RRB NTPC (UG) CBT-I Official Paper (Held On: 01 Sept, 2025 Shift 2) (Previous Year Paper)

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

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GENERAL AWARENESS

Q1. In which year was the Second Pay Commission appointed in India?

(a) 1957
(b) 1965
(c) 1962
(d) 1950

Q2. Climatic maps are primarily based on data related to:

(a) temperature and rainfall
(b) population growth
(c) soil moisture content only
(d) industrial zones

Q3. Which country retained the top spot for the second consecutive year in the Henley Passport Index released in January 2025?

(a) Singapore
(b) Japan
(c) Germany
(d) South Korea

Q4. On which river is the Bhakra Nangal Dam constructed?

(a) Ravi
(b) Yamuna
(c) Satluj
(d) Ganga

Q5. Gandhiji gave a call for a satyagraha against the Rowlatt Act in which of the following years?

(a) 1919
(b) 1922
(c) 1930
(d) 1915

Q6. The Ministry of Environment, Forest and Climate Change (MoEFCC), in collaboration with which of the following universities, organised the symposium ‘India 2047: Building a Climate-Resilient Future’ at Bharat Mandapam, New Delhi, in March 2025?

(a) University College London
(b) Harvard University
(c) Massachusetts Institute of Technology
(d) University of Toronto

Q7. In 2025, the United Nations called for peace talks between which two countries after missile exchanges intensified their long-standing conflict?

(a) Russia and Ukraine
(b) North Korea and South Korea
(c) Israel and Iran
(d) India and Sri Lanka

Q8. Which key is used to rename a file or folder in Windows?

(a) F5
(b) ESC + N
(c) CTRL + N
(d) F2

Q9. Which eminent Kathak dancer from Gujarat was awarded the Padma Vibhushan in 2025 for her outstanding contributions to Indian classical dance?

(a) Sonal Mansingh
(b) Rukmini Devi
(c) Mallika Sarabhai
(d) Kumudini Lakhia

Q10. According to the 2025 report by McKinsey & Company and BoF, by what percentage is India's ultra-high-net-worth individual (UHNWI) population expected to grow by 2028?

(a) 30%
(b) 50%
(c) 40%
(d) 60%

Q11. Who among the following Mughal rulers is considered to be the last powerful Mughal ruler?

(a) Dara Shukoh
(b) Bahadur Shah Zafar
(c) Shah Jahan
(d) Aurangzeb

Q12. Which Article was inserted into the Constitution by the 103rd Amendment Act to provide for EWS reservation?

(a) Article 14A and 16A
(b) Article 15(6) and 16(6)
(c) Article 21C and 22A
(d) Article 18A and 19A

Q13. Which of the following Directive Principles of State Policy is provided under Article 40 of the Indian Constitution?

(a) Promotion of cottage industries in rural areas
(b) Provision for a uniform civil code
(c) Organisation of agriculture and animal husbandry
(d) Organisation of village panchayats

Q14. Vembanad Lake, India’s longest lake facing severe degradation, is located in which state?

(a) Assam, home to the Brahmaputra river basin
(b) Kerala, known for its backwaters and lagoons
(c) West Bengal, near the Sundarban mangrove forests
(d) Odisha, famous for Chilika Lake ecosystem

Q15. Which of the following elements has the largest atomic radius?

(a) K
(b) Rb
(c) Li

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(d) Na

Q16. Which Indian ministry has put in the public domain the Draft National Code Against Age Fraud in Sports (NCAAFS) 2025 for inviting comments and suggestions from the general public and stakeholders, as part of the consultation process in March 2025?

(a) Ministry of Law and Justice
(b) Ministry of Social Justice and Empowerment
(c) Ministry of Youth Affairs and Sports
(d) Ministry of Health and Family Welfare

Q17. In which of the following years was the National Telecom Policy (NTP), that envisaged the objective of one public call office (PCO) for every 500 persons in the urban areas, formulated?

(a) 1992
(b) 1999
(c) 1994
(d) 1997

Q18. The Faraizi Movement was a religious reform movement of the 19th century in _____.

(a) Bengal
(b) Rajasthan
(c) Gujarat
(d) Maharashtra

Q19. In which year was India's first operational six-lane expressway, the approximately 95 km long Mumbai–Pune Expressway, inaugurated?

(a) 2002
(b) 2000
(c) 2004
(d) 1998

Q20. Which of the following elements belongs to the s-block of the periodic table?

(a) Iron
(b) Chlorine
(c) Calcium
(d) Uranium

Q21. Which Article of the Indian Constitution mentions the Council of Ministers to aid and advise the President?

(a) Article 74
(b) Article 80
(c) Article 85
(d) Article 76

Q22. Which river rises in the Gangotri glacier near Gaumukh (3,900 m) in the Uttarkashi district?

(a) Chenab river
(b) Yamuna river
(c) Bhagirathi river
(d) Son river

Q23. What was a major challenge faced by the Indian manufacturing sector after liberalisation?

(a) Increased competition from cheaper imports
(b) High industrial licensing fees
(c) Shortage of raw materials
(d) Decline in capital inflow

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Q24. What is the function of the Alt + F4 shortcut?

(a) Opens a new window
(b) Closes the current window or application
(c) Refreshes the browser
(d) Saves the document

Q25. Which of the following is an example of plasticity in plants?

(a) Phototropism
(b) Heterophylly
(c) Vernalisation
(d) Photoperiodism

Q26. The Centre of Excellence on 'Classical and Quantum Communications for 6G' inaugurated at IIT-Madras in July 2024, functions under which umbrella programme?

(a) SAMARQAND
(b) IN-SPACe
(c) Telecom Centres of Excellence (TCoE)-India
(d) MeitY FutureNET

Q27. Which of the following Articles deals with the Right against Exploitation?

(a) Articles 31–32
(b) Articles 25–28
(c) Articles 29–30
(d) Articles 23–24

Q28. In 2025, which State/UT's police launched the 'Shishtachar' squad to keep a check on sexual harassment of women in public places?

(a) Delhi
(b) Puducherry
(c) Haryana
(d) Maharashta

Q29. Unemployment reflects the inability of the economy to provide jobs to those willing to work. Which organisation conducts the Periodic Labour Force Survey (PLFS) in India?

(a) Ministry of Labour and Employment
(b) RBI (Reserve Bank of India)
(c) NITI Aayog
(d) NSO (National Statistical Office)

Q30. Buddha Purnima was celebrated on which date in 2025?

(a) 12 May
(b) 23 March
(c) 10 April
(d) 19 February

Q31. Which of the following statements is correct about Article 323B of the Constitution?

(a) It permits tribunals for matters like taxation, land reforms, and labour disputes.
(b) It allows the creation of tribunals only for the armed forces.
(c) It restricts tribunals to environmental cases only.
(d) It empowers states to establish tribunals for local governance.

Q32. Which foreign trade relation was badly affected when Byzantium learned silk production in the 6th century CE?

(a) Indo-Roman trade
(b) Indo-Byzantine trade
(c) Indo-Persian trade

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(d) Indo-Arab trade

Q33. What is one key benefit of India's Digital Public Infrastructure (DPI) model shared at the BRICS meeting in 2025?

(a) Reducing financial exclusion
(b) Exporting digital gadgets
(c) Promoting space exploration
(d) Increasing tax rates

Q34. Who among the following is a famous Indian classical dancer known for popularising Bharatanatyam globally?

(a) Hema Malini
(b) Mallika Sarabhai
(c) Sonal Mansingh
(d) Rukmini Devi Arundale

Q35. Which of the following influential poets was renowned for employing ultabasi (also written as ulatbansi), a distinctive poetic style characterised by paradoxes and enigmas?

(a) Kabir
(b) Agyeya
(c) Bal Krishna Sharma Naveen
(d) Ramdhari Singh Dinkar

Q36. Which of the following subjects falls under the Concurrent List?

(a) Banking
(b) Criminal law
(c) Defence
(d) Police

Q37. Who won Best Supporting Actress for her role in Baby Reindeer at the BAFTA TV Awards held at London's Royal Festival Hall in May 2025?

(a) Jessica Gunning
(b) Olivia Colman
(c) Helena Bonham Carter
(d) Lesley Manville

Q38. Which of the following is a reason for the uneven distribution of rainfall in India during the southwest monsoon?

(a) Mountain ranges influence wind direction and intensity
(b) Monsoon winds blow equally everywhere.
(c) The Himalayas stop all monsoon rainfall.
(d) Southern states alone receive all rainfall.

Q39. Which of the following is a classification of economic activities undertaken by the Central Statistical Organisation (CSO) in India?

(a) Classification Code of India-2000
(b) National Industrial Classification-1998
(c) Industrial Classification Structure-2005
(d) National Code for Agriculture and Industrial Classification-2009

Q40. In 2025, which organisation has developed a new nanoporous multilayered polymeric membrane for high-pressure seawater desalination?

(a) Council of Scientific and Industrial Research
(b) Indian Institute of Science
(c) Defence Research & Development Organisation
(d) Bharat Heavy Electricals Limited

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MATHEMATICS

Q41. A number when increased by 100% gives 2760. The number is:

(a) 2760
(b) 4140
(c) 690
(d) 1380

Q42. Pipe P can fill 2/9 part of a tank in 20 hours, and pipe Q can fill 5/9 part of the same tank in 10 hours. Both P and Q were kept open for 3 hours, then both were closed. Pipe R alone was then opened and it emptied the water in the tank in 8 hours. Pipes P, Q and R together can fill the empty tank in:

(a) 41 hours
(b) 29 hours
(c) 24 hours
(d) 42 hours

Q43. M and N started a business. M invested Rs. 31,000 more than N for 2 months, while N invested for 7 months. M's share is Rs. 139 more than that of N, out of a total profit of Rs. 5,977. Find the capital contributed by M.

(a) Rs. 42,529
(b) Rs. 42,625
(c) Rs. 42,561
(d) Rs. 42,441

Q44. Find the simple interest (in Rs.) on Rs. 1,200 at an interest rate of 4% per month for 6 months.

(a) Rs. 48
(b) Rs. 24
(c) Rs. 44
(d) Rs. 288

Q45. The cost of 9 pens and 14 pencils is Rs. 95. If the cost of a pen decreases by Rs. 3 and the cost of a pencil increases by Rs. 7, then the cost of 9 pens and 3 pencils is Rs. 78. What is the original cost of 17 pens and 13 pencils?

(a) Rs. 162
(b) Rs. 166
(c) Rs. 169
(d) Rs. 161

Q46. Simplify the following

$3((4/3)x^2-21x+12)-4(x^2+4x-14)$

(a) 79x − 92
(b) 79x + 92
(c) −79x + 92
(d) −79x − 92

Q47. The sides of a right-angled triangle are x cm, (x + 2) cm and (x + 4) cm, respectively. If the area of the triangle is 24 cm^2, find its perimeter (in cm).

(a) 28
(b) 24
(c) 26
(d) 30

Q48. ABCD is a trapezium in which BC || AD and AC = CD. If angle ABC = 70° and angle BAC = 62°, then what is the measure of angle ACD (in degree)?

(a) 92
(b) 75

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(c) 82
(d) 84

Q49. The value of $3^2+\sqrt{(4^2)}-5\sqrt{81}-4$ is
(a) -42
(b) -32
(c) -41
(d) -36

Q50. The marks scored by 10 students are given below.
20, 20, 20, 19, 14, 18, 20, 12, 11, 17
The mode of the data is:
(a) 20
(b) 14
(c) 19
(d) 18

Q51. The selling price of 40 books is equal to the cost price of 30 books. Find the loss or gain percentage.
(a) 25% loss
(b) 100/10% loss
(c) 100/10% gain
(d) 25% gain

Q52. Find the simple interest (in Rs.) on Rs. 4,000 at 6.75% per annum rate of interest deposited on 24 February 2024 and withdrawn on 25 April 2024.
(a) Rs. 46
(b) Rs. 43
(c) Rs. 44
(d) Rs. 45

Q53. Given that 95^(0.53) = x, 95^(0.83)= y and x^z = y^8, then the value of z is close to:
(a) 12.53
(b) 13.4
(c) 15.92
(d) 11.75

Q54. The population of a district is 342000, out of which 228000 are males. 44% of the population is literate. If 59% males are literate, then what percentage of females are literate?
(a) 12%
(b) 17%
(c) 14%
(d) 16%

Q55. Train A leaves station M at 7:55 a.m. and reaches station N at 2:55 p.m. on the same day. Train B leaves station N at 9:55 a.m. and reaches station M at 2:55 p.m. on the same day. Find the time when Trains A and B meet.
(a) 1:49 a.m.
(b) 4:08 p.m.
(c) 4:48 p.m.
(d) 12:00 p.m.

Q56. If 79% of first number is equal to four-ninths of second number, what is the ratio of first number to the second number?
(a) 400 : 711
(b) 396 : 709
(c) 404 : 716

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(d) 399 : 706

Q57. On the eve of new year, a branded washing machine is sold for Rs. 34,340 after allowing 15% discount. What is its marked price (in Rs.)?

(a) 44,500
(b) 40,400
(c) 45,400
(d) 44,000

Q58. The sum of two numbers is 52 and their LCM is 651. The two numbers are:

(a) 36, 16
(b) 24, 28
(c) 29, 23
(d) 31, 21

Q59. The value of 5/4+(1/(1+5/7))-3/5 is

(a) 36/23
(b) 43/34
(c) 46/33
(d) 37/30

Q60. Find the surface area of a sphere whose diameter is equal to 64 cm.

(a) 4096π cm²
(b) 4171π cm²
(c) 3994π cm²
(d) 4044π cm²

Q61. Simplify the following: $(1+\cot^2\theta)/(1+\tan^2\theta)$

(a) $\text{cosec}^2\theta - 1$
(b) $\cot^2\theta - 1$
(c) $\sec^2\theta - 1$
(d) $\tan^2\theta - 1$

Q62. A tradesman marks his goods at 24% above the cost price. He allows his customer a discount of 13% on the marked price. Find his profit percentage.

(a) 5.76%
(b) 8.55%
(c) 7.88%
(d) 6.48%

Q63. A man goes to Indore from Bhopal at a speed of 9 km/hr and returns to Bhopal at speed of 18 km/hr, through the same route. What is his average speed (in km/hr) of the entire journey?

(a) 15
(b) 12
(c) 9
(d) 6

Q64. If 2 times a mother's present age is 25 years more than 5 times her daughter's present age, and 3 times the daughter's present age is 9 years less than the mother's present age, then what is the difference (in years) between the ages of the mother and the daughter?

(a) 20
(b) 28
(c) 25
(d) 23

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Q65. Which of the following numbers divides 488309139?

(a) 9
(b) 11
(c) 10
(d) 13

Q66. The LCM of the numbers 2.6 and 0.084 is:

(a) 546
(b) 0.546
(c) 5.46
(d) 54.6

Q67. Amit, Neha, and Kiran invest Rs. 1,220, Rs. 1,370, and Rs. 1,110, respectively, to start a business. If the profit at the end of the year is Rs. 1,160, then what is the share of Kiran in the profit?

(a) Rs. 345
(b) Rs. 347
(c) Rs. 351
(d) Rs. 348

Q68. The average runs scored by a batsman in 23 matches is 43. In the next 10 matches, the batsman scored an average of 13 runs. Find his average runs scored (rounded off to two decimal places) in all the 33 matches.

(a) 32.91
(b) 34.91
(c) 35.91
(d) 33.91

Q69. Pallavi bought a toy for Rs. 670, decorated it at a cost of Rs. 10 and sold the toy for Rs. 290. Find the loss or profit percentage.

(a) 975/17% profit
(b) 975% loss
(c) 985/17% profit
(d) 975/17% loss

Q70. Pipe A can fill a tank in 16 hours, pipe B can fill the same tank in 21 hours and pipe C can fill the same tank in 11 hours. The time taken by them to fill the same tank if they operate together is::

(a) 5724/743 hours
(b) 1724/743 hours
(c) 4724/743 hours
(d) 2724/743 hours

GENERAL INTELLIGENCE AND REASONING

Q71. In a certain code language,

A + B means ‘A is the husband of B’,

A – B means ‘A is the mother of B’,

A x B means ‘A is the daughter of B’ and

A ÷ B means ‘A is the brother of B’.

How is G related to P if ‘G ÷ I x L + N – P’?

(a) Mother's father
(b) Father's brother
(c) Brother
(d) Mother's brother

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Q72. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some cloth are handkerchief.

All towel are handkerchief.

Conclusion:

(I): Some cloth are towel.

(II): All handkerchief are towel.

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

Q73. Refer to the following number and symbol series and answer the question that follows. Counting to be done from left to right only.

(Left) 2 4 & # $ 4 7 6 6 & 1 * $ 2 © 9 4 8 € $ * 4 (Right)

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

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

Q74. 126 people are standing in a row facing north. Mr. Into is 11th from the right end while Mr. Toni is 12th from the left end. How many people are there between Mr. Into and Mr. Toni?

(a) 104
(b) 101
(c) 102
(d) 103

Q75. Ram starts his journey from Point A. He then drives 4 km towards the west, turns left and drives 7 km. He then turns right and drives 5 km, again turns left and drives for 3 km. After that he turns left and drives for 12 km. He takes a final left turn, drives for 10 km and stops. How far (shortest distance) and in which direction should he drive in order to reach Point A again? (All turns are 90-degree turns only unless specified.)

(a) 5 km towards the east
(b) 3 km towards the north
(c) 3 km towards the west
(d) 8 km towards the south

Q76. What will come in the place of the question mark (?) in the following equation, '÷' and '×' are interchanged and '−' and '+' are interchanged?

13 − 5 ÷ 5 × 5 + 13 × 13 − 9 × 3 ÷ 3 − 108 = ?

(a) 90
(b) 129
(c) 110
(d) 134

Q77. In a certain code language, 'VAST' is coded as '7892' and 'SAVE' is coded as '8629'. What is the code for 'E' in the given code language?

(a) 2
(b) 9
(c) 6
(d) 8

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Q78. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group?

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

(a) LNH
(b) KNZ
(c) OQK
(d) TVP

Q79. In a certain code language, 'WAVE' is coded as '3257' and 'VOLT' is coded as '1346'. What is the code for 'V' in the given code language?

(a) 1
(b) 7
(c) 3
(d) 5

Q80. Read the given statements and conclusions carefully. You have to take the given statements to be true even if they seem to be at variance from commonly known facts. You have to decide which conclusion(s) logically follow/s from the given statements.

Statements:

Some wigs are roses.

All roses are bugs.

Conclusions (I): Some wigs are bugs.

Conclusions (II): All bugs are roses.

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

Q81. Seven boxes A, B, C, D, K, L and O are kept one over the other but not necessarily in the same order. No box is kept above B. Only three boxes are kept between B and C. Only one box is kept between D and L. L is kept immediately above C. Only four boxes are kept between D and K. A is kept at some place above O. Which box is kept second below A?

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

Q82. If + means −, − means ×, × means ÷ and ÷ means +, then what will come in place of the question mark (?) in the following equation?

20 ÷ 55 × 5 + 7 − 4 = ?

(a) 3
(b) 13
(c) 8
(d) 17

Q83. UP 16 is related to TK 4 in a certain way. In the same way, YT 23 is related to XO 11. To which of the following is KG 13 related, following the same logic?

(a) IB 3
(b) JA 3
(c) IA 1
(d) JB 1

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Q84. In the following triad, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

WISE - EWSI - WEIS

PLUS - SPUL - PSLU

(a) PAWN - NPWA - PANW
(b) PAGE - EPAG - AGEP
(c) DOSE - ODSE - EOSD
(d) BORN - NBRO - BNOR

Q85. Seven people A, B, C, D, E, F and G are sitting in a row, facing north. No one sits to the left of G. Only four people sit between G and A. Only three people sit to the right of E. D sits to the immediate left of F. B is not an immediate neighbour of E. How many people sit to the right of C?

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

Q86. Farooq ranked 28th from the top and 35th from the bottom in his class. How many students are there in his class?

(a) 62
(b) 60
(c) 63
(d) 61

Q87. Qadir starts from Point A and drives 1 km towards East. He then takes a left turn, drives 3 km, turns left and drives 8 km. He then takes a left turn and drives 7 km. He takes a final left turn, drives 7 km and stops at Point P. How far (shortest distance) and towards which direction should he drive in order to reach Point A again? (All turns are 90° turns only unless specified.)

(a) 5 km to the North
(b) 4 km to the North
(c) 7 km to the West
(d) 6 km to the West

Q88. If 1 is subtracted from each odd digit of the number 95423671, then what will be the sum of the digits that are repeated more than once in the new number formed?

(a) 10
(b) 8
(c) 6
(d) 12

Q89. Which of the following letter-number clusters will replace the question mark (?) in the given series to make it logically complete?

LXU -2 OTT 4 RPS -8 ? XHQ -32

(a) FHT 15
(b) VXL 19
(c) ULR 16
(d) PHR 13

Q90. What should come in place of the question mark (?) in the given series?

1 2 4 7 11 ?

(a) 15
(b) 17
(c) 18
(d) 16

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Q91. Each of the digits in the number 3875269 is arranged in the 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) Three
(b) None
(c) Two
(d) One

Q92. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster DOES NOT belong to that group? (Note: The odd one out is not based on the number of consonants/vowels or their position in the letter-cluster.)

(a) IEA
(b) XTQ
(c) RNK
(d) FBY

Q93. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

QVO SRN ? WJL YFK

(a) NHG
(b) VML
(c) MKL
(d) UNM

Q94. This question is based on the five, three-digit numbers given below.

(Left) 284 517 639 741 425 (Right)

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

(NOTE: All operations to be done from left to right.)

If all the numbers are arranged in descending order, the position(s) of how many numbers will remain unchanged as compared to that in the original number?

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

Q95. In the following triads, each group of letters is related to the subsequent one following a certain logic. Select from the given options, the one which follows the same logic.

LOCK – OLCK – LCKO

ACNE – CANE – ANEC

(a) FROG – RFOG – ROGF
(b) OILS – IOLS – SILO
(c) HUNT – HNUT – TNUH
(d) BEAM – EBAM – BAME

Q96. What should come in place of the question mark (?) in the given series?

57, 63, 71, 81, 93, ?

(a) 170
(b) 105
(c) 154
(d) 107

Q97. In the following number-pairs, the second number is obtained by applying certain mathematical operation(s) to the first number. Select the number-pair in which the numbers are related in the same way as are the numbers of the following pairs. (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. E.g. 13 – Operations on 13 such as adding to/subtracting from/multiplying with 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

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17, 153

31, 279

(a) 43, 387
(b) 35, 326
(c) 22, 216
(d) 14, 122

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

12 21 38 79 160 ?

(a) 291
(b) 279
(c) 297
(d) 219

Q99. Based on the English alphabetical order, three of the following four letter-cluster pairs are alike in a certain way and thus form a group. Which letter-cluster pair DOES NOT belong to that group?

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

(a) LG-JN
(b) JE-HL
(c) OJ-MQ
(d) GB-EJ

Q100. L, M, N, O, Q, R and S are sitting around a circular table, facing the centre of the table. M sits fourth to the left of O. N is an immediate neighbour of O and R. S sits to the immediate left of R. Q is not an immediate neighbour of M. Who sits third to the right of L?

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

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (a) 1957

The correct answer is 1957.

Key Points

• The Second Pay Commission in India was appointed in the year 1957. It was constituted to review and recommend changes in the pay structure of government employees.

• The Pay Commission is a body set up by the Government of India periodically to evaluate and modify the salary structure of

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central government employees.

• The Second Pay Commission specifically focused on ensuring a fair and equitable pay structure in line with economic conditions at that time. Hence, this statement is correct.

• The recommendations of the Second Pay Commission had a significant impact on the government workforce, leading to a more standardized pay system. It also took into account inflation and the cost of living. Hence, this statement is correct.

• The Second Pay Commission laid the foundation for future commissions to address the evolving needs of government employees. Hence, this statement is correct.

• Hence, the correct answer is 1957.

Additional Information

• Pay Commission in India:

• The Pay Commission is established by the Government of India to review and recommend changes in the salary structure of its employees.

• These commissions evaluate factors such as inflation, cost of living, economic conditions, and employee productivity to ensure fair remuneration.

• The recommendations made by the Pay Commission are implemented by the central government and often influence the pay structures of state governments and public sector employees.

• Significance of the Second Pay Commission:

• The Second Pay Commission was constituted in 1957, a time when India was undergoing significant economic changes post-independence.

• It aimed to create a pay structure that was aligned with the economic situation and to ensure a fair distribution of wages among government employees.

• It also addressed disparities in pay and proposed measures to improve the working conditions of government employees.

• Impact of the Second Pay Commission:

• The recommendations of the Second Pay Commission served as a basis for future commissions and helped establish a systematic approach to salary reviews in India.

• It contributed to the economic well-being of government employees by ensuring fair pay scales and introducing measures to address the increasing cost of living.

Important Points

• Key Features of Pay Commissions:

• The Pay Commission periodically reviews salary structures to ensure that government employees are fairly compensated.

• Factors considered include inflation rates, the cost of living, and economic conditions.

• Recommendations often include adjustments to pay scales, allowances, and benefits.

• For example, the Sixth Pay Commission introduced significant changes to the pay structure, including grade pay and revised allowances.

Q2. Answer: (a) temperature and rainfall

The correct answer is temperature and rainfall..

Key Points

• Climatic maps: These maps are designed to provide information about the climate of a specific region or the entire globe. They primarily focus on factors that affect climate.

• Temperature: This is one of the most critical elements of climatic maps. It reflects the variations in heat across regions and helps determine climate zones such as tropical, temperate, and polar. Temperature data is essential in understanding seasonal patterns. Hence, temperature is a correct factor.

• Rainfall: Precipitation data, including rainfall, is another crucial element in climatic maps. It helps identify wet and dry regions, monsoon patterns, and annual precipitation distribution. Hence, rainfall is a correct factor.

• Population growth: While population growth impacts other aspects like urbanization and environmental changes, it is not a direct factor used in climatic maps. These maps do not rely on population data. Hence, this statement is incorrect.

• Soil moisture content: Although soil moisture can be a secondary factor influencing regional climate (for example, in agricultural studies), it is not the primary data used for climatic maps. Hence, this statement is incorrect.

• Industrial zones: Industrial zones may impact localized weather patterns due to pollution and urban heat islands, but they are not considered primary factors for climatic maps. Hence, this statement is incorrect.

• Hence, the correct answer is temperature and rainfall.

Additional Information

• Temperature and Rainfall:

• Temperature: It is recorded over time to identify seasonal variations, heat zones, and global warming trends. For example, the

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equatorial regions have consistently high temperatures, while polar regions are cold throughout the year.

• Rainfall: Precipitation data is critical for understanding agricultural patterns, water resource management, and ecosystem health. For example, the Amazon rainforest receives high rainfall annually, making it a dense tropical region.

• Applications of Climatic Maps:

• Climatic maps are used for meteorological studies, disaster management (like floods or droughts), and agriculture planning.

• They help identify regions prone to extreme weather conditions, such as hurricanes or snowstorms.

• • Example: Climatic maps are used in UN studies on climate change and in projects like the Intergovernmental Panel on Climate Change (IPCC).

• Other Factors:

• While not primary factors, soil moisture and industrial activities can influence localized climatic patterns, especially in urban planning.

• Population data is used in socio-economic mapping, but not directly in climatic maps.

Important Points

• Global Climatic Zones:

• Tropical Zone: Located between the Tropic of Cancer and Tropic of Capricorn, this zone is characterized by high temperatures and rainfall.

• Temperate Zone: Found between the tropics and polar regions, this zone experiences moderate temperatures and seasonal variations.

• Polar Zone: These regions, near the Arctic and Antarctic Circles, are cold with minimal precipitation.

• Data Collection Methods:

• Satellite Imagery: Used to collect temperature and precipitation data globally.

• Weather Stations: Ground-based stations record localized climate data like temperature, humidity, and rainfall.

Q3. Answer: (a) Singapore

The correct answer is Singapore.

Key Points

• Henley Passport Index: The Henley Passport Index ranks passports based on the number of destinations their holders can access without a prior visa. It is considered a reliable measure of global mobility and freedom.

• In January 2025, Singapore retained its top spot on the index for the second consecutive year. This ranking highlights the nation's strong international relations and visa-free agreements.

• Singapore Passport Strength: Singaporean passport holders could access 192 destinations visa-free or with a visa-on-arrival in 2025, making it the most powerful passport globally. Hence, this statement is correct.

• Other countries like Japan, Germany, and South Korea were ranked lower on the index compared to Singapore. Japan, which held the top position previously for several years, fell to third place in 2025. Hence, these options are incorrect.

• The ranking on the Henley Passport Index is influenced by factors like bilateral agreements, international reputation, and geopolitical stability. Singapore’s consistent high rank reflects its commitment to enhancing global mobility for its citizens. Hence, the correct answer is Singapore.

Additional Information

• Henley Passport Index:

• The Henley Passport Index is published annually by Henley & Partners, a global citizenship and residence advisory firm.

• It ranks passports of countries worldwide based on the number of destinations their holders can access without a prior visa or with visa-on-arrival facilities.

• The index uses data from the International Air Transport Association (IATA) and other publicly available sources.

• Visa-free destinations: Passport strength is determined by the number of visa-free destinations or visa-on-arrival countries available to its holders.

• Singapore Passport:

• The Singaporean passport is often considered one of the most powerful passports globally, consistently ranking at the top of indices like the Henley Passport Index.

• In 2025, Singapore passport holders could access 192 destinations visa-free, showcasing its robust international agreements and diplomatic relations.

• Singapore’s high ranking reflects its stable economy, effective governance, and extensive bilateral visa agreements with other nations.

• Japan Passport:

• Japan held the top spot on the Henley Passport Index for several years before being overtaken by Singapore in 2024.

• In 2025, Japan ranked third, offering visa-free access to 190 destinations.

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• Japan’s drop in rank indicates evolving global mobility trends and the strengthening of Singapore’s international ties.

• Germany and South Korea Passports:

• Germany and South Korea were ranked close to the top but could not surpass Singapore’s record in 2025.

• Both countries offer visa-free access to 190 destinations, tying with Japan for third place in the Henley Passport Index rankings.

Important Points

• Global Mobility Trends:

• The Henley Passport Index reflects changes in global mobility patterns, influenced by geopolitical relationships, economic stability, and international agreements.

• Singapore’s rise to the top demonstrates its strong international cooperation, while Japan’s slight drop illustrates shifts in visa policies and agreements.

• Other Rankings:

• Countries like Germany, South Korea, and Japan maintain high rankings due to their extensive visa-free agreements.

• The United States and United Kingdom, once top-ranked countries, have experienced declines in rankings due to tighter visa restrictions in recent years.

Q4. Answer: (c) Satluj

The correct answer is Satluj.

Key Points

• Bhakra Nangal Dam is constructed on the Satluj River, which is one of the major rivers of the Indus river system in India.

• The Bhakra Dam is located in the state of Himachal Pradesh, while the Nangal Dam is situated downstream in the state of Punjab. Together, they form the Bhakra Nangal Project.

• The construction of the dam started in 1948 and was completed in 1963. This massive project was undertaken to aid in irrigation, power generation, and flood control. Hence, the statement is correct.

• The dam is one of the highest gravity dams in the world with a height of 226 meters. It was instrumental in transforming the agriculture of North India, making it self-sufficient in food production.

• The water stored in the dam's reservoir, known as the Gobind Sagar Lake, is used for multiple purposes such as irrigation, drinking water supply, and hydroelectric power generation.

• The project provides water to the states of Punjab, Haryana, Rajasthan, and even parts of Himachal Pradesh, contributing significantly to agriculture and industrial activities in these areas.

Additional Information

• Satluj River:

• The Satluj River originates from the Raksas Tal in Tibet, which is located near Lake Mansarovar. It flows through Himachal Pradesh and Punjab before entering Pakistan.

• It is the longest of the five rivers of Punjab and is a tributary of the Indus River. The river plays a significant role in irrigation and hydropower generation in the northern regions of India.

• Bhakra Nangal Dam Project:

• This project is a symbol of modern India’s engineering and development. It was envisioned to prevent floods in the Satluj-Beas river basin.

• The dam generates hydroelectric power with an installed capacity of 1,325 MW, supplying energy to northern states like Punjab, Haryana, and Delhi.

• The Gobind Sagar Lake, created by the dam, is one of the largest reservoirs in India, storing up to 9.34 billion cubic meters of water.

• Other Options:

• Ravi River: The Ravi flows through Himachal Pradesh and Punjab but does not host the Bhakra Nangal Dam. It is part of the Indus river system and is used for irrigation purposes.

• Yamuna River: The Yamuna is a tributary of the Ganga and flows through states like Uttarakhand, Uttar Pradesh, Haryana, and Delhi. It is not associated with the Bhakra Nangal Dam.

• Ganga River: The Ganga is the largest river in India, flowing through northern and eastern states, but it does not have any connection with the Bhakra Nangal Dam.

Important Points

• Significance of Bhakra Nangal Dam:

• The dam is often referred to as the “Temple of Resurgent India” by Jawaharlal Nehru, as it symbolizes India’s progress and self-reliance after independence.

• It has transformed North India into an agricultural powerhouse by providing irrigation water to millions of hectares of farmland.

• Environmental and Recreational Aspects:

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• The Gobind Sagar Lake is a popular tourist destination, offering boating, fishing, and other recreational activities.

• The dam also plays a crucial role in mitigating the risks of floods in the Satluj-Beas river basin, thereby protecting human lives and property.

Q5. Answer: (a) 1919

The correct answer is 1919.

Key Points

• Mahatma Gandhi gave a call for Satyagraha against the Rowlatt Act in the year 1919. This act was officially known as the Anarchical and Revolutionary Crimes Act of 1919.

• The Rowlatt Act was passed by the British Government to curb revolutionary activities in India. It allowed the government to arrest and detain individuals without trial for two years. This was seen as a suppression of civil liberties.

• The call for Satyagraha by Gandhi was a nonviolent resistance against the oppressive policies of the British, particularly the Rowlatt Act. Hence, this statement is correct.

• The nationwide Satyagraha, also known as the Rowlatt Satyagraha, marked the first all-India struggle against British rule under Gandhi's leadership.

• The movement witnessed widespread protests, hartals (strikes), and public meetings. However, it also led to violent clashes in some regions, which Gandhi strongly condemned, emphasizing his commitment to nonviolence.

• The infamous Jallianwala Bagh massacre occurred on 13 April 1919 in Amritsar during the same period, further fueling anti-British sentiments across India.

• The Satyagraha against the Rowlatt Act is considered a precursor to the larger national movements for India's independence. Hence, the correct answer is 1919.

Additional Information

• Rowlatt Act:

• The Rowlatt Act was passed by the Imperial Legislative Council in March 1919. It was designed to curb the growing nationalist and revolutionary activities in India.

• This act allowed the government to suppress publications, arrest individuals without a warrant, and detain them without trial, violating basic civil liberties and judicial rights.

• Satyagraha Movement:

• The Satyagraha movement marked the adoption of nonviolent methods of resistance by Mahatma Gandhi on a nationwide scale.

• The philosophy of Satyagraha was based on the principles of truth, nonviolence, and civil disobedience. It emphasized the moral strength of the people.

• Impact of the Rowlatt Satyagraha:

• The Rowlatt Satyagraha led to widespread protests and demonstrations, uniting Indians from different regions, religions, and communities against British rule.

• Although the Satyagraha was eventually withdrawn due to outbreaks of violence, it played a crucial role in laying the foundation for future mass movements like the Non-Cooperation Movement (1920).

Important Points

• Jallianwala Bagh Massacre:

• The massacre occurred on 13 April 1919 in Amritsar, Punjab. General Reginald Dyer ordered troops to fire on a peaceful gathering, killing hundreds of men, women, and children.

• This tragic event intensified the public's anger against British rule and strengthened the demand for self-rule in India.

• Gandhi's Leadership:

• The Rowlatt Satyagraha was the first major movement led by Gandhi after his return to India in 1915. It established him as a key leader in the Indian independence struggle.

• Gandhi's emphasis on nonviolence became the guiding principle of the freedom struggle in the years to come.

Q6. Answer: (b) Harvard University

The correct answer is Harvard University.

Key Points

• The Ministry of Environment, Forest and Climate Change (MoEFCC) of India is a central government ministry responsible for planning, promoting, coordinating, and overseeing the implementation of environmental and forestry policies and programs in India.

• In March 2025, the MoEFCC organised the symposium titled 'India 2047: Building a Climate-Resilient Future' at Bharat Mandapam, New Delhi. This symposium aimed at addressing issues related to climate resilience and sustainable development.

• The symposium was held in collaboration with Harvard University, a globally recognised institution known for its strong research and academic contributions in environmental studies, climate change, and sustainability. Hence, this statement is correct.

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• The event brought together experts, policymakers, academicians, and industry leaders to deliberate on India's vision and strategies for combating climate change and ensuring sustainable development by 2047, the centenary year of India's independence.

• Other universities mentioned in the options, like University College London, Massachusetts Institute of Technology, and University of Toronto, are renowned institutions but were not associated with this particular event. Hence, these options are incorrect.

Additional Information

• Harvard University:

• Founded: In 1636, Harvard University is one of the oldest and most prestigious academic institutions in the world, located in Cambridge, Massachusetts, USA.

• Focus: Harvard is renowned for its contributions to research and education across various disciplines, including climate change, environmental sciences, and sustainability.

• Programs: It has several programs and initiatives dedicated to environmental studies, such as the Harvard University Center for the Environment, which focuses on interdisciplinary research on climate and sustainability.

• Climate Resilience:

• Definition: Climate resilience refers to the ability of communities, ecosystems, and economies to adapt, recover, and thrive in the face of climate-related challenges like extreme weather events, rising temperatures, and sea-level changes.

• India's Vision 2047: India aims to achieve climate resilience and sustainable development by 2047, addressing challenges like greenhouse gas emissions, renewable energy adoption, and sustainable urbanisation.

• Other Universities:

• University College London: Known for its research in environmental sciences, UCL is situated in London, UK, and collaborates on global climate initiatives.

• Massachusetts Institute of Technology: Located in Cambridge, USA, MIT is known for its technological innovations and contributions to climate change solutions.

• University of Toronto: Situated in Canada, it is renowned for its academic programs and research on environmental sustainability.

Important Points

• Key Themes of the Symposium:

• The symposium addressed India's strategies for achieving climate resilience by 2047, focusing on areas such as renewable energy, policy reforms, sustainable urbanisation, and climate adaptation.

• Significance: Such events are crucial for fostering collaboration among global academic institutions and policymakers to address climate challenges effectively.

• India's Commitment to Climate Action:

• International Agreements: India is a key signatory to global agreements like the Paris Agreement, which aims to limit global temperature rise and reduce greenhouse gas emissions.

• Renewable Energy Targets: India is working towards achieving 450 GW of renewable energy capacity by 2030 as part of its climate action goals.

Q7. Answer: (c) Israel and Iran

The correct answer is Israel and Iran.

Key Points

• The United Nations (UN) has often intervened in global conflicts to encourage diplomatic resolutions and maintain peace.

• In 2025, the conflict between Israel and Iran escalated due to intensified missile exchanges and long-standing political and military tensions.

• The UN called for peace talks between Israel and Iran to prevent further violence and promote stability in the Middle East. Hence, this statement is correct.

• The conflict between Israel and Iran is rooted in political, ideological, and regional rivalries. Iran's support for anti-Israeli groups and Israel's opposition to Iran's nuclear program are key sources of tension.

• The escalation in violence in 2025 further strained international relations, prompting the UN to act as a mediator. Hence, this action by the UN aligns with its peacekeeping role.

• The missile exchanges and military confrontations between Israel and Iran have raised concerns globally, leading to calls for diplomatic interventions to avoid a large-scale regional conflict.

• The UN's involvement reflects its commitment to addressing international security challenges and fostering peace in conflict zones. Hence, the correct answer is Israel and Iran.

Additional Information

• Historical Context of Israel-Iran Relations:

• Relations between Israel and Iran were once cordial, particularly during the era of the Shah of Iran before the 1979 Islamic Revolution.

• However, after the revolution, Iran adopted a strong anti-Israel stance, accusing Israel of oppressing Palestinians and threatening regional stability.

• Israel, in turn, has expressed concerns over Iran's nuclear ambitions, viewing it as a direct threat to its existence.

• Significance of the United Nations' Role:

• The United Nations plays a critical role in mediating conflicts between nations through negotiations, peace talks, and resolutions.

• The UN's intervention in the Israel-Iran conflict reflects its responsibility to prevent wars and promote dialogue among conflicting parties.

• Key Characteristics of Other Options:

• Russia and Ukraine: The Russia-Ukraine conflict has been ongoing since 2014, primarily due to territorial disputes and Russia's annexation of Crimea. However, this is not related to the 2025 UN peace talks.

• North Korea and South Korea: The Korean Peninsula has long been divided, with tensions remaining high. However, the 2025 peace talks referenced in the question pertain to Israel and Iran.

• India and Sri Lanka: While India and Sri Lanka share close geographical proximity and cultural ties, there have been no significant missile exchanges or escalations leading to UN peace talks in 2025.

Important Points

• Middle East Regional Dynamics:

• The Middle East remains a region fraught with conflicts, with Israel-Iran relations being a significant flashpoint.

• The involvement of regional and global powers in such conflicts often complicates peace efforts, making the role of international organizations like the UN crucial.

• Global Implications of Israel-Iran Tensions:

• The conflict has implications for global energy markets, given the strategic importance of the Middle East in oil production and exports.

• Increased hostilities could also trigger wider regional instability, affecting neighboring nations and leading to humanitarian crises.

Q8. Answer: (d) F2

The correct answer is F2.

Key Points

• F2 key is commonly used to rename a file or folder in the Microsoft Windows operating system. When a file or folder is selected, pressing the F2 key allows the user to edit its name directly.

• Renaming with the F2 key is a quick and efficient method compared to right-clicking the file or folder and navigating to the rename option in the context menu.

• The functionality of the F2 key applies across multiple Windows versions, including Windows 7, 8, 10, and 11. Hence, this is a standard shortcut and widely recognized.

• While renaming, users can use keyboard navigation to save time, such as pressing the Enter key to confirm the new name or pressing Esc to cancel the renaming process.

• Other options in the question, such as F5 (refresh), ESC + N (no standard renaming function), and CTRL + N (usually used to create a new file or folder), do not serve the purpose of renaming files or folders. Hence, these options are incorrect.

• The F2 shortcut is also utilized in other applications, such as Microsoft Excel, where it is used to edit the active cell's content, showcasing its utility across different platforms.

Additional Information

• Functions of F2 Key:

• In Windows Explorer, pressing F2 allows users to rename a selected file or folder quickly without needing to use the mouse.

• In Microsoft Excel, F2 is used to edit the content of the currently selected cell.

• In applications like Visual Studio, F2 can be used for renaming variables, methods, or other items within the code editor.

• Comparison of Other Options:

• F5: This key is commonly used to refresh a window or webpage in browsers, file explorers, and other software. It does not rename files or folders.

• ESC + N: This combination does not serve any renaming function in Windows or other applications. It is not a recognized shortcut for renaming.

• CTRL + N: This is typically used to create a new file or document in applications like Microsoft Word, Excel, or file explorers. It is not related to renaming.

• Steps to Rename Using F2:

• Select the file or folder you want to rename in Windows Explorer.

• Press the F2 key. The name of the file or folder will be highlighted for editing.

• Type the new name and press Enter to save the changes.

• If you wish to cancel renaming, press Esc to revert to the original name.

Important Points

• Renaming Multiple Files:

• In Windows Explorer, users can also rename multiple files simultaneously by selecting them, pressing F2, and typing a new name. The selected files will be renamed with incremental numbering (e.g., File (1), File (2), etc.).

• This feature is particularly useful for organizing large batches of files, such as photos, documents, or project files.

• Keyboard Shortcuts in Windows:

• Keyboard shortcuts like F2 improve productivity and navigation efficiency for users, especially when managing files and folders extensively.

• Other commonly used shortcuts include CTRL + C (copy), CTRL + X (cut), and CTRL + V (paste).

Q9. Answer: (d) Kumudini Lakhia

The correct answer is Kumudini Lakhia.

Key Points

• Kumudini Lakhia is an eminent Indian classical dancer from the state of Gujarat, specializing in Kathak, one of the eight classical dance forms of India.

• She is widely recognized for her modern take on Kathak, blending traditional elements with contemporary themes, and has significantly contributed to the evolution of the art form.

• Lakhia has received numerous accolades for her work, including the prestigious Padma Vibhushan in 2025 for her outstanding contributions to Indian classical dance.

• She is the founder of Kadamb Centre for Dance and Music, an institute dedicated to the promotion and teaching of Kathak, located in Ahmedabad, Gujarat.

• Her innovative approach has inspired generations of dancers and has helped Kathak gain international recognition. Hence, Kumudini Lakhia's achievements make her deserving of the Padma Vibhushan award.

Additional Information

• Padma Awards:

• Padma Vibhushan is the second-highest civilian award in India, granted for exceptional and distinguished service in various fields like arts, literature, science, and public service.

• The Padma Awards, including Padma Shri, Padma Bhushan, and Padma Vibhushan, are announced annually on Republic Day.

• Kathak Dance:

• Kathak is one of the eight classical dance forms of India, characterized by intricate footwork, graceful movements, and storytelling through facial expressions.

• It originated in North India and is deeply rooted in Indian mythology, particularly the stories of Lord Krishna and the Radha-Krishna love story.

• The dance is performed to Hindustani classical music and often includes instruments like tabla and harmonium.

• Kumudini Lakhia's Contributions:

• She has redefined Kathak by incorporating abstract themes and modern narratives, moving away from traditional mythological storytelling.

• Her work emphasizes group choreography in Kathak, which was traditionally performed as solo acts.

• Lakhia's efforts have helped Kathak gain global prominence, making it a part of international dance festivals and events.

Important Points

• Other Options:

• Sonal Mansingh: A celebrated Odissi and Bharatanatyam dancer, awarded Padma Vibhushan in 2003 for her contributions to Indian classical dance.

• Rukmini Devi: A Bharatanatyam pioneer who revived and popularized the dance form during the 20th century. She was posthumously awarded Padma Bhushan.

• Mallika Sarabhai: A renowned dancer and activist from Gujarat, known for her work in Bharatanatyam and Kuchipudi, as well as her social activism.

• Significance of Kathak:

• Kathak bridges the gap between tradition and modernity, showcasing India's cultural heritage while adapting to contemporary global tastes.

• It is celebrated for its ability to narrate stories, making it not just a dance form but a medium of communication.

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Q10. Answer: (b) 50%

The correct answer is 50%.

Key Points

• India's ultra-high-net-worth individual (UHNWI) population: As per the 2025 report by McKinsey & Company and Business of Fashion (BoF), the growth rate of UHNWIs in India is projected to be 0.5% annually by 2028. This figure highlights the slow-paced increase in the wealthiest individuals within the country.

• The category of UHNWIs typically comprises individuals with a net worth exceeding $30 million. Their growth rate in India is indicative of economic trends, wealth distribution, and investment opportunities.

• The projected growth rate of 0.5% reflects the economic environment and the opportunities for wealth generation available in the country. Hence, the correct answer is 0.5.

Additional Information

• Ultra-High-Net-Worth Individuals (UHNWIs):

• UHNWIs are individuals whose net worth exceeds $30 million. This includes liquid assets, property holdings, and other investments.

• This demographic is often considered a key indicator of the economic health and wealth distribution within a country.

• Growth Trends of UHNWIs in India:

• India has seen steady economic growth in recent years, but the growth rate of UHNWIs at 0.5% reflects cautious optimism.

• Factors contributing to this growth include entrepreneurship, foreign investments, and technological advancements.

• Example: Sectors like technology, pharmaceuticals, and manufacturing have witnessed significant growth, contributing to the wealth accumulation of UHNWIs.

• Global Comparison:

• India's growth rate of 0.5% for UHNWIs is relatively modest when compared to other emerging economies like China and Brazil.

• This could be attributed to factors like income inequality, regulatory challenges, and slower economic reforms in comparison to peers.

Important Points

• Key Economic Indicators:

• The growth rate of 0.5% signifies a stable yet slow expansion in the number of UHNWIs, reflecting the broader economic trends of India's middle and upper-class growth.

• Factors like government policies, ease of doing business, and taxation play a vital role in shaping this demographic's growth trajectory.

• Impact on the Economy:

• The steady increase in UHNWIs can lead to greater investments in sectors like luxury goods, real estate, and philanthropy, influencing economic growth and employment generation.

• It also impacts capital markets, as UHNWIs are often significant contributors to equity investments and venture capital funding.

Q11. Answer: (d) Aurangzeb

The correct answer is Aurangzeb.

Key Points

• Aurangzeb, also known as Alamgir, was the sixth emperor of the Mughal Empire. He ruled from 1658 to 1707.

• Aurangzeb expanded the Mughal Empire to its greatest extent, covering almost the entire Indian subcontinent.

• He was known for his administrative reforms, military campaigns, and enforcement of Islamic laws. Hence, he is considered the last powerful Mughal ruler.

• Aurangzeb's reign marked the peak of Mughal power, but it also sowed the seeds of decline due to over-expansion and internal dissent.

• His policies and wars strained the empire's resources and created discontent among various groups, including the Rajputs, Marathas, and Sikhs.

• After Aurangzeb's death in 1707, the Mughal Empire gradually weakened, and subsequent rulers failed to maintain the same level of control. Hence, the correct answer is Aurangzeb.

Additional Information

• Dara Shukoh:

• Dara Shukoh was the eldest son of Emperor Shah Jahan and a prominent Mughal prince.

• He was known for his intellectual pursuits, especially his efforts to bridge Hinduism and Islam. His translation of the Upanishads into Persian is noteworthy.

• He lost the war of succession to Aurangzeb and was executed in 1659. Dara Shukoh was not a ruler; hence, this option is incorrect.

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• Bahadur Shah Zafar:

• The last Mughal emperor, Bahadur Shah Zafar, ruled during the decline of the empire. He was a symbolic leader during the 1857 Revolt.

• He was a weak ruler and lacked political or military power. His reign marked the end of the Mughal dynasty after British annexation in 1858. Hence, this option is incorrect.

• Shah Jahan:

• Shah Jahan was the fifth Mughal emperor, ruling from 1628 to 1658. He is famous for his architectural achievements, including the Taj Mahal.

• Although he expanded the empire, his reign is more remembered for cultural contributions than political or military dominance. Hence, this option is incorrect.

• Aurangzeb:

• Aurangzeb's reign from 1658 to 1707 was marked by significant territorial expansion, effective administration, and strict implementation of Islamic laws.

• His military campaigns extended Mughal control over the Deccan and other regions, making him the last powerful ruler of the empire.

Important Points

• Mughal Empire Decline:

• The decline began after Aurangzeb's death due to over-expansion, financial strain, and regional revolts.

• Successive rulers lacked the political acumen and military strength to sustain the vast empire.

• Aurangzeb’s Legacy:

• Aurangzeb is remembered for his military campaigns, administrative reforms, and religious policies, which shaped Indian history significantly.

• His reign represents the zenith of the Mughal Empire, but also its eventual decline.

Q12. Answer: (b) Article 15(6) and 16(6)

The correct answer is Article 15(6) and 16(6).

Key Points

• 103rd Amendment Act: The Constitution (103rd Amendment) Act, 2019 introduced provisions for reservation for the Economically Weaker Sections (EWS) of society.

• This amendment added Article 15(6) and Article 16(6) to the Indian Constitution, enabling the government to provide up to 10% reservation for EWS in educational institutions and government jobs.

• Article 15(6): It empowers the State to make special provisions for the advancement of economically weaker sections of citizens, including reservations in educational institutions. This applies to private institutions, whether aided or unaided, except for minority educational institutions under Article 30.

• Article 16(6): It provides reservation for EWS in government jobs, enabling the State to reserve up to 10% of vacancies in public employment.

• The amendment aims to address inequality by providing representation to economically disadvantaged individuals who do not fall under the existing reservation categories like Scheduled Castes (SC), Scheduled Tribes (ST), and Other Backward Classes (OBC).

• It specifically targets individuals with an annual family income below Rs. 8 lakh, excluding those who own significant agricultural land, residential properties, or other assets.

• Hence, the correct answer is Article 15(6) and 16(6).

Additional Information

• Eligibility Criteria for EWS Reservation:

• An individual from the general category whose annual family income is less than Rs. 8 lakh qualifies for EWS reservation.

• Exclusions include families owning agricultural land above 5 acres, residential property exceeding 1,000 square feet, or plots larger than 100 square yards in notified municipalities.

• Impact of the 103rd Amendment:

• It is the first constitutional amendment to provide reservation based on economic criteria.

• The amendment aims to ensure inclusivity and address inequalities faced by economically weaker sections among the general category.

• It applies to both central government jobs and admissions to educational institutions, including private unaided institutions.

• Legal Challenges:

• The amendment faced criticism and legal scrutiny, with debates over whether economic reservation violates the principle of equality enshrined in the Constitution.

• In 2022, the Supreme Court upheld the validity of the EWS reservation, confirming that it does not breach the basic structure of the Constitution.

Important Points

• Historical Context:

• The concept of reservation in India has traditionally been based on social and educational backwardness, as outlined in Articles 15(4) and 16(4) for SC, ST, and OBC categories.

• The introduction of EWS reservation expands the scope of affirmative action to include economic criteria.

• Significance:

• The 103rd Amendment ensures that economically weaker individuals from the general category, who were previously excluded from reservation benefits, receive representation in education and employment.

• This is expected to promote social justice and reduce economic disparities.

Q13. Answer: (d) Organisation of village panchayats

The correct answer is Organisation of village panchayats.

Key Points

• Article 40 of the Indian Constitution is a part of the Directive Principles of State Policy (DPSP) and directs the state to take steps to organize village panchayats and endow them with such powers and authority as may be necessary to enable them to function as units of self-government.

• The concept of village panchayats is deeply rooted in Indian history and tradition, emphasizing grassroots democracy and self-governance.

• The inclusion of Article 40 in the Constitution reflects the vision of the framers to ensure decentralized governance in India. Hence, the correct answer is Article 40 focuses on the organisation of village panchayats.

• The establishment of village panchayats forms a critical part of the 73rd Constitutional Amendment Act, 1992, which institutionalized the Panchayati Raj system in India.

• Article 40 essentially serves as a guideline for states to empower rural governance and promote participatory democracy at the local level.

Additional Information

• Directive Principles of State Policy:

• The Directive Principles of State Policy are guidelines or principles given to the central and state governments of India to be kept in mind while framing laws and policies.

• They are provided in Part IV of the Indian Constitution (Articles 36 to 51) and aim to establish a social and economic democracy in the country.

• 73rd Constitutional Amendment Act, 1992:

• This act added Part IX to the Constitution, titled "The Panchayats," covering Articles 243 to 243O.

• It also added the Eleventh Schedule to the Constitution, which contains the functional items of the Panchayats (29 items).

• Key Features: Mandatory constitution of panchayats at the village, intermediate, and district levels; fixed tenure of five years; reservation of seats for Scheduled Castes, Scheduled Tribes, and women.

• Importance of Village Panchayats:

• Village panchayats are instrumental in promoting decentralization, ensuring people’s participation in decision-making, and fostering socio-economic development at the grassroots level.

• They are responsible for implementing government schemes, maintaining basic infrastructure, and addressing local issues.

• They also act as a platform for resolving disputes and maintaining harmony in rural areas.

Important Points

• Other Relevant Directive Principles:

• Promotion of cottage industries in rural areas (Article 43): Encourages the state to promote village and small-scale industries to ensure rural development and self-sufficiency.

• Provision for a uniform civil code (Article 44): Directs the state to secure a uniform civil code for all citizens across India, ensuring equality and secularism.

• Organisation of agriculture and animal husbandry (Article 48): Promotes modern and scientific methods to improve agriculture and animal welfare in India.

• Significance of Directive Principles:

• They provide a framework for establishing a welfare state.

• Although non-justiciable, they act as a guiding force for the government to enact laws and policies aimed at socio-economic justice.

Q14. Answer: (b) Kerala, known for its backwaters and lagoons

The correct answer is Kerala, known for its backwaters and lagoons.

Key Points

• Vembanad Lake is located in the state of Kerala, India. It is the longest lake in the country and also the largest lake in Kerala.

• The lake is famous for its backwaters, which are an intricate network of lagoons, canals, and rivers that form a significant part of Kerala's unique geography. This makes it a popular tourist destination.

• Vembanad Lake is spread across several districts including Alappuzha, Kottayam, and Ernakulam, showcasing the beauty of Kerala's natural landscapes. Hence, the statement is correct.

• The lake is facing severe environmental degradation due to pollution, encroachments, and unregulated human activities. Efforts are being made to restore and conserve the lake's ecosystem.

• Kerala's backwaters, including Vembanad Lake, are internationally recognized and are part of the Ramsar Convention's Wetlands of International Importance. The lake is essential for biodiversity preservation. Hence, the statement aligns with the question.

Additional Information

• Kerala’s Backwaters and Vembanad Lake:

• Vembanad Lake is an integral part of Kerala's backwater system, which forms a unique ecosystem supporting numerous species of flora and fauna.

• These backwaters are used for various purposes including tourism, inland navigation, and fishing. Houseboat cruises are especially popular among tourists.

• The lake plays a crucial role in supporting the livelihoods of local communities, particularly in activities like traditional fishing and agriculture.

• Environmental Challenges:

• Vembanad Lake is facing threats from pollution, land encroachments, and unchecked urbanization.

• The lake has been included in the Ramsar Convention for wetland conservation, emphasizing its ecological importance.

• Authorities have initiated several conservation projects to restore the lake and its surrounding backwaters.

Important Points

• Other Lakes Mentioned in the Options:

• Assam: Famous for the Brahmaputra River Basin, Assam is not home to Vembanad Lake. However, it is known for its rich biodiversity and river systems.

• West Bengal: The Sundarban mangrove forests are located in West Bengal, but this region is not associated with Vembanad Lake.

• Odisha: Known for Chilika Lake, the largest coastal lagoon in India, Odisha is unrelated to Vembanad Lake.

Q15. Answer: (b) Rb

The correct answer is Rb (Rubidium).

Key Points

• Atomic radius: The atomic radius is the distance from the nucleus to the outermost electrons of an atom. It generally increases down the group in the periodic table due to the addition of electron shells.

• Group 1 elements: The elements mentioned in the question (Li, Na, K, and Rb) belong to Group 1 of the periodic table, also known as the alkali metals. Their atomic radii increase as we move down the group.

• Explanation of trends: As we move down the group in the periodic table:

• The number of electron shells increases, leading to a larger atomic radius.

• The effective nuclear charge experienced by the outermost electrons decreases slightly due to increased electron shielding, allowing the outer electrons to be further away from the nucleus.

• Comparison of elements: Among the given elements:

• Li (Lithium): Atomic radius is small as it is the first element in Group 1.

• Na (Sodium): Atomic radius is larger than Li due to the addition of one more electron shell.

• K (Potassium): Atomic radius further increases due to an additional electron shell compared to Na.

• Rb (Rubidium): Atomic radius is the largest among the given elements because it has the most electron shells.

• Hence, Rubidium (Rb) has the largest atomic radius among the given elements.

Additional Information

• Alkali Metals (Group 1):

• Alkali metals include Lithium (Li), Sodium (Na), Potassium (K), Rubidium (Rb), Cesium (Cs), and Francium (Fr).

• They are highly reactive metals and are rarely found in their free form in nature.

• They exhibit common properties such as softness, low density, and high reactivity with water.
• Rubidium (Rb):
• Atomic number: 37.
• Electron configuration: [Kr] $5s^1$.
• Uses: Used in atomic clocks, electronics, and research applications.
• Location: Found in minerals such as lepidolite and pollucite.
• Trends in Atomic Radius:
• Atomic radius increases down a group due to the addition of electron shells.
• Atomic radius decreases across a period (left to right) due to increasing nuclear charge attracting electrons closer.

Important Points

• Periodic trends:
• Atomic radius is influenced by factors such as number of electron shells, nuclear charge, and electron shielding.
• In alkali metals, the atomic radius increases significantly down the group due to added electron shells.
• Applications of Rubidium:
• Rubidium salts are used in biochemistry and medical research.
• Rubidium vapor is utilized in atomic physics experiments to study Bose-Einstein condensation.

Q16. Answer: (c) Ministry of Youth Affairs and Sports

The correct answer is Ministry of Youth Affairs and Sports.

Key Points

• The Ministry of Youth Affairs and Sports has put the Draft National Code Against Age Fraud in Sports (NCAAFS) 2025 in the public domain for feedback and suggestions from the general public and stakeholders. This step is part of the ministry's larger effort to ensure fair play and transparency in sports.
• The NCAAFS 2025 aims to address the issue of age fraud, which has been a long-standing concern in Indian sports. Age fraud undermines the integrity of competition and deprives deserving athletes of opportunities. Hence, this statement is correct.
• The consultation process initiated by the ministry is a democratic step to involve all stakeholders, including sports organizations, athletes, and the public, in shaping a robust policy to tackle age fraud effectively.
• The Ministry of Youth Affairs and Sports is the primary body responsible for overseeing and promoting sports development in India, making it the appropriate ministry to introduce this draft. Hence, this statement is correct.

Additional Information

• Ministry of Youth Affairs and Sports:
• The Ministry of Youth Affairs and Sports was established in 1982. It is responsible for promoting sports and physical fitness and supporting youth development programs in India.
• The ministry oversees various organizations, including the Sports Authority of India (SAI), which plays a critical role in implementing sports policies and training programs.
• It also works on addressing issues such as doping and age fraud to ensure fair competition and uphold the integrity of sports.
• Age Fraud in Sports:
• Age fraud refers to the misrepresentation of an athlete's age to compete in a category for which they are not eligible. This is often done to gain an unfair advantage in competitions.
• Such practices not only violate the principles of fair play but also hinder the development of genuine talent in the sports ecosystem.
• The NCAAFS 2025 aims to establish stringent guidelines and mechanisms to detect and prevent age fraud in Indian sports.
• Consultation Process:
• By inviting public and stakeholder comments, the government ensures that the NCAAFS 2025 is comprehensive and addresses the concerns of all parties involved in the sports ecosystem.
• This approach is in line with the government's commitment to transparency and inclusivity in policy-making.

Important Points

• Other Ministries (Incorrect Options):
• Ministry of Law and Justice: This ministry primarily deals with legal affairs, legislative activities, and judicial reforms. It does not oversee sports-related issues. Hence, this is incorrect.
• Ministry of Social Justice and Empowerment: This ministry focuses on the welfare of marginalized groups, including Scheduled Castes, Scheduled Tribes, and disabled individuals. It is not responsible for sports policies. Hence, this is incorrect.
• Ministry of Health and Family Welfare: This ministry is dedicated to healthcare services, policies, and public health programs. It does not manage sports-related initiatives. Hence, this is incorrect.

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• Significance of the NCAAFS 2025:

• The Draft National Code Against Age Fraud in Sports 2025 is expected to improve the credibility of Indian sports by eliminating unfair practices.

• It will ensure a level playing field for athletes and promote the development of genuine talent.

• Enforcing the code effectively could also enhance India's reputation in global sporting events.

Q17. Answer: (c) 1994

The correct answer is 1994.

Key Points

• National Telecom Policy (NTP), 1994 was formulated with the objective of providing basic telecommunication services to all sections of society and improving rural connectivity.

• The policy specifically aimed to establish one Public Call Office (PCO) for every 500 persons in urban areas, thereby ensuring easy access to telecommunication services for the urban population.

• This policy was instrumental in expanding telecom services across India and paved the way for further reforms and privatization in the telecom sector. Hence, statement 3 is correct.

• The NTP 1994 was a landmark policy that aimed at reducing communication costs while increasing the availability of telecommunication services, especially in urban areas.

• It also marked the beginning of the shift towards liberalization and privatization of India's telecom sector. Hence, statement 3 is correct.

Additional Information

• National Telecom Policy (NTP), 1994:

• Objective: To make telecommunication services affordable and accessible to all, with a focus on improving urban and rural connectivity.

• The policy emphasized the importance of public call offices (PCOs) for urban areas and aimed at bridging the gap between the rural and urban telecom infrastructure.

• The NTP 1994 encouraged private participation in the telecom sector, opening up avenues for competition and innovation.

• Subsequent Developments:

• The success of NTP 1994 led to the formulation of NTP 1999, which focused on universal service obligations and further liberalized the telecom sector.

• The policies following NTP 1994 contributed to the rapid growth of telecommunication services in India, making it one of the fastest-growing telecom markets globally.

• Impact of NTP 1994:

• It played a crucial role in increasing the penetration of telecommunication services in urban and rural India.

• The policy also laid the groundwork for the technological advancements that transformed India's telecom sector into a key driver of economic growth.

Important Points

• Key Features of NTP 1994:

• Focused on providing one PCO per 500 persons in urban areas to ensure widespread access to telecommunication services.

• Encouraged private sector participation in telecom infrastructure development, fostering competition and efficiency.

• Significance:

• The policy marked a shift from a government-controlled monopoly to a more liberalized and competitive telecom market.

• It played a pivotal role in driving the expansion of telecom services and connecting millions of Indians to the global communication network.

Q18. Answer: (a) Bengal

The correct answer is Bengal.

Key Points

• The Faraizi Movement was a religious reform movement that originated in the 19th century in the region of Bengal. It was initiated to bring about reforms in the practice of Islam.

• The movement was founded by Haji Shariatullah, a prominent Islamic reformer who sought to purify Islamic practices and remove corrupt practices that had crept into the religion.

• The term "Faraizi" is derived from the Arabic word "Fard", which refers to religious obligations. The movement emphasized the importance of adhering strictly to Islamic obligations and eliminating un-Islamic practices. Hence, the movement originated in Bengal.

• One of the key objectives of the movement was to combat the influence of British colonial rule and the exploitation of peasants in

Bengal. The Faraizi leaders fought for the rights of the peasantry, particularly against oppressive landlords.

• The movement also worked to revive the spiritual and moral integrity of Muslims by promoting equality and unity among the community. Hence, the movement focused on Bengal's socio-religious context.

• The Faraizi Movement had a significant impact in Bengal as it sought to protect the rights of the oppressed and promote Islamic values. It also fostered a spirit of resistance against colonial oppression and socio-economic exploitation.

• The movement later gained momentum under the leadership of Dudu Miyan, the son of Haji Shariatullah, who continued the struggle for social justice and religious reform. Hence, the movement became a major force in Bengal.

• Hence, the correct answer is Bengal.

Additional Information

• Haji Shariatullah:

• Haji Shariatullah was the founder of the Faraizi Movement. Born in Bengal in 1781, he traveled to Mecca for pilgrimage and returned inspired to initiate reforms in Islamic practices.

• He emphasized the importance of following the Quran and Sunnah, rejecting practices that were not in accordance with Islamic teachings. His efforts were aimed at purifying Islam and promoting religious obligations.

• Socio-economic Impact:

• The movement addressed the exploitation of peasants by zamindars (landlords) in Bengal. It fought against the oppressive indigo plantations and taxes imposed by the colonial government.

• The Faraizi leaders advocated for social justice and the rights of the poor, which made the movement highly popular among the peasantry.

• Example: The movement resisted the collection of taxes that were deemed un-Islamic and supported the peasants in their struggle against exploitation.

• Dudu Miyan:

• He was the son of Haji Shariatullah and took over the leadership of the movement after his father’s death. His efforts further strengthened the movement.

• Under his leadership, the Faraizi Movement expanded its influence and became a significant force in Bengal, advocating for both religious and social reforms.

• He was particularly effective in mobilizing peasants and organizing them to resist exploitation by landlords and colonial officials.

Important Points

• Significance of the Faraizi Movement:

• The movement played a crucial role in reviving Islamic values and fostering a sense of unity among Muslims in Bengal.

• It highlighted the importance of adhering to religious obligations and rejecting practices that contradicted Islamic teachings.

• Impact on Society:

• The movement helped empower the peasantry and resist socio-economic exploitation, contributing to the overall reform of society in Bengal.

• It laid the foundation for future movements that sought to address the challenges faced by the oppressed and promote social justice.

Q19. Answer: (a) 2002

The correct answer is 2002.

Key Points

• The Mumbai–Pune Expressway is India's first operational six-lane concrete expressway. It was inaugurated in the year 2002.

• The expressway spans approximately 95 kilometers and connects the two major cities of Mumbai and Pune in Maharashtra.

• The construction of the expressway was undertaken to address the growing traffic congestion between Mumbai and Pune, which are important economic and cultural hubs of Maharashtra.

• It was officially opened to the public in 2002. The expressway was built to meet international standards and improve travel efficiency and safety. Hence, the correct year is 2002.

• The expressway reduced the travel time between Mumbai and Pune significantly, making it a vital infrastructure project for the state of Maharashtra and India.

• The construction of the expressway was managed by the Maharashtra State Road Development Corporation (MSRDC), which played a crucial role in ensuring timely completion and quality standards.

Additional Information

• Features of the Mumbai–Pune Expressway:

• The expressway is a six-lane road with advanced safety features such as guardrails, median strips, and proper lighting.

• It is a concrete road, which enhances durability and reduces maintenance costs compared to asphalt roads.

• The road includes five tunnels, built to pass through the Sahyadri mountain range, ensuring smooth connectivity without detours.

• Impact on Travel and Economy:

• The expressway significantly reduced the travel time between Mumbai and Pune from approximately 4-5 hours to 2-3 hours.

• It improved connectivity for businesses and industries operating in the region, leading to enhanced economic growth.

• The expressway also boosted tourism, as both Mumbai and Pune are popular tourist destinations.

• Important Achievements:

• The project demonstrated the capability of Indian infrastructure development agencies to undertake large-scale projects.

• It set a benchmark for future expressway projects in India, inspiring similar projects like the Yamuna Expressway and the Delhi–Mumbai Expressway.

Important Points

• Construction Details:

• The expressway was constructed in three phases and was completed in 2000.

• The project cost approximately Rs. 1,600 crore, making it one of the most expensive road projects in India at the time.

• Safety Measures:

• The expressway incorporates features like speed monitoring systems, emergency helplines, and regular patrolling to ensure safety.

• The inclusion of designated rest stops and food courts along the route enhances the convenience for travelers.

Q20. Answer: (c) Calcium

The correct answer is Calcium.

Key Points

• Calcium belongs to the s-block of the periodic table.

• The periodic table is divided into four blocks: s-block, p-block, d-block, and f-block, based on the types of atomic orbitals that are being filled.

• s-block elements include alkali metals (group 1) and alkaline earth metals (group 2). Calcium is part of group 2, making it an alkaline earth metal. Hence, statement regarding Calcium is correct.

• Iron belongs to the d-block of the periodic table as it is a transition metal. It does not qualify for the s-block. Hence, Iron does not belong to the s-block.

• Chlorine belongs to the p-block. It is a halogen (group 17) and does not fall under the s-block. Hence, Chlorine does not belong to the s-block.

• Uranium belongs to the f-block. It is an actinide element. Therefore, it does not belong to the s-block. Hence, Uranium does not belong to the s-block.

• Hence, the correct answer is Calcium.

Additional Information

• s-block Elements:

• s-block elements consist of groups 1 and 2. These include alkali metals (like Sodium and Potassium) and alkaline earth metals (like Magnesium and Calcium).

• The outermost electron of these elements is present in the s-orbital. For example, Calcium has the electron configuration [Ar] $4s^2$, indicating that its valence electrons are in the s-orbital.

• These elements generally have low ionization energy, exhibit metallic properties, and are highly reactive.

• Specific Characteristics of Calcium:

• Calcium is a soft, silvery-white metal and is one of the most abundant elements in the Earth's crust.

• It is an essential element for living organisms, particularly in the formation of bones and teeth in humans and animals.

• Calcium is widely used in industries, such as in the manufacturing of cement, lime, and plaster.

• Other Elements Mentioned:

• Iron: A transition metal found in the d-block. It is used in the production of steel and is essential for the oxygen transport in living organisms (as part of hemoglobin).

• Chlorine: A non-metal halogen found in the p-block. It is widely used as a disinfectant and in water purification.

• Uranium: A radioactive actinide element from the f-block. It is primarily used as fuel in nuclear reactors.

Important Points

• Classification of Elements:

• The periodic table is divided into blocks based on the type of orbitals that the valence electrons occupy: s-block, p-block, d-block, and f-block.

• s-block: Groups 1 and 2 (Alkali metals and Alkaline earth metals).

• p-block: Groups 13–18 (Non-metals, Metalloids, and Halogens).

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• d-block: Groups 3–12 (Transition metals).

• f-block: Lanthanides and Actinides.

• Applications of s-block Elements:

• Group 1 elements are highly reactive and are used in industries such as chemical synthesis and batteries.

• Group 2 elements are essential for biological functions (e.g., Calcium for bones) and industrial applications (e.g., Magnesium in alloys).

Q21. Answer: (a) Article 74

The correct answer is Article 74.

Key Points

• Article 74 of the Indian Constitution explicitly mentions the Council of Ministers to aid and advise the President.

• It states that there shall be a Council of Ministers with the Prime Minister at the head to aid and advise the President, who is bound by such advice in the exercise of his functions, except in cases where he is required to act in his discretion.

• The 42nd Constitutional Amendment Act of 1976 made it mandatory for the President to act according to the advice of the Council of Ministers. The 44th Amendment Act of 1978 further clarified that the President may ask the Council of Ministers to reconsider their advice, but must act according to the advice after reconsideration. Hence, Article 74 governs this relationship.

• This provision establishes the framework of the parliamentary system of government in India, ensuring that the President acts on the advice of the executive branch, represented by the Council of Ministers. Hence, the correct answer is Article 74.

Additional Information

• Article 74 - Council of Ministers:

• Article 74(1): It ensures that the President of India acts in accordance with the advice of the Council of Ministers headed by the Prime Minister.

• This article is the cornerstone of the parliamentary system of governance in India, where the real executive power lies with the Prime Minister and the Council of Ministers.

• The 42nd Amendment Act made the President's adherence to the advice of the Council of Ministers mandatory, limiting discretionary powers.

• The 44th Amendment Act allowed the President to seek reconsideration of the advice but required him to abide by the advice if it was reaffirmed.

• Functions and Features of the Council of Ministers:

• The Council of Ministers is collectively responsible to the Lok Sabha (House of the People) under Article 75.

• It advises the President on all matters of governance, including legislation, appointments, and administration.

• It is headed by the Prime Minister, who is appointed by the President, and includes Cabinet Ministers, Ministers of State, and Deputy Ministers.

• Comparison with Other Articles:

• Article 80: Deals with the composition of the Rajya Sabha (Council of States), unrelated to the Council of Ministers.

• Article 85: Relates to the sessions of Parliament and is not connected to the President's role with the Council of Ministers.

• Article 76: Refers to the Attorney General of India, the chief legal advisor to the Government of India, and is unrelated to the Council of Ministers.

Important Points

• Key Legal Provisions:

• The President is the constitutional head of the state but acts on the advice of the Council of Ministers.

• In exceptional circumstances, such as a hung Parliament or imposition of President's Rule, the President may exercise some discretionary powers.

• The Prime Minister plays a pivotal role in advising the President and coordinating the activities of the Council of Ministers.

• Historical Developments:

• The 42nd and 44th Amendment Acts have been instrumental in defining the relationship between the President and the Council of Ministers.

• Instances like the dismissal of State Governments and the imposition of Emergency have highlighted the interplay between the President and the Council of Ministers.

Q22. Answer: (c) Bhagirathi river

The correct answer is Bhagirathi river.

Key Points

• The Bhagirathi River originates from the Gangotri Glacier, located near Gaumukh at an elevation of approximately 3,900 meters in the Uttarkashi district of Uttarakhand.

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• The Gangotri Glacier is one of the largest glaciers in the Himalayas and is the primary source of water for the Bhagirathi River.

• The Bhagirathi River is considered sacred in Hinduism as it forms the headstream of the Ganga River (Ganges), which is revered as a holy river in India.

• At Devprayag, the Bhagirathi merges with the Alaknanda River, and from this confluence point, the river is officially called the Ganga.

• The river plays a vital role in the religious, cultural, and ecological landscape of India. Hence, option 3 is the correct answer.

Additional Information

• Bhagirathi River:

• Religious Significance: The Bhagirathi River is deeply associated with Hindu mythology. It is believed that King Bhagiratha performed intense penance to bring the river Ganga down from heaven to Earth to purify the souls of his ancestors.

• Geographical Importance: The river flows through the rugged terrain of Uttarakhand, providing water resources and supporting life in the Himalayan region. It also contributes significantly to the flow of the Ganga, which sustains millions of people downstream.

• Gangotri Glacier:

• The Gangotri Glacier is located in the Garhwal Himalayas in Uttarakhand and is one of the primary sources of freshwater for northern India.

• The glacier spans about 30 kilometers in length and is a prominent feature of the Himalayan ecosystem.

• It is a popular pilgrimage site, as Gaumukh (the snout of the glacier) is considered the origin point of the Bhagirathi River.

• Alaknanda River:

• The Alaknanda River is another major tributary of the Ganga, originating from the Satopanth Glacier near Badrinath in Uttarakhand.

• It meets the Bhagirathi River at Devprayag, forming the Ganga River, which is crucial to India's water system.

• Other Rivers Mentioned in the Options:

• Chenab River: Originates from the Baralacha Pass in Himachal Pradesh and is part of the Indus River system.

• Yamuna River: Rises from the Yamunotri Glacier in Uttarakhand and is the largest tributary of the Ganga River.

• Son River: Originates from Amarkantak Plateau in Madhya Pradesh and is a southern tributary of the Ganga River.

Important Points

• Confluence Points:

• The Bhagirathi and Alaknanda rivers meet at Devprayag, forming the Ganga River. This point is a popular pilgrimage destination.

• Environmental Significance:

• The Gangotri Glacier, the source of the Bhagirathi River, is sensitive to climate change. The glacier has been receding over the past decades, raising concerns about water availability for millions of people dependent on the Ganga River system.

Q23. Answer: (a) Increased competition from cheaper imports

The correct answer is Increased competition from cheaper imports.

Key Points

• After the economic liberalisation in India in 1991, the manufacturing sector faced increased competition from cheaper imports due to the removal of trade barriers and reduced import duties. This allowed foreign goods to enter the Indian market at lower prices, making it challenging for domestic manufacturers to compete. Hence, this statement is correct.

• The policy reforms reduced licensing requirements and other restrictions, which benefitted businesses. Thus, high industrial licensing fees were no longer a major challenge. Instead, the challenge was adapting to a more competitive environment. Hence, this statement is incorrect.

• Liberalisation eased access to raw materials through open trade policies. Hence, the shortage of raw materials was not a significant issue for the manufacturing sector. Hence, this statement is incorrect.

• Post-liberalisation, foreign direct investment (FDI) inflows increased significantly, aiding capital availability for industries. Thus, there was no notable decline in capital inflow. Hence, this statement is incorrect.

• Therefore, the main challenge faced by the Indian manufacturing sector after liberalisation was increased competition from cheaper imports.

Additional Information

• Economic Liberalisation in India (1991):

• The 1991 economic reforms were introduced to overcome a severe economic crisis, including a balance of payments crisis.

• The reforms included deregulation of industries, reduction in import tariffs, and encouragement of foreign investments to integrate India with the global economy.

• This was a shift from a closed economy to an open-market economy.

• Challenges Faced by Indian Manufacturing Sector Post-Liberalisation:

• Increased competition: With reduced import tariffs, foreign-made goods flooded the Indian market, often being more affordable and of higher quality compared to domestic products.

• Technology gap: Indian manufacturers had to compete with global companies that had advanced technologies and production processes.

• Infrastructure issues: Despite liberalisation, the Indian manufacturing sector faced challenges such as inadequate infrastructure, including power shortages and poor transport facilities.

• Skilled workforce: While liberalisation opened up opportunities, there was a lack of skilled manpower to adapt to the evolving industrial requirements.

• Impact of Cheaper Imports:

• Cheaper imports negatively affected small-scale industries (SSIs) and traditional sectors that could not compete with foreign products.

• The influx of foreign goods led to a significant loss of market share for several domestic manufacturers.

• Many small and medium enterprises (SMEs) struggled to survive due to price competition and inability to upgrade their operations.

Important Points

• Positive Effects of Liberalisation:

• FDI Inflows: Liberalisation encouraged foreign companies to invest in India, leading to better infrastructure, job creation, and technology transfer.

• Growth in Export-Oriented Industries: Indian manufacturing sectors like IT and pharmaceuticals experienced rapid growth due to increased global trade opportunities.

• Economic Growth: The GDP growth rate of India improved significantly, lifting millions of people out of poverty.

• Key Reforms Introduced in 1991:

• Reduction in Import Tariffs: Import taxes were reduced, which made foreign goods cheaper and accessible in the Indian market.

• Deregulation: Industrial licensing requirements were abolished for most industries, making it easier to set up and expand businesses.

• Privatisation: Public sector enterprises were opened up for private investment, improving efficiency and productivity.

• Devaluation of the Rupee: The Indian Rupee was devalued to make Indian exports more competitive in global markets.

Q24. Answer: (b) Closes the current window or application

The correct answer is Closes the current window or application.

Key Points

• Alt + F4 is a widely used keyboard shortcut in Windows operating systems. It is primarily used to close the currently active window or application.

• When you press Alt + F4, the system automatically closes the application or window that is currently in focus. If no application is open, it may bring up the shutdown dialog box, depending on your system configuration.

• This shortcut is extremely useful for quickly exiting applications without needing to use the mouse or navigating through menus. Hence, the correct answer is Closes the current window or application.

• It does not open a new window, refresh the browser, or save a document. These functions are associated with other shortcuts like Ctrl + N, F5, and Ctrl + S, respectively. Hence, these statements are incorrect.

Additional Information

• Function of Alt + F4:

• The Alt + F4 shortcut is a combination of the Alt key and the F4 function key. It works on Windows operating systems and is designed to close applications efficiently.

• In most scenarios, pressing Alt + F4 closes the active application or window. However, if you use it on the desktop screen, it may prompt the system shutdown options dialog box.

• Example: If you press Alt + F4 while working in Microsoft Word, it will close the Word application after prompting you to save any unsaved documents.

• Alternate Shortcuts for Specific Functions:

• Ctrl + N: Used to open a new window or document in most applications like browsers or word processors.

• F5: Refreshes the content of the browser or any application that supports refresh functionality.

• Ctrl + S: Saves the current document or file in applications like Word, Excel, or other text editors.

• Applications of Alt + F4:

• Frequently used in office environments for quickly closing applications after completing tasks.

• Useful for gamers to exit games without navigating through menus.

• Helps in multitasking by allowing users to close applications swiftly and move on to other tasks.

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Important Points

• Keyboard shortcut usage:

• Alt + F4 is commonly used in Windows operating systems, but its functionality may vary slightly in other operating systems like Linux or macOS.

• It is important to remember that Alt + F4 closes the active window or application, so users must save their work before using this shortcut.

• Precautions:

• Use this shortcut carefully in applications where unsaved work might be lost after closure.

• Ensure that important data is saved before exiting, especially in programs like Microsoft Word, Excel, or other text editors.

Q25. Answer: (b) Heterophylly

The correct answer is Heterophylly.

Key Points

• Plasticity in plants refers to the ability of plants to adapt their growth and development in response to environmental conditions or genetic factors.

• Heterophylly is a classic example of plasticity in plants. It refers to the occurrence of more than one type of leaf shape on the same plant.

• There are three types of heterophylly observed in plants:

• Developmental heterophylly: Different types of leaves arise at different stages of development in a plant. Example: Cotton.

• Habitual heterophylly: Different forms of leaves occur due to environmental conditions. Example: Buttercup.

• Habitual heterophylly induced by genetic factors: Leaf variations arise due to genetic makeup. Example: Coriander.

• Heterophylly allows plants to optimize their physiological and ecological functions, such as photosynthesis, water absorption, and reproduction, adapting them better to their environment. Hence, the correct answer is Heterophylly.

Additional Information

• Phototropism:

• Phototropism is the growth movement of plants in response to light. It is not related to plasticity but is a directional growth mechanism. Example: Shoots grow towards light while roots grow away.

• This process involves the hormone auxin, which facilitates elongation of cells on the shaded side of the plant.

• Vernalisation:

• Vernalisation is the process of inducing flowering by exposing plants to prolonged cold temperatures. It is related to seasonal adaptation, not plasticity.

• For example, crops like wheat and barley require vernalisation for timely flowering.

• Photoperiodism:

• Photoperiodism refers to the response of plants to the duration of light and darkness in a day. It is responsible for regulating flowering and other physiological processes.

• Plants are categorized into short-day plants, long-day plants, and day-neutral plants based on their photoperiodic response.

Important Points

• Key Characteristics of Heterophylly:

• It is a form of adaptive plasticity that allows plants to survive in varying environmental conditions.

• Examples: Cotton, coriander, and buttercup demonstrate different forms of heterophylly.

• Heterophylly plays a critical role in enhancing the efficiency of photosynthesis and water use, ensuring better survival and reproduction.

Q26. Answer: (c) Telecom Centres of Excellence (TCoE)-India

The correct answer is Telecom Centres of Excellence (TCoE)-India.

Key Points

• The Centre of Excellence (CoE) on 'Classical and Quantum Communications for 6G' was inaugurated in July 2024 at the prestigious Indian Institute of Technology-Madras (IIT-Madras), one of India's leading technical institutions.

• This CoE functions under the umbrella of the Telecom Centres of Excellence (TCoE)-India programme, which is a government initiative aimed at fostering research, innovation, and skill development in the field of telecommunications. Hence, this statement is correct.

• TCoE-India was established as a public-private partnership model to bridge the gap between academia, industry, and the government for technological advancements in the telecom sector.

• The CoE on 'Classical and Quantum Communications for 6G' focuses on areas like quantum technologies, classical communication systems, and 6G advancements, which are critical for developing next-generation telecommunications systems.

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• The initiative is part of India's broader mission to lead in 6G communication technologies, ensuring technological self-reliance and global competitiveness in the telecommunications sector.

• The establishment of such CoEs is essential for fostering cutting-edge research, promoting industry-relevant innovations, and preparing India for the challenges of advanced communication technologies. Hence, the correct answer is Telecom Centres of Excellence (TCoE)-India.

Additional Information

• Telecom Centres of Excellence (TCoE)-India:

• Established: TCoE-India was initiated as a public-private partnership model under the Department of Telecommunications (DoT), Government of India, to drive telecom research and development.

• Purpose: The programme aims to foster collaboration between academia, industry, and the government to develop cutting-edge telecom technologies and solutions.

• Focus Areas: The TCoEs focus on 5G, 6G, IoT, AI, quantum technologies, and other emerging fields in telecommunications.

• Classical and Quantum Communications for 6G:

• Quantum Technologies: This CoE emphasizes research in quantum communication, which is a secure method of communication leveraging principles of quantum mechanics.

• Classical Communication: It also investigates advancements in traditional communication methods to support the transition to 6G networks.

• 6G Technologies: 6G is expected to provide ultra-fast data speeds, ultra-low latency, and support for massive device connectivity, making it integral for applications like smart cities, autonomous vehicles, and IoT.

• Other Options Explained:

• SAMARQAND: This is unrelated to the given context. It is not a programme under the Department of Telecommunications or related to the CoE at IIT-Madras.

• IN-SPACe: The Indian National Space Promotion and Authorization Center focuses on promoting private sector participation in India's space activities and is not related to telecom research.

• MeitY FutureNET: This programme is under the Ministry of Electronics and Information Technology (MeitY) and focuses on electronic hardware and IT but does not directly oversee the CoE for 6G communications.

Important Points

• Significance of 6G Research:

• 6G networks are expected to revolutionize communication with speeds up to 1 Tbps, enabling real-time data transfer for advanced applications like AR, VR, and AI-powered systems.

• India's focus on 6G research aligns with its ambition to become a global leader in telecom technology, reducing dependency on foreign technologies.

• Importance of Quantum Communication:

• Quantum communication ensures secure data transfer using principles like quantum entanglement, making it crucial for sectors like defense, banking, and governance.

Q27. Answer: (d) Articles 23–24

The correct answer is Articles 23–24.

Key Points

• Article 23: This article prohibits human trafficking and forced labor. It is aimed at preventing exploitation in various forms, such as bonded labor, slavery, and trafficking.

• Article 23 ensures that no person is subjected to exploitation or forced into labor against their will. It protects individuals from practices like begar (compulsory labor without payment), which was prevalent in pre-independence India.

• It also allows the state to impose compulsory service for public purposes, but without any discrimination based on religion, race, caste, or class. Hence, Article 23 is correct.

• Article 24: This article prohibits the employment of children below the age of 14 years in hazardous industries or workplaces.

• Article 24 aims to protect children from exploitation and ensures their rights to education and a safe childhood. It aligns with the Child Labour (Prohibition and Regulation) Act, 1986, which provides specific guidelines for safeguarding children. Hence, Article 24 is correct.

• Together, Articles 23 and 24 form the cornerstone of the Right against Exploitation in the Indian Constitution, ensuring protection from human trafficking, forced labor, and child labor. Hence, the correct answer is Articles 23–24.

Additional Information

• Right against Exploitation:

• This right is enshrined in Part III of the Indian Constitution and aims to protect individuals from practices that exploit their dignity, labor, or personal freedom.

• Article 23: Prevents exploitation such as bonded labor, human trafficking, and begar. The state can enforce service for public

purposes but cannot discriminate on grounds such as caste or religion.

• Article 24: Ensures the protection of children by prohibiting their employment in hazardous industries. It also supports their right to education as per the Right to Education Act (2009).

• Legislation Related to Right against Exploitation:

• Child Labour (Prohibition and Regulation) Act, 1986: This act prohibits the employment of children below 14 years in hazardous occupations and industries.

• Bonded Labour System (Abolition) Act, 1976: Abolishes bonded labor and provides for the rehabilitation of freed bonded laborers.

• International Conventions:

• India is a signatory to the UN Convention on the Rights of the Child, which mandates the protection of children from exploitation.

• India has ratified the International Labour Organization (ILO) conventions to combat forced labor and child labor.

Important Points

• Key Legal Framework:

• Article 23: Prevents exploitation through practices like begar, trafficking, and forced labor. It allows compulsory service for public purposes but prohibits discrimination.

• Article 24: Prevents the exploitation of children by banning their employment in hazardous industries.

• Recent Developments:

• 2016 Amendment: The Child Labour (Prohibition and Regulation) Amendment Act, 2016 expanded the scope of prohibited occupations for children and mandated stricter penalties for violators.

• Right to Education Act (2009): Ensures free and compulsory education for children aged 6–14 years, aligning with Article 24's intent to protect child rights.

Q28. Answer: (a) Delhi

The correct answer is Delhi.

Key Points

• 'Shishtachar' squad was launched by the police in Delhi in 2025 to address the growing issue of sexual harassment of women in public places.

• The squad aims to create a safe and secure environment for women by patrolling public areas, identifying offenders, and taking immediate action against them.

• The initiative is part of women-centric safety measures undertaken by the Delhi Police to curb incidents of harassment, stalking, and eve-teasing in crowded areas like markets, metro stations, and public transport.

• Shishtachar squad members include both male and female police officers who are trained to handle cases of harassment with sensitivity and ensure privacy for victims.

• The squad not only focuses on taking legal action against offenders but also on spreading awareness about women's safety and encouraging victims to report incidents. Hence, the correct answer is Delhi.

Additional Information

• Delhi Police:

• The Delhi Police functions under the administrative control of the Ministry of Home Affairs, Government of India. It is responsible for maintaining law and order and ensuring the safety of residents and visitors in the national capital.

• Delhi has seen a rise in crimes against women in recent years, prompting the police to implement various women-friendly initiatives like the 'Shishtachar' squad and other helpline services.

• Other Women Safety Initiatives:

• The 'Himmat' app launched by Delhi Police is a mobile-based application that allows women to send distress signals to the police during emergencies.

• The Pink Booths, set up in public places, offer a safe space for women to report crimes and seek immediate assistance.

• Several public awareness campaigns and self-defense training programs have been initiated to empower women in Delhi.

• Sexual Harassment in Public Places:

• Sexual harassment includes unwelcome physical advances, verbal remarks, or any behavior that causes discomfort to a person.

• It is a punishable offense under Section 354A of the Indian Penal Code (IPC), which prescribes penalties ranging from imprisonment for up to three years to monetary fines.

• Public places like markets, metro stations, and buses are often hotspots for such incidents, necessitating proactive measures like the 'Shishtachar' squad.

Important Points

• Key Features of the Shishtachar Squad:

• The squad is deployed at strategic locations like shopping malls, colleges, metro stations, and bus stops, where incidents of

sexual harassment are more likely to occur.

• The squad members wear distinctive uniforms to ensure their visibility and act as a deterrent for potential offenders.

• Significance of Women's Safety Initiatives:

• Such initiatives help in reducing crime rates and increasing women's confidence in using public spaces.

• They also promote awareness about legal rights and support mechanisms available to women in distress.

Q29. Answer: (d) NSO (National Statistical Office)

The correct answer is NSO (National Statistical Office).

Key Points

• Periodic Labour Force Survey (PLFS) is conducted by the National Statistical Office (NSO) under the Ministry of Statistics and Programme Implementation (MoSPI).

• The PLFS was launched in April 2017 to provide quarterly estimates of unemployment and labor force participation rates in urban areas and annual estimates for both urban and rural areas.

• The primary objective of the PLFS is to measure key indicators like the Worker Population Ratio (WPR), Labour Force Participation Rate (LFPR), and Unemployment Rate (UR). Hence, the statement regarding PLFS being conducted by NSO is correct.

• The NSO collects data through household surveys, providing insights into employment trends, sectoral distribution of workers, and gender-based workforce participation.

• The survey is critical for formulating policies to address unemployment and improving labor market conditions. Hence, the statement regarding its economic significance is correct.

• The NSO relies on a scientifically designed sampling method, ensuring data accuracy and representation of diverse socio-economic groups across India.

• The Ministry of Labour and Employment, RBI, and NITI Aayog do not conduct the PLFS but may use its findings for policy-making or economic analysis. Hence, these options are incorrect.

• Hence, the correct answer is NSO (National Statistical Office).

Additional Information

• Role of NSO:

• NSO operates under the Ministry of Statistics and Programme Implementation (MoSPI). It is responsible for conducting large-scale surveys to collect official statistics on various socio-economic parameters.

• The NSO provides data on employment, wages, household expenditure, health, education, and other vital indicators.

• Periodic Labour Force Survey (PLFS):

• The PLFS is the first of its kind survey launched in India to provide quarterly and annual estimates on labor force indicators.

• It focuses on understanding the employment-unemployment scenario and assists policymakers in designing strategies to address labor market challenges.

• Example: Data from the PLFS has been used to analyze the impact of events like the COVID-19 pandemic on employment in urban and rural areas.

• Uses of PLFS Data:

• The data helps in assessing the performance of various government schemes aimed at improving employment levels, such as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).

• It also provides insights into sectoral trends, such as the shift from agriculture to manufacturing and services over the years.

• The data supports research and analysis for addressing issues like gender disparities in the workforce, informal sector employment, and regional variations.

Important Points

• Key Characteristics of PLFS:

• The survey uses stratified sampling to ensure representation from all sections of society, focusing on urban and rural areas equally.

• It provides estimates based on age groups, gender, educational qualifications, and other demographic factors.

• Benefits for Policymaking:

• The data from PLFS is critical for evaluating the success of initiatives like Skill India and addressing regional unemployment variations.

• It aids in tracking the impact of policies focused on formalizing the informal sector and improving job quality.

• Helps in designing targeted programs for women empowerment and increasing their participation in the workforce.

Q30. Answer: (a) 12 May

The correct answer is Mon May 12 2025.

Key Points

• Buddha Purnima, also known as Vesak, is celebrated to mark the birth, enlightenment, and passing away of Lord Buddha, which all occurred on the same day according to the Buddhist tradition.

• The date of Buddha Purnima is determined based on the lunar calendar, specifically the full moon day in the month of Vaisakh (April-May).

• In 2025, Buddha Purnima falls on Monday, May 12, as per the lunar calendar and the alignment of the full moon. Hence, statement 1 is correct.

• The other dates mentioned in the options, such as March 23, April 10, and February 19, do not align with the lunar calendar or the traditional full moon of Vaisakh. Hence, these options are incorrect.

• Buddha Purnima is celebrated worldwide by Buddhists and other followers, and it is a public holiday in several countries, including India, Nepal, Sri Lanka, Myanmar, Thailand, Cambodia, and Indonesia.

Additional Information

• Significance of Buddha Purnima:

• Buddha Purnima commemorates three major events in Lord Buddha's life: his birth, his enlightenment (nirvana), and his death (parinirvana).

• It is celebrated by offering prayers, chanting, and meditating. Devotees also engage in acts of charity, distribute food, and visit monasteries.

• Celebration in India:

• In India, Buddha Purnima is observed with great devotion, particularly at sites associated with Lord Buddha, such as Bodh Gaya, Sarnath, and Kushinagar.

• The Mahabodhi Temple in Bodh Gaya becomes a focal point for celebrations, attracting pilgrims from all over the world.

• Global Observance:

• UN Vesak Day: The United Nations recognizes Vesak as the most significant day for Buddhists globally and celebrates it as a day of peace and spirituality.

• Countries like Sri Lanka, Myanmar, and Thailand host elaborate rituals and ceremonies, which include processions, prayer meetings, and cultural events.

Important Points

• Historical Background:

• Lord Buddha was born as Siddhartha Gautama in Lumbini, Nepal, around the 5th or 6th century BCE.

• He attained enlightenment under the Bodhi Tree in Bodh Gaya and propagated the teachings of Dhamma, emphasizing the Middle Path, compassion, and the cessation of suffering.

• Customs and Traditions:

• Devotees wear white clothing, abstain from non-vegetarian food, and engage in acts of charity and kindness.

• Rituals include bathing Buddha statues, decorating shrines, and lighting lamps as symbols of enlightenment.

Q31. Answer: (a) It permits tribunals for matters like taxation, land reforms, and labour disputes.

The correct answer is It permits tribunals for matters like taxation, land reforms, and labour disputes..

Key Points

• Article 323B of the Constitution of India empowers the legislature to establish tribunals for specific matters.

• It allows tribunals to deal with matters related to taxation, land reforms, industrial and labour disputes, ceiling on urban property, elections to Parliament and state legislatures, production and distribution of essential goods, and other specified matters.

• The tribunals under Article 323B are not restricted to any single domain but can cover various socio-economic and administrative issues. Hence, statement 1 is correct.

• The statement that Article 323B allows the creation of tribunals only for the armed forces is incorrect. Tribunals for the armed forces are governed by Article 323A.

• Article 323B does not restrict tribunals to environmental cases only. Environmental tribunals are governed by specific laws like the National Green Tribunal Act, 2010. Hence, statement 3 is incorrect.

• The statement that Article 323B empowers states to establish tribunals for local governance is also incorrect. Article 323B primarily focuses on tribunals for specific subjects at the national or state level but does not directly address local governance tribunals. Hence, statement 4 is incorrect.

• Thus, the correct answer is "It permits tribunals for matters like taxation, land reforms, and labour disputes."

Additional Information

• Article 323B of the Constitution:

• Article 323B allows the legislature to establish tribunals for adjudication or trial of disputes concerning specific matters mentioned in the Constitution.

• The matters include taxation, land reforms, ceiling on urban property, industrial and labour disputes, elections, production and distribution of essential goods, and other socio-economic concerns.

• Difference between Article 323A and Article 323B:

• Article 323A pertains exclusively to administrative tribunals dealing with service matters of public servants.

• Article 323B has a broader scope and addresses tribunals for socio-economic, tax-related, and other specified issues.

• Example: Administrative Tribunals under Article 323A and Tribunals like Income Tax Appellate Tribunal under Article 323B.

• Tribunals in India:

• Tribunals are quasi-judicial bodies that aim to reduce the burden on regular courts.

• Examples include the National Green Tribunal, Income Tax Appellate Tribunal, and Armed Forces Tribunal.

• Tribunals play a crucial role in ensuring speedy resolution of disputes and specialized adjudication.

Important Points

• Key Characteristics of Tribunals:

• Tribunals are established through legislative enactment and function independently of the regular judiciary.

• They are designed to handle specific disputes, ensuring expertise and efficiency in adjudication.

• Role of Tribunals in India:

• Tribunals help in reducing the workload of the judiciary and provide quicker resolutions.

• They also contribute to specialized justice delivery in areas like taxation, environmental protection, and labour disputes.

Q32. Answer: (b) Indo-Byzantine trade

The correct answer is Indo-Byzantine trade.

Key Points

• The transfer of silk production technology to Byzantium in the 6th century CE significantly impacted foreign trade relations, particularly the Indo-Byzantine trade.

• Byzantium, which previously imported silk from regions like India and China, began producing its own silk after learning the techniques from smuggled silkworms and skilled workers.

• This development reduced Byzantium’s dependence on Indian silk exports, affecting the volume and profitability of Indo-Byzantine trade. Hence, the Indo-Byzantine trade was badly affected.

• Silk production was a highly lucrative industry, and India was one of the major suppliers of silk to Byzantium before this technological transfer. The local production of silk in Byzantium disrupted this long-standing trade relationship.

• While other trades such as the Indo-Roman trade and Indo-Arab trade continued, the Indo-Byzantine trade suffered significantly due to the emergence of Byzantine silk production.

• The strategic advantage gained by Byzantium in producing silk locally led to a decline in the demand for Indian silk, which was previously sought after for its quality and craftsmanship.

• Byzantium also began exporting silk to other regions, competing directly with Indian silk producers. This further diminished India's share in the global silk trade during that period.

• Hence, the correct answer is Indo-Byzantine trade.

Additional Information

• Silk Trade in Ancient Times:

• Silk was highly valued in ancient times for its luxurious texture, aesthetic appeal, and durability. It became one of the most sought-after commodities for trade between Asia, Europe, and the Middle East.

• India was a major producer and exporter of silk, contributing significantly to the Indo-Roman trade and Indo-Byzantine trade. Indian silk was known for its fine craftsmanship and superior quality.

• Byzantium’s Silk Production:

• In the 6th century CE, Byzantine Emperor Justinian I facilitated the smuggling of silkworms from China. This marked the beginning of silk production in Byzantium.

• Byzantium developed its own silk industry, which helped the empire reduce reliance on imports from India and China, impacting the Indo-Byzantine trade.

• Impact on Trade Relations:

• The emergence of Byzantine silk production reduced India's role as a major supplier of silk, leading to a decline in Indo-Byzantine trade.

• Other trade routes, such as the Silk Road, continued to thrive, with China playing a dominant role in silk exports.

• The decline in Indo-Byzantine trade was more pronounced compared to Indo-Roman trade or Indo-Arab trade, which were less affected by silk production developments in Byzantium.

Important Points

• Key Characteristics of Other Trade Relations:

• Indo-Roman trade: Focused on the exchange of spices, textiles, precious stones, and other commodities. It was not significantly impacted by silk production in Byzantium.

• Indo-Persian trade: Involved the trade of textiles, luxury goods, and spices. Silk played a role, but the trade relations were not as dependent on silk as Indo-Byzantine trade.

• Indo-Arab trade: Centered around the trade of spices, pearls, and textiles. Silk was important but not the primary commodity in this trade route.

• Historical Significance:

• The rise of silk production in Byzantium is a notable example of how technological advancements can reshape global trade dynamics and impact the economic relationships between regions.

Q33. Answer: (a) Reducing financial exclusion

The correct answer is Reducing financial exclusion.

Key Points

• India's Digital Public Infrastructure (DPI) refers to an ecosystem of digital platforms and technologies designed to facilitate public service delivery and financial inclusion.

• At the BRICS meeting in 2025, a key benefit highlighted was the role of DPI in reducing financial exclusion, ensuring that underserved and marginalized populations have access to financial services. This statement is correct.

• Financial exclusion refers to the lack of access to formal financial services such as banking, credit, and insurance. India's DPI model, through initiatives like Aadhaar-enabled services and UPI (Unified Payments Interface), addresses this challenge effectively.

• The DPI model integrates digital identity (Aadhaar), payment systems (UPI), and mobile connectivity to create an inclusive financial system. This ensures that even people in rural and remote areas gain access to essential financial services.

• The success of India's DPI in reducing financial exclusion has been acknowledged globally, including at international forums like G20 and BRICS. This makes it a model for other developing economies to adopt and replicate.

Additional Information

• India's Digital Public Infrastructure (DPI):

• Launched: Key DPI initiatives like Aadhaar were launched in 2009, while UPI was introduced in 2016.

• Components: DPI comprises three main components:

• Digital Identity: Aadhaar, India's biometric-based unique identity system, enables authentication and financial inclusion.

• Digital Payments: UPI allows instant, interoperable, and low-cost digital payments.

• Data Empowerment: Platforms like DigiLocker and Account Aggregator facilitate secure digital data sharing.

• Global Adoption: Several developing countries, including Brazil and South Africa, are exploring India's DPI model to address their financial inclusion challenges.

• Benefits of DPI in Financial Inclusion:

• Enables direct benefit transfers (DBT), reducing leakages in government subsidies and ensuring timely delivery of funds.

• Facilitates access to banking services for underserved populations through initiatives like Jan Dhan Yojana.

• Promotes cashless transactions, reducing dependency on cash and enhancing transparency.

• Encourages innovation in fintech, with startups leveraging UPI and Aadhaar for new financial solutions.

• Other Options Explained:

• Exporting digital gadgets: While India has made advancements in electronics manufacturing, DPI is not directly focused on exporting digital gadgets. Hence, this option is incorrect.

• Promoting space exploration: India's achievements in space, such as ISRO's Chandrayaan missions, are separate from the DPI framework. Hence, this option is incorrect.

• Increasing tax rates: DPI aids in improving tax compliance through digitization but does not focus on increasing tax rates. Hence, this option is incorrect.

Important Points

• UPI Success: As of 2023, UPI processes over 9 billion transactions monthly, showcasing India's leadership in digital payments.

• Jan Dhan-Aadhaar-Mobile (JAM) Trinity: This trinity connects bank accounts, Aadhaar, and mobile numbers to streamline financial services delivery.

• Global Recognition: The World Bank and IMF have praised India's DPI model for its role in financial inclusion and poverty alleviation.

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Q34. Answer: (d) Rukmini Devi Arundale

The correct answer is Rukmini Devi Arundale.

Key Points

• Rukmini Devi Arundale was a pioneering Indian classical dancer who is credited with reviving and popularizing Bharatanatyam on a global scale.

• Bharatanatyam, originally a temple dance form, was seen as a dying art during the early 20th century. Rukmini Devi played a crucial role in transforming it into a widely respected and sophisticated art form.

• She introduced innovative elements to Bharatanatyam while preserving its traditional essence, making it accessible to a larger audience globally. Hence, the statement is correct.

• Rukmini Devi was the first woman to perform Bharatanatyam publicly, breaking societal stereotypes associated with the dance form. Her efforts greatly influenced its acceptance in modern Indian society.

• She founded the Kalakshetra Foundation in 1936, an institution dedicated to promoting Bharatanatyam and Carnatic music. It remains a premier cultural institution in India today.

• Rukmini Devi's contributions extended beyond Bharatanatyam, as she was also an advocate for animal rights and a theosophist. She was nominated to the Rajya Sabha in 1952.

• Hence, the correct answer is Rukmini Devi Arundale.

Additional Information

• Bharatanatyam:

• Bharatanatyam is one of the oldest classical dance forms in India, originating in Tamil Nadu. It was traditionally performed in temples as an act of devotion to deities.

• It combines three key elements: Bhava (expression), Raga (melody), and Tala (rhythm). It emphasizes intricate footwork, graceful movements, and elaborate expressions.

• Bharatanatyam is recognized as a significant cultural heritage of India and is performed globally today, thanks to the efforts of pioneers like Rukmini Devi.

• Other Options:

• Hema Malini: A celebrated Bollywood actress and trained Bharatanatyam dancer, but she is not primarily known for reviving or globally popularizing Bharatanatyam.

• Mallika Sarabhai: A renowned Kuchipudi and Bharatnatyam dancer and activist, but her contributions are not specific to popularizing Bharatanatyam globally.

• Sonal Mansingh: An acclaimed Odissi and Bharatanatyam dancer, but her work is more focused on promoting multiple classical dance forms rather than solely reviving Bharatanatyam.

Important Points

• Rukmini Devi's Legacy:

• She redefined Bharatanatyam by introducing themes from Indian epics, such as the Ramayana and Mahabharata, in her performances.

• Her efforts were instrumental in bringing a sense of respect and dignity to Bharatanatyam, which was earlier stigmatized.

• Kalakshetra Foundation:

• This institution is located in Chennai and promotes Bharatanatyam, Carnatic music, and other cultural art forms.

• The foundation has trained many renowned artists and continues to play a pivotal role in preserving India's cultural heritage.

Q35. Answer: (a) Kabir

The correct answer is Kabir.

Key Points

• Kabir, a 15th-century Indian mystic poet and saint, is renowned for employing the poetic style known as Ultabasi, also written as Ulatbansi.

• This style is characterized by the use of paradoxes and enigmatic expressions to convey profound spiritual truths and challenge conventional thinking.

• Ultabasi poetry often employs seemingly contradictory phrases that invite deeper introspection and reflection. Hence, Kabir's poetic style is associated with Ultabasi.

• Kabir's poetry transcends religious boundaries, promoting universal truths and emphasizing the need for inner realization over ritualistic practices.

• His verses were composed in vernacular languages like Hindi and Awadhi, making them accessible to the common people. Hence, Kabir is the correct answer.

Additional Information

• Characteristics of Kabir's Poetry:

• Kabir's poems, also known as Dohas, are short couplets that convey profound spiritual and philosophical messages.

• He used simple language infused with metaphors and allegories, making his poetry relatable to the common folk.

• Kabir's works emphasize themes of unity, love, and the futility of external rituals. He criticized blind adherence to religious practices and promoted introspection.

• Significance of Ultabasi:

• Ultabasi is a poetic style that uses paradoxical statements to provoke thought and challenge conventional beliefs.

• This style reflects Kabir's philosophy of breaking free from dogmas and emphasizing the inner truth.

• Comparison of Other Options:

• Agyeya: Agyeya was a modern Hindi poet and novelist known for experimental literature but not associated with Ultabasi.

• Bal Krishna Sharma Naveen: He was a nationalist poet known for patriotic themes, not related to Ultabasi.

• Ramdhari Singh Dinkar: Famous for his epic poetry, primarily focused on heroic and nationalist themes, but not associated with Ultabasi.

Important Points

• Historical Context of Kabir:

• Kabir lived during the 15th century in northern India and is believed to have been influenced by both Hindu and Muslim traditions.

• His teachings aimed to bridge the gap between religious communities and promote universal spiritual values.

• Ultabasi and Spiritual Philosophy:

• Ultabasi demonstrates Kabir's unique approach to spirituality, focusing on the inner realization rather than external religious practices.

• It challenges the reader or listener to think beyond literal meanings and uncover deeper truths.

Q36. Answer: (b) Criminal law

The correct answer is Criminal Law.

Key Points

• The Concurrent List is one of the three lists in the Seventh Schedule of the Indian Constitution. It includes subjects where both the Central and State Governments can legislate.

• Criminal Law is explicitly mentioned under the Concurrent List. This means that both the Parliament and State Legislatures can enact laws related to criminal offenses, procedures, and administration.

• Hence, the correct answer is Criminal Law.

• Banking falls under the Union List, which includes subjects where only the Central Government has the exclusive power to legislate. Hence, statement 1 is incorrect.

• Defence is also part of the Union List, as it is a subject that requires national-level coordination and cannot be handled at the state level. Hence, statement 3 is incorrect.

• Police falls under the State List, which means only State Governments can legislate and administer laws related to police matters. Hence, statement 4 is incorrect.

Additional Information

• Concurrent List:

• The Concurrent List consists of 52 subjects as per the Seventh Schedule of the Constitution of India.

• It includes topics such as education, marriage and divorce, bankruptcy, adoption, forests, and criminal law.

• Both the Central and State Governments can make laws on subjects mentioned in this list. However, in case of a conflict, the law enacted by the Central Government prevails.

• Union List:

• The Union List contains 97 subjects as per the original Constitution but currently includes 100 subjects. It empowers the Parliament to legislate on these matters.

• Examples include Banking, Defence, Foreign Affairs, Atomic Energy, and Communication.

• State List:

• The State List includes 66 subjects, where State Governments have exclusive legislative authority.

• Examples include Police, Public Health, Agriculture, and Local Government.

Important Points

• Key Facts:

• In case of a conflict between laws enacted by the Parliament and State Legislature on a Concurrent List subject, the Central law prevails.

• The inclusion of Criminal Law in the Concurrent List ensures a uniform system of criminal justice across the country.

• Historical Context:

• The Concurrent List was adopted from the Government of India Act, 1935, which also included a similar division of powers.

• This arrangement provides flexibility in governance, allowing both levels of government to address issues collaboratively.

Q37. Answer: (a) Jessica Gunning

The correct answer is Jessica Gunning.

Key Points

• Jessica Gunning won the Best Supporting Actress award for her role in Baby Reindeer at the BAFTA TV Awards, held at London's Royal Festival Hall in May 2025.

• The BAFTA TV Awards is one of the most prestigious awards ceremonies in the television industry, recognizing outstanding performances and contributions to television.

• Baby Reindeer is a critically acclaimed production that gained attention for its compelling narrative and outstanding performances. Hence, the recognition for Jessica Gunning is well-deserved.

• Jessica Gunning is known for her talent and versatility as an actress, and her performance in Baby Reindeer showcased her ability to portray complex characters with depth and emotion.

• Her win at the BAFTA TV Awards in 2025 further solidifies her reputation as one of the leading actresses in the television industry. Hence, the statement is correct.

Additional Information

• Jessica Gunning:

• Jessica Gunning is a British actress known for her performances in both television and theatre. Her ability to deliver powerful and nuanced performances has earned her recognition and awards.

• Her role in Baby Reindeer is particularly noted for its emotional depth and complexity, showcasing her skill as an actress.

• Baby Reindeer:

• Baby Reindeer is a critically acclaimed production that has received widespread praise for its storytelling and performances.

• The show addresses deep and thought-provoking themes, making it a standout piece in the television industry.

• BAFTA TV Awards:

• The BAFTA TV Awards are an annual event hosted by the British Academy of Film and Television Arts to celebrate outstanding contributions to the television industry.

• Winning a BAFTA award is considered one of the highest honors in the television industry and serves as a benchmark for excellence.

Important Points

• Other Nominees:

• Olivia Colman is an award-winning actress known for her roles in productions like The Crown. She was nominated for her exceptional performance but did not win this award.

• Helena Bonham Carter is another celebrated actress known for her roles in Harry Potter and The Crown. She was a strong contender but did not secure the award.

• Lesley Manville, a renowned actress, was also nominated for this award, showcasing her incredible talent in television.

• Significance of the Award:

• Winning the Best Supporting Actress award is a testament to an actor's skill and dedication to their craft.

• It highlights their contribution to the success of a production and their ability to bring characters to life in a meaningful way.

Q38. Answer: (a) Mountain ranges influence wind direction and intensity

The correct answer is Mountain ranges influence wind direction and intensity.

Key Points

• Mountain ranges play a significant role in influencing the direction and intensity of monsoon winds in India. When the southwest monsoon winds encounter the western ghats or the Himalayan ranges, they are forced to rise, leading to orographic rainfall. This explains why regions near these mountain ranges receive heavy rainfall.

• Wind movement: The southwest monsoon winds do not blow equally across India due to geographical barriers such as mountains, which cause variations in rainfall distribution. Hence, statement 2 is incorrect.

• The Himalayas: While the Himalayas act as a barrier that prevents the monsoon winds from moving northwards and helps concentrate rainfall in northern India, they do not stop all monsoon rainfall. Rain still occurs in various regions. Hence, statement 3 is incorrect.

• Southern states alone receiving all rainfall is an inaccurate statement. While southern states like Kerala and Karnataka receive significant rainfall due to proximity to the Arabian Sea and Western Ghats, other regions like northeastern India also experience heavy rainfall due to geographical factors. Hence, statement 4 is incorrect.

Additional Information

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• Factors affecting rainfall distribution:

• Geography of India: India's geography, including mountain ranges like the Western Ghats, Eastern Ghats, and the Himalayas, significantly influences rainfall distribution.

• Orographic rainfall: Regions near mountains experience heavy rainfall due to the moist air rising over mountain ranges. Example: Western Ghats receive heavy rainfall during the southwest monsoon.

• Pressure systems: Monsoon winds are driven by pressure differences between the Indian Ocean and the landmass of India. This impacts how rainfall is distributed across regions.

• Specific examples:

• Cherrapunji and Mawsynram in Meghalaya receive the highest rainfall in India due to their geographical location and proximity to the Khasi Hills.

• The Western Ghats receive heavy rainfall on their windward side, while the leeward side experiences scanty rainfall. Example: The rain shadow region of Maharashtra.

• The Deccan Plateau receives moderate rainfall as it is located away from the monsoon's direct path.

• Monsoon winds:

• Southwest monsoon winds originate from the Indian Ocean and bring rainfall to most parts of India during June to September.

• Regions like Rajasthan and parts of Gujarat receive less rainfall due to their geographical location and being far from the main path of monsoon winds.

Important Points

• Role of the Himalayas:

• The Himalayas act as a barrier, preventing the cold winds from Central Asia from entering India during the monsoon season.

• They also help retain the moisture-laden monsoon winds within the Indian subcontinent, contributing to rainfall.

• Rainfall variations:

• Regions like the Thar Desert receive minimal rainfall due to their geographical location and absence of topographical features to cause moisture uplift.

• Areas such as the northeastern states receive heavy rainfall due to their location and proximity to moisture-laden winds.

• Impact of Western Ghats:

• The Western Ghats cause heavy rainfall on the windward side but result in dry conditions on the leeward side, showcasing the role of orographic effects.

Q39. Answer: (b) National Industrial Classification-1998

The correct answer is National Industrial Classification-1998.

Key Points

• National Industrial Classification (NIC) is a statistical standard used for the classification of economic activities.

• The Central Statistical Organisation (CSO) of India introduced the National Industrial Classification-1998 to establish a standardized structure for categorizing economic activities.

• NIC-1998 is based on the International Standard Industrial Classification (ISIC), designed by the United Nations, ensuring global compatibility. Hence, option 2 is correct.

• It provides a detailed classification structure to categorize sectors such as agriculture, manufacturing, construction, trade, and services.

• The classification assists in collecting and analyzing data for various economic surveys, censuses, and reports conducted in India. Hence, option 2 is correct.

• NIC-1998 is extensively used for sectoral analysis, economic studies, and in the formulation of government policies in India.

• Other classifications like the hypothetical "Classification Code of India-2000," "Industrial Classification Structure-2005," and "National Code for Agriculture and Industrial Classification-2009" are not officially recognized by CSO, making them incorrect answers.

• Hence, the correct answer is National Industrial Classification-1998.

Additional Information

• National Industrial Classification (NIC):

• NIC is a framework developed by the Central Statistical Organisation (CSO), Ministry of Statistics and Programme Implementation (MoSPI), to classify economic activities in India.

• NIC classifications are revised periodically to adapt to the changing economic and industrial scenarios. The NIC-1998 was succeeded by NIC-2004 and later updated to NIC-2008.

• Applications of NIC:

• NIC is crucial for compiling and analyzing economic data such as GDP, employment, and industrial production.

• It is used in framing policies related to industries and services sectors, conducting economic surveys, and planning

developmental strategies.

• Example: The classification aids in identifying the contribution of agriculture, manufacturing, and service industries to the overall economy.

• Key Features of NIC-1998:

• NIC-1998 provides a hierarchical structure, including divisions, groups, and classes, to organize activities systematically.

• The classification ensures compatibility with international standards like the ISIC, facilitating comparative studies and international reporting.

• It includes all major economic activities such as agriculture, mining, manufacturing, construction, wholesale trade, retail trade, transport, and services.

Important Points

• Comparison with Other Classifications:

• The hypothetical classifications mentioned in the question, such as "Classification Code of India-2000" and others, do not exist in official records, making them irrelevant.

• NIC-1998 remains one of the most significant classifications introduced by CSO for the economic categorization of activities.

• Global Context:

• NIC aligns with international standards like the ISIC, ensuring data comparability across countries.

• This global compatibility is essential for international trade, economic agreements, and comparative studies.

Q40. Answer: (c) Defence Research & Development Organisation

The correct answer is Defence Research and Development Organisation (DRDO).

Key Points

• Defence Research and Development Organisation (DRDO) developed a nanoporous multilayered polymeric membrane for high-pressure seawater desalination in 2025. This innovation is a significant step in addressing water scarcity.

• The membrane is specifically designed to withstand high-pressure conditions, which are necessary for reverse osmosis desalination processes. This ensures durability and efficiency in water purification.

• The polymeric membrane is nanoporous, which means it has extremely small pores, allowing only water molecules to pass through, while blocking salts, contaminants, and impurities. Hence, the statement is correct.

• This development aims to provide a solution to the rising demand for freshwater, especially in regions where seawater desalination is a critical necessity.

• The DRDO, known for its contributions to India's defense technologies, has been diversifying into civilian technologies, including water purification systems. Hence, the statement is correct.

• This technological advancement can have applications in both military and civilian sectors, ensuring access to clean drinking water in remote areas and during disaster relief operations.

• This innovation aligns with India's broader goals of achieving sustainable development and addressing critical resource challenges, such as water scarcity.

• Hence, the correct answer is Defence Research and Development Organisation (DRDO).

Additional Information

• Defence Research and Development Organisation (DRDO):

• Established: 1958.

• Headquarters: New Delhi, India.

• Primary Role: DRDO is responsible for the research and development of technology for India's defense forces. Over time, it has expanded its scope to include technologies for civilian applications, such as water purification and disaster relief.

• Key Achievement: Development of advanced technologies like missile systems, radar systems, and now, nanoporous membranes for water desalination.

• Nanoporous Polymeric Membranes:

• Definition: These are membranes with nanoscale pores that filter out contaminants, salts, and impurities from water, making it drinkable.

• Applications: Used in reverse osmosis for seawater desalination, wastewater treatment, and industrial water purification.

• Advantages: High efficiency, durability under high pressure, and ability to produce clean water from saline or contaminated sources.

• Seawater Desalination:

• Importance: Provides a sustainable solution to freshwater scarcity, particularly in coastal and arid regions.

• Process: Includes methods like reverse osmosis, where high-pressure membranes remove salt and impurities from seawater.

• Global Context: Countries like Israel, Saudi Arabia, and the UAE extensively use desalination to meet their freshwater needs.

Important Points

• Water Scarcity:

• Global Issue: Water scarcity affects billions of people globally, making innovations like seawater desalination critical.

• Indian Context: India faces severe water shortages in many regions, necessitating advanced solutions like nanoporous membranes.

• Other Organizations:

• CSIR: Known for its contributions to scientific research, but not directly involved in this development.

• IISc: Specializes in academic and research contributions, primarily in collaboration with other institutions.

• BHEL: Focuses on power generation and infrastructure, with no direct involvement in desalination technology.

Q41. Answer: (d) 1380

Shortcut Trick

When a number is increased by 100%, it becomes twice its original value (100% + 100% = 200%).

=> 200% of the number = 2760

=> 100% of the number = 2760 ÷ 2 = 1380

Therefore The correct answer is 1380.

Alternate Method

Given:

Increased Value = 2760

Percentage Increase = 100%

Formula Used:

New Number = Original Number × (1 + Percentage Increase/100)

Calculations:

Let the original number be x.

=> x + (100% of x) = 2760

=> x + x = 2760

=> 2x = 2760

=> x = 2760 ÷ 2

=> x = 1380

Therefore The correct answer is 1380.

Additional Information

Percentage Increase

To increase a quantity by n%, multiply the original quantity by (100 + n)/100.

Percentage Change

Percentage change is calculated as (Change ÷ Original Value) × 100.

Base Change Property

If a number is increased by 100%, it becomes 200% of itself. To return to the original value, it must be decreased by 50%.

Q42. Answer: (c) 24 hours

Shortcut Trick

Time for P = 20 × (9/2) = 90 hours; Time for Q = 10 × (9/5) = 18 hours.

Let Total Work (LCM of 90, 18) = 90 units => Efficiencies: P = 1, Q = 5.

Work done in 3 hours = (1 + 5) × 3 = 18 units. Efficiency of R = 18/8 = 2.25 (emptying).

Combined Efficiency (P + Q − R) = 1 + 5 − 2.25 = 3.75 units/hr.

Time required = 90 ÷ 3.75 = 24 hours.

Therefore The correct answer is 24 hr.

Alternate Method

Pipe	Total Time (Full Tank)	Total Work	Efficiency
P	20 × (9/2) = 90 hr	90 units	90 ÷ 90 = 1
Q	10 × (9/5) = 18 hr	90 ÷ 18 = 5	

=> Water filled by P and Q in 3 hours = (1 + 5) × 3 = 18 units.

=> Efficiency of pipe R (emptying) = Water filled ÷ Time taken = 18 ÷ 8 = 2.25 units/hr.

=> Combined efficiency of P, Q, and R = Eff_P + Eff_Q − Eff_R

=> Combined efficiency = 1 + 5 − 2.25 = 3.75 units/hr.

=> Time to fill the empty tank together = Total Work ÷ Combined Efficiency

=> Time = 90 ÷ 3.75 = 24 hours.

Therefore The correct answer is 24 hr.

Additional Information

Total Work Concept

If a fraction 1/x of a tank is filled in 't' hours, the full tank is filled in (t × x) hours.

Pipes and Cisterns efficiency

Filling pipes have positive efficiency, while emptying/outlet pipes have negative efficiency.

Time formula

Time taken = Total Capacity ÷ Net Efficiency of all active pipes.

Q43. Answer: (b) Rs. 42,625

Shortcut Trick

Total profit = 5,977. M's share − N's share = 139.

M's profit = (5,977 + 139) ÷ 2 = 3,058. N's profit = 5,977 − 3,058 = 2,919.

Profit Ratio (M : N) = 3,058 : 2,919. Let N's investment be x and M's investment be (x + 31,000).

Ratio of Profit = (Capital_M × Time_M) : (Capital_N × Time_N).

((x + 31,000) × 2) ÷ (x × 7) = 3,058 ÷ 2,919 => (x + 31,000) ÷ 3.5x = 3,058 ÷ 2,919.

Solving for x: x = 11,625. M's capital = 11,625 + 31,000 = 42,625.

Therefore The correct answer is Rs. 42,625.

Alternate Method

Given: Total Profit = 5,977, Profit Difference = 139, Time_M = 2, Time_N = 7, Capital_M = Capital_N + 31,000.

Formula: Profit Ratio = (C1 × T1) : (C2 × T2)

=> Let M's profit be P_M and N's profit be P_N.

=> P_M + P_N = 5,977 and P_M − P_N = 139.

=> Adding both: 2P_M = 6,116 => P_M = 3,058. Thus, P_N = 2,919.

=> Let N's capital be x. Then M's capital is x + 31,000.

=> Ratio: (x + 31,000) × 2 ÷ (x × 7) = 3,058 ÷ 2,919.

=> (x + 31,000) ÷ 7x = 1,529 ÷ 2,919 => (x + 31,000) ÷ 7x = 509 ÷ 973.

=> 973x + 30,163,000 = 3,563x => 2,590x = 30,163,000 => x = 11,645.9... (Wait, recalculating: 2919 ÷ 3058 = 0.9545).

=> Simplified ratio: 2919 ÷ 7 = 417. 3058 ÷ 2 = 1529.

=> (x + 31,000) × 417 = 1,529x => 417x + 12,927,000 = 1,529x => 1,112x = 12,927,000.

=> x = 11,625. M's Capital = 11,625 + 31,000 = 42,625.

Therefore The correct answer is Rs. 42,625.

Additional Information

Partnership Investment Rule

When investments are for different time periods, the profit is shared in the ratio of the product of Capital and Time: P1 : P2 = C1 × T1 : C2 × T2.

Profit Distribution

If Total Profit (S) and Difference (D) are known, then Higher Share = (S + D) ÷ 2 and Lower Share = (S − D) ÷ 2.

Q44. Answer: (d) Rs. 288

Shortcut Trick

Total interest percentage = Interest Rate × Time

Total interest % = 4% × 6 months = 24%

Simple Interest = 24% of Rs. 1,200

SI = 0.24 × 1200 = 288

Therefore The correct answer is Rs. 288.

Alternate Method

Given:

Principal (P) = Rs. 1,200

Interest Rate (R) = 4% per month

Time (T) = 6 months

Formula Used:

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

Calculations:

=> SI = (1200 × 4 × 6) ÷ 100

=> SI = (1200 × 24) ÷ 100

=> SI = 12 × 24

=> SI = 288

Therefore The correct answer is Rs. 288.

Additional Information

Total Amount (A)

The total sum returned after the interest period, calculated as A = P + SI. For this case, A = 1200 + 288 = Rs. 1488.

Rate and Time Consistency

Always ensure the rate (R) and time (T) are in the same units (e.g., both monthly or both yearly) before applying the SI formula.

Simple Interest vs. Compound Interest

Simple Interest is calculated only on the principal amount, whereas Compound Interest is calculated on the principal plus the accumulated interest of previous periods.

Q45. Answer: (b) Rs. 166

Shortcut Trick

Let original costs be x for a pen and y for a pencil.

Case 1: 9x + 14y = 95

Case 2: 9(x − 3) + 3(y + 7) = 78 => 9x − 27 + 3y + 21 = 78 => 9x + 3y = 84.

Subtracting (2) from (1): 11y = 11 => y = 1. Putting y in (2): 9x + 3 = 84 => 9x = 81 => x = 9.

Total cost = 17 × 9 + 13 × 1 = 153 + 13 = 166.

Therefore The correct answer is Rs. 166.

Alternate Method

Given → 9 Pens + 14 Pencils = 95 and 9(Pen − 3) + 3(Pencil + 7) = 78.

Formulas: Total Cost = (Quantity1 × Price1) + (Quantity2 × Price2).

=> Let Pen = x and Pencil = y.

=> 9x + 14y = 95 --- (Eq. 1)

=> 9x − 27 + 3y + 21 = 78 => 9x + 3y = 84 --- (Eq. 2)

=> (Eq. 1) − (Eq. 2) gives 11y = 11 => y = 1.

=> Substitute y in Eq. 2: 9x + 3(1) = 84 => 9x = 81 => x = 9.

=> Required: 17(9) + 13(1) = 153 + 13 = 166.

Therefore The correct answer is Rs. 166.

Additional Information

Linear Equations in Two Variables

A system of equations ax + by = c can be solved using substitution or elimination methods to find individual unit costs.

Cost Calculation

Total Cost is derived by the summation of the products of unit price and quantity for each item category.

Q46. Answer: (c) −79x + 92

Shortcut Trick

Expand terms and cancel x^2 components: $3 \times (4/3)x^2 - 4x^2 = 0$.

Calculate x-coefficient: $(3 \times -21) - (4 \times 4) = -63 - 16 = -79x$.

Calculate constant: $(3 \times 12) - (4 \times -14) = 36 + 56 = 92$.

Therefore The correct answer is −79x + 92.

Alternate Method

Given Expression: $3((4/3)x^2-21x+12)-4(x^2+4x-14)$

Step 1: Multiply the first bracket by 3.

=> $3 \times (4/3)x^2 - 3 \times 21x + 3 \times 12$

=> $4x^2 - 63x + 36$

Step 2: Multiply the second bracket by 4 (careful with the minus sign).

=> $-4 \times x^2 - 4 \times 4x - 4 \times (-14)$

=> $-4x^2 - 16x + 56$

Step 3: Combine like terms.

=> $(4x^2 - 4x^2) + (-63x - 16x) + (36 + 56)$

=> $0x^2 - 79x + 92$

Therefore The correct answer is $-79x + 92$.

Additional Information

Distributive Property

The rule $a(b + c) = ab + ac$ is used to expand brackets by multiplying the outer term with every term inside.

BODMAS Rule

Always solve operations inside Brackets first, followed by Orders, Division/Multiplication, and finally Addition/Subtraction.

Sign Conventions

Multiplying two negative numbers results in a positive value: $(-) \times (-) = (+)$.

Q47. Answer: (b) 24

Shortcut Trick

The sides x, (x + 2), and (x + 4) are in an Arithmetic Progression with a common difference of 2.

In a right-angled triangle, the only triplet in AP is 3, 4, 5 or its multiples.

Since the difference is 2, the sides are 3×2, 4×2, 5×2 → 6, 8, 10.

Area = 1/2 × 6 × 8 = 24 cm^2 (matches given data).

Perimeter = 6 + 8 + 10 = 24 cm.

Therefore The correct answer is 24 cm.

Alternate Method

Given: Sides = x, x + 2, x + 4; Area = 24 cm^2

Formula Used: Area of Triangle = 1/2 × Base × Height; Perimeter = sum of all sides.

=> Area = $1/2 \times x \times (x + 2) = 24$

=> $x^2 + 2x = 48$

=> $x^2 + 2x - 48 = 0$

=> $x^2 + 8x - 6x - 48 = 0$

=> $x(x + 8) - 6(x + 8) = 0$

=> $(x - 6)(x + 8) = 0$ => $x = 6$ (as side cannot be negative)

=> Sides are 6 cm, 8 cm, and 10 cm.

=> Perimeter = 6 + 8 + 10 = 24 cm.

Therefore The correct answer is 24 cm.

Additional Information

Pythagorean Triplets

Sets of three integers (a, b, c) that satisfy $a^2 + b^2 = c^2$. Common examples: (3, 4, 5), (5, 12, 13), (8, 15, 17).

Right-Angled Triangle Area

The area is calculated using the two smaller sides (base and perpendicular): Area = (Product of legs) ÷ 2.

In-radius of Right Triangle

The radius of the inscribed circle is r = (Base + Perpendicular − Hypotenuse) ÷ 2.

Q48. Answer: (d) 84

Shortcut Trick

In triangle ABC, the third angle angle ACB = 180° − (70° + 62°) = 48°.

Since BC || AD, the alternate interior angle angle CAD = angle ACB = 48°.

In the isosceles triangle ACD (where AC = CD), the base angles are equal: angle ADC = angle CAD = 48°.

Thus, the vertex angle angle ACD = 180° − (48° + 48°) = 84°.

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Therefore The correct answer is 84°.

Alternate Method

Given:

In trapezium ABCD, BC || AD and AC = CD.

angle ABC = 70° and angle BAC = 62°.

Formula Used:

1. The sum of interior angles in a triangle is 180°.

2. Alternate interior angles formed by a transversal intersecting parallel lines are equal.

3. Angles opposite to equal sides in an isosceles triangle are equal.

Calculations:

Consider triangle ABC:

=> angle ABC + angle BAC + angle ACB = 180°

=> 70° + 62° + angle ACB = 180°

=> 132° + angle ACB = 180°

=> angle ACB = 180° − 132° = 48°

Since BC || AD and AC acts as a transversal line:

=> angle CAD = angle ACB = 48° (Alternate interior angles)

Now, consider triangle ACD:

Given that AC = CD, triangle ACD is an isosceles triangle.

=> angle ADC = angle CAD = 48° (Angles opposite to equal sides are equal)

Using the angle sum property in triangle ACD:

=> angle ACD + angle CAD + angle ADC = 180°

=> angle ACD + 48° + 48° = 180°

=> angle ACD + 96° = 180°

=> angle ACD = 180° − 96° = 84°

Option Evaluation:

=> Option (1) 92° is incorrect because the calculated value of angle ACD is 84°.

=> Option (2) 75° is incorrect because the calculated value of angle ACD is 84°.

=> Option (3) 82° is incorrect because the calculated value of angle ACD is 84°.

=> Option (4) 84° is correct because angle ACD = 180° − (48° + 48°) = 84°.

Therefore The correct answer is 84°.

Additional Information

Properties of a Trapezium

A trapezium is a quadrilateral with at least one pair of parallel sides. The consecutive interior angles along the non-parallel sides are supplementary (sum up to 180°).

Isosceles Triangle Theorem

If two sides of a triangle are congruent, then the angles opposite those sides are congruent. Conversely, if two angles of a triangle are congruent, then the sides opposite those angles are congruent.

Alternate Interior Angles Theorem

When two parallel lines are cut by a transversal, the alternate interior angles are equal in measure.

Q49. Answer: (d) -36

Given:

$3^2+\sqrt{(4^2)}-5\sqrt{81}-4$

Formula Used:

$a^2 = a \times a$

$\sqrt{(a^2)} = a$

Calculation:

$3^2+\sqrt{(4^2)}-5\sqrt{81}-4$

=> 9 + 4 - 5 × 9 - 4

=> 9 + 4 - 45 - 4 = -36

Therefore The correct answer is -36.

Q50. Answer: (a) 20

Shortcut Trick

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

Count the frequency of each mark in the given data:

11 → 1 time, 12 → 1 time, 14 → 1 time, 17 → 1 time, 18 → 1 time, 19 → 1 time, 20 → 4 times.

Since 20 has the highest frequency (4 times), the mode is 20.

Therefore The correct answer is 20.

Alternate Method

Given:

Marks scored by 10 students: 20, 20, 20, 19, 14, 18, 20, 12, 11, 17

Formula Used:

Mode = Value with the highest frequency in the given observation set.

Let us arrange the given data in ascending order to count the frequencies easily:

11, 12, 14, 17, 18, 19, 20, 20, 20, 20

Now, let us construct a frequency table for the given observations:

=> Frequency of 11 = 1

=> Frequency of 12 = 1

=> Frequency of 14 = 1

=> Frequency of 17 = 1

=> Frequency of 18 = 1

=> Frequency of 19 = 1

=> Frequency of 20 = 4

Comparing the frequencies, the mark 20 has the maximum frequency of 4.

=> Mode = 20

Why other options are incorrect:

=> Option (2) 14: The frequency of 14 is only 1, which is not the maximum.

=> Option (3) 19: The frequency of 19 is only 1, which is not the maximum.

=> Option (4) 18: The frequency of 18 is only 1, which is not the maximum.

Therefore The correct answer is 20.

Additional Information

Mean, Median, and Mode Relationship

For a moderately skewed distribution, the empirical relationship is: Mode = 3 × Median − 2 × Mean.

Types of Mode Distributions

A data set can have one mode (unimodal), two modes (bimodal), multiple modes (multimodal), or no mode if all values occur with equal frequency.

Median of Data

The median is the middlemost value when data is arranged in ascending order. For n = 10 (even), Median = [(5^(th) term + 6^(th) term) ÷ 2] = (18 + 19) ÷ 2 = 18.5.

Q51. Answer: (a) 25% loss

Shortcut Trick

If the Selling Price of 'x' articles equals the Cost Price of 'y' articles.

Gain or Loss percentage = (y − x) ÷ x × 100%.

Here x = 40 (articles sold) and y = 30 (articles costed).

Percentage = (30 − 40) ÷ 40 × 100% = −10 ÷ 40 × 100% = −25%.

The negative sign indicates a Loss.

Therefore The correct answer is 25% loss.

Alternate Method

Given: SP of 40 books = CP of 30 books.

Formulas: Loss = CP − SP | Loss% = (Loss ÷ CP) × 100 | SP/CP ratio method.

=> Let CP of 1 book be Re. 1.

=> CP of 40 books = Rs. 40.

=> Given: SP of 40 books = CP of 30 books = Rs. 30.

=> Loss = CP − SP = 40 − 30 = Rs. 10.

=> Loss% = (10 ÷ 40) × 100 = 25%.

Therefore The correct answer is 25% loss.

Additional Information

Cost Price (CP) vs Selling Price (SP)

When CP > SP, there is a Loss. Loss% = [(CP − SP) ÷ CP] × 100. Always calculate profit or loss on the Cost Price unless specified otherwise.

Ratio Method

Express the relation as a ratio: 40 × SP = 30 × CP => SP ÷ CP = 30 ÷ 40 = 3 ÷ 4. This directly shows that for every 4 units of cost, there is 1 unit of loss.

Q52. Answer: (d) Rs. 45

Shortcut Trick

Total days: February (5 days) + March (31 days) + April (25 days) = 61 days.

As 2024 is a leap year, total days = 366.

Time (T) = 61 ÷ 366 = 1/6 years.

Simple Interest = (4000 × 6.75 × 1) ÷ (100 × 6) = 40 × 1.125 = Rs. 45.

Therefore The correct answer is Rs. 45.

Alternate Method

Given:

Principal (P) = Rs. 4,000

Rate (R) = 6.75% per annum

Time Period: 24 February 2024 to 25 April 2024

Step-by-step Calculation:

=> Leap Year Check: 2024 is divisible by 4, so it has 366 days.

=> Days in Feb: 29 − 24 = 5 days.

=> Days in Mar: 31 days.

=> Days in Apr: 25 days.

=> Total Days: 5 + 31 + 25 = 61 days.

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

=> SI = (4000 × 6.75 × (61 ÷ 366)) ÷ 100

=> SI = (4000 × 6.75 × 1 ÷ 6) ÷ 100

=> SI = (40 × 6.75) ÷ 6

=> SI = 270 ÷ 6

=> SI = Rs. 45.

Therefore The correct answer is Rs. 45.

Additional Information

Leap Year Calculation

A leap year occurs every 4 years and contains 366 days (February has 29 days). For calculating interest, the denominator changes from 365 to 366.

Counting Days for Interest

In banking practice, the day of deposit is usually excluded and the day of withdrawal is included when calculating the interest period.

Simple Interest Formula

SI = (P × R × T) ÷ 100, where P is Principal, R is Rate per annum, and T is Time in years.

Q53. Answer: (a) 12.53

Given:

95^(0.53) = x

95^(0.83) = y

x^z = y^8

Formula Used:

a^m = b => log form used only for exponent comparison

$(a^m)^n = a^{(mn)}$

Calculation:

=> x = 95^(0.53)

=> y = 95^(0.83)

=> x^z = y^8

=> (95^(0.53))^z = (95^(0.83))^8

=> 95^(0.53z) = 95^(0.83 × 8)

=> 0.53z = 0.83 × 8

=> 0.53z = 6.64

=> z = 6.64 ÷ 0.53

=> z ≈ 12.53

Therefore The correct answer is 12.53.

Q54. Answer: (c) 14%

Shortcut Trick

Ratio of Males to Females = 228000 : (342000 − 228000) = 228 : 114 = 2 : 1.

Total Literacy % = 44% | Male Literacy % = 59%.

Using Alligation or Weighted Average: (2 × 59 + 1 × x) ÷ 3 = 44.

118 + x = 132 => x = 132 − 118 = 14%.

Therefore The correct answer is 14%.

Alternate Method

Given: Total Population = 342000, Males = 228000, Literacy = 44%.

=> Total Literate Population = 342000 × (44/100) = 150480.

=> Females in district = 342000 − 228000 = 114000.

=> Literate Males = 228000 × (59/100) = 134520.

=> Literate Females = 150480 − 134520 = 15960.

=> Female Literacy % = (15960 ÷ 114000) × 100 = 14%.

Therefore The correct answer is 14%.

Additional Information

Weighted Average Formula

Average = (n1x1 + n2x2) ÷ (n1 + n2), where n represents the quantity and x represents the percentage/value.

Alligation Method

Ratio of quantities = (Higher Value − Mean Value) : (Mean Value − Lower Value). Used to find ratios or missing percentages in mixtures.

Percentage Change

Percentage change = (Difference ÷ Original Value) × 100. Always ensure the base value is correct.

Q55. Answer: (d) 12:00 p.m.

Shortcut Trick

Time taken by Train A = 7 hours (7:55 a.m. to 2:55 p.m.)

Time taken by Train B = 5 hours (9:55 a.m. to 2:55 p.m.)

Let Total Distance = LCM of 7 and 5 = 35 units.

Relative Speed calculation after 9:55 a.m. (2 hours after Train A starts):

Train A covers 10 units in 2 hours. Remaining 25 units covered at combined speed (5 + 7 = 12 units/hr).

Meeting time = 9:55 a.m. + (25 ÷ 12) hours ≈ 9:55 a.m. + 2 hours 5 mins = 12:00 p.m.

Therefore The correct answer is 12:00 p.m.

Alternate Method

Given:

Train A: Start = 7:55 a.m., Arrival = 2:55 p.m. => Total Duration = 7 hours.

Train B: Start = 9:55 a.m., Arrival = 2:55 p.m. => Total Duration = 5 hours.

Calculations:

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Let the distance between M and N be D.
=> Speed of Train A (V_A) = D ÷ 7
=> Speed of Train B (V_B) = D ÷ 5
=> Distance covered by Train A in 2 hours (from 7:55 to 9:55) = (D ÷ 7) × 2 = 2D/7
=> Remaining distance at 9:55 a.m. = D − 2D/7 = 5D/7
=> Relative speed (opposite direction) = V_A + V_B = D/7 + D/5 = 12D/35
=> Time to meet = Remaining Distance ÷ Relative Speed = (5D/7) ÷ (12D/35)
=> Time to meet = (5/7) × (35/12) = 25/12 hours = 2 hours 5 minutes
=> Meeting time = 9:55 a.m. + 2 hours 5 minutes = 12:00 p.m.
Therefore The correct answer is 12:00 p.m.
Additional Information
Relative Speed Concept
When two objects move in opposite directions, their relative speed is the sum of their individual speeds (S1 + S2).
Time and Distance Relation
Distance = Speed × Time. If distance is constant, speed is inversely proportional to time (S prop. to 1/T).
Meeting Time Formula
Meeting Time = (Initial gap between objects) ÷ (Relative Speed).

Q56. Answer: (a) 400 : 711

Given:
79% of first number = four-ninths of second number
First number : Second number = ?
Formula Used:
Percentage formula: x% = x/100
Ratio formula: a/b = a : b
Calculation:
=> (79 ÷ 100) × First number = (4 ÷ 9) × Second number
=> 79 × First number = 400 × Second number
=> First number ÷ Second number = 400 ÷ 79
=> First number : Second number = 400 : 711
Therefore The correct answer is 400 : 711.

Q57. Answer: (b) 40,400

Shortcut Trick
Discount = 15% = 3/20. This means if MP = 20, then Discount = 3 and SP = 17.
According to the question, SP = 17 units = Rs. 34,340.
1 unit = 34,340 ÷ 17 = Rs. 2,020.
Marked Price (MP) = 20 units = 20 × 2,020 = Rs. 40,400.
Therefore The correct answer is Rs. 40,400.
Alternate Method
Given: Selling Price (SP) = Rs. 34,340, Discount Percentage = 15%.
Formula: MP = [SP × 100] ÷ [100 − Discount%]
=> Let the Marked Price be Rs. X.
=> X × (100 − 15) ÷ 100 = 34,340
=> X × 85 ÷ 100 = 34,340
=> X = (34,340 × 100) ÷ 85
=> X = 40,400
Therefore The correct answer is Rs. 40,400.
Additional Information
Marked Price & Discount
The Marked Price (MP) is the price printed on the label. Discount is always calculated on the MP. SP = MP − Discount.
Relationship between CP and MP

CP ÷ MP = (100 − D%) ÷ (100 + P%), where D% is discount and P% is profit.

Q58. Answer: (d) 31, 21

Shortcut Trick

Check options for Sum = 52 and LCM = 651.

Option 3: 29 + 23 = 52, but 29 × 23 = 667 (Both prime).

Option 4: 31 + 21 = 52. Since 21 = 3 × 7 and 31 is prime, LCM = 31 × 3 × 7 = 651.

Therefore The correct answer is 31, 21.

Alternate Method

Given: Sum (x + y) = 52, LCM(x, y) = 651.

Formula: Product of two numbers = HCF × LCM.

=> Factorize LCM 651: 651 = 3 × 7 × 31 = 21 × 31.

=> Let the numbers be 31 and 21.

=> Check Sum: 31 + 21 = 52. (Satisfied)

=> Check LCM: Since HCF(31, 21) = 1, LCM = 31 × 21 = 651. (Satisfied)

Therefore The correct answer is 31, 21.

Additional Information

Product Rule

For any two numbers a and b, a × b = HCF(a, b) × LCM(a, b).

HCF and Sum Property

The HCF of two numbers is also a factor of their sum and their difference.

Co-prime Numbers

If two numbers are co-prime (HCF = 1), their LCM is simply their product.

Q59. Answer: (d) 37/30

Given:

5/4+(1/(1+5/7))-3/5

Formula Used:

For fractions: a/b ÷ c/d = (a × d) / (b × c)

For subtraction: a/b - c/d = (ad - bc) / bd

Calculation:

5/4+(1/(1+5/7))-3/5

=> 5/4+(1/(12/7))-3/5

=> 5/4+(7/12)-3/5

=> (75 + 35 - 36)/60

=> 74/60

=> 37/30

Therefore The correct answer is 37/30.

Q60. Answer: (a) 4096π cm²

Shortcut Trick

Diameter (d) = 64 cm => Radius (r) = 32 cm.

Surface Area of sphere = $4\pi r^2$.

Calculation: $4 \times \pi \times (32)^2 = 4 \times \pi \times 1024 = 4096\pi$ cm².

Therefore The correct answer is 4096π cm².

Alternate Method

Given:

Diameter of the sphere (d) = 64 cm

Formula Used:

Radius (r) = d ÷ 2

Surface Area (A) = $4\pi r^2$

Calculations:

=> Radius (r) = 64 ÷ 2 = 32 cm

=> Surface Area = 4 × π × $(32)^2$

=> Surface Area = 4 × π × 1024

=> Surface Area = 4096π cm^2

Therefore The correct answer is 4096π cm^2.

Additional Information

Volume of a Sphere

The amount of space inside a sphere is given by $V = (4/3)\pi r^3$.

Surface Area of a Hemisphere

Curved Surface Area = $2\pi r^2$ and Total Surface Area = $3\pi r^2$.

Radius vs Diameter

The radius is exactly half of the diameter (r = d/2).

Q61. Answer: (a) $\text{cosec}^2\theta$ - 1

Shortcut Trick

Using Trigonometric Identities: $1 + \cot^2\theta = \text{cosec}^2\theta$ and $1 + \tan^2\theta = \sec^2\theta$.

Expression = $\text{cosec}^2\theta \div \sec^2\theta = (1/\sin^2\theta) \div (1/\cos^2\theta) = \cos^2\theta / \sin^2\theta = \cot^2\theta$.

Since $\cot^2\theta = \text{cosec}^2\theta - 1$, the result matches $\text{cosec}^2\theta - 1$.

Therefore The correct answer is $\text{cosec}^2\theta - 1$.

Alternate Method

Given: $(1 + \cot^2\theta) \div (1 + \tan^2\theta)$

Formula Used: $1 + \tan^2\theta = \sec^2\theta$; $1 + \cot^2\theta = \text{cosec}^2\theta$; $\cot\theta = \cos\theta / \sin\theta$

=> $(1 + \cot^2\theta) / (1 + \tan^2\theta)$

=> $\text{cosec}^2\theta / \sec^2\theta$

=> $(1 / \sin^2\theta) / (1 / \cos^2\theta)$

=> $\cos^2\theta / \sin^2\theta$

=> $\cot^2\theta$

=> $\text{cosec}^2\theta - 1$

Therefore The correct answer is $\text{cosec}^2\theta - 1$.

Additional Information

Pythagorean Identities

Standard relations: $\sin^2\theta + \cos^2\theta = 1$, $1 + \tan^2\theta = \sec^2\theta$, and $1 + \cot^2\theta = \text{cosec}^2\theta$.

Reciprocal Relations

$\text{cosec}\,\theta = 1/\sin\theta$, $\sec\theta = 1/\cos\theta$, and $\cot\theta = 1/\tan\theta$.

Ratio Identities

$\tan\theta = \sin\theta / \cos\theta$ and $\cot\theta = \cos\theta / \sin\theta$.

Q62. Answer: (c) 7.88%

Shortcut Trick

Use the Successive Percentage formula to find the Net Profit Percentage.

Net Change = a + b + (a × b) ÷ 100

Here, markup percentage a = 24% and discount percentage b = −13% (negative as it reduces price).

Net Profit% = 24 − 13 + (24 × (−13)) ÷ 100

Net Profit% = 11 − 312 ÷ 100 = 11 − 3.12 = 7.88%.

Therefore The correct answer is 7.88%.

Alternate Method

Given: Markup = 24%, Discount = 13%.

Formulas: MP = CP × (100 + Markup%) ÷ 100 | SP = MP × (100 − Discount%) ÷ 100 | Profit% = (SP − CP) ÷ CP × 100

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

=> Marked Price (MP) = 100 + 24% of 100 = 124.

=> Selling Price (SP) = MP − 13% of 124 = 124 − (0.13 × 124).

=> SP = 124 − 16.12 = 107.88.

=> Profit = SP − CP = 107.88 − 100 = 7.88.

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=> Profit% = (7.88 ÷ 100) × 100 = 7.88%.

Therefore The correct answer is 7.88%.

Additional Information

Relationship between CP and MP

The ratio of Marked Price to Cost Price can be expressed as: MP ÷ CP = (100 + Profit%) ÷ (100 − Discount%).

Marked Price & Discount

Discount is always calculated on the Marked Price (MP), while Profit or Loss is always calculated on the Cost Price (CP) unless stated otherwise.

Q63. Answer: (b) 12

Shortcut Trick

When the distance traveled is the same for both parts of the journey, use the harmonic mean formula.

Average Speed = (2 × s1 × s2) ÷ (s1 + s2)

Average Speed = (2 × 9 × 18) ÷ (9 + 18) = 324 ÷ 27 = 12 km/hr

Therefore The correct answer is 12 km/hr.

Alternate Method

Given: Speed from Bhopal to Indore (v1) = 9 km/hr, Speed from Indore to Bhopal (v2) = 18 km/hr.

Formula Used: Average Speed = Total Distance ÷ Total Time

=> Let the distance between Bhopal and Indore be 18 km (LCM of 9 and 18).

=> Time taken to go (t1) = 18 ÷ 9 = 2 hours.

=> Time taken to return (t2) = 18 ÷ 18 = 1 hour.

=> Total Distance = 18 + 18 = 36 km.

=> Total Time = 2 + 1 = 3 hours.

=> Average Speed = 36 ÷ 3 = 12 km/hr.

Therefore The correct answer is 12 km/hr.

Additional Information

Average Speed for Different Distances

If distances d1, d2 are covered with speeds v1, v2, then Average Speed = (d1 + d2) ÷ (d1/v1 + d2/v2).

Relative Speed

When two objects move in the opposite direction, relative speed = s1 + s2. In same direction, relative speed = |s1 − s2|.

Unit Conversion

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

Q64. Answer: (d) 23

Shortcut Trick

Let Mother = M and Daughter = D.

From given: M − 3D = 9 => M = 3D + 9.

Substitute in first eq: 2(3D + 9) − 5D = 25 => 6D + 18 − 5D = 25 => D = 7 years.

M = 3(7) + 9 = 30 years. Difference = 30 − 7 = 23 years.

Therefore The correct answer is 23 years.

Alternate Method

Given:

2 × Mother's age = 5 × Daughter's age + 25

3 × Daughter's age = Mother's age − 9

Calculations:

=> 2M − 5D = 25 --- (i)

=> M − 3D = 9 => M = 3D + 9 --- (ii)

Substitute (ii) in (i):

=> 2(3D + 9) − 5D = 25

=> 6D + 18 − 5D = 25

=> D = 25 − 18 = 7

Put D = 7 in (ii):

=> M = 3(7) + 9 = 21 + 9 = 30

Difference = M − D = 30 − 7 = 23

Therefore The correct answer is 23 years.

Additional Information

Linear Equations in Two Variables

Problems involving two unknown ages are best solved by forming a pair of linear equations and using the substitution or elimination method.

Age Difference Constant

The difference between the ages of two people remains constant regardless of how many years pass or go back.

Ratio Method in Ages

If ratios at different times are given, ensure the difference between ratio parts is equalized to find the age units quickly.

Q65. Answer: (a) 9

Shortcut Trick

To check divisibility by 9, find the sum of digits of the number.

Sum = 4 + 8 + 8 + 3 + 0 + 9 + 1 + 3 + 9 = 45.

Since 45 is divisible by 9, the entire number is divisible by 9.

Therefore The correct answer is 9.

Alternate Method

Given: The number is 488309139.

Divisibility Rules Check:

=> Rule for 9: Sum of digits must be a multiple of 9.

=> Sum = 4 + 8 + 8 + 3 + 0 + 9 + 1 + 3 + 9 = 45

=> 45 ÷ 9 = 5 (Remains 0), so it is divisible by 9.

=> Rule for 11: Difference between sum of odd-placed digits and even-placed digits must be 0 or 11.

=> (4+8+0+1+9) − (8+3+9+3) = 22 − 23 = −1 (Not divisible by 11).

=> Rule for 10: Unit digit must be 0 (Last digit is 9, so not divisible).

Therefore The correct answer is 9.

Additional Information

Divisibility by 3 and 9

A number is divisible by 3 if the sum of its digits is divisible by 3, and similarly for 9.

Divisibility by 11

Calculate the alternating sum of digits. If the result is 0 or a multiple of 11, the number is divisible by 11.

Divisibility by 13

Add 4 times the last digit to the remaining number. Repeat if necessary until the result is divisible by 13.

Q66. Answer: (d) 54.6

Shortcut Trick

Make the number of decimal places same for all numbers by adding zeros: 2.600 and 0.084.

Remove the decimals and find the LCM of integers 2600 and 84.

$2600 = 2^3 \times 5^2 \times 13$ and $84 = 2^2 \times 3 \times 7$.

LCM = $2^3 \times 5^2 \times 13 \times 3 \times 7 = 54600$. Put the decimal back at 3 places.

Therefore The correct answer is 54.6.

Alternate Method

Given: Numbers are 2.6 and 0.084.

Formula Used: LCM of fractions = (LCM of Numerators) ÷ (HCF of Denominators).

=> Convert decimals to fractions: 2.6 = 26/10 and 0.084 = 84/1000.

=> Simplify or equalize denominators: 2600/1000 and 84/1000.

=> LCM of Numerators (2600, 84):

=> 2600 = 2 × 2 × 2 × 5 × 5 × 13

=> 84 = 2 × 2 × 3 × 7

=> LCM = 2 × 2 × 2 × 5 × 5 × 13 × 3 × 7 = 54600

=> Result = 54600 ÷ 1000 = 54.6

Therefore The correct answer is 54.6.

Additional Information

LCM of Decimals

Always equate the number of decimal places before treating them as integers to avoid calculation errors.

HCF of Fractions

HCF of fractions is calculated as (HCF of Numerators) ÷ (LCM of Denominators).

Relationship between LCM and HCF

For two numbers A and B, the product of the numbers is equal to the product of their LCM and HCF: A × B = LCM × HCF.

Q67. Answer: (d) Rs. 348

Shortcut Trick

Profit distribution ratio = Investment ratio = 1220 : 1370 : 1110 = 122 : 137 : 111.

Total ratio parts = 122 + 137 + 111 = 370 units.

Given total profit of 370 units = Rs. 1,160.

Multiplier = 1,160 ÷ 370 = 3.135... (or 116 ÷ 37).

Kiran's share = 111 × (1160 ÷ 370) = 111 × (116 ÷ 37) = 3 × 116 = Rs. 348.

Therefore The correct answer is Rs. 348.

Alternate Method

Given: Investments of Amit = Rs. 1,220, Neha = Rs. 1,370, Kiran = Rs. 1,110. Total Profit = Rs. 1,160.

Formulas: Profit Share = (Individual Investment × Time) ÷ Total Investment. Since time is same, Profit Share prop. to Investment.

=> Ratio of investment = 1220 : 1370 : 1110 = 122 : 137 : 111.

=> Sum of ratios = 122 + 137 + 111 = 370.

=> Kiran's share = (Kiran's ratio ÷ Total ratio) × Total Profit.

=> Kiran's share = (111 ÷ 370) × 1160.

=> Kiran's share = 111 × (116 ÷ 37) = 111 × 3.135... = 348.

Therefore The correct answer is Rs. 348.

Additional Information

Partnership Ratios

When the time period of investment is the same for all partners, the profit is divided in the ratio of their initial investments.

Variable Time Investment

If partners invest for different durations, Profit Ratio = (Capital1 × Time1) : (Capital2 × Time2).

Q68. Answer: (d) 33.91

Shortcut Trick

Net deviation method: Assume the overall average is 43.

For the next 10 matches, the deviation is (13 − 43) = −30 per match.

Total negative deviation = 10 × (−30) = −300.

Average reduction across 33 matches = −300 ÷ 33 ≈ −9.09.

New average runs = 43 − 9.09 = 33.91.

Therefore The correct answer is 33.91.

Alternate Method

Given: Matches1 = 23, Average1 = 43 | Matches2 = 10, Average2 = 13.

Formula: Combined Average = (Sum of all runs) ÷ (Total matches)

=> Total runs in first 23 matches = 23 × 43 = 989

=> Total runs in next 10 matches = 10 × 13 = 130

=> Grand total runs = 989 + 130 = 1119

=> Total matches = 23 + 10 = 33

=> Overall average = 1119 ÷ 33

=> Overall average ≈ 33.9090...

=> Rounded average = 33.91

Therefore The correct answer is 33.91.

Additional Information

Weighted Average Formula

When two groups with averages A1 and A2 and sizes n1 and n2 are combined, the combined average is (n1A1 + n2A2) ÷ (n1 + n2).

Sum of Observations

The total sum of all observations is always calculated as Average × Number of Observations.

Concept of Net Deviation

In any distribution, the sum of deviations of all observations from the arithmetic mean is always zero.

Q69. Answer: (d) 975/17% loss

Shortcut TrickTotal Cost Price (CP) = 670 + 10 = 680.Selling Price (SP) = 290.Since SP < CP, there is a loss.Loss = 680 − 290 = 390.Loss% = (390 ÷ 680) × 100 = (39 ÷ 68) × 100 = (3900 ÷ 68)% = (975 ÷ 17)%.Therefore The correct answer is (975)/(17)% loss.Alternate Method

Given → Purchasing Price = 670, Overhead Expenses = 10, Selling Price (SP) = 290.

Formulas: Total CP = Purchasing Price + Overhead Expenses | Loss = CP − SP | Loss% = (Loss ÷ CP) × 100

=> Total Cost Price (CP) = 670 + 10 = 680.

=> Selling Price (SP) = 290.

=> Loss = 680 − 290 = 390.

=> Loss percentage = (390 ÷ 680) × 100.

=> Loss% = (3900 ÷ 68)% = (975 ÷ 17)%.

Therefore The correct answer is (975)/(17)% loss.Additional InformationTotal Cost PriceThe total cost price includes the original purchase price plus any overhead expenses like transportation, repairs, or decoration.Loss ConditionA loss occurs when the Selling Price (SP) is less than the total Cost Price (CP). Loss% is always calculated on the Cost Price.

Q70. Answer: (c) 4724/743 hours

Shortcut Trick

Combined Time = (A × B × C) ÷ (AB + BC + CA)

Product = 16 × 21 × 11 = 3696

Sum of products = (16 × 21) + (21 × 11) + (11 × 16) = 336 + 231 + 176 = 743

Time = 3696 ÷ 743 = 4(724/743) hours

Therefore The correct answer is 4(724/743) hr.

Alternate Method

Given: Pipe A = 16 hrs, Pipe B = 21 hrs, Pipe C = 11 hrs.

Person	Days	Total Work	Efficiency
Pipe A	16	3696	231
Pipe B	21	176	
Pipe C	11	336	

=> Total Work = LCM(16, 21, 11) = 3696 units

=> Combined Efficiency = 231 + 176 + 336 = 743 units/hr

=> Time taken = Total Work ÷ Combined Efficiency

=> Time = 3696 ÷ 743

=> Time = 4(724/743) hr

Therefore The correct answer is 4(724/743) hr.

Additional Information

Pipes and Cisterns Rule

If a pipe fills a tank in x hours, then the part filled in 1 hour = 1/x.

Inlet and Outlet Pipes

Inlet work is taken as positive (+) and outlet/leakage work is taken as negative (−) in net efficiency calculations.

Total Capacity

Total capacity of tank = L.C.M. of time taken by individual pipes to fill or empty the tank.

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Q71. Answer: (c) Brother

Family Chart:

Decoding the Symbols:

Symbol	•	•	×	÷
Meaning	Husband	Mother	Daughter	Brother

Given: G ÷ I x L + N – P

It means:

G is the Brother of I.

I is the Daughter of L.

Lis the Husband of N.

N is the Mother of P.

So, G is the 'Brother' of P.

Hence, the correct answer is "Option 3".

Q72. Answer: (b) Neither conclusion (I) nor (II) follows.

Given Statements:

Some cloth are handkerchief.

All towel are handkerchief.

The least possible Venn diagram for the given statement is:

Conclusions:

(I) Some cloth are towel:

From the statements, we only know that Cloth overlaps Handkerchief, and Towel is inside Handkerchief. The statements do not provide any direct or implied link between Cloth and Towel. The overlap is a possibility, but not a certainty.

Conclusion (I) does not follow.

(II) All handkerchief are towel:

The statement says "All towel are handkerchief", which is the opposite of the conclusion. In a standard Venn diagram, the Handkerchief circle is usually larger than the Towel circle or, at most, the same size. The statements do not allow for the Handkerchief circle to be smaller than the Towel circle.

Conclusion (II) does not follow.

Thus, Neither conclusion (I) nor (II) follows.

Hence, the correct answer is "Option 2".

Q73. Answer: (a) 2

Given: (Left) 2 4 & # $ 4 7 6 6 & 1 * $ 2 © 9 4 8 € $ * 4 (Right)

Now,

Numbers which is immediately preceded by a symbol and also immediately followed by a symbol.

So, Needed pattern is: Symbol - Number - Symbol.

There are 2 Numbers which is immediately preceded by a symbol and also immediately followed by a symbol.

Hence, the correct answer is 'Option 1'.

Q74. Answer: (d) 103

The logic followed here is:

Given: Total people = 126

Mr. Into is 11th from the right → his position from the left :

=> 126 − 11 + 1 = 116

Mr. Toni is 12th from the left:

So, People between them = (116 − 12) − 1 = 103

Hence, the correct answer is 'Option 4'.

Q75. Answer: (c) 3 km towards the west

Given:

Ram starts his journey from Point A.

He then drives 4 km towards the west, turns left and drives 7 km.

He then turns right and drives 5 km, again turns left and drives for 3 km.
After that he turns left and drives for 12 km.
He takes a final left turn, drives for 10 km and stops.
So, He should drive 3 km towards the west in order to reach Point A again.
Hence, the correct answer is "Option 3".

Q76. Answer: (d) 134

BODMAS Table:
Given equation: 13 − 5 ÷ 5 × 5 + 13 × 13 − 9 × 3 ÷ 3 − 108 = ?
Now, if '+' and '-' and '×' and '÷' are interchanged, then:
=> 13 + 5 × 5 ÷ 5 − 13 ÷ 13 + 9 ÷ 3 × 3 + 108 = ?
=> 13 + 25 ÷ 5 − 1 +3 × 3 + 108 = ?
=> 13 + 5 − 1 + 9 + 108 = ?
=> 17 − 1 + 9 + 108 = ?
=>18 + 9 + 108 = ?
=> 26 + 108 = 134.
Hence, the correct answer is "Option 4".

Q77. Answer: (c) 6

The logic followed here is:
'VAST' is coded as '7892'

V	A	S	T
7	8	9	2

'SAVE' is coded as '8629'

S	A	V	E
8	6	2	9

From SAVE = 8629, the last letter E corresponds to the last digit 9.
So, the code for E is 9.
Hence, the correct answer is 'Option 3'.

Q78. Answer: (b) KNZ

The logic followed here is:
Option 1) LNH
Option 2) KNZ
Option 3) OQK
Option 4)TVP
Here, 'KNZ' is odd among the given options.
Hence, the correct answer is "Option 2".

Q79. Answer: (c) 3

The logic followed here is:
'WAVE' is coded as '3257'

W	A	V	E
3	2	5	7

'VOLT' is coded as '1346'

V	O	L	T
1	3	4	6

V is common in both the words and 3 is common among both the codes.
So, the code for V is 3.

Hence, the correct answer is 'Option 1'.

Q80. Answer: (c) Only conclusion (I) follows.

Given Statements:

Some wigs are roses.

All roses are bugs.

The least possible Venn diagram for the given statement is:

Conclusions:

(I) Some wigs are bugs:

then those same wigs (which are roses) must also be bugs.

So, Conclusion (I) follows.

(II) All bugs are roses:

The statement says all roses are bugs, but it does not say that all bugs come from roses.

Thus, we cannot conclude that all bugs are roses.

So, Conclusion (II) does NOT follow.

So, Only conclusion (I) follows.

Hence, the correct answer is "Option 3".

Q81. Answer: (a) C

Given: Seven boxes A, B, C, D, K, L and O are kept one over the other but not necessarily in the same order.

1) No box is kept above B..

2) Only three boxes are kept between B and C.

3) Only one box is kept between D and L.

4) L is kept immediately above C.

5) Only four boxes are kept between D and K.

6) A is kept at some place above O.

B
D
A
L
C
O
K

So, 'C' is kept second below A.

Hence, the correct answer is "Option 1".

Q82. Answer: (a) 3

BODMAS Table:

Given equation: 20 ÷ 55 × 5 + 7 − 4 = ?

Now, if '+' and '-' and '×' and '÷' are interchanged, then:

=> 20 + 55 ÷ 5 − 7 × 4 = ?

=> 20 + 11 − 7 × 4 = ?

=> 20 + 11 − 28 = ?

=> 31 − 28 = 3

Hence, the correct answer is "Option 1".

Q83. Answer: (d) JB 1

The logic followed here is:

For, UP 16 is related to TK 4

For, YT 23 is related to XO 11

Similarly, for KG 13

So, KG 13 will be related to JB 1

Hence, the correct answer is "Option 4".

Q84. Answer: (d) BORN - NBRO - BNOR

Now,

WISE - EWSI - WEIS

PLUS - SPUL - PSLU

Let's check each Option One by One.

Option 1) PAWN - NPWA - PANW

P	A	W	N
1	2	3	4
N	A	N	W
4	2	3	3
P	A	N	W
4	2	4	3

Option 2) PAGE - EPAG - AGEP

P	A	G	E
1	2	3	4
E	P	A	G
4	1	2	3
A	G	E	P
2	3	4	1

Option 3) DOSE - ODSE - EOSD

D	O	S	E
1	2	3	4
O	D	S	E
2	1	3	4
E	O	S	D
4	2	3	1

Option 4) BORN - NBRO - BNOR

B	O	R	N
1	2	3	4
N	B	R	O
4	1	3	2
B	N	O	R
1	4	2	3

So, Only BORN - NBRO - BNOR follows the pattern of given letter cluster.

Hence, the correct answer is 'Option 4'.

Q85. Answer: (a) 2

Given: Seven people A, B, C, D, E, F and G are sitting in a row, facing north.

1) No one sits to the left of G.

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2) Only four people sit between G and A.
3) Only three people sit to the right of E.
4) D sits to the immediate left of F.
5) B is not an immediate neighbour of E.
So, 2 people sit to the right of C.
Hence, the correct answer is "Option 1".

Q86. Answer: (a) 62

Given:
Farooq's rank from the top = 28th
Farooq's rank from the bottom = 35th
Total students = (Rank from top) + (Rank from bottom) − 1
=> 28 + 35 − 1 = 62
Hence, the correct answer is 'Option 1'.

Q87. Answer: (b) 4 km to the North

Given:
Qadir starts from Point A and drives 1 km towards East.
He then takes a left turn, drives 3 km, turns left and drives 8 km.
He then takes a left turn and drives 7 km.
He takes a final left turn, drives 7 km and stops at Point P.
So, He should drive 4 km to the North in order to reach Point A again.
Hence, the correct answer is "Option 2".

Q88. Answer: (d) 12

Given numbers: 95423671
If 1 is subtracted from each odd digit of the number, we get
new number 84422660.
Digits repeated more than once: 4, 2, 6.
So, sum = 4 + 2 + 6 = 12.
Hence, the correct answer is 'Option 4'.

Q89. Answer: (c) ULR 16

The logic followed here is:
So, 'ULR 16' will replace the question mark in the given series.
Hence, the correct answer is "Option 3".

Q90. Answer: (d) 16

The logic followed here is:
thus, "16" will replace the question mark in the given series.
Hence, the correct option is "Option 4".

Q91. Answer: (d) One

The logic followed here is:
Given Number: 3875269
Sort the digits of 3875269 in ascending order: 2 3 5 6 7 8 9.
Only the digit 9 stays in the same (7th) position.
So, only one digit is same.
Hence, the correct answer is 'Option 4'.

Q92. Answer: (a) IEA

The logic followed here is:
Option 1) IEA
Option 2) XTQ

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Option 3) RNK

Option 4) FBY

Here, 'IEA' is odd among the given options.

Hence, the correct answer is "Option 1".

Q93. Answer: (d) UNM

The logic followed here is:

So, 'UNM' will replace the question mark in the given series.

Hence, the correct answer is "Option 4".

Q94. Answer: (a) None

Given: (Left) 284 517 639 741 425 (Right)

Now, 284, 517, 639, 741, 425

So, No number remains in the same position after arranging in descending order.

Hence, the correct answer is 'Option 1'.

Q95. Answer: (d) BEAM – EBAM – BAME

Now,

LOCK – OLCK – LCKO

ACNE – CANE – ANEC

Let's check each Option One by One.

Option 1) FROG – RFOG – ROGF

F	R	O	G
1	2	3	4
R	F	O	G
2	1	3	4
R	O	G	F
2	3	4	1

Option 2) OILS – IOLS – SILO

O	I	L	S
1	2	3	4
I	O	L	S
2	1	3	1
S	I	L	O
4	2	3	1

Option 3) HUNT – HNUT – TNUH

H	U	N	T
1	2	3	4
H	N	U	T
1	3	2	4
T	N	U	H
4	3	2	1

Option 4) BEAM – EBAM – BAME

B	E	A	M
1	2	3	4

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E	B	A	M
2	1	3	4
B	A	M	E
1	3	4	2

So, Only BEAM – EBAM – BAME follows the pattern of given letter cluster.
Hence, the correct answer is 'Option 4'.

Q96. Answer: (d) 107

The logic followed here is:
thus, "107" will replace the question mark in the given series.
Hence, the correct option is "Option 4".

Q97. Answer: (a) 43, 387

The logic followed here is:
Logic: The rule is: multiply the first number by 9 to get the second.
17, 153
=> 153÷17=9153 ÷ 17 = 9153÷17=9 => second = first × 9.
31, 279
=> 279÷31=9279 ÷ 31 = 9279÷31=9 => second = first × 9.
Now, checking the options:
Option 1) 43, 387
=> 43 × 9 = 387
Option 2) 35, 326
=> 35 × 9 = 315
Option 3) 22, 216
=> 22 × 9 = 198
Option 4) 14, 122
=> 14 × 9 = 126
Hence, the correct option is "Option 1"

Q98. Answer: (c) 297

The logic followed here is:
thus, "297" will replace the question mark in the given series.
Hence, the correct option is "Option 3".

Q99. Answer: (d) GB-EJ

The logic followed here is:
Option 1) LG-JN
Option 2) JE-HL
Option 3) OJ-MQ
Option 4) GB-EJ
Here, 'GB-EJ' is odd among the given options.
Hence, the correct answer is "Option 4".

Q100. Answer: (b) R

Given: L, M, N, O, Q, R and S are sitting around a circular table, facing the centre of the table.
1) M sits fourth to the left of O.
2) N is an immediate neighbour of O and R.
3) S sits to the immediate left of R.
4) Q is not an immediate neighbour of M.
Here, R sits third to the right of L.
Hence, the correct answer is "Option 2".

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