 2πrh.
Volume of a Cylinder
The total capacity or space enclosed by a cylinder is given by πr²h.
Open Cylinder TSA
If a cylinder is open at one end, the surface area is πr² + 2πrh = πr(r + 2h).

Q24. Answer: (d) Rs. 10.80

Shortcut Trick
Effective Selling Price (SP) per 1 kg displayed = 60 × 1.20 × 0.90 = Rs. 64.80.
Actual Cost Price (CP) for 900 g given = (60 ÷ 1000) × 900 = Rs. 54.

YourMockTest.com — Free Study Material

Profit on each transaction = 64.80 − 54 = Rs. 10.80.

Therefore The correct answer is Rs. 10.80.

Alternate Method

Given:

Cost Price (CP) of rice = Rs. 60 per kg

Mark-up percentage = 20%

Discount percentage = 10%

Faulty weight = 900 g instead of 1000 g

Step-by-step Calculation:

=> Cost Price (CP) of 1000 g = Rs. 60

=> Marked Price (MP) = 60 + (20% of 60) = 60 + 12 = Rs. 72

=> Selling Price (SP) = 72 − (10% of 72) = 72 − 7.20 = Rs. 64.80

=> Since the shopkeeper gives only 900 g when the buyer pays for 1 kg, we must find the cost of the actual quantity sold.

=> Actual CP for 900 g = (60 ÷ 1000) × 900 = Rs. 54

=> Profit = Selling Price − Actual Cost Price

=> Profit = 64.80 − 54 = Rs. 10.80

Therefore The correct answer is Rs. 10.80.

Additional Information

Dishonest Dealer Concept

Profit occurs in two ways: by increasing the price (markup) and by reducing the weight given. Net Profit % = [(True weight − False weight) / False weight] × 100 (when sold at CP).

Successive Percentage Change

If a value is increased by x% and then decreased by y%, the effective change is [x − y − (xy/100)] %.

Relationship between CP, MP, and SP

MP = CP × (100 + Mark-up%)/100 and SP = MP × (100 − Discount%)/100.

Q25. Answer: (d) 15

Shortcut Trick

To find the larger value (Mary) when the sum and difference of two quantities are known:

Mary's age = (Combined Sum + Age Difference) ÷ 2

Mary's age = (27 + 3) ÷ 2 = 30 ÷ 2 = 15 years.

Therefore The correct answer is 15 years.

Alternate Method

Given:

Combined age of Mary and Sister = 27 years

Difference in their ages = 3 years

Calculation:

Let the age of Mary's sister be x years.

=> Mary's age = x + 3

=> Total combined age = x + (x + 3) = 27

=> 2x + 3 = 27

=> 2x = 27 − 3

=> 2x = 24

=> x = 24 ÷ 2 = 12 years (Sister's age)

=> Mary's age = 12 + 3 = 15 years.

Therefore The correct answer is 15 years.

Additional Information

Sum and Difference Formula

If the sum of two numbers is S and their difference is D, then the larger number is (S + D) ÷ 2 and the smaller number is (S − D) ÷ 2.

Constant Age Difference

The age difference between two individuals remains constant throughout their lives; it does not change as they grow older.

Ratio Method for Ages

If ages are given in a ratio a:b, the difference between the ratio parts corresponds directly to the numerical age difference.

Q26. Answer: (a) 41

Shortcut Trick

Solve the nested radical from the innermost part: √(419 + 157) = √576 = 24.

Proceed to the next layer: √(3225 + 24) = √3249 = 57.

Solve the final outer layer: √(1624 + 57) = √1681 = 41.

Shortcut logic: The result of √(1624 + x) must be slightly more than √1624 ≈ 40.3. Among the options, 41 is the only possible integer.

Therefore The correct answer is 41.

Alternate Method

Given Expression: √(1624 + √(3225 + √(419 + 157)))

Simplification Steps:

=> First, add the innermost numbers: 419 + 157 = 576

=> √(1624 + √(3225 + √576))

=> Since √576 = 24:

=> √(1624 + √(3225 + 24))

=> Add the values inside the next root: 3225 + 24 = 3249

=> √(1624 + √3249)

=> Since √3249 = 57 (as $50^2 = 2500$ and $60^2 = 3600$):

=> √(1624 + 57)

=> Add the remaining values: 1624 + 57 = 1681

=> √1681

=> 41

Therefore The correct answer is 41.

Additional Information

Square Root Properties

For a number ending in 1, its square root ends in either 1 or 9. Since $41^2 = 1681$ and $49^2 = 2401$, 41 is the correct root for 1681.

Perfect Square Identification

A perfect square never ends with the digits 2, 3, 7, or 8. This helps in quickly eliminating incorrect results during multi-step simplification.

Nested Radicals

Always solve nested radicals from inside-out. Simplification of the innermost root provides a whole number that completes the next perfect square.

Q27. Answer: (d) Rs. 30,000

Shortcut Trick

Ratio of Officers to Clerks = 10 : 30 = 1 : 3

Assume base average = Rs. 25,000 (lower value)

Extra from 1 Officer = 45,000 − 25,000 = Rs. 20,000

Distribute this extra among total parts (1 + 3 = 4): 20,000 ÷ 4 = Rs. 5,000

Net Average = 25,000 + 5,000 = Rs. 30,000

Therefore The correct answer is Rs. 30,000.

Alternate Method

Given:

Number of officers = 10 | Average salary of officers = Rs. 45,000

Number of clerks = 30 | Average salary of clerks = Rs. 25,000

Formula: Average = (Total Salary of all staff) ÷ (Total number of staff)

=> Total salary of 10 officers = 10 × 45,000 = Rs. 4,50,000

=> Total salary of 30 clerks = 30 × 25,000 = Rs. 7,50,000

=> Total salary of entire staff = 4,50,000 + 7,50,000 = Rs. 12,00,000

=> Total number of staff members = 10 + 30 = 40

=> Average salary of staff = 12,00,000 ÷ 40

=> Average salary = Rs. 30,000

Therefore The correct answer is Rs. 30,000.

Additional Information

Weighted Average Formula

When two groups are combined, the combined average A is given by (n1A1 + n2A2) ÷ (n1 + n2).

Alligation Rule

The ratio of the number of items in two groups is (A2 − A_(mix)) : (A_(mix) − A1), where A_(mix) is the average of the combined group.

Average Property

The combined average always lies between the lowest and the highest individual averages of the constituent groups.

Q28. Answer: (a) Rs. 18000

Shortcut Trick

Ratio of E : F : G : H = 9 : 7 : 5 : 3

Difference between F and G units = 7 − 5 = 2 units

Given, 2 units = Rs. 4000 => 1 unit = Rs. 2000

E's share = 9 units = 9 × 2000 = Rs. 18000

Therefore The correct answer is Rs. 18000.

Alternate Method

Given:

Ratio of distribution among E, F, G, H = 9 : 7 : 5 : 3

Difference between share of G and F = Rs. 4000

Formula Used:

Value of one unit = Difference in values ÷ Difference in ratio units

Individual share = Ratio unit × Value of one unit

Calculations:

=> Let the amounts received by E, F, G, and H be 9x, 7x, 5x, and 3x.

=> According to the question, F − G = 4000

=> 7x − 5x = 4000

=> 2x = 4000

=> x = 4000 ÷ 2 = 2000

=> Share of E = 9x = 9 × 2000

=> Share of E = Rs. 18000

Therefore The correct answer is Rs. 18000.

Additional Information

Ratio Equality

A ratio remains unchanged if both terms are multiplied or divided by the same non-zero number (e.g., a:b = ak:bk).

Proportional Distribution

To divide a total amount T in the ratio a:b:c, the first part is [a / (a+b+c)] × T.

Compound Ratio

For two ratios a:b and c:d, the compounded ratio is (ac) : (bd).

Q29. Answer: (b) 6

Given:

Expression = 3.46 + 3 1/4 − 5 1/8 + 4.25 + 0.165

Formula used:

Conversion of mixed fractions to decimal form and BODMAS rule for basic arithmetic.

Calculations:

First, convert the mixed fractions into decimals:

=> 3 1/4 = 3 + 0.25 = 3.25

=> 5 1/8 = 5 + 0.125 = 5.125

Now, substitute these values into the given expression:

=> 3.46 + 3.25 − 5.125 + 4.25 + 0.165

Group the positive terms together to simplify the addition:

=> (3.46 + 3.25 + 4.25 + 0.165) − 5.125

=> 11.125 − 5.125

=> 6

Therefore The correct answer is option (2).

Q30. Answer: (a) 3%

Shortcut Trick

Ratio of Amount (A) to Principal (P) = 21218 : 20000

Divide both sides by 2 to get perfect squares: 10609 : 10000

Since the time is 2 years, take the square root: √10609 : √10000 = 103 : 100

Rate of Interest = (103 − 100) / 100 × 100 = 3%

Therefore The correct answer is 3%.

Alternate Method

Given:

Principal (P) = Rs. 20,000

Amount (A) = Rs. 21,218

Time (n) = 2 years

Formula Used:

$A = P(1 + r/100)^n$

Calculations:

=> $21218 = 20000(1 + r/100)^2$

=> $21218 \div 20000 = (1 + r/100)^2$

=> $10609 \div 10000 = (1 + r/100)^2$

=> $(103/100)^2 = (1 + r/100)^2$

=> $103/100 = 1 + r/100$

=> $1.03 = 1 + r/100$

=> $r/100 = 1.03 − 1 = 0.03$

=> $r = 0.03 \times 100 = 3$

Therefore The correct answer is 3%.

Additional Information

Effective Rate of Interest

For 2 years at r% compound interest, the effective rate is given by R_(eff) = r + r + (r × r)/100.

Difference between CI and SI

The difference between Compound Interest and Simple Interest for 2 years is $P \times (r/100)^2$.

Rule of 72

A quick way to estimate how long it takes for an investment to double is dividing 72 by the annual rate of interest ($t \approx 72/r$).

Q31. Answer: (b) Session Manager

The correct answer is Session Manager.

Key Points

• The Session Manager Subsystem, represented by the executable smss.exe, is the very first user-mode process started by the Windows kernel (ntoskrnl.exe) during the boot sequence.

• It is responsible for critical early-stage tasks such as creating system-wide environment variables and defining symbolic links for MS-DOS device names (like COM1 or LPT1).

• Session Manager initializes the Windows subsystem (win32k.sys and csrss.exe) and establishes the initial sessions, including Session 0 for background services and the first interactive session for user login.

• Once the environment is ready, it launches the Windows Logon Process (winlogon.exe), which facilitates the user authentication interface and the subsequent loading of the user profile.

• If smss.exe terminates unexpectedly during system operation, it triggers a Stop Error or Blue Screen of Death (BSOD) because it is classified as a critical system process.

YourMockTest.com – Free Study Material

Additional Information

• Control Panel

• A centralized management utility in Windows that provides a graphical user interface (GUI) for users to modify hardware settings, system configurations, and security policies.

• In modern versions of Windows, many of its functions are being migrated to the Settings App, though it remains a core part of the Windows NT architecture.

• Windows Explorer

• Also known as File Explorer, it acts as the primary shell of the operating system, providing the desktop interface and the hierarchical view for file management.

• It starts significantly later in the boot process than the Session Manager, specifically after a user successfully logs in via Winlogon.

• Task Manager

• A system monitoring tool (taskmgr.exe) used to view real-time performance data such as CPU usage, RAM allocation, and active network throughput.

• It allows users to manually manage startup applications and forcefully terminate non-responsive tasks or background processes.

Q32. Answer: (b) Kesavananda Bharati Case, 1973

The correct answer is Kesavananda Bharati Case, 1973.

Key Points

• In the landmark case of Kesavananda Bharati v. State of Kerala (1973), a 13-judge Constitutional Bench of the Supreme Court held that the Preamble is an integral part of the Constitution.

• The Court explicitly overruled its previous stand in the Berubari Union case (1960), declaring that the Preamble is not a mere introduction but a part of the constitutional structure.

• It observed that the Preamble serves as a guide to the interpretation of the Constitution, reflecting the grand and noble vision of the founding fathers.

• The judgment established the Basic Structure Doctrine, stating that while Parliament has the power to amend the Constitution under Article 368, it cannot alter the basic features mentioned or implied in the Preamble and the Constitution.

• The Preamble is neither a source of power to the legislature nor a prohibition upon the powers of the legislature; however, it is justiciable in the sense that the basic structure cannot be violated.

Additional Information

• Berubari Union Case (1960):

• In this case, the Supreme Court opined that the Preamble is the 'key to open the mind of the makers', but it is not a part of the Constitution.

• Consequently, it was held that the Preamble could not be used to override the specific provisions of the Constitution.

• Golaknath Case (1967):

• The Supreme Court held that Fundamental Rights are given a 'transcendental and immutable' position and Parliament cannot abridge or take them away.

• Although the Preamble was discussed as the 'soul' of the Constitution, the case did specifically address the Preamble's status as a 'part' in the way the 1973 judgment did.

• S.R. Bommai Case (1994):

• The Supreme Court reaffirmed the Kesavananda Bharati ruling, stating that the Preamble is an integral part of the Constitution.

• It also declared that Secularism is one of the basic features of the Indian Constitution.

Q33. Answer: (a) Vitamin A

The correct answer is Vitamin A.

Key Points

• Vitamin A, also scientifically known as Retinol, is a fat-soluble vitamin that plays a critical role in maintaining healthy vision, skin, and immune function.

• It is a precursor to rhodopsin (visual purple), a light-sensitive photopigment located in the rod cells of the retina, which is essential for seeing in low-light or dim conditions.

• The deficiency of Vitamin A leads to Nyctalopia, commonly referred to as night blindness, where the eyes fail to adapt to darkness, making it difficult or impossible to see at night.

• Severe and prolonged deficiency can progress to Xerophthalmia, a condition characterized by extreme dryness of the conjunctiva and cornea, which may eventually lead to permanent blindness if left untreated.

• Vitamin A is also necessary for cell growth, reproduction, and the maintenance of the epithelial tissues that line the internal and external surfaces of the body.

Additional Information

• Vitamin C (Ascorbic Acid):

• It is a water-soluble vitamin vital for the synthesis of collagen, which helps in wound healing and maintaining the integrity of blood vessels.

• A deficiency in Vitamin C causes Scurvy, leading to symptoms like bleeding gums, fatigue, and skin spots.

• Vitamin B12 (Cobalamin):

• This vitamin is essential for red blood cell formation, DNA synthesis, and the healthy functioning of the nervous system.

• Deficiency often results in Pernicious Anemia and potential neurological damage or cognitive impairment.

• Vitamin D (Calciferol):

• It facilitates the absorption of calcium and phosphorus in the intestines, which is crucial for bone mineralization.

• Lack of Vitamin D leads to Rickets in children (softening of bones) and Osteomalacia or Osteoporosis in adults.

• Dietary Sources:

• Rich sources of Vitamin A include carrots, spinach, sweet potatoes, liver, cod liver oil, and dairy products.

Q34. Answer: (c) PSLV-C60

The correct answer is PSLV-C60.

Key Points

• The Indian Space Research Organisation (ISRO) has designated the PSLV-C60 mission to carry out the SpaDex (Space Docking Experiment), which is a critical technology demonstrator.

• SpaDex is designed to test and validate autonomous docking and undocking capabilities, where two separate spacecraft modules join together in orbit.

• The mission involves two distinct spacecraft components—a Chaser and a Target—that will be launched together on the PSLV-C60 and then separated to perform complex proximity maneuvers.

• This experiment is a foundational step for India's future space endeavors, specifically for the construction of the Bharatiya Antariksha Station (Indian Space Station) by 2035.

• The PSLV (Polar Satellite Launch Vehicle) is chosen for this mission due to its high reliability and precision in injecting multiple payloads into specific Low Earth Orbits (LEO).

• Mastering docking technology is essential for crewed missions, in-orbit refueling, and satellite servicing, as well as complex planetary missions like Chandrayaan-4 for sample returns.

Additional Information

• GSLV Mk III / LVM3

• Known as India's heaviest rocket, used for the Chandrayaan-3 and Gaganyaan missions.

• Capable of carrying 4,000 kg class satellites into Geosynchronous Transfer Orbit (GTO).

• SSLV-D2

• The second developmental flight of the Small Satellite Launch Vehicle, designed for the 'launch-on-demand' market.

• Successfully deployed the EOS-07, Janus-1, and AzaadiSAT-2 satellites in February 2023.

• GSLV Mk II

• A three-stage launch vehicle equipped with an indigenous Cryogenic Upper Stage (CUS).

• Primarily used for launching INSAT and GSAT series communication satellites.

Q35. Answer: (d) Chemistry

The correct answer is Chemistry.

Key Points

• The 2025 Nobel Prize in Chemistry was awarded to Susumu Kitagawa, Richard Robson, and Omar M. Yaghi for their pioneering work in the development and advancement of Metal-Organic Frameworks (MOFs).

• Omar M. Yaghi, a professor at the University of California, Berkeley, is widely credited with establishing the field of Reticular Chemistry, which involves linking molecular building blocks into strong, crystalline, and highly porous structures.

• Susumu Kitagawa of Kyoto University was recognized for his discovery of porous coordination polymers (PCPs) and for demonstrating that these frameworks can be dynamic and flexible, allowing them to selectively recognize and store specific molecules.

• Richard Robson from the University of Melbourne provided the foundational architectural principles in the late 1980s and early 1990s, predicting that coordination polymers could be engineered to have predictable, open-network structures.

• The discovery of MOFs revolutionized materials science by creating substances with the highest known internal surface areas (sometimes exceeding 7,000 square meters per gram), which are essential for gas storage and molecular separation.

Additional Information

YourMockTest.com — Free Study Material

• Metal-Organic Frameworks (MOFs):

• Structural Features: Composed of metal ions or clusters coordinated to organic ligands to form one-, two-, or three-dimensional lattices.

• Carbon Capture: MOFs are used to selectively adsorb CO_2 from industrial flue gases, helping to mitigate climate change.

• Water Harvesting: Specifically developed MOF-303 can extract potable water from desert air with low humidity levels using solar energy.

• Hydrogen Storage: They provide a safe and efficient medium for storing hydrogen fuel at lower pressures for clean energy vehicles.

• Alternative Nobel Categories:

• Physics: This prize typically honors discoveries in quantum mechanics, astrophysics, or particle physics, rather than molecular synthesis.

• Medicine: Focuses on physiology, genetics, or biomedical breakthroughs like mRNA vaccines or CRISPR technology.

• Economic Sciences: Officially known as the Sveriges Riksbank Prize, it recognizes contributions to economic theory and social sciences.

Q36. Answer: (a) Crystallization

The correct answer is Crystallization.

Key Points

• A physical change is a type of change in which only the physical properties of a substance, such as its shape, size, state, or color, undergo a transformation while the chemical composition remains identical.

• Crystallization is the process of forming solid crystals from a solution, melt, or gas. This occurs when a solute precipitates out of a solution, arranging its atoms or molecules into a highly ordered lattice structure.

• During crystallization, no new chemical substance is created; the substance simply transitions from a liquid or dissolved state into a solid state. For example, obtaining pure copper sulfate from an impure sample is a classic physical process.

• This method is predominantly used as a purification technique in laboratories and industrial processes because it allows for the separation of a solid from its saturated solution without altering its internal chemical identity.

Additional Information

• Oxidation:

• It is a chemical change that involves the loss of electrons or an increase in the oxidation state of an atom or molecule.

• A common example is rusting, where iron reacts with oxygen and moisture to form Iron(III) Oxide (Fe_2O_3).

• Combustion:

• This is an exothermic chemical reaction between a fuel and an oxidant (usually Oxygen) that produces heat and light.

• It results in the formation of entirely new substances, such as Carbon Dioxide (CO_2) and Water (H_2O), making it an irreversible chemical change.

• Reduction:

• A chemical process characterized by the gain of electrons or the removal of oxygen from a compound.

• It is the functional opposite of oxidation and is a vital step in the extraction of metals from their naturally occurring ores.

Q37. Answer: (d) Representation of the People Act, 1951

The correct answer is Representation of the People Act, 1951.

Key Points

• The Union Territories Laws (Amendment) Bill, 2024 was introduced in the Lok Sabha on December 17, 2024, by the Union Minister of Law and Justice to facilitate simultaneous elections (One Nation, One Election).

• The Bill specifically proposes amendments to the Government of National Capital Territory of Delhi Act, 1991 to synchronize the term of the Delhi Legislative Assembly with that of the Lok Sabha. Hence, statement 1 is correct.

• It proposes to amend the Jammu and Kashmir Reorganisation Act, 2019, ensuring that the legislative cycle of the Union Territory of Jammu and Kashmir aligns with the national electoral calendar. Hence, statement 2 is correct.

• The Bill also targets the Government of Union Territories Act, 1963, which governs the administration and legislature of Puducherry, to enable concurrent polling for its assembly. Hence, statement 3 is correct.

• The Representation of the People Act, 1951, which regulates the conduct of elections, corrupt practices, and disqualifications of members, is not proposed for amendment under this specific Bill. Hence, statement 4 is incorrect.

• Under the proposed framework, if a UT Assembly is dissolved prematurely, the new assembly will only serve for the unexpired term of the five-year cycle to maintain synchronization.

Additional Information

• Acts Proposed for Amendment:

YourMockTest.com — Free Study Material

• Government of National Capital Territory of Delhi Act, 1991: This Act was enacted to supplement the provisions of the Constitution relating to the Legislative Assembly and a Council of Ministers for the NCT of Delhi under Article 239AA.

• Jammu and Kashmir Reorganisation Act, 2019: This landmark legislation bifurcated the erstwhile state into the Union Territories of Jammu and Kashmir and Ladakh, following the abrogation of Article 370.

• Government of Union Territories Act, 1963: This Act provides for the establishment of Legislative Assemblies and Councils of Ministers in certain Union Territories, including Puducherry.

• Representation of the People Act, 1951: Enacted under Article 327, it provides the actual machinery for conducting elections to the Parliament and State Legislatures. While separate amendments were introduced for this Act in 2024 (such as those concerning paid news), it is distinct from the Union Territories Laws (Amendment) Bill.

Q38. Answer: (b) Farm subsidies

The correct answer is Farm subsidies.

Key Points

• Farm subsidies refer to domestic financial assistance provided by the government to farmers to stabilize prices and ensure food security for the nation.

• Unlike the other factors, these subsidies are internal fiscal tools designed to protect domestic producers from the volatility of international market prices and competition.

• In the context of the World Trade Organization (WTO), large farm subsidies are often classified as trade-distorting measures because they can lead to overproduction and artificially low prices, which hinders free global trade.

• While the 1991 Economic Reforms focused on opening the Indian economy, farm subsidies remained a protectionist mechanism aimed at social welfare rather than a driver of global integration.

• The process of Globalisation is characterized by the free flow of capital, goods, and labor, whereas subsidies often function as a buffer that isolates domestic sectors from global market forces.

Additional Information

• E-commerce:

• Utilizes digital infrastructure to facilitate cross-border transactions and global market access for Indian enterprises.

• It has effectively minimized the geographic distance between local manufacturers and international consumers.

• Reduction of Trade Barriers:

• A core component of Liberalisation, involving the removal of import licenses, quotas, and high tariffs.

• This allowed foreign products and capital to flow more freely into the Indian market, increasing efficiency and competition.

• Multinational Companies (MNCs):

• These organizations bring Foreign Direct Investment (FDI) and advanced technology to India, creating jobs and enhancing local manufacturing capabilities.

• The presence of global brands like Samsung, Hyundai, and Apple integrates India into Global Value Chains (GVCs).

Q39. Answer: (a) Ghaggar River

The correct answer is Ghaggar River.

Key Points

• The Ghaggar River is an endorheic and seasonal river in India that flows primarily during the monsoon season and disappears into the sands of the Thar Desert (Great Indian Desert).

• It originates in the Sivalik Hills of Himachal Pradesh and travels through the states of Punjab and Haryana before entering Rajasthan.

• Within the arid landscape of the Great Indian Desert, the old bed of the Ghaggar River forms a distinct fertile tract known as the Ghaggar Plain, primarily located in the Hanumangarh and Sri Ganganagar districts.

• The region is characterized by alluvial soil deposits which, coupled with extensive irrigation from the Indira Gandhi Canal, have transformed this part of the desert into a highly productive agricultural hub for crops like wheat, cotton, and rice.

• Geologists and historians often identify the Ghaggar-Hakra river system with the Vedic Saraswati River, and its banks host several Indus Valley Civilization sites, including the famous town of Kalibangan.

Additional Information

• Beas River

• It is a major river of North India originating at the Beas Kund near Rohtang Pass in Himachal Pradesh and is a tributary of the Sutlej River.

• While it contributes water to the Indira Gandhi Canal which irrigates the desert, the river itself does not flow through the Great Indian Desert.

• Narmada River

• This is the largest west-flowing river of Peninsular India, originating from the Amarkantak Plateau in Madhya Pradesh.

• It flows through a rift valley between the Vindhya and Satpura ranges, far south of the desert regions of Rajasthan.

• Sabarmati River

• Originating in the Aravalli Range of the Udaipur district, it flows southwards through Rajasthan and Gujarat into the Gulf of Khambhat.

• Although it passes through semi-arid zones, it does not define the internal fertile plains of the Thar Desert like the Ghaggar system.

Q40. Answer: (d) 99th

The correct answer is 99th.

Key Points

• The Sustainable Development Report (SDR) 2025 is an annual global assessment that tracks the progress of all 193 UN Member States toward the 17 Sustainable Development Goals (SDGs).

• In the 2025 SDG Index, India secured the 99th position, showing a marked improvement in its global standing compared to previous years where it ranked outside the top 100.

• The report is produced by the Sustainable Development Solutions Network (SDSN) and provides a score for each country based on its performance across 169 targets.

• India's progress in 2025 is attributed to successful domestic policies like National Green Hydrogen Mission and Swachh Bharat Mission, which directly impact environmental and sanitation goals.

• The SDG Index score for India reflects its efforts to balance economic growth with environmental sustainability and social equity as part of the 2030 Agenda.

Additional Information

• Sustainable Development Solutions Network (SDSN):

• It was established in 2012 under the leadership of Professor Jeffrey Sachs to support the implementation of the SDGs.

• It operates under the auspices of the United Nations Secretary-General.

• SDG India Index:

• While the global SDR is published by the SDSN, the NITI Aayog releases a localized SDG India Index to monitor state-level progress.

• This internal monitoring helps India identify specific regions requiring intervention, contributing to its rise to the 99th rank globally.

• Sustainable Development Goals (SDGs):

• Adopted in September 2015, these 17 goals aim to end poverty, protect the planet, and ensure peace and prosperity by 2030.

• The 2025 report marks a critical juncture as nations enter the final five-year countdown toward the 2030 deadline.

Q41. Answer: (d) Article 3

The correct answer is Article 3.

Key Points

• Article 3 of the Indian Constitution vests the Parliament with the authority to undergo internal reorganization of the states of the Union of India.

• It empowers the legislature to form a new state by separating territory from any state, uniting two or more states, or joining any territory to a part of any state.

• The Parliament can also use this article to increase or diminish the area, alter the boundaries, or change the name of any existing state through a simple majority.

• A bill intended for these purposes can only be introduced in either House of Parliament with the prior recommendation of the President.

• If the bill affects the area, boundary, or name of a state, the President must refer the bill to the relevant State Legislature for its views within a specified period, though the Parliament is not legally bound by those views.

• This article highlights the unitary tilt of the Indian federal system, where the territorial integrity of states is not guaranteed by the Constitution.

Additional Information

• Article 2:

• Relates to the admission or establishment of new states that are not part of the Union of India.

• It was notably used during the admission of Sikkim into the Indian Union via the 36th Constitutional Amendment Act, 1975.

• Article 5:

• Deals with citizenship at the commencement of the Constitution on January 26, 1950.

• It covers persons who were born in India, whose parents were born in India, or who were ordinarily resident in India for five years preceding the commencement.

YourMockTest.com - Free Study Material

• Article 6:

• Confers citizenship rights to individuals who migrated to India from Pakistan before the specified cutoff date.

• Article 4:

• Mandates that laws made under Article 2 and Article 3 provide for the amendment of the First Schedule and Fourth Schedule without being considered formal amendments under Article 368.

Q42. Answer: (a) Indian-language newspapers critical of British rule

The correct answer is Indian-language newspapers critical of British rule.

Key Points

• The Vernacular Press Act of 1878 was a restrictive law enacted by the British administration to curtail the freedom of the Indian-language (vernacular) press.

• Introduced by Lord Lytton, the then Viceroy of India (1876–1880), the act was primarily designed to suppress the growing nationalist sentiment and criticism of government policies in local languages.

• The legislation empowered District Magistrates to require publishers of vernacular newspapers to enter into a bond, pledging not to publish any material that could incite disaffection or hatred against the British Crown.

• If a newspaper violated the bond, the government had the authority to seize the printing press and other equipment without a court trial.

• A defining characteristic of this law was its discriminatory nature, as it was applicable only to newspapers published in Indian languages, while the English-language press was completely exempted from its provisions.

Additional Information

• Historical Context and Impact:

• The act was a direct response to the scathing criticism of Lord Lytton regarding his handling of the Great Famine of 1876–1878 and the costly Second Anglo-Afghan War.

• Due to its repressive nature, the law was widely condemned by Indian nationalists and was nicknamed the Gagging Act.

• A famous incident related to this act involved the Amrita Bazar Patrika; to escape the legal trap, the newspaper converted from a bilingual (Bengali/English) weekly into a purely English-language publication overnight.

• Repeal of the Act:

• The act faced intense opposition from the Indian public and liberal politicians in Britain. It was eventually repealed in 1882 by the successor Viceroy, Lord Ripon.

• The repeal was part of Lord Ripon's more liberal policy framework, which aimed to restore freedom of the press in India.

Q43. Answer: (d) 1905–1919

The correct answer is 1905-1919.

Key Points

• The period between 1905 and 1919 is historically recognized as the Extremist Phase or the era of Militant Nationalism within the Indian National Congress.

• The Partition of Bengal in 1905, orchestrated by Lord Curzon, served as the primary catalyst that shifted the national movement from moderate constitutionalism to radical action.

• The movement was led by the famous trio Lal-Bal-Pal, consisting of Lala Lajpat Rai, Bal Gangadhar Tilak, and Bipin Chandra Pal, along with the intellectual leadership of Aurobindo Ghosh.

• Unlike the previous phase, the Extremists demanded Swaraj (self-rule) as a right and utilized methods such as the Swadeshi movement, Boycott of foreign goods, and the promotion of National Education.

• Internal ideological friction led to the Surat Split in 1907, where the Indian National Congress divided into two groups: the Moderates and the Extremists.

• The phase drew to a close around 1919 with the enactment of the Government of India Act 1919 and the subsequent transition of leadership to Mahatma Gandhi following the Rowlatt Act and Jallianwala Bagh Massacre.

Additional Information

• Moderate Phase (1885-1905):

• Characterized by the leadership of Dadabhai Naoroji, Gopal Krishna Gokhale, and Pherozeshah Mehta.

• Followed the policy of 3Ps: Prayers, Petitions, and Protests to seek administrative reforms.

• Gandhian Phase (1920-1947):

• Marked by the dominance of Mahatma Gandhi and the philosophy of Satyagraha (truth force) and Ahimsa (non-violence).

• Included massive pan-India movements such as the Non-Cooperation Movement, Civil Disobedience Movement, and the Quit India Movement.

• Key Ideological Shifts:

• While the Moderates believed in the essential sense of justice of the British, the Extremists believed that British Rule was inherently exploitative and could only be challenged through mass sacrifice and direct agitation.

• Bal Gangadhar Tilak popularized the slogan, 'Swaraj is my birthright and I shall have it,' which became the anthem of this era.

Q44. Answer: (c) Cultural symbols like Shivaji and Ganapati were used for political mobilisation.

The correct answer is Cultural symbols like Shivaji and Ganapati were used for political mobilisation..

Key Points

• The Extremist phase of the Indian national movement (roughly 1905−1919) was characterised by a shift from the constitutional methods of the Moderates to more radical forms of mass agitation and political mobilisation.

• Bal Gangadhar Tilak, a prominent leader of the Garam Dal, pioneered the use of traditional religious and cultural icons to bridge the gap between the western-educated elite and the common masses.

• In 1893, Tilak transformed the Ganapati Festival from a private domestic ritual into a grand sarvajanik (public) event in Maharashtra. This allowed for large gatherings where patriotic songs were sung and nationalist ideas were disseminated despite British bans on political meetings.

• In 1895, he introduced the Shivaji Festival to commemorate the birth anniversary of the Maratha ruler Chhatrapati Shivaji Maharaj. The objective was to invoke a sense of pride and a spirit of resistance against foreign rule by highlighting Shivaji as a national hero.

• These cultural symbols served as a powerful medium for political mobilisation, enabling the extremist leadership to reach the rural population and urban working classes who identified strongly with these religious and historical traditions.

Additional Information

• Lal-Bal-Pal: This influential trio consisted of Lala Lajpat Rai from Punjab, Bal Gangadhar Tilak from Maharashtra, and Bipin Chandra Pal from Bengal, who collectively advocated for Swaraj (Self-Rule).

• Extremist Ideology:

• They relied on the principles of Swadeshi (use of indigenous goods) and Boycott of foreign products to weaken British economic interests.

• Unlike Moderates who sought reforms through petitions, Extremists believed in Passive Resistance and direct mass action.

• While the use of religious symbolism successfully galvanised the Hindu majority, historians often discuss how it unintentionally fostered a sense of alienation among some sections of the Muslim community, contributing to the growth of communal identities.

• The movements were not confined to religious gatherings; they expanded into Swadeshi stores, national schools, and widespread protests in the streets, especially during the Anti-Partition Movement of 1905.

Q45. Answer: (c) Anatomically Modern Homo sapiens across the Old World

The correct answer is Anatomically Modern Homo sapiens across the Old World.

Key Points

• The Upper Paleolithic cultural phase, which lasted from approximately 50,000 to 12,000 years ago, is universally associated with the global expansion and dominance of Anatomically Modern Homo sapiens (AMH).

• This era is characterized by a technological revolution, moving away from the flake-based tools of the Middle Paleolithic to sophisticated blade-tool technology, where tools were manufactured from long, thin stone flakes.

• It marks the first appearance of complex symbolic behavior, evidenced by cave paintings, personal ornaments (beads and pendants), and portable art like the Venus figurines, which are linked to the cognitive development of Homo sapiens.

• Geographically, this phase saw modern humans colonizing the entire Old World, including various regions of Africa, Europe, and Asia, while adapting to diverse climatic conditions during the Late Pleistocene.

• The period also saw the intensive use of organic materials such as bone, antler, and ivory to produce specialized hunting equipment like barbed harpoons, sewing needles, and spear-throwers.

Additional Information

• Comparison of other hominin species:

• Homo neanderthalensis: Primarily associated with the Middle Paleolithic and the Mousterian tool industry; while they coexisted with modern humans during the early Upper Paleolithic in Europe, they are not the defining species of this global phase.

• Homo erectus: Associated with the Lower Paleolithic period, specifically the Acheulean culture, known for bifacial hand-axes and cleavers.

• Denisovans: A distinct lineage identified in Central and East Asia, contemporary with Neanderthals and modern humans, known for specific adaptations to high-altitude environments like the Tibetan Plateau.

Q46. Answer: (b) Lothal

The correct answer is Lothal.

Key Points

• Lothal, situated in the modern state of Gujarat in India, was a vital port city of the Indus Valley Civilization located near the Sargwala village on the banks of the Bhogava River, a tributary of the Sabarmati.

• The site is most distinguished for its artificial dockyard, which is considered the earliest known structure of its kind in the world, measuring roughly 218 meters in length and 37 meters in width.

• This dockyard was meticulously engineered with burnt bricks and featured a sluice gate system to maintain a constant water level, enabling ships to enter from the Gulf of Khambhat during high tides.

• The presence of this maritime infrastructure facilitated extensive overseas trade with Mesopotamia and the Persian Gulf, supported by the archaeological discovery of circular seals and bead-making workshops at the site.

• Archaeologists have also uncovered a unique warehouse near the dockyard, which was used for storing commercial goods before they were exported or after they were imported.

Additional Information

• Kalibangan:

• Located in the Hanumangarh district of Rajasthan, this site is famous for the earliest recorded ploughed field and the presence of fire altars.

• The name literally translates to black bangles, derived from the numerous fragments of terracotta bangles found during excavations.

• Rakhigarhi:

• Situated in the Hisar district of Haryana, it is identified as one of the largest settlements of the Harappan civilization, spanning over 350 hectares.

• It has yielded evidence of a sophisticated drainage system, granaries, and terracotta artifacts.

• Nal:

• This site is associated with the Amri-Nal culture and is located in the Jhalawan region of Balochistan, Pakistan.

• It represents a transitional phase between the Early Harappan and Mature Harappan periods, known for its distinct polychrome pottery.

Q47. Answer: (c) Analyze Wait Chain

The correct answer is Analyze Wait Chain.

Key Points

• Analyze Wait Chain is a sophisticated diagnostic utility embedded within the Windows Task Manager, specifically accessible via the Details tab for troubleshooting stalled applications.

• Its primary purpose is to allow users to visualize process dependencies by showing which threads or processes are waiting for resources held by other background services or applications.

• This feature is invaluable for identifying deadlocks, a state where two or more processes are waiting for each other to release a resource, such as a mutex or semaphore, causing the system to hang.

• When a user selects this option, it displays a Wait Chain Tree, listing the specific background services, child processes, or I/O operations that the main program relies on to continue execution.

• If a process is marked as Not Responding, this tool can pinpoint whether the issue is internal to the application code or caused by an external Operating System service, driver, or network resource.

Additional Information

• Open File Location:

• This utility is used to quickly identify the physical path of an application executable on the hard drive, which is useful for verifying security signatures or manual uninstallation of software.

• Go to Details:

• This function serves as a bridge that transitions the user from the simplified Processes tab to the granular Details tab, where technical metrics like CPU affinity, Process ID (PID), and Memory Priority are managed.

• End Task:

• This is a basic administrative command used to forcefully terminate a stalled or unwanted application; however, unlike Analyze Wait Chain, it provides no diagnostic insight into the root cause of process hangings or dependency failures.

Q48. Answer: (c) 131st

The correct answer is 131st.

Key Points

• The Women, Peace and Security (WPS) Index 2025/26 is a comprehensive assessment tool that evaluates the well-being and status of women across 181 countries worldwide.

• According to the findings of this report, India has been ranked 131st, reflecting its global position regarding gender equality, justice, and security for women.

• The index is jointly developed and published by the Georgetown Institute for Women, Peace and Security (GIWPS) and the PRIO Centre on Gender, Peace and Security based in Oslo.

• The WPS Index utilizes 13 indicators grouped into three core dimensions: Inclusion, Justice, and Security, to provide a multi-dimensional view of women's lives.

• India's ranking of 131st highlights specific areas of concern and progress in female labor force participation, access to justice, and safety from political violence.

Additional Information

• Dimensions of the WPS Index:

• Inclusion: Measures women's participation in economic, social, and political life, focusing on financial inclusion, education, and employment.

• Justice: Evaluates both formal laws and informal discrimination, including legal reforms and discriminatory norms like son bias.

• Security: Tracks safety at individual and societal levels, measuring community safety, intimate partner violence, and proximity to conflict.

• Global Trends and Significance:

• The index serves as a critical indicator for monitoring progress toward the United Nations Sustainable Development Goal 5 (Gender Equality) and Goal 16 (Peace, Justice, and Strong Institutions).

• High-performing countries typically include Scandinavian nations such as Norway and Denmark, while lower rankings are often associated with conflict-affected regions.

Therefore, the correct option is 3.

Q49. Answer: (d) Iron Ore

The correct answer is Iron Ore.

Key Points

• Kudremukh, located in the Chikkamagaluru district of Karnataka, is globally recognized for containing one of the largest deposits of Magnetite iron ore.

• The name Kudremukh translates to Horse-face in the local Kannada language, which describes the distinctive shape of the mountain peak in the Western Ghats range.

• The Kudremukh Iron Ore Company Limited (KIOCL) was incorporated in 1976 as a specialized public sector undertaking to exploit these reserves, primarily for exports to Iran and other nations.

• The mining project was technically advanced, featuring a 67-kilometre-long slurry pipeline to transport iron ore concentrates from the hills to the Mangaluru port.

• Due to its location within a sensitive ecological zone, the Supreme Court of India ordered the cessation of mining activities in December 2005 to protect the Kudremukh National Park and its biodiversity.

Additional Information

• Limestone:

• It is a vital raw material for the cement industry; in Karnataka, major deposits are concentrated in the Kalaburagi, Bagalkot, and Vijayapura districts.

• Manganese:

• Karnataka is a leading producer of manganese ore in India, with high-quality deposits found in the Sandur region of Ballari and parts of Shimoga.

• Copper:

• While not found in Kudremukh, copper mining in Karnataka is historically associated with Ingaldhal in the Chitradurga district and Kalyadi in the Hassan district.

• Geography:

• The region serves as the origin for three major rivers: the Tunga, the Bhadra, and the Netravati, emphasizing its environmental importance beyond mineral wealth.

Q50. Answer: (c) Greenland

The correct answer is Greenland.

Key Points

• Greenland is the world's largest island and is an autonomous territory within the Kingdom of Denmark, with its administrative center located in Nuuk.

• In August 2019, then-U.S. President Donald Trump generated international headlines by expressing a serious interest in purchasing Greenland, citing its geostrateic importance and vast natural resources.

• By 2025, the territory has remained at the center of Arctic geopolitics as major powers like the United States, China, and Russia compete for influence over newly accessible shipping routes and critical mineral deposits.

YourMockTest.com — Free Study Material

• The island holds some of the world's largest untapped reserves of rare earth elements, such as neodymium and praseodymium, which are essential for green energy technologies and advanced electronics.

• The United States maintains a significant military presence at the Pituffik Space Base (formerly Thule Air Base), which serves as a vital link in the global ballistic missile early-warning system.

Additional Information

• Faroe Islands

• Another autonomous territory under the Danish Crown located in the North Atlantic.

• Its economy is heavily dependent on fishing and aquaculture, and while strategically located, it did not face the same specific land acquisition bids as its neighbor.

• Iceland

• A sovereign island nation that was formerly in a personal union with Denmark but achieved full independence in 1944.

• It is a NATO member but does not have its own standing army, hosting a rotating presence of allied forces for air surveillance.

• Svalbard

• An archipelago located in the Arctic Ocean that is under Norwegian sovereignty.

• It is governed by the 1920 Svalbard Treaty, which grants signatory nations (including Russia) equal rights to engage in commercial activities like coal mining.

Q51. Answer: (d) State protects all religions equally

The correct answer is State protects all religions equally.

Key Points

• The term Secular in the context of the Indian Constitution signifies that the nation does not have a state religion and ensures that the State treats all religious groups with equal respect and dignity.

• Indian secularism is based on the concept of Positive Secularism, where the government maintains a principled distance from religion but can intervene for social reforms and provides equal protection to all faiths.

• The word Secular was formally incorporated into the Preamble through the 42nd Constitutional Amendment Act of 1976, reinforcing the pluralistic nature of the Indian polity.

• This constitutional provision ensures that the State neither promotes a majority religion nor discriminates against any minority religion, upholding the ideal of Sarva Dharma Sambhava (equal respect for all religions).

• It implies that every citizen has the right to follow their faith without state interference, and the government's policies are not guided by any specific religious doctrine.

Additional Information

• Constitutional Provisions:

• Article 25: Guarantees the freedom of conscience and the right to freely profess, practice, and propagate religion to all individuals.

• Article 26: Grants every religious denomination the right to manage its own religious affairs and establish institutions for charitable purposes.

• Article 27: Prohibits the State from compelling any person to pay taxes specifically for the promotion or maintenance of any particular religion.

• Article 28: Restricts religious instruction in educational institutions wholly maintained out of State funds.

• Legal Significance:

• In the S.R. Bommai vs. Union of India (1994) case, the Supreme Court held that Secularism is a Basic Structure of the Constitution, meaning it cannot be abridged or destroyed by Parliament.

• The Directive Principles of State Policy under Article 44 advocate for a Uniform Civil Code, aiming to create a common set of laws for all citizens irrespective of their religion, which is a key pillar of secular governance.

Q52. Answer: (d) Haryana

The correct answer is Haryana.

Key Points

• Saang, also known as Swang, is a prominent folk dance-theatre tradition deeply rooted in the cultural fabric of Haryana.

• It is a highly ritualistic performance that integrates music, dance, mimicry, and dialogue to narrate stories from Indian mythology, historical legends, and folklore.

• The performance traditionally occurs in the open-air on a raised wooden platform or a designated space called an Akhada, allowing the audience to watch from all sides.

• A distinctive feature of Saang is that it is traditionally an all-male art form; male performers take on female roles using elaborate costumes, jewelry, and makeup.

• The musical element is grounded in Haryanvi dialects and the Raag-Ragini system, usually accompanied by instruments such as the Sarangi, Harmonium, Dholak, and Khartal.

• The art form reached its peak through the contributions of legendary artists like Deep Chand Bahman, often called the Shakespeare of Haryana, and Pandit Lakhmi Chand, known as the Surya Kavi of the state.

Additional Information

• Kerala

• Home to Kathakali, a classical dance-drama characterized by heavy makeup and stylized gestures.

• Mohiniyattam is another classical dance from this state, performed exclusively by women.

• Sikkim

• Famous for the Singhi Chham (Snow Lion Dance) and Yak Chham, which are ritualistic mask dances performed during festivals like Pang Lhabsol.

• These dances are deeply influenced by Tibetan Buddhism.

• Punjab

• Features the world-famous Bhangra, an energetic folk dance traditionally performed during the Baisakhi harvest festival.

• Giddha is the corresponding folk dance performed by women, known for its rhythmic clapping and Boliyan singing.

Q53. Answer: (c) United States of America

The correct answer is United States of America.

Key Points

• The United States of America (USA) finished at the top of the medal table at the Paris 2024 Summer Olympics, securing the highest total number of medals among all participating nations.

• The USA won a total of 126 medals, which included 40 Gold, 44 Silver, and 42 Bronze medals. This performance reinforced their dominance in global athletics, particularly in disciplines like Swimming and Track and Field.

• While the United States and China both finished with exactly 40 Gold medals, the USA was ranked first in the final standings because they won a significantly higher number of Silver medals (44 compared to China's 27).

• The 2024 Summer Olympics, officially the Games of the XXXIII Olympiad, took place in Paris, France, from July 26 to August 11, 2024, featuring approximately 10,500 athletes from 206 National Olympic Committees.

Additional Information

• China:

• Ranked second overall with a total of 91 medals, including 40 Gold, 27 Silver, and 24 Bronze.

• They showed exceptional performance in Diving, winning all eight available gold medals, and in Table Tennis.

• Australia:

• Finished in 4th place in the gold medal tally with 18 Gold, 19 Silver, and 16 Bronze medals, totaling 53.

• This marked one of Australia's most successful Olympic campaigns, heavily driven by their success in Swimming events at the La Defense Arena.

• India:

• India concluded its campaign with 6 medals in total, comprising 1 Silver and 5 Bronze.

• Key highlights included Neeraj Chopra winning silver in Javelin Throw and Manu Bhaker becoming the first Indian athlete in independent India to win two medals in a single Olympic edition (Shooting).

Q54. Answer: (b) Kalhana

The correct answer is Kalhana.

Key Points

• The Rajatarangini, which literally translates to 'The River of Kings', is a historical chronicle written by the poet Kalhana between 1148 and 1150 CE.

• The text is written in Sanskrit verse and is widely recognized as the earliest and most authentic attempt at historiography in ancient India.

• It provides a chronological account of the various dynasties and monarchs who ruled Kashmir, ranging from the legendary period of the Gonanda dynasty to the medieval period under King Jayasimha of the Lohara dynasty.

• Kalhana is praised by modern historians for his relatively objective approach and his critical evaluation of historical sources, such as inscriptions, coins, temple records, and land grants.

• The work is structured into eight books or cantos, known as Tarangas (waves), containing nearly 8,000 verses (Shlokas).

Additional Information

• Bilhana:

• He was an 11th-century Kashmiri poet who served in the court of King Vikramaditya VI of the Western Chalukya Empire.

• He is famous for writing the Vikramankadevacharita, a biographical poem celebrating the life and achievements of his patron king.

• Kshemendra:

• A prolific 11th-century polymath and satirist from Kashmir, he was a disciple of the philosopher Abhinavagupta.

• His notable works include the Brihatkathamanjari, Deshopadesha, and Dashavataracharita, which reflect the socio-cultural life of his time.

• Somadeva:

• An 11th-century poet who composed the Kathasaritsagara ('Ocean of the Streams of Stories') for the amusement of Queen Suryamati of Kashmir.

• This work is a massive collection of legends, fairy tales, and fables, originally based on the legendary Brihatkatha.

Q55. Answer: (c) Sachin Tendulkar

The correct answer is Sachin Tendulkar.

Key Points

• The Col. CK Nayudu Lifetime Achievement Award is the most prestigious honor presented by the Board of Control for Cricket in India (BCCI) to former cricketers for their unparalleled contribution to the sport.

• During the BCCI Naman Awards 2025, the legendary Sachin Tendulkar was conferred with this lifetime achievement award in the men's category for his monumental impact on global cricket.

• The award is named after Cottari Kanakaiya Nayudu, who served as India's first Test captain in 1932, symbolizing the highest level of excellence and longevity in the game.

• Sachin Tendulkar, known as the God of Cricket, remains the highest run-scorer in the history of both Test and ODI formats, finishing his career with a record 100 international centuries.

• The recognition at the 2025 ceremony honors his 24-year long career (1989–2013), during which he became the face of Indian cricket and inspired generations of athletes.

Additional Information

• Sachin Tendulkar:

• He was the first sportsperson to be awarded the Bharat Ratna, India's highest civilian award, in 2014.

• He played a pivotal role in India's 2011 ICC Cricket World Cup victory, finishing as the second-highest run-getter in the tournament.

• Tendulkar holds the record for playing the most number of Test matches (200) and ODIs (463).

• Col. CK Nayudu Lifetime Achievement Award:

• It was first instituted in 1994, with Lala Amarnath being the inaugural recipient.

• The award typically includes a trophy, a citation, and a significant cash prize (usually Rs. 25 Lakhs) presented during the annual BCCI Awards ceremony.

• Previous winners include cricketing icons such as Sunil Gavaskar, Kapil Dev, Ravi Shastri, and Farokh Engineer.

• BCCI Naman Awards:

• These awards recognize the best performers in Indian domestic and international cricket across various age groups and categories.

• Other major honors include the Polly Umrigar Award for the Best International Cricketer (Men) and the Jagmohan Dalmiya Award.

Q56. Answer: (a) Active cell division

The correct answer is Active cell division.

Key Points

• The meristematic phase represents the earliest stage of plant growth, occurring primarily at the root apex and shoot apex, where cells are constantly undergoing mitotic division.

• Cells in this phase are characterized by having a dense protoplasm and large, prominent nuclei, which are essential for managing the high metabolic demands of frequent replication.

• The cell walls of meristematic cells are primary in nature, meaning they are thin, elastic, and composed mainly of cellulose to allow for expansion and division.

• These cells maintain rich plasmadesmatal connections, facilitating the rapid transfer of molecules and signals between adjacent actively dividing cells.

• A high metabolic rate is a hallmark of this phase, as the plant prioritizes the production of new cellular components over storage or structural maturation.

Additional Information

• Comparison with other growth phases:

• Elongation Phase: In this zone, cells undergo increased vacuolation. This is where large vacuoles begin to form, driving the physical lengthening of the cell through turgor pressure.

• Maturation Phase: Cells in this region achieve their maximum size. This phase is characterized by significant cell wall thickening and specialized protoplasmic modifications to perform specific permanent functions.

• Cellular structures in Meristems:

• Vacuoles: In the meristematic phase, vacuoles are typically absent or extremely small, as the cell volume is occupied mostly by cytoplasm and the nucleus.

• Intercellular Spaces: Meristematic tissues usually lack intercellular spaces, presenting a compact arrangement that supports structural integrity during rapid growth.

Q57. Answer: (d) Command-based Interface

The correct answer is Command-based Interface.

Key Points

• A Command-based Interface, commonly referred to as a Command Line Interface (CLI) or Character User Interface (CUI), is a text-based system where the user interacts with the computer by typing specific instructions.

• This interface relies almost exclusively on the keyboard for input, as the system does not provide visual cues like icons or menus to guide the user.

• Users must possess precise knowledge of syntax and command names to execute tasks, such as dir for listing files or cd for changing directories in a disk operating system.

• Historically, this was the primary way to interact with early computers before the commercial success of visual systems in the 1980s, with MS-DOS and Unix being the most prominent examples.

• In modern computing, it remains highly valued by system administrators and programmers for its resource efficiency, speed, and ability to automate tasks through shell scripting.

Additional Information

• Graphical User Interface (GUI):

• Enables interaction through visual indicators like windows, icons, and buttons (collectively known as WIMP).

• It is highly user-friendly and allows for navigation using pointing devices such as a mouse, trackball, or trackpad.

• Voice-based Interface:

• Uses Natural Language Processing (NLP) to allow users to interact with software using speech commands.

• Common examples include virtual assistants like Amazon Alexa, Apple Siri, and Google Assistant.

• Touch-based Interface:

• Allows input via direct contact with a capacitive or resistive screen using fingers or a stylus.

• This interface is the standard for mobile operating systems like Android and iOS, utilizing gestures like tapping, swiping, and pinching.

Q58. Answer: (c) Educate Girls

The correct answer is Educate Girls.

Key Points

• Educate Girls is a prominent Indian non-profit organization founded in 2007 by Safeena Husain, focusing on mobilizing communities for girls education in India rural areas.

• In 2025, the organization made history by becoming the first Indian non-profit entity to receive the Ramon Magsaysay Award, often referred to as the Nobel Prize of Asia, for its transformative impact on gender equality.

• The award recognizes the organization innovative model that employs over 18,000 community volunteers, known as Team Balika, to identify and enroll out-of-school girls (OOSG) in states like Rajasthan, Madhya Pradesh, and Uttar Pradesh.

• A significant milestone leading to this recognition was the successful execution of the world first Development Impact Bond (DIB) in education, which proved that performance-based financing could effectively scale social outcomes.

• By 2025, the organization had successfully integrated more than 1.5 million girls into the formal school system and improved learning outcomes for millions more through its remedial curriculum and data-driven approach.

Additional Information

• Teach For India:

• Established in 2009 by Shaheen Mistri, it follows a two-year fellowship model aimed at building a movement of leaders to end educational inequity in India.

• Pratham:

• Founded in 1995, it is renowned for the Annual Status of Education Report (ASER), which provides the most reliable data on

learning levels of children in rural India.

• Akshaya Patra:

• Operating the world largest NGO-run mid-day meal program, it partners with the Government of India to provide nutritious meals to school children to boost enrollment and retention.

Q59. Answer: (d) Land not suitable for cultivation due to natural or human causes

The correct answer is Land not suitable for cultivation due to natural or human causes.

Key Points

• Wasteland is defined as degraded land that is currently under-utilized and is deteriorating due to a lack of appropriate water and soil management or on account of natural constraints.

• These lands are characterized by a loss of vegetative cover and biological productivity, making them unsuitable for regular agricultural cultivation without significant reclamation efforts.

• Natural causes for wasteland formation include water erosion (leading to gullies and ravines), wind erosion (forming sand dunes), salinity, alkalinity, and extreme waterlogging.

• Human-induced causes involve deforestation, overgrazing, improper irrigation practices, and mining activities that strip the land of its fertile topsoil.

• The National Wasteland Development Board (NWDB), established in 1985, classifies such land into two broad categories: Culturable Wasteland (which can be reclaimed for use) and Unculturable Wasteland (such as barren rocky areas or steep slopes).

• According to the Wastelands Atlas of India, these areas are monitored to implement integrated watershed management programs to restore ecological balance and improve rural livelihoods.

Additional Information

• River valley fertile land

• Characterized by Alluvial soil deposited by river systems.

• Possesses high humus content and mineral richness, making it the most productive land for intensive farming.

• Land covered by forests

• Lands specifically designated under the Indian Forest Act, 1927 or recognized by satellite imagery as having significant canopy density.

• Primary functions include biodiversity conservation, carbon sequestration, and providing timber and non-timber products.

• Urban green areas

• Refer to planned open spaces within municipal limits such as public parks, green belts, and botanical gardens.

• These areas are critical for urban ecology, air purification, and reducing the urban heat island effect.

Q60. Answer: (c) Mohenjo-daro

The correct answer is Mohenjo-daro.

Key Points

• The Great Bath is a premier architectural structure located within the Citadel mound of Mohenjo-daro, situated in the Larkana district of Sindh, Pakistan.

• It is widely recognized as the earliest public water tank of the ancient world, dating back to the Mature Harappan phase of the Indus Valley Civilization (circa 2600–1900 BCE).

• The tank measures approximately 11.88 meters in length, 7.01 meters in width, and has a maximum depth of 2.43 meters.

• Construction involved finely fitted baked bricks set on edge using gypsum mortar, further waterproofed with a thick layer of bitumen (natural tar) to prevent seepage.

• The structure features two wide staircases leading down from the north and south, with a series of small rooms or changing rooms located on three sides.

• Scholars suggest that the Great Bath was primarily used for ritualistic purification or religious bathing ceremonies by the elite population residing on the Citadel.

• The site was discovered by R.D. Banerji in 1922, shortly after the discovery of Harappa, and it was designated a UNESCO World Heritage Site in 1980.

Additional Information

• Lothal

• Located in Gujarat near the Gulf of Khambhat, it served as a major maritime trade center.

• It is famous for the world's earliest known artificial dockyard, which connected the city to the Sabarmati River.

• Dholavira

• Situated in the Khadir Bet area of the Rann of Kutch, Gujarat.

• It is renowned for its unique three-tier town planning and a highly sophisticated water harvesting system consisting of massive

YourMockTest.com — Free Study Material

stone-cut reservoirs.

• Surkotada

• Located in the Kutch district of Gujarat, this site provided the first actual remains of horse bones in the Indus Valley Civilization.

• It featured a fortified settlement with a stone rubble wall and a gateway.

Q61. Answer: (a) Uttar Pradesh

The correct answer is Uttar Pradesh.

Key Points

• The Upper Ganga Plain is a distinct physiographic sub-region of the Indo-Gangetic Plain, situated between the Yamuna River in the west and the 100-meter contour line in the east.

• The maximum portion of this plain extends across the state of Uttar Pradesh, specifically covering its western and central districts, encompassing an area of approximately 1,49,000 square kilometers.

• Geographically, it is bounded by the Siwalik Range to the north and the Peninsular Plateau (Bundelkhand) to the south.

• The region is subdivided into three major micro-regions: the Ganga-Yamuna Doab, the Rohilkhand Plain, and parts of the Avadh Plain.

• The topography is largely flat, formed by Pleistocene and Holocene alluvial deposits brought down by the Ganga, Yamuna, Ramganga, and Sharda rivers.

Additional Information

• Middle Ganga Plain:

• This region starts from the 100-meter contour line and extends eastward to the Bihar-West Bengal border.

• It primarily covers eastern Uttar Pradesh and the entire state of Bihar.

• Lower Ganga Plain:

• This section extends from the foot of the Darjeeling Himalayas to the Bay of Bengal.

• It is located almost entirely within the state of West Bengal and includes the massive Sunderbans Delta.

• Soil and Agriculture:

• The Upper Ganga Plain is dominated by Bhangar (older alluvium) and Khadar (newer alluvium) soils.

• Due to fertile Alluvial soil and extensive Canal Irrigation, it is a leading producer of Wheat, Sugar cane, and Rice.

• Haryana:

• While some parts of eastern Haryana touch the Yamuna boundary, the state is predominantly categorized under the Indo-Gangetic Divide or the Punjab-Haryana Plain, separating the Indus and Ganga river systems.

Q62. Answer: (c) Tropical thorn forest

The correct answer is Tropical thorn forest.

Key Points

• Tropical thorn forests are characteristic of regions that receive less than 70 cm of annual rainfall, indicating extreme arid or semi-arid conditions.

• These forests are primarily located in the north-western parts of India, spanning the states of Rajasthan, Gujarat, Punjab, Haryana, Madhya Pradesh, and Uttar Pradesh.

• The vegetation is specially adapted to conserve water; the plants often have long, taproot systems that penetrate deep into the ground to reach the water table.

• A defining feature of these forests is that many plants remain leafless for a major part of the year to minimize water loss through transpiration.

• When leaves are present, they are typically small, thick, and waxy, or modified into thorns to discourage herbivores and further reduce evaporation.

• Common flora found in this ecosystem includes Acacia, Euphorbias, Palms, and various types of Cacti, many of which have succulent stems for water storage.

Additional Information

• Montane forest:

• These occur in high-altitude mountain regions like the Himalayas, where vegetation changes from broad-leaf evergreen to coniferous trees (like Pine and Deodar) as elevation increases.

• Littoral and swamp forest:

• Found in coastal and deltaic regions, these are also known as Mangrove forests.

• The Sundari trees of the Ganga-Brahmaputra delta are a prime example, known for their pneumatophores or breathing roots.

• Evergreen forests:

YourMockTest.com — Free Study Material

• Found in areas with high rainfall (over 200 cm), such as the Western Ghats and North-East India.

• The trees do not have a specific shedding season, ensuring the forest remains green throughout the year.

Q63. Answer: (d) National Institution for Transforming India

The correct answer is National Institution for Transforming India.

Key Points

• The NITI Aayog was established via a Union Cabinet resolution on January 1, 2015, as a specialized institution to replace the erstwhile Planning Commission.

• The full form of NITI is the National Institution for Transforming India, which acts as the apex public policy think tank of the Government of India.

• The primary objective of this institution is to foster Cooperative Federalism by ensuring the active involvement of State Governments in the economic policy-making process, moving away from the old top-down planning model.

• It adopts a bottom-up approach, empowering states to formulate their own development strategies while providing the necessary technical advice and directional inputs at the national level.

• The Prime Minister of India serves as the Ex-officio Chairperson of the NITI Aayog, providing high-level political leadership to the country's developmental agenda.

Additional Information

• Planning Commission vs. NITI Aayog:

• The Planning Commission was established in March 1950 and focused on the formulation of Five-Year Plans and the allocation of funds to states.

• The NITI Aayog does not have the power to allocate funds; this responsibility was transferred to the Ministry of Finance.

• Governing Council:

• The Council is a key feature of NITI Aayog, comprising the Chief Ministers of all States and Lieutenant Governors of all Union Territories.

• Operational Hubs:

• Team India Hub: Acts as an interface between the States and the Center to promote a collective national developmental framework.

• Knowledge and Innovation Hub: Focuses on building the internal think-tank capabilities of the institution through research and best practices.

• Structure:

• The organization includes a Vice-Chairperson (appointed by the PM), Full-time members, and a Chief Executive Officer (CEO) who holds the rank of Secretary to the Government of India.

Q64. Answer: (a) 17.2 m

The correct answer is 17.2 m.

Key Points

• The sensation of any sound persists in the human brain for a duration of approximately 0.1 seconds. This biological phenomenon is known as the persistence of hearing.

• To hear a distinct echo, the reflected sound must reach the observer at least 0.1 seconds after the original sound is produced.

• The speed of sound in air varies with temperature; however, at a standard room temperature of 22°C, the speed of sound is approximately 344 m/s.

• The total distance traveled by the sound wave from the source to the obstacle and back to the ear is calculated by the formula: Total Distance = Speed × Time.

• By substituting the standard values, the total distance required is 344 m/s × 0.1 s = 34.4 m.

• Since this represents the round-trip distance, the actual minimum distance between the source of sound and the reflecting surface is half of this value: 34.4 m ÷ 2 = 17.2 m.

Additional Information

• Factors Affecting Echo:

• Temperature: As the temperature of the air increases, the speed of sound also increases. Consequently, the minimum distance required to hear an echo will be slightly larger on a hot day compared to a cold day.

• Medium: The speed of sound is different in different media (solid, liquid, gas). For instance, sound travels much faster in seawater (approx. 1531 m/s), requiring a much larger distance for an echo.

• Reflection Laws: Sound waves follow the laws of reflection, meaning they bounce off large, hard obstacles like mountains, high-rise buildings, or cave walls.

• Reverberation: This occurs when the reflecting surface is less than 17.2 m away. The reflections reach the ear too quickly (less than 0.1s), causing the original sound to appear prolonged or blurred rather than a distinct repetition.

YourMockTest.com — Free Study Material

Q65. Answer: (c) Saubhagya Scheme (Pradhan Mantri Sahaj Bijli Har Ghar Yojana)

The correct answer is Saubhagya Scheme (Pradhan Mantri Sahaj Bijli Har Ghar Yojana).

Key Points

• The Pradhan Mantri Sahaj Bijli Har Ghar Yojana, popularly known as Saubhagya, was launched by the Government of India on September 25, 2017, coinciding with the birth anniversary of Pandit Deendayal Upadhyaya.

• The primary objective of the scheme is to achieve universal household electrification by providing last-mile connectivity and electricity connections to all un-electrified households in rural areas and poor households in urban areas.

• Under the Saubhagya guidelines, the identification of beneficiaries is carried out using the Socio Economic and Caste Census (SECC) 2011 data; identified households receive free electricity connections.

• For households not covered under SECC 2011, electricity connections are provided at a nominal cost of 500 rupees, which is collected by the DISCOMs (Distribution Companies) in 10 installments through the monthly electricity bills.

• The scheme specifically includes provisions for Solar Power Packs (200 to 300 Wp) with battery banks for un-electrified households located in remote and inaccessible areas where grid extension is not feasible.

• The Rural Electrification Corporation (REC) Limited is designated as the Nodal Agency for the implementation and operationalization of this scheme throughout the country.

Additional Information

• Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY):

• Launched in December 2014, this scheme focused on rural electrification infrastructure, specifically the separation of agriculture and non-agriculture feeders and the strengthening of sub-transmission networks.

• While DDUGJY focused on village-level infrastructure, Saubhagya was designed to bridge the gap between village electrification and individual household electrification.

• Power for All Scheme:

• This is a joint initiative of the Central Government and State Governments to provide 24×7 reliable and quality power to all consumers; it serves as an umbrella vision rather than a single timestamped scheme like Saubhagya.

• GARV App:

• The Grameen Vidyutikaran (GARV) mobile application was developed to monitor the progress of rural electrification and ensure transparency and accountability in achieving the goals of DDUGJY and Saubhagya.

Q66. Answer: (d) Compact Disc-ReWritable

The correct answer is Compact Disc-ReWritable.

Key Points

• Compact Disc-ReWritable (CD-RW) is an optical storage format that allows for the recording, erasing, and re-recording of data on a single disc. Introduced in 1997, it transitioned optical storage from a write-once medium to a reusable one.

• The technology relies on a phase-change alloy recording layer, typically composed of Silver, Indium, Antimony, and Tellurium. This material can shift between crystalline and amorphous states when hit by different intensities of a laser beam.

• To write data, a high-power laser melts the alloy to create amorphous spots (pits) that have low reflectivity. To erase or update data, a medium-power laser heats the material to its annealing temperature, restoring it to a crystalline state (land) with high reflectivity.

• A standard CD-RW can typically be rewritten approximately 1,000 times, making it an ideal choice for incremental backups, temporary file transfers, and personal data management before the widespread adoption of USB flash drives.

• Unlike CD-ROM or CD-R, the reflectivity of a CD-RW is lower (about 15 to 25 percent), which originally required specialized MultiRead compatible optical drives to read them effectively.

Additional Information

• CD-R (Compact Disc-Recordable):

• Utilizes the WORM (Write Once, Read Many) principle.

• Data is written by a laser burning a photosensitive organic dye layer; once burned, the chemical change is permanent and the data cannot be erased or modified.

• CD-ROM (Compact Disc Read-Only Memory):

• The data is physically pressed into the polycarbonate substrate during the injection molding process at the factory.

• It is strictly a read-only medium used for the distribution of operating systems, video games, and encyclopedias.

• Storage Specifications:

• Most rewritable discs follow the Orange Book Part III standard.

• They generally offer a storage capacity of 700 MB, which is equivalent to 80 minutes of standard audio or roughly 480 floppy disks.

Q67. Answer: (b) Judicial review

The correct answer is Judicial review.

Key Points

• Judicial review is the foundational power of the Judiciary to examine the constitutionality of legislative enactments and executive orders of both the Central and State governments.

• This power ensures that the Constitution remains the supreme law of the land and that no branch of government violates the Fundamental Rights of the citizens.

• Under Article 13 of the Indian Constitution, the judiciary has the mandate to declare any law null and void if it is found to be inconsistent with Part III (Fundamental Rights).

• The Supreme Court and the High Courts act as the guardians of the document by invoking Article 32 and Article 226 respectively to protect individual liberties against unconstitutional state actions.

• By exercising judicial review, the courts maintain the federal equilibrium and uphold the Basic Structure Doctrine, preventing the Legislature from exercising arbitrary power.

Additional Information

• Independence of the Judiciary:

• Refers to the autonomy of the judicial branch, ensuring that judges can perform their duties without political interference from the Executive or Legislature.

• It is maintained through features like security of tenure, fixed salaries, and Article 50, which mandates the separation of the judiciary from the executive.

• Judicial Overreach:

• Describes a situation where the judiciary exceeds its constitutional limits and interferes in the policy-making or administrative domain belonging to the Legislature or Executive.

• While Judicial Activism is seen as a tool for social justice, overreach is often criticized as a violation of the Separation of Powers.

• Service Conditions:

• Includes the appointment, salary, allowances, and pensions of judges, which are charged on the Consolidated Fund of India.

• These conditions are protected and cannot be varied to a judge's disadvantage after their appointment, except during a Financial Emergency under Article 360.

Q68. Answer: (b) Ploughmen

The correct answer is Ploughmen.

Key Points

• In the ancient Tamil region, social structure and agricultural hierarchies were extensively documented in Sangam literature, which encompasses works like the Ettuthogai and Pattuppattu composed between 300 BCE and 300 CE.

• The term Uzhavar was used to denote the ordinary ploughmen who formed the backbone of the agrarian economy in the fertile Marutam (wetland) regions.

• These individuals were responsible for the actual tilling and cultivation of the soil, distinguishing them from the wealthier administrative or land-owning classes of the period.

• Historical records, including NCERT guidelines on ancient Indian history, categorize the rural population of South India into three distinct groups: Vellalar, Uzhavar, and Adimai.

• The Uzhavar played a critical role in the prosperity of the Chola, Chera, and Pandya dynasties by ensuring a steady supply of food grains, primarily rice, which was the staple crop.

Additional Information

• Large landowners:

• In the Tamil social hierarchy, they were known as Vellalar.

• They often held high positions in the royal administration and served as local village headmen or Velis.

• Slaves:

• Known as Adimai, they occupied the lowest tier of the social strata and were often attached to the land of the Vellalar.

• They worked alongside Kadaisiyar, who were defined as landless labourers.

• Priests:

• Often referred to as Anthanar in later Sangam layers, they were respected for their knowledge of rituals and sacred texts.

• They acted as advisors to the Arasar (kings) and played a role in the performance of Vedic sacrifices.

Q69. Answer: (c) Articles 19, 20, 21 and 22

The correct answer is Articles 19, 20, 21 and 22.

Key Points

• The Right to Freedom is one of the six fundamental rights recognized by the Constitution of India, specifically detailed under Articles 19 to 22 in Part III.

• Article 19 guarantees citizens six specific freedoms: Freedom of speech and expression, peaceful assembly without arms, formation of associations or unions, free movement throughout India, residence and settlement in any part of the territory, and the practice of any profession, occupation, trade, or business.

• Article 20 provides protection against arbitrary and excessive punishment to an accused person, whether a citizen or a foreigner. It includes clauses against ex-post-facto laws, double jeopardy, and self-incrimination.

• Article 21 declares that no person shall be deprived of their life or personal liberty except according to the procedure established by law. This article is considered the most evolved and fundamental, covering rights like the right to privacy and right to a clean environment.

• Article 22 deals with protection against arrest and detention in certain cases. It ensures that arrested individuals are informed of the grounds of arrest, allowed to consult legal practitioners, and produced before a Magistrate within 24 hours.

Additional Information

• Right to Equality (Articles 14–18):

• This cluster ensures equality before the law and equal protection of the laws (Article 14), prohibits discrimination (Article 15), and provides equality of opportunity in public employment (Article 16).

• It also includes the abolition of untouchability (Article 17) and the abolition of titles (Article 18).

• Right against Exploitation (Articles 23–24):

• Article 23 prohibits human trafficking and forced labor (Begar).

• Article 24 forbids the employment of children below the age of 14 in hazardous factories or mines.

• Right to Freedom of Religion (Articles 25–28):

• This set guarantees the freedom of conscience and the right to freely profess, practice, and propagate any religion of choice.

• Right to Constitutional Remedies (Articles 32–35):

• Article 32 allows citizens to move the Supreme Court for the enforcement of fundamental rights via writs like Habeas Corpus and Quo-Warranto.

Q70. Answer: (d) Production of intangible goods

The correct answer is Production of intangible goods.

Key Points

• Tertiary activities, often referred to as the service sector, involve the provision of services rather than the production of tangible physical commodities.

• The primary focus of this sector is the production of intangible goods, which are services that provide utility and value but do not have a physical form, such as expertise, labor, and advice.

• These activities facilitate the smooth functioning of the economy by providing essential support to the Primary and Secondary sectors through infrastructure and logistics.

• Key examples of tertiary services include transportation, banking, insurance, tourism, healthcare, and education.

• Unlike manufacturing, the output of the tertiary sector is usually consumed at the point of production and cannot be stored for future use.

• In modern developed economies, the tertiary sector often accounts for the largest share of the Gross Domestic Product (GDP) and employment.

Additional Information

• Primary Sector:

• Involves the extraction of natural resources directly from the earth.

• Includes activities such as agriculture, mining, fishing, and forestry.

• It provides the raw materials necessary for industrial processes.

• Secondary Sector:

• Focuses on the transformation of raw materials into finished or semi-finished products.

• Includes manufacturing, construction, and power generation.

• It adds value to natural resources by changing their physical form through industrial labor and machinery.

• Quaternary and Quinary Activities:

• Quaternary activities are specialized tertiary services involving information technology, research and development (R&D), and knowledge-based services.

• Quinary activities involve high-level decision-making by executives, government officials, and consultants who formulate policies and strategies.

Q71. Answer: (a) GEF

The logic followed here is,
Logic: 1st Letter − 4 = 2nd Letter and 2nd Letter + 3 = 3rd Letter.
GEF,
IEH,
XTW,
NJM,
Therefore, the letter cluster that is different from the others is GEF.
Hence, the correct answer is 'Option 1'.

Q72. Answer: (d) 12

BODMAS Table:

Letter	Operator
A	•
B	−
C	×
D	÷

Given Expression:
40 D 5 A 8 C 2 B 12 = ?
After replacing the letters and applying the BODMAS rule,
= 40 ÷ 5 + 8 × 2 − 12
= 8 + 8 × 2 − 12
= 8 + 16 − 12
= 24 − 12
= 12
Hence, the correct answer is "option 4"

Q73. Answer: (c) ZI - WF

The logic followed here is,
XD - UB,
UC - RA,
ZI - WF,
TG - QE,
Therefore, the letter-cluster pair that is different from the others is ZI - WF.
Hence, the correct answer is 'Option 3'.

Q74. Answer: (d) EHJ

The logic followed here is,
YAD,
MOR,
SUX,
EHJ,
Therefore, the letter cluster that does not belong to the group is EHJ.
Hence, the correct answer is 'Option 4'.

Q75. Answer: (c) 28, 337

The logic followed here is:
Logic: Second Number = (First Number × 12) + 1
For the first set 19, 229
=> (19 × 12) + 1
=> 228 + 1 = 229.

YourMockTest.com — Free Study Material

For the second set 22, 265
=> (22 × 12) + 1
=> 264 + 1 = 265.
Applying the same logic to the numbers in Option 3
28 : 337
=> (28 × 12) + 1
=> 336 + 1 = 337.
Hence, the correct answer is 'Option 3'.

Q76. Answer: (d) Two

Given: Seven people, Manu, Neha, Ojas, Pooja, Shina, Tina and Upendra, are sitting around a circular table, facing the center.
1. Neha sits second to the left of Ojas.
2. Upendra sits second to the left of Neha.
3. Tina sits to the immediate left of Shina.
4. Manu is not an immediate neighbor of Upendra.
The final arrangement is,
There are two people between Manu and Upendra.
Hence, the correct answer is 'Option 4'.

Q77. Answer: (b) 358

The logic followed here is:
• 8 + 14 = 22
• 22 + 42 = 64
• 64 + 70 = 134
• 134 + 98 = 232
• 232 + 126 = 358
Thus, the missing term in the series is 358.
Hence, the correct answer is 'Option 2';

Q78. Answer: (b) GNP : KRT

The logic followed in this pattern is a series of alphabetical shifts where each letter is shifted forward by 4 positions.
For 'CFG' related to 'GJK':
For 'KMP' related to 'OQT':
Applying the same logic to the options:
Thus, GNP is related to KRT following the same pattern of adding 4 to the positional value of each letter.
Hence, the correct answer is 'Option 2'.

Q79. Answer: (a) vs

The logic followed here is,
Thus, the code for watch is vs.
Hence, the correct answer is "option 1"

Q80. Answer: (d) 5

The logic followed here is.
(Left) D F T B M E Q Y O W G U S I K A R C X Z H (Right)
Required Conditions: Consonant − Vowel − Consonant
(Left) D F T B M E Q Y O W G U S I K A R C X Z H (Right)
M E Q, Y O W, G U S, S I K, K A R
Hence, the correct answer is "option 4"

Q81. Answer: (b) Only conclusion (II) follows

The least possible Venn diagram for the given statements is:
(I) No pens are wings - Doesn't follow
There is no direct relation between pens and wings may be it is possible but not definite. Hence, it is false)

YourMockTest.com — Free Study Material

(II) Some wings are not pens - Follow

(Some wings are toys that past of toys are not in pens. Non pens is toys. Hence, it is true)

Only conclusion (II) follows.

Hence, the correct answer is " Option 2"

Q82. Answer: (b) S

Given: Seven boxes, M, N, O, P, Q, R and S, are kept one over the other, but not necessarily in the same order.

1. Only P is kept above Q.
2. Only four boxes are kept between Q and O.

Position	Box
7	P
6	Q
5	
4	
3	
2	
1	O

1. Only two boxes are kept between N and R.
2. S is kept immediately above M.
3. R is not kept immediately above S.

Final Arrangement:

7	P
6	Q
5	N
4	S
3	M
2	R
1	O

Thus, the box kept fourth from the top is S.

Hence, the correct answer is 'Option 2'.

Q83. Answer: (d) TWO

Given number: 5421389

After being arranged in ascending order:

Number	5	4	2	1	3	8	9
Ascending order	1	2	3	4	5	8	9

So, the total count of digits whose positions remain unchanged is:Two (Digits 8 and 9).

Hence, the correct answer is 'Option 4'.

Q84. Answer: (d) S

Given: Seven boxes M, N, O, P, Q, R and S are kept one over the other but not necessarily in the same order

1. No box is kept above O.
2. Only three boxes are kept between O and S.
3. M is kept immediately above S.

Position	Box

YourMockTest.com — Free Study Material

7	O
6	
5	
4	M
3	S
2	
1	

1. Only one box is kept between Q and M.
2. Only four boxes are kept between Q and P.
3. R is kept at some place above N.

Final Arrangement:

7	**O**
6	Q
5	R
4	M
3	S
2	N
1	P

Box R is at the 5th position. The first box below R is M and the second box below R is S.

Thus, the box kept second below R is S.

Hence, the correct answer is 'Option 4'.

Q85. Answer: (c) Mother's mother

Preparing the family tree diagram by using the following symbols:

Let us first decode the given symbols and then draw a family tree.

Symbol	@	×	•	÷
Meaning	Mother	Wife	Brother	Father

Given: S × D ÷ R + Y @ H

Therefore, S is the mother of Y, who is the mother of H .S is the Mother's mother of H.

Hence, the correct answer is 'Option 3'.

Q86. Answer: (c) 16

The logic followed here is:

• Total number of people in the row = 46

• Position of Batul from the right end = 33^(rd)

• Position of Jaya from the left end = 31^(st)

Position of Batul from the left = Total number of people − Position of Batul from the right + 1

= 46 − 33 + 1

= 14

Number of people between them = (Position of Jaya from the left − Position of Batul from the left) − 1

= 31 − 14 − 1

= 16

Hence, the correct answer is 'Option 3'.

Q87. Answer: (d) XRTW

The logic followed in this pattern is a series of alphabetical shifts based on the positional values of the letters.

For 'KEGJ' related to 'RLNQ':

For 'NHJM' related to 'UOQT',

Applying the same logic to 'QKMP':

Thus, QKMP is related to XRTW.

Hence, the correct answer is 'Option 4'.

Q88. Answer: (a) One

The logic followed here is:

Applying the logic to the word LIMEADE:

L	I	M	E	A	D	E
−1	+1	−1	+1	+1	−1	+1
K	J	L	F	B	C	F

Word: K, J, L, F, B, C, F.

From the above list, only the letter F appears exactly twice.

Therefore, there is only one such letter.

Hence, the correct answer is "option 1"

Q89. Answer: (a) EOR : JLQ

The logic follows here,

For 'JTT' related to 'OQS':

For 'NQS' related to 'SNR':

Applying the same logic to 'EOR':

Thus, 'EOR' is related to 'JLQ'.

Hence, the correct answer is 'Option 1'.

Q90. Answer: (d) 108

Logic followed here is,

BODMAS Table:

Letter	A	B	C	D
Mathematical Sign	÷	×	•	−

Substituting the signs for the letters, and applying BODMAS rule the equation becomes:

= 2 × 32 ÷ 1 − 1 + 45

= 2 × 32 − 1 + 45

= 64 + 45 − 1

= 109 − 1

= 108

The final value obtained is 108.

Hence, the correct answer is "option 4."

Q91. Answer: (a) UPC

The logic followed here is,

Combining the results, the next term in the series is UPC.

Hence, the correct answer is "option 1"

Q92. Answer: (a) ha

The logic followed here is,

By matching the common word with the common code, we can conclude that the code for "city" is "ha."

Hence, the correct answer is "option 1"

YourMockTest.com — Free Study Material

Q93. Answer: (c) One

Given: (Left) 4 9 6 5 9 9 7 7 9 7 9 3 6 2 1 2 1 6 9 1 7 4 7 (Right)

Required Conditions: Even Digit — Even Digit — Odd Digit.

(Left) 4 9 6 5 9 9 7 7 9 7 9 3 6 2 1 2 1 6 9 1 7 4 7 (Right)

(6 2 1)

Hence, the correct answer is 'Option 3'.

Q94. Answer: (c) 9

The shaded part represents animals that are also Toys but are not Dolls

• The Circle represents Animals.

• The Rectangle represents Toys.

• The Triangle represents Dolls.

Thus, the number of such Animals is 9.

Hence,the correct answer is 9.

Q95. Answer: (b) U

Given: Seven people, U, T, E, N, S, I and L, are sitting in a row, facing the north.

1. Only five people sit between I and L.

2. S sits to the immediate left of L.

3. Only one person sits between S and N.

4. U sits at some place to the left of E but at some place to the right of T

The Final Arrangement is,

As per the arrangement, U sits third from the left end of the line.

Hence, the correct answer is "Option 2"

Q96. Answer: (d) North-west

• Town J is to the west of Town T.

• Town R is to the east of Town T.

• Town K is to the south of Town R.

• M is to the west of Town K.

• Town M is to the south-west of Town T.

• Town J is to the north of Town M.

The Final Diagarm,

Town J is located in the North-west direction with respect to Town K.

Hence, the correct answer is "Option 4".

Q97. Answer: (a) KGC 39

The logic follows here,

Combining the results, the next term in the series is KGC 39.

Hence, the correct answer is "option 1"

Q98. Answer: (a) 128

The logic followed here is:

41 + 12 = 53

53 + 13 = 66

66 + 14 = 80

80 + 15 = 95

95 + 16 = 111

111 + 17 = 128

Thus, the missing term in the series is 128.

Hence, the correct answer is 'Option 1';

YourMockTest.com — Free Study Material

Q99. Answer: (b) Mother’s mother

Preparing the family tree diagram by using the following symbols:

As per the given information:

Let us first decode the given symbols and then draw a family tree.

Symbol	•	•	times	div
Meaning	Sister	Wife	Father	Mother

Therefore, U is the mother of X, who is the mother of Y.U is the Mother’s mother of Y.

Hence, the correct answer is 'Option 2'.

Q100. Answer: (c) NWU

The logic follows here,

The next cluster is NWU.

Hence, the correct answer is "option 3"

More previous year papers and mock tests: **www.yourmocktest.com/pyq**

YourMockTest.com — Free Study Material