RRB NTPC CBT-I Official Paper (Held On: 3 April 2021 Shift 1) (Previous Year Paper)

RRB NTPC • 2021 • 100 questions • 90 minutes • Answer key and solutions

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Q1. If Rs. 1,313 is divided into three parts proportional to 1/3:3/5:3/4, then the second part is _____.

(a) Rs. 360
(b) Rs. 260
(c) Rs. 585
(d) Rs. 468

Q2. In a certain code language, DEFECT is written as FEDTCE. How will DEARTH be written as in that language?

(a) AEDHTR
(b) ADEHTR
(c) AEDHRT
(d) ADEHRT

Q3. What is the full form of MCB?

(a) Miniature Current breaker
(b) Miniature Circuit Breaker
(c) Mini Circuit Breaker
(d) Miniature Circuit Board

Q4. On which of the following rivers is Idukki Hydroelectric Project built?

(a) Kosi
(b) Ganga
(c) Tapti
(d) Periyar

Q5. If each side of square is increased by 20% then find the percentage change in its area.

(a) 20%
(b) 2.05%
(c) 40%
(d) 44%

Q6. P can complete a task in 10 days working 6 hours a day. Q can complete the same task in 9 days working 10 hours a day. If both P and Q work together working 6 hours a day, then in how many days can they complete the task?

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

Q7. Infant Mortality Rate (or IMR) indicates:

(a) the number of children who die before the age of one year as a proportion of 1000 live children born in that particular year
(b) the number of children who die before the age of six month as a proportion of 1000 live children born in that particular year
(c) the number of children who die before the age of two year as a proportion of 1000 live children born in that particular year
(d) the number of children who die before the age of three months as a proportion of 1000 live children born in that particular

year

Q8. Which of the following is an 'Earth Observation Satellite'?

(a) Youthsat
(b) INS-1A
(c) APPLE
(d) SARAL

Q9. Rs. 900 becomes Rs. 1,134 in 4 years at a certain rate of simple interest. If the rate of interest is increased by 3%, what amount will Rs. 900 become in 4 years?

(a) Rs. 1,234
(b) Rs. 1,242
(c) Rs. 1,200
(d) Rs. 1,248

Q10. When was the International Human Rights Commission established in Geneva?

(a) 31^(st)October, 2012
(b) 24^(th) December, 2003
(c) 12^(th) October, 1993
(d) 14^(th) November, 2015

Q11. AB and CD are two chords of a circle. AB = 6 cm, CD = 8 cm and AB || CD. If the distance between AB and CD is 7 cm and the centre of the circle lies in the interior of the quadrilateral ABCD, then find the radius of the circle (in cm).

(a) 5
(b) 7.5
(c) 8
(d) 10

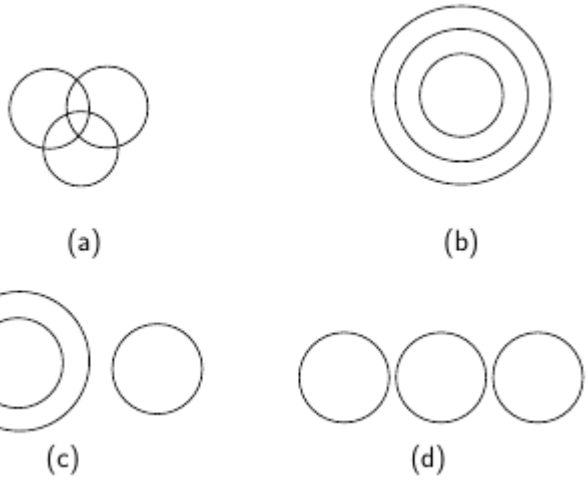
Q12. Seven houses A, B, C, D, E, F and H are built in a row (not necessarily in the same order) facing towards north. D is built at the extreme right. A and F are immediate neighbours of B. E is built immediate next to A. H is fourth to the right of B.

Three of the combinations listed in the options are alike in a certain way based on the position of the houses in the above arrangement. Identify the odd combination.

(a) HE
(b) CA
(c) AF
(d) BE

Q13. Select the Venn diagram that best represents the relationship among the given set of classes.

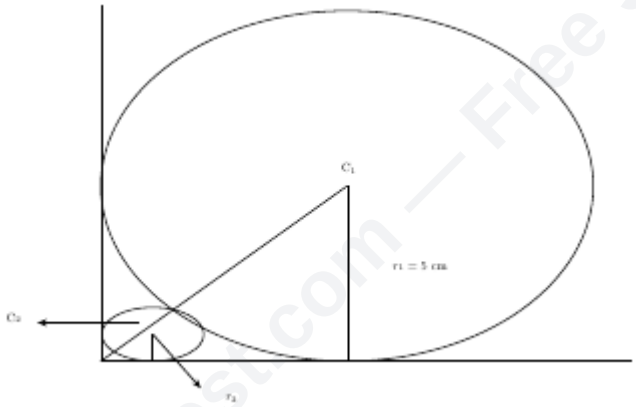
Boys, Football players, Cricket fans



(a) d

(b) b
(c) a
(d) c

Q14. A circle having centre c1, radius r1 = 5 cm is placed against a right angle. Another smaller circle having centre c2, radius r2 is also placed touching the sides of angle and the bigger circle as shown in the figure. Find the radius, r2 in cm, of the smaller circle.



(a) 5(3 - 2√2)
(b) 3(5 + 2√2)
(c) 3(5 - 2√2)
(d) 5(3 + 2√2)

Q15. The ratio of two numbers is 7 : 5. Their HCF is 3, their LCM is_____.

(a) 35
(b) 42
(c) 105
(d) 3

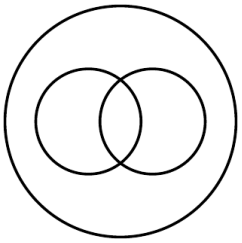
Q16. A hemispherical bowl of internal radius of 12 cm contains a liquid. This liquid is to be filled into conical shaped small bottles of base diameter 3 cm and height 4 cm. How many same type of bottles will be needed to empty the bowl?

(a) 520
(b) 384
(c) 438
(d) 400

Q17. Select the Venn diagram that best represents the relationship between the following classes.

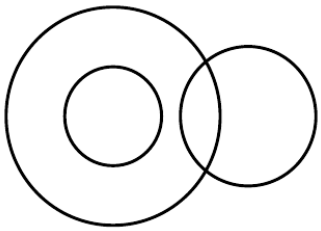
Milky Way, Jupiter, Earth

(a)

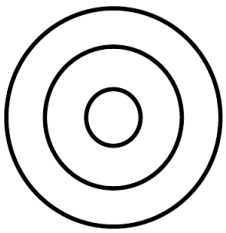


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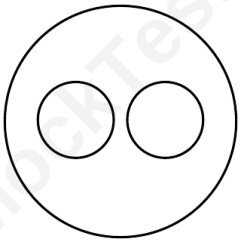
(b)



(c)



(d)



Q18. A computer on the Internet is identified by:

(a) password
(b) IP address
(c) cryptographic code
(d) E-mail address of the owner

Q19. Who among the following is sworn as new Prime minister of Italy in Feb, 2021?

(a) Mario Monti
(b) Matteo Renzi
(c) Mario Draghi
(d) Christine Legarde

Q20. As per UNESCO World Heritage Sites in India, identify the incorrect pair as per the year of inclusion.

(a) Red Fort, Delhi - 2007
(b) Agra Fort (UP) – 1983
(c) Sanchi Stupa (MP) – 1988
(d) Fatehpur Sikri (UP) – 1986

Q21. Two articles are sold by a trader. One of them is sold for 20% profit. Its selling price equals the cost price of the other article which is sold for 20% loss. Find the effective profit/loss percentage approximately.

(a) 4% loss
(b) 1.8% profit
(c) 1.8% loss
(d) 2.5% profit

Q22. Sarkaria Commission was set up in 1983 to:

(a) examine the feasibility of replacing the existing multiple taxes by an integrated Goods and Services Tax
(b) examine the relationship and balance of power between state and central governments and suggest changes
(c) recommend measures to clear backlog of cases in courts
(d) make recommendations regarding reservations in civil services and posts

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Q23. Find the value of $((759 + 253)^2 + (759 - 253)^2)/(759 \times 759 + 253 \times 253)$:

(a) 1012
(b) 2
(c) 0
(d) 1

Q24. Apart from the 22 scheduled languages in the Constitution of India, which other two languages have been recognised by the Sahitya Academy?

(a) Rajasthani and English
(b) Prakrit and Rajasthani
(c) Haryanvi and Punjabi
(d) English and Pali

Q25. 0.002 is what percent of 0.12?

(a) 6%
(b) 5%
(c) 5/3%
(d) 3/5%

Q26. The commonwealth of nations, normally known as 'The Commonwealth' is a:

(a) political association
(b) human rights association
(c) social organisation
(d) economic association

Q27. The 'Sangai' festival is celebrated in awhich of the following states of India?

(a) Manipur
(b) Tripura
(c) Nagaland
(d) Mizoram

Q28. Hirakud dam is built on the river:

(a) Brahmaputra
(b) Ganga
(c) Mahanadi
(d) Godavari

Q29. Looking at a photo Sachit said, "This woman gave birth to the brother of my father's only daughter." How is Sachit related to the husband of the woman?

(a) Son
(b) Daughter
(c) Sister
(d) Brother

Q30. Malala has penned a book on refugee girls titled:

(a) We are Displaced
(b) We are Deprived
(c) We are exploited
(d) Women Deprivation

Q31. A, B and C together can complete a task in 16 days. After, three of them worked together for 2 days, A left. B and C continued for 9 more days and then B left. C completed the remaining work work in 6 days. If C alone can complete the entire task in 24 days, then in how many days can B alone complete it?

(a) 30 days
(b) 32 days

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(c) 35 days
(d) 36 days

Q32. Who initiated the Young Bengal Movement?
(a) Ishwar Chandra Vidyasagar
(b) Raja Ram Mohan Roy
(c) Denis Clive
(d) Henry Vivian Derozio

Q33. Five members A, B, C, D and E have different heights. They play one among different games namely cricket, football, chess, tennis and volley ball. No two members play same game. A is shorter than only two members and plays football. The tallest member among them plays chess. B is taller than E but shorter than D. E plays Tennis and he is not the shortest.

Who among them plays chess?
(a) B
(b) C
(c) E
(d) D

Q34. The price of a car is Rs. 6,25,000. It was insured to 80% of its price. The car was damaged completely, and the insurance company paid 90% of the insurance. What was the difference between the price of the car and the amount received?
(a) Rs. 1,50,000
(b) Rs. 1,75,000
(c) Rs. 18,000
(d) Rs. 1,25,000

Q35. AB is the diameter of a semicircle. C is a point on line AB, AC = 6 cm, D is the point on the semicircle such that CD is perpendicular to AB and CD = 9 cm. Find the diameter of the semicircle.
(a) 15 cm
(b) 12 cm
(c) 19.5 cm
(d) 7.5 cm

Q36. A bag contains 50 paise, 25 paise and 10 paise coins in the ratio 9 : 5 : 6 amounting to Rs. 317.5. Find the number of coins of 25 paise.
(a) 450
(b) 600
(c) 250
(d) 300

Q37. Religious teacher Miyan Mir of the period between 1600 – 1700 belonged to:
(a) Uttar Pradesh
(b) Karnataka
(c) Punjab
(d) Haryana

Q38. Pipes A and B are fitted to a tank. A is the filling pipe and B can be used for filling or emptying at the same rate. When B is used for filling, it takes time ‘t’ along with A to fill the tank. If it is used for emptying when A is filling the tank, the time taken for the tank to fill up would be ‘5t’. Find the ratio of the rates of A and B.
(a) 2 : 3
(b) 1 : 3
(c) 5 : 1
(d) 3 : 2

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Q39. Name the Dutch who helped Raja Ram Mohan Roy in the promotion of modern education in India?

(a) Alexander Duff
(b) David Hare
(c) Grant Duff
(d) Derozio

Q40. The members of phylum _____ are exclusively free-living marine animals.

(a) Mollusca
(b) Nematoda
(c) Arthropoda
(d) Echinodermata

Q41. The capacity of a cylindrical tank is 38,500 litres. If the height is 4 metres, then what is the diameter of the base?

(a) 1.75 m
(b) 17.5 m
(c) 7 m
(d) 3.5 m

Q42. Solve the following:

1498 × 1498 = _____.

(a) 22,44,004
(b) 22,56,004
(c) 22,44,000
(d) 2,25,600

Q43. Sundarbans in West Bengal is an example of:

(a) mangrove forests
(b) tropical evergreen forests
(c) tropical deciduous forests
(d) montane forests

Q44. Who presided over the first session of Indian National Congress?

(a) S. N. Bannerjee
(b) Dada Bhai Naoroji
(c) W.C. Bannerjee
(d) A.O. Hume

Q45. Six boys B1, B2, B3, B4, B5 and B6 are sitting around a circular table facing towards the centre. (not necessarily in the same order). B1 sits second to the right of B4. B4 is neighbour of B6. B3 sits third to the left of B6. B2 is not neighbour of B1.

What is the position of B5 with respect to B2?

(a) Second to the right
(b) Second to the left
(c) Immediate right
(d) Immediate left

Q46. The LCM of two numbers is 315 and their HCF is 21, and the difference of the numbers is 42. The sum of the numbers is _____.

(a) 83
(b) 168
(c) 105
(d) 63

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Q47. Which of the following describes a drainage pattern resembling a dome like structure?

(a) Trellis
(b) Dendritic
(c) Radial
(d) Rectangular

Q48. The positive value of m for which the roots of the equation $12x^2 + mx + 6 = 0$ are in the ratio of 2 : 3 is _____.

(a) 30 √3
(b) 5 √3
(c) 6 √3
(d) 10 √3

Q49. Who was the 1^(st) Indian to be elected to the leadership of Communist International?

(a) Swami Vivekananda
(b) Subhash Chandra Bose
(c) Jawaharlal Nehru
(d) Manabendra Nath Roy

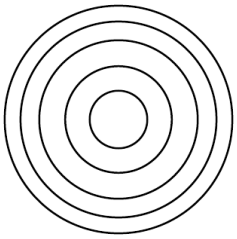
Q50. Three of the given options are alike in a certain way and so form a group. Which of the four options does NOT belong to the group?

(a) Equator
(b) Tropic of Capricorn
(c) Tropic of Cancer
(d) Prime Meridian

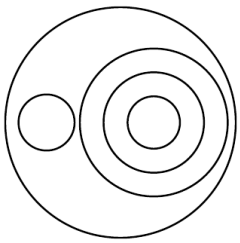
Q51. Select the Venn diagram that best represents the relationship between the following classes.

Real Numbers, Rational Numbers, Integers, Whole Numbers, Natural Numbers

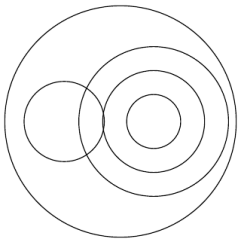
(a)



(b)

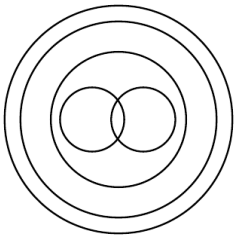


(c)



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(d)



Q52. Which of the following amendment granted financial powers to the panchayats and helped to strengthen the local government?

(a) 63^(rd) Amendment
(b) 73^(rd) Amendment
(c) 74^(th) Amendment
(d) 64^(th) Amendment

Q53. A milk vendor sells milk at 20% more than the cost price. Also, he adds 3 litres of water to every 5 litres of milk. Find his overall gain percent.

(a) 80%
(b) 25%
(c) 92%
(d) 60%

Q54. Which of the following states is NOT governed by 6^(th) schedule of Indian Constitution?

(a) Arunachal Pradesh
(b) Mizoram
(c) Tripura
(d) Assam

Q55. Which of the following is an example of an unorganised sector?

(a) Police
(b) Government jobs
(c) Farming
(d) Banks

Q56. Which of the following are the two components of the CPU of a computer?

(a) Control unit and Bus
(b) ALU and Bus
(c) Registers and Main memory
(d) Control unit and ALU

Q57. Two concentric circles form a circular path. The inner and outer circumferences of the path are 564/7 m and 942/7 m respectively. Find the width of the path.

(a) 6 m
(b) 9 m
(c) 3 m
(d) 2 m

Q58. Select the option that will fill in the blank and complete the given series.

0, 1, 8, 27, _____

(a) 64
(b) 56
(c) 63
(d) 54

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Q59. Select the option that will fill in the blank and complete the given series.

4, 5, 7, 13, 37, _____

(a) 85
(b) 157
(c) 87
(d) 158

Q60. Ubuntu, Mint and Fedora are versions of:

(a) Linux
(b) Windows 10
(c) MS DOS
(d) Apple MAC OS X

Q61. India and _____ signed an agreement to build Shahtoot Dam in Feb,2021.

(a) Bhutan
(b) Afghanistan
(c) Pakistan
(d) Bangladesh

Q62. If $x = 3 + \sqrt{5}$ and $y = 3 - \sqrt{5}$, then find the value of $x^2 + y^2$.

(a) 14
(b) 4
(c) 28
(d) 5

Q63. The perimeters of two squares are 48 cm and 60 cm. Find the perimeter of a third square whose area is equal to the difference of the area of the squares.

(a) 40 cm
(b) 32 cm
(c) 44 cm
(d) 36 cm

Q64. The term 'Isotope' refers to:-

(a) elements having same bond structure
(b) elements having same atomic number but different mass number
(c) elements having different atomic number but same mass number
(d) elements having same physical and chemical properties

Q65. Which of the following technologies has been used by China for its 'artificial sun'?

(a) Nuclear fission
(b) Electromagnetic induction
(c) Gravitational force
(d) Nuclear fusion

Q66. Select the option that will fill in the blank and complete the given series.

C1D3, D2F5, _____, F4J9

(a) E4H7
(b) E3G7
(c) E3H7
(d) E3H6

Q67. Which of the following personality was conferred the country's highest civilian award Bharat Ratna in 2019, for immense contributions in the field of education, health and rural self-reliance?

(a) Bhupen Hazarika
(b) Nanaji Deshmukh

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(c) Amartya Sen
(d) Pranab Mukherjee

Q68. There are 29 bones in the human head. Which of the following classifications is correct?
(a) Forehead-8, Facial-14, Ear-6, Hyoid-1
(b) Forehead-8, Facial-12, Ear-6, Hyoid-3
(c) Forehead-8, Facial-14, Ear-4, Hyoid-3
(d) Forehead-8, Facial-12, Ear-8, Hyoid-1

Q69. Which of the following is paired incorrectly (region-Grassland)?
(a) Central Asia – Steppe
(b) South Africa – Veld
(c) Argentina – Prairies
(d) Australia – Downs

Q70. Raj told Rahul, “Yesterday, I defeated the father of the only sister of my maternal uncle.” Whom did Raj defeat?
(a) Father’s Father
(b) Father’s Brother
(c) Mother’s Brother
(d) Mother’s Father

Q71. Find the value of (515.86 × 515.86 - 314.87 × 314.87)/200.99 :
(a) 201
(b) 830.73
(c) 200.19
(d) 83.073

Q72. The interest on a sum of money at 10% p.a. for 2 years with interest being compounded annually is Rs. 630. Find the simple interest (inRs.) on the sum at the same rate of interest for 3 years.
(a) 650
(b) 900
(c) 850
(d) 950

Q73. In how many categories did the Industrial Policy Resolution 1956 that formed the basis of 2^(nd) 5 year plan classified the industries?
(a) 3
(b) 5
(c) 4
(d) 2

Q74. MSP is the abbreviated form of:
(a) Maximum Sale Price
(b) Maximum Support Price
(c) Minimum Stock Price
(d) Minimum Support Price

Q75. 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:

1. All doctors are good.

2. Some men are doctors.

Conclusion:

I. All good doctors are men.

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II. Some men are good.

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

Q76. When was the RTI Act passed by the Indian Parliament and when did it get the Presidential assent?

(a) November 2005, December 2005
(b) August 2005, September 2005
(c) September 2005, October 2005
(d) May 2005, June 2005

Q77. The sum of the prime numbers between the integer greater than 8 and less than 59 is _____.

(a) 359
(b) 365
(c) 361
(d) 364

Q78. Which of the following straits connects the Arctic Ocean to the Pacific Ocean?

(a) Bering Strait
(b) Palk Strait
(c) Beaufort Strait
(d) Norwegian Strait

Q79. From which of the following countries has the aircraft Rafale been procured by Indian Defense ministry?

(a) Russia
(b) Mexico
(c) France
(d) Israel

Q80. If $(7 + 2\sqrt{5})/(11 + 3\sqrt{5}) = a + b\sqrt{5}$, then:

(a) $a = 1; b = \sqrt{5}$
(b) $a = \sqrt{5}; b = 1$
(c) $a = 47/76; b = 1/76$
(d) $a = 1/16; b = 47/76$

Q81. Two ships are sailing in the sea on two sides of a lighthouse. The angles of elevation of top of the lighthouse as observed from the two ships are 30° and 45° respectively. If the light house is 90 m high, then the distance between the two ships is _____.

(a) $90(\sqrt{3} – 1)$ m
(b) $90(\sqrt{3} + 1)$ m
(c) $90\sqrt{3}$ m
(d) 100 m

Q82. Three of the given options are alike in a certain way and so form a group. Which of the four options does NOT belong to the group?

(a) Vulture
(b) Kite
(c) Ostrich
(d) Eagle

Q83. The principal judicial organ of the United Nations is situated in:

(a) New York
(b) Geneva
(c) Vienna

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(d) Hague

Q84. Which of the following pairs of acid and the substance in which it is found is incorrectly matched?

(a) Acetic acid – Vinegar
(b) Oxalic acid – Spinach
(c) Lactic acid – Curd
(d) Ascorbic acid – Tamarind

Q85. The HCF of 17.5, 42 and 14 is _____.

(a) 0.07
(b) 3.5
(c) 7
(d) 70

Q86. The given table provides the classification of employees in a private firm in the years 2000 and 2002.

Category of Employees	Number in 2000	Number in 2002
Managers	19	19
Accountants	115	154
Programmers	134	173
Technicians	116	120
Analysts	32	133
Peons	96	149

Which category of employees among the given options have registered the highest percentage growth from 2000 to 2002?

(a) Programmers
(b) Accountants
(c) Managers
(d) Technicians

Q87. The given table provides the classification of employees in a private firm in the years 2000 to 2002.

Category of Employees	Number in 2000	Number in 2002
Managers	19	19
Accountants	115	154
Programmers	134	173
Technicians	116	120
Analysts	32	133
Peons	96	149

Based on the data provided above, which of the following statements is TRUE?

(a) The second highest increase in numbers from 2000 to 2002 was in category of Accountants.
(b) The total number of Programmers and Technicians in 2000 was less than 50% of the number of employees in these two categories in 2002.
(c) The number of Programmers, Technicians and Analysts together was more than 50% of the total employees in 2000.
(d) The percentage increase in the number of Programmers is higher than the percentage increase in the number of Peons.

Q88. Study the given table and answer the question that follows.

Category of Employees	Number in 2000	Number in 2002
Managers	19	19

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Accountants	115	154
Programmers	134	173
Technicians	116	120
Analysts	32	133
Peons	96	149

What is the approximate percentage increase in total strength of all employees from 2000 to 2002?

(a) 68%
(b) 32%
(c) 46%
(d) 146%

Q89. Study the given table and answer the question that follows.

Category of Employees	Number in 2000	Number in 2002
Managers	19	19
Accountants	115	154
Programmers	134	173
Technicians	116	120
Analysts	32	133
Peons	96	149

What is the approximate difference in the percentage increase of Accountants and Technicians between 2000 to 2002?

(a) 31%
(b) 25%
(c) 22%
(d) 34%

Q90. Select the option that is related to the third term in the same way as the second term is related to the first term.

Barber : Hair :: Tailor : ?

(a) Shirt
(b) Cloth
(c) Cut
(d) Sew

Q91. Select the option that will fill in the blank and complete the given series.

K33K, I24M, G15O, _____

(a) E06Q
(b) F06R
(c) E07Q
(d) F15Q

Q92. Select the option that is related to the third term in the same way as the second term is related to the first term.

Bricks : Kiln :: Coins : ?

(a) Mint
(b) Laboratory
(c) Factory
(d) Mine

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Q93. There are 20 pigeons, 10 cows, 15 dogs and some buffalos. If the total number of feet is 125 more than the heads, then what is the number of buffalos?

(a) 5
(b) 10
(c) 8
(d) 15

Q94. Three of the given options are alike in a certain way and so form a group. Which of the four options does NOT belong to the group?

(a) Railways
(b) Roadways
(c) Cargo
(d) Shipping

Q95. Select the option that will fill in the blank and complete the given series.

11, 14, 19, 26, _____, 46

(a) 30
(b) 37
(c) 35
(d) 34

Q96. Group captain is selecting 5 members out of A, B, C, D, E, F, P, Q, R and T for his team. A, E and F can only be selected together. If B is selected, then neither Q nor D can be selected. C cannot be selected with E or F. Only one can be selected from B or T.

Which of the following selection is correct?

(a) D, P, R, C, Q
(b) A, B, E, P, R
(c) B, P, R, C, T
(d) A, B, C, E, F

Q97. Read the given statement(s) and conclusions carefully and decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

1. All dogs are pets.

2. No pets is a tiger.

Conclusion:

I. All pets are dogs.

II. No dog is a tiger.

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

Q98. In a certain code language, PROBLEM is written as PSMEHJG. How will SPRINGS be written as in that language?

(a) SQPLJLM
(b) SQPLJLS
(c) SOPLJLS
(d) SQTLJLS

Q99. Select the option that will fill in the blank and complete the given series.

LS, QY, VE, _____

(a) AK
(b) BK
(c) BJ

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(d) AJ

Q100. Pointing to a photograph, a woman said to a man, “She is the only child of the sister of the only son of your paternal grandfather”. How is the man related to the person in the picture?

(a) Father
(b) Mother’s Brother’s Son
(c) Son
(d) Father’s Sister’s Son

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Rs. 468

Given:

If Rs. 1,313 is divided into three parts proportional to 1/3:3/5:3/4, then the second part is _____.

Formula used:

Let the parts be x, y, z respectively.

Then, x : y : z = 1/3 : 3/5 : 3/4

First, find a common multiple for the denominators: 3, 5, and 4.

LCM of 3, 5, 4 = 60.

So, x : y : z = 20 : 36 : 45.

Calculation:

Sum of parts = 20 + 36 + 45 = 101.

Total amount = Rs. 1,313.

=> y = (36/101) * 1313

=> y = Rs. 468

Therefore The correct answer is option (4).

Q2. Answer: (a) AEDHTR

The logic followed here is:

DEFECT is written as FEDTCE.

Similarly, DEARTH will be written as:

Hence, the correct answer is "AEDHTR".

Q3. Answer: (b) Miniature Circuit Breaker

The correct answer is Miniature Circuit Breaker.

Key Points

• A Miniature Circuit Breaker (MCB) is an automatically operated electrical switch designed to protect an electrical circuit from damage caused by excess current from an overload or short circuit.

• MCBs are used in residential, commercial, and industrial settings to provide reliable protection against electrical faults.

• They are more sensitive to changes in current compared to traditional fuses, which means they can provide more precise protection.

• MCBs can be easily reset after they trip, unlike fuses which need to be replaced after a fault condition.

Additional Information

• Circuit Breakers

• Circuit breakers are electrical devices designed to protect an electrical circuit from damage caused by overload or short circuit.

• They work by interrupting the flow of electricity when a fault is detected, preventing further damage to the circuit and connected devices.

• Circuit breakers come in various types, including Miniature Circuit Breakers (MCBs), Molded Case Circuit Breakers (MCCBs), and Residual Current Circuit Breakers (RCCBs).

• Unlike fuses, which need to be replaced after they blow, circuit breakers can be reset, making them more convenient and cost-effective in the long run.

• Overload Protection

• Overload protection is a feature of circuit breakers that prevents excessive current from flowing through an electrical circuit.

• When a circuit is overloaded, the circuit breaker trips and interrupts the flow of electricity, protecting the wiring and connected devices from damage.

• This is particularly important in residential and commercial settings where electrical devices and appliances are frequently used.

• Short Circuit Protection

• Short circuit protection is another crucial feature of circuit breakers.

• In the event of a short circuit, where a direct connection is made between the live and neutral wires, a large amount of current flows through the circuit.

• This sudden surge in current can cause significant damage to the wiring and connected devices, as well as pose a fire hazard.

• MCBs detect this surge in current and trip, interrupting the flow of electricity and preventing further damage.

Q4. Answer: (d) Periyar

The correct answer is Periyar.

Key Points

• The Idukki Hydroelectric Project is built on the Periyar River in the Indian state of Kerala.

• This project is one of the largest hydroelectric projects in India, with an installed capacity of 780 MW.

• The project is renowned for the Idukki Dam, which is a double curvature arch dam and one of the highest of its kind in Asia.

• The dam is built between two mountains, Kuravan and Kurathi, and it creates a reservoir with a capacity of 2,000 million cubic meters.

Additional Information

• Periyar River:

• The Periyar River is the longest river in the state of Kerala, India, with a length of 244 km.

• It originates from the Sivagiri peaks of the Western Ghats and flows through the state, providing water for irrigation, drinking, and power generation.

• The river is also known as the Lifeline of Kerala due to its immense importance in the socio-economic and environmental landscape of the region.

• Idukki Dam:

• The Idukki Dam, part of the Idukki Hydroelectric Project, is one of the highest arch dams in Asia, standing at 168.91 meters (554 feet).

• It was constructed by the Kerala State Electricity Board (KSEB) and was commissioned in 1976.

• The dam plays a crucial role in power generation, flood control, and irrigation for the state of Kerala.

• Hydroelectric Power:

• Hydroelectric power is a form of renewable energy that utilizes the energy of flowing or falling water to generate electricity.

• It is one of the most widely used forms of renewable energy due to its ability to generate large amounts of power with low operational costs and minimal environmental impact.

• Hydroelectric projects like the Idukki Hydroelectric Project play a significant role in meeting the energy needs of a region while contributing to sustainable development.

Q5. Answer: (d) 44%

Given:

If each side of square is increased by 20% then find the percentage change in its area.

Formula used:

New Side Length = Original Side Length × (1 + Percentage Increase)

New Area = (New Side Length)²

Percentage Change in Area = (New Area - Original Area)/(Original Area) × 100

Calculation:

Let original side length = a

New Side Length = a × (1 + 0.20) = 1.2a

Original Area = a^2

New Area = $(1.2a)^2 = 1.44a^2$

Percentage Change in Area = $(1.44a^2 - a^2)/(a^2) \times 100$

=> $(0.44a^2)/(a^2) \times 100$

=> 0.44×100

=> 44%

Therefore The correct answer is option (4).

Q6. Answer: (a) 6 days

Given:

P can complete a task in 10 days working 6 hours a day.

Q can complete the same task in 9 days working 10 hours a day.

Both P and Q work together working 6 hours a day.

Formula used:

Work done by P in 1 hour = Total work / (Number of days × Hours per day)

Work done by Q in 1 hour = Total work / (Number of days × Hours per day)

Work done by P and Q together in 1 hour = Work done by P in 1 hour + Work done by Q in 1 hour

Time taken by P and Q together = Total work / Work done by P and Q together in 1 hour

Calculation:

Work done by P in 1 hour:

=> 1 / (10 × 6) = 1 / 60

Work done by Q in 1 hour:

=> 1 / (9 × 10) = 1 / 90

Work done by P and Q together in 1 hour:

=> 1 / 60 + 1 / 90

=> (3 + 2) / 180

=> 5 / 180

=> 1 / 36

Time taken by P and Q together working 6 hours a day:

=> Total work / (Work done by P and Q together in 1 hour × 6)

=> ()1 / {(1 / 36) × 6}

=> 1 / (1 / 6)

=> 6 days

Therefore The correct answer is option 1.

Q7. Answer: (a) the number of children who die before the age of one year as a proportion of 1000 live children born in tha...

The correct answer is the number of children who die before the age of one year as a proportion of 1000 live children born in that particular year.

Key Points

• Infant Mortality Rate (IMR) is a crucial indicator of the overall health of a population, particularly reflecting the health conditions and quality of medical services available to infants and mothers.

• IMR is defined as the number of deaths of infants under one year old per 1,000 live births in a given year, providing a snapshot

of the mortality risks faced by infants.

• A high IMR suggests poor socio-economic conditions, inadequate healthcare, and issues such as malnutrition and infections among infants and mothers.

• Efforts to reduce IMR typically involve improving maternal health care, ensuring adequate nutrition, and enhancing medical facilities and services for both mothers and infants.

Additional Information

• Maternal Mortality Rate (MMR)

• MMR is the number of maternal deaths during pregnancy, childbirth, or within 42 days of termination of pregnancy, per 100,000 live births.

• It is an important indicator of the quality of health care systems in a country, especially concerning maternal health.

• High MMR can indicate inadequate healthcare services, poor access to medical care, and other socio-economic issues.

• Under-Five Mortality Rate (U5MR)

• U5MR is the number of deaths of children under five years of age per 1,000 live births.

• It reflects the overall health environment, including factors like nutrition, sanitation, and access to medical care.

• Reducing U5MR is a global health priority, often targeted by international health initiatives and sustainable development goals.

• Neonatal Mortality Rate (NMR)

• NMR is the number of deaths of infants within the first 28 days of life per 1,000 live births.

• It is an indicator of the conditions during pregnancy and the immediate postnatal period.

• Efforts to reduce NMR focus on improving maternal and newborn care, including skilled birth attendance and neonatal intensive care.

• Perinatal Mortality Rate (PMR)

• PMR is the number of stillbirths and deaths within the first week of life per 1,000 total births.

• It provides insights into the health of the fetus and the quality of obstetric and immediate postnatal care.

• High PMR can indicate issues with maternal health, complications during delivery, or inadequate neonatal care.

Q8. Answer: (d) SARAL

The correct answer is SARAL.

Key Points

• SARAL stands for Satellite with ARgos and ALtiKa.

• SARAL is a joint Indo-French satellite mission for oceanographic studies.

• The satellite carries an altimeter (AltiKa) for studying ocean surface topography and a data collection system (ARGOS).

• SARAL helps in climate research and operational oceanography by providing precise information on sea surface heights.

Additional Information

• Earth Observation Satellites

• Earth Observation Satellites are used to monitor and assess the Earth's environment and climate.

• These satellites provide valuable data for applications such as weather forecasting, environmental monitoring, and disaster management.

• They are equipped with sensors and instruments to capture images and other data about the Earth's surface and atmosphere.

• Youthsat

• Youthsat is a joint Indo-Russian satellite for stellar and atmospheric studies.

• It aims to understand the relationship between solar variability and thermosphere-ionosphere changes.

• Youthsat is not primarily an Earth Observation Satellite.

• INS-1A

• INS-1A is an Indian Nano Satellite.

• It is used for technology demonstration and scientific research.

• INS-1A is not specifically designed for Earth observation.

• APPLE

• APPLE stands for Ariane Passenger Payload Experiment.

• It was India's first experimental geostationary communication satellite.

• APPLE is not an Earth Observation Satellite.

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Q9. Answer: (b) Rs. 1,242

Given:

Principal (P) = Rs. 900

Amount (A) = Rs. 1,134

Time (t) = 4 years

Formula used:

A = P + (P × r × t) / 100

Where, r = rate of interest

Calculation:

1134 = 900 + (900 × r × 4) / 100

=> 1134 - 900 = (900 × r × 4) / 100

=> 234 = (3600r) / 100

=> 234 = 36r

=> r = 6.5%

If the rate of interest is increased by 3%,

New rate = 6.5% + 3% = 9.5%

New amount = 900 + (900 × 9.5 × 4) / 100

=> New amount = 900 + (3420) / 100

=> New amount = 900 + 342

=> New amount = 1242

Therefore The correct answer is option 2.

Q10. Answer: (b) 24^(th) December, 2003

The correct answer is 24th December, 2003.

Key Points

• The International Human Rights Commission (IHRC) was established on 24th December, 2003.

• The IHRC is an intergovernmental organization that promotes and protects human rights around the world.

• It is headquartered in Geneva, Switzerland, which is a hub for numerous international organizations.

• The IHRC works closely with the United Nations and other international bodies to address human rights issues globally.

Additional Information

• Human Rights

• Human rights are the basic rights and freedoms that belong to every person in the world, from birth until death.

• They apply regardless of where you are from, what you believe, or how you choose to live your life.

• They can never be taken away, although they can sometimes be restricted – for example, if a person breaks the law, or in the interests of national security.

• United Nations Human Rights Council (UNHRC)

• Established in 2006, the UNHRC is an intergovernmental body within the United Nations system.

• It is responsible for strengthening the promotion and protection of human rights around the globe and for addressing situations of human rights violations and making recommendations on them.

• The Council is made up of 47 United Nations Member States which are elected by the UN General Assembly.

• Geneva

• Geneva is a city in Switzerland that is home to numerous international organizations, including the United Nations Office at Geneva, the World Health Organization (WHO), and the International Labour Organization (ILO).

• It is known for its role in diplomacy and international cooperation.

Q11. Answer: (a) 5

Given:

AB and CD are two chords of a circle

AB = 6 cm

CD = 8 cm

AB || CD

Distance between AB and CD = 7 cm

Centre of the circle lies in the interior of the quadrilateral ABCD

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Formula used:

Let O be the center of the circle and radius be r.

In a circle, the perpendicular distance from the center to a chord is given by

Calculations:

Let OP = x, OM = 7-x

In ΔPOD:

$OD^2 = OP^2 + PD^2$

$OD^2 = x^2 + (CD/2)^2$

$OD^2 = x^2 + (8/2)^2$

$OD^2 = x^2 + 16$ ... (1)

In ΔOBM

$OB^2 = (7-x)^2 + 9$

$OB^2 = 49 + x^2 - 14x + 9$

$OB^2 = 49 + x^2 - 14x + 9$ ... (2)

Since, $OD^2 = OB^2$ (Both are radius)

So, $x^2 + 16 = 49 + x^2 - 14x + 9$

$14x = 42$

$x = 3$ cm

$OD^2 = 9 + 16$

OD = 5 cm

The correct answer is option (1).

Q12. Answer: (d) BE

Given: Seven houses A, B, C, D, E, F and H are built in a row facing towards north.

1) H is fourth to the right of B.

2) A and F are immediate neighbours of B.

3) E is built immediate next to A.

4) D is built at the extreme right.

Here case 1 gets eliminated.

Thus, the final arrangement:

Option 1) HE → H is second to the right of E.

Option 2) CA → C is second to the right of A.

Option 3) AF → A is second to the right of F.

Option 4) BE → B is second to the left of E.

So, BE is odd combination.

Hence, the correct answer is "BE".

Q13. Answer: (c) a

Given: Boys, Football players, Cricket fans

Some Boys can be both Football players and Cricket fans.

Some Football players can not be Boys or Cricket fans.

Some Cricket fans can not be Boys or Football players.

The best possible Venn diagram:

Hence, the correct answer is "a".

Q14. Answer: (a) 5(3 - 2√2)

Given:

A circle having centre c1, radius r1 = 5 cm is placed against a right angle. Another smaller circle having centre c2, radius r2 is also placed touching the sides of angle and the bigger circle.

Formula used:

Using Pythagoras theorem :

In ΔOCB, $OC^2 = OB^2 + BC^2$

Calculation:

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In ΔOCB, OC2 = OB2 + BC2
$OC^2 = 25 + 25$
$OC = 5\sqrt{2}$
In ΔOAP, $OP^2 = OA^2 + AP^2$
$OP^2 = r2^2 + r2^2$
$OP = r2\sqrt{2}$
Now OC = OP + PC
$5\sqrt{2} = r2\sqrt{2} + (PQ + CQ)$
$5\sqrt{2} = r2\sqrt{2} + r2 + 5$
$5(\sqrt{2} - 1) = r2(\sqrt{2} + 1)$
$r2 = 5(\sqrt{2}-1)/(\sqrt{2}+1)$
$r2 = 5(2+1-2\sqrt{2})/(2-1)$ ---- (rationalising the terms)
$r2 = 5(3-2\sqrt{2})$
Therefore The correct answer is option (1).

Q15. Answer: (c) 105

Given:
The ratio of two numbers is 7 : 5. Their HCF is 3.
Formula used:
LCM × HCF = Product of the numbers
Calculation:
Let the numbers be 7x and 5x.
HCF = 3
So, the numbers are 7 × 3 and 5 × 3, which are 21 and 15.
=> Product of the numbers = 21 × 15
=> Product of the numbers = 315
We know HCF = 3
=> LCM × HCF = Product of the numbers
=> LCM × 3 = 315
=> LCM = 315 ÷ 3
=> LCM = 105
Therefore The correct answer is option (3).

Q16. Answer: (b) 384

Given:
Internal radius of hemispherical bowl (r) = 12 cm
Base diameter of conical bottle = 3 cm
Base radius of conical bottle (R) = 1.5 cm
Height of conical bottle (h) = 4 cm
Formula used:
Volume of hemispherical bowl = $2/3\pi r^3$
Volume of one conical bottle = $1/3\pi R^2h$
Calculations:
Volume of hemispherical bowl = $2/3\pi (12)^3$
=> Volume of hemispherical bowl = $2/3\pi \times 1728$
=> Volume of hemispherical bowl = 1152π cm^3
Volume of one conical bottle = $1/3\pi (1.5)^2 \times 4$
=> Volume of one conical bottle = $1/3\pi \times 2.25 \times 4$
=> Volume of one conical bottle = 3π cm^3
Number of bottles needed = $1152\pi/3\pi$
=> Number of bottles needed = 384
Therefore The correct answer is option (2).

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Q17. Answer: (d) [figure]

Given: Milky Way, Jupiter, Earth

Milky Way - A galaxy that contains all the stars, planets, and celestial objects within it, including the Solar System.

Earth and Jupiter are different planets in the Solar System.

Hence, the correct answer is "Option 4".

Q18. Answer: (b) IP address

The correct answer is IP address.

Key Points

• An IP address (Internet Protocol address) is a unique string of numbers separated by periods or colons that identifies each computer using the Internet Protocol to communicate over a network.

• IP addresses are used to identify and locate devices on a network, ensuring data is sent to the correct destination.

• There are two types of IP addresses: IPv4 and IPv6. IPv4 uses 32 bits while IPv6 uses 128 bits, allowing for a greater number of unique addresses.

• An IP address can be static (permanently assigned) or dynamic (temporarily assigned via DHCP).

Additional Information

• Password

• A password is a string of characters used for authenticating a user to access a system or a service.

• Passwords are critical for ensuring that only authorized individuals gain access to sensitive information and systems.

• Cryptographic Code

• A cryptographic code is a method used to secure and protect data through encryption and decryption processes.

• It ensures the confidentiality, integrity, and authenticity of information by converting it into a format that cannot be easily understood by unauthorized users.

• Email Address

• An email address is an identifier for an email account that allows a user to send and receive electronic messages over the Internet.

• It typically consists of a username, the "@" symbol, and the domain name of the email service provider.

Q19. Answer: (c) Mario Draghi

The correct answer is Mario Draghi.

Key Points

• Mario Draghi was sworn in as the Prime Minister of Italy on February 13, 2021.

• Prior to becoming Prime Minister, Mario Draghi was the President of the European Central Bank (ECB) from 2011 to 2019.

• He is known for his crucial role in handling the Eurozone crisis during his tenure at the ECB, where he famously said he would do "whatever it takes" to save the Euro.

• Mario Draghi is an Italian economist and banker, often referred to as "Super Mario" for his handling of economic crises.

Additional Information

• Prime Minister of Italy

• The Prime Minister of Italy, also known as the President of the Council of Ministers, is the head of government of the Italian Republic.

• The Prime Minister is appointed by the President of the Republic and must have the confidence of the Italian Parliament to remain in office.

• The Prime Minister is responsible for coordinating the actions of the government and representing Italy in international affairs.

• European Central Bank (ECB)

• The ECB is the central bank for the Euro and administers monetary policy within the Eurozone, which consists of 19 of the 27 European Union member states.

• The ECB aims to maintain price stability within the Eurozone and supports economic growth and employment.

• As President of the ECB, Mario Draghi played a pivotal role in addressing the financial instability and sovereign debt crises within the Eurozone.

• Eurozone Crisis

• The Eurozone crisis was a multi-year debt crisis that took place in the European Union from 2009 onwards.

• It was characterized by high sovereign debt levels, banking sector vulnerabilities, and economic recessions in several Eurozone countries.

• Mario Draghi's leadership at the ECB, including his pledge to do "whatever it takes" to preserve the Euro, was instrumental in

stabilizing the Eurozone financial markets.

Q20. Answer: (c) Sanchi Stupa (MP) – 1988

The correct answer is option 3.

Key Points

• Sanchi Stupa (MP) was included in the UNESCO World Heritage Sites in 1989, not 1988.

• The Red Fort, Delhi was included in the year 2007.

• Agra Fort in Uttar Pradesh was included in the year 1983.

• Fatehpur Sikri in Uttar Pradesh was included in the year 1986.

Additional Information

• UNESCO World Heritage Sites:

• These are landmarks or areas which are selected by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as having cultural, historical, scientific or other forms of significance, and are legally protected by international treaties.

• The list is maintained by the international World Heritage Program administered by the UNESCO World Heritage Committee.

• India has several UNESCO World Heritage Sites which include cultural, natural, and mixed sites.

• Sanchi Stupa:

• Located in Madhya Pradesh, it is one of the oldest stone structures in India and an important monument of Indian Architecture.

• It was originally commissioned by the emperor Ashoka in the 3rd century BCE.

• Red Fort:

• Located in Delhi, it was the main residence of the Mughal emperors for nearly 200 years, until 1856.

• It was designated a UNESCO World Heritage Site in 2007.

• Agra Fort:

• Located in Agra, Uttar Pradesh, it is a historical fort which served as the main residence of the Mughal emperors until 1638.

• It was inscribed as a UNESCO World Heritage site in 1983.

• Fatehpur Sikri:

• Located in Uttar Pradesh, it was the capital of the Mughal Empire from 1571 to 1585.

• It was designated a UNESCO World Heritage Site in 1986.

Q21. Answer: (c) 1.8% loss

Given:

Article 1:

Selling Price (SP1) = Cost Price (CP1) + 20% of CP1

Article 2:

Selling Price (SP2) = Cost Price (CP2) - 20% of CP2

SP1 = CP2

Formula used:

Effective Profit/Loss Percentage = (Total SP - Total CP)/(Total CP) × 100

Calculations:

Let CP1 = x

SP1 = x + 0.2x = 1.2x

SP1 = CP2 => CP2 = 1.2x

SP2 = CP2 - 0.2(CP2) = 1.2x - 0.24x = 0.96x

Total CP = x + 1.2x = 2.2x

Total SP = 1.2x + 0.96x = 2.16x

Effective Profit/Loss Percentage = (2.16x - 2.2x)/2.2x × 100

=> (-0.04x)/2.2x × 100

=> (-0.04)/2.2 × 100

=> -1.8%

Therefore The correct answer is option (3) 1.8% loss.

Q22. Answer: (b) examine the relationship and balance of power between state and central governments and suggest changes

The correct answer is examine the relationship and balance of power between state and central governments and suggest

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changes.

Key Points

• The Sarkaria Commission was established by the Government of India in 1983.

• The main purpose was to review the existing arrangements between the Centre and the States.

• The Commission was tasked with suggesting improvements to the balance of power and relationship between the Centre and the States.

• Justice R.S. Sarkaria, a retired judge of the Supreme Court of India, was appointed as the chairman of this commission.

Additional Information

• Goods and Services Tax (GST)

• GST is an indirect tax that has replaced many indirect taxes in India such as the excise duty, VAT, services tax, etc.

• The GST Act was passed in the Parliament on 29th March 2017 and came into effect on 1st July 2017.

• It is a comprehensive, multi-stage, destination-based tax that is levied on every value addition.

• The GST aims to streamline the tax structure and remove the cascading effect of taxes.

• Backlog of Cases in Courts

• India has one of the world's largest backlogs of cases pending in courts.

• Efforts to clear the backlog include the introduction of Fast Track Courts, Lok Adalats, and measures to enhance the efficiency of the judiciary.

• The National Mission for Justice Delivery and Legal Reforms aims to reduce delays and arrears in the judicial system.

• Reservations in Civil Services and Posts

• Reservation in India is a system of affirmative action that provides historically disadvantaged groups representation in education, employment, and politics.

• The system is meant to uplift Scheduled Castes (SC), Scheduled Tribes (ST), and Other Backward Classes (OBC).

• Reservations are intended to promote equality by ensuring that underrepresented groups have fair access to opportunities.

Q23. Answer: (b) 2

Given:

$((759+253)^2 + (759-253)^2)/(759 \times 759 + 253 \times 253)$

Formula used:

$(a + b)^2 + (a - b)^2 = 2(a^2 + b^2)$

Calculation:

$((759+253)^2 + (759-253)^2)/(759 \times 759 + 253 \times 253)$

$=> (2(759^2 + 253^2))/(759^2 + 253^2)$

$=> (2(759^2 + 253^2))/(759^2 + 253^2)$

$=> 2$

Therefore The correct answer is option (2).

Q24. Answer: (a) Rajasthani and English

The correct answer is Rajasthani and English.

Key Points

• The Sahitya Akademi, India's National Academy of Letters, recognizes various languages for literary awards and promotion.

• In addition to the 22 scheduled languages mentioned in the Eighth Schedule of the Indian Constitution, the Sahitya Akademi has recognized Rajasthani and English for its literary endeavors.

• Rajasthani is a language spoken in the state of Rajasthan and has a rich literary tradition.

• English, although not an indigenous language, has a significant presence in Indian literature due to the colonial history and its status as an associate official language of India.

Additional Information

• Scheduled Languages of India:

• The Eighth Schedule of the Indian Constitution lists 22 languages that are recognized as scheduled languages.

• These include Assamese, Bengali, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Malayalam, Manipuri, Marathi, Nepali, Oriya, Punjabi, Sanskrit, Sindhi, Tamil, Telugu, Urdu, Bodo, Santhali, Maithili, and Dogri.

• These languages are given special status and support by the government for their development and preservation.

• Sahitya Akademi:

• The Sahitya Akademi is an autonomous organization under the Ministry of Culture, Government of India.

• It was established in 1954 to promote literature in various Indian languages and to recognize and reward literary excellence.

• The Akademi organizes literary events, publishes books, and confers awards on writers in recognized languages.

• Recognition of Additional Languages:

• Beyond the scheduled languages, the Sahitya Akademi has also recognized Rajasthani and English to honor literary works in these languages.

• This recognition allows for a broader representation of India's diverse literary heritage.

Q25. Answer: (c) 5/3%

Given:

0.002 is what percent of 0.12?

Formula used:

part/whole × 100

Calculation:

Given Part = 0.002

Given Whole = 0.12

=> 0.002/0.12 × 100

=> 2/120 × 100

=> 1/60 × 100

=> 100/60

=> 5/3 %

Therefore The correct answer is option (3).

Q26. Answer: (a) political association

The correct answer is political association.

Key Points

• The Commonwealth of Nations, often referred to as 'The Commonwealth', is a political association of 56 member states, most of which are former territories of the British Empire.

• The Commonwealth operates by intergovernmental consensus of the member states, organized through the Commonwealth Secretariat and non-governmental organizations, organized through the Commonwealth Foundation.

• The Commonwealth's objectives include promoting democracy, human rights, good governance, rule of law, individual liberty, and sustainable development.

• One of the key platforms of the Commonwealth is the Commonwealth Heads of Government Meeting (CHOGM), which is held biennially to discuss global and Commonwealth issues, and to agree on collective policies and initiatives.

Additional Information

• Commonwealth Secretariat

• It is the main intergovernmental agency and central institution of the Commonwealth of Nations.

• The Secretariat organizes meetings, facilitates consultation and cooperation among member governments and countries, and provides technical assistance and advice.

• It is headquartered in Marlborough House, London, UK.

• Commonwealth Foundation

• It is an intergovernmental organization established by the Commonwealth Heads of Government in 1965.

• The Foundation aims to support civil society organizations, provide grants for sustainable development, and promote cultural exchange and artistic expression within the Commonwealth.

• It works closely with non-governmental organizations (NGOs) to achieve its objectives.

• Commonwealth Charter

• The Charter of the Commonwealth is a document that outlines the values and principles of the Commonwealth as well as the commitment of member states to democracy, human rights, and the rule of law.

• It was signed by Queen Elizabeth II as Head of the Commonwealth on Commonwealth Day, 11 March 2013, at Marlborough House.

• The Charter encompasses 16 core beliefs of the Commonwealth, including democracy, human rights, peace, tolerance, respect, understanding, freedom of expression, and sustainable development.

• Commonwealth Games

• The Commonwealth Games is an international multi-sport event involving athletes from the Commonwealth of Nations.

• The event was first held in 1930, and has since taken place every four years.

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• It is often referred to as the 'Friendly Games', focusing on promoting goodwill and understanding among the member states.

• The Games include a wide variety of sports, and are among the world's largest multi-sport events.

Q27. Answer: (a) Manipur

The correct answer is Manipur.

Key Points

• The Sangai Festival is an annual cultural festival organized by the government of Manipur, India.

• The festival is named after the state animal, the Sangai, which is an endangered species of brow-antlered deer found only in Manipur.

• The Sangai Festival aims to promote Manipur as a world-class tourism destination, showcasing the state's rich culture, tradition, and natural beauty.

• The festival features a wide range of activities including cultural performances, traditional music and dance, indigenous sports, handloom and handicraft exhibitions, and various other events that highlight the state's heritage.

Additional Information

• Sangai Deer

• The Sangai deer, also known as the Manipur brow-antlered deer, is an endangered species found only in the Keibul Lamjao National Park in Manipur.

• The deer is known for its distinctive antlers that form a unique shape, resembling a crown.

• Conservation efforts are in place to protect the Sangai deer and its habitat, as it is a symbol of Manipur's natural heritage.

• Keibul Lamjao National Park

• Keibul Lamjao National Park is the only floating national park in the world, located in the Bishnupur district of Manipur.

• The park is situated on the Loktak Lake, which is characterized by its unique floating phumdis (heterogeneous mass of vegetation, soil, and organic matter).

• Keibul Lamjao National Park is home to the endangered Sangai deer and serves as a crucial habitat for various other flora and fauna.

• Cultural Significance of Manipur

• Manipur is known for its rich cultural heritage, including traditional dance forms such as Manipuri dance, which is one of the classical dance forms of India.

• The state is also famous for its indigenous sports like polo, which is believed to have originated in Manipur.

• Manipur's handloom and handicrafts are renowned for their intricate designs and craftsmanship, reflecting the state's artistic traditions.

Q28. Answer: (c) Mahanadi

The correct answer is Mahanadi.

Key Points

• The Hirakud Dam is built across the Mahanadi River in the state of Odisha, India.

• It is one of the longest dams in the world, with a total length of about 25.8 kilometers.

• The dam was constructed to control floods and provide irrigation and hydroelectric power.

• Hirakud Dam was completed in 1957 and is one of the first major multipurpose river valley projects started after India's independence.

Additional Information

• Hirakud Dam:

• The primary purpose of the dam is flood control. The dam helps control the flow of water from the Mahanadi River, which used to cause severe flooding in the delta region.

• It also serves as a source of irrigation for the surrounding agricultural areas. The irrigation benefits extend to a large area of land, ensuring crop security and improving agricultural productivity.

• Hirakud Dam is a major source of hydroelectric power. It has several powerhouses that generate electricity, contributing significantly to the energy needs of the region.

• The reservoir created by the dam, known as Hirakud Reservoir, is a large water body that supports fishing and provides water for industrial and domestic use.

• Mahanadi River:

• The Mahanadi River is one of the major rivers in East-Central India, flowing through the states of Chhattisgarh and Odisha.

• It originates in the Sihawa hills of the Dhamtari district in Chhattisgarh and flows eastward to drain into the Bay of Bengal.

• The river is about 858 kilometers (533 miles) long and has a basin area of around 141,600 square kilometers.

• The Mahanadi is known for its fertile delta and is a major source of water for irrigation, supporting extensive agricultural activities

in its basin.

• Other Dams on Indian Rivers:

• Brahmaputra: The Subansiri Lower Dam is under construction on the Subansiri River, a tributary of the Brahmaputra in Arunachal Pradesh and Assam.

• Ganga: The Tehri Dam is a major dam built on the Bhagirathi River, which is one of the primary headstreams of the Ganga River, located in Uttarakhand.

• Godavari: The Polavaram Dam, also known as the Indira Sagar Project, is being built on the Godavari River in Andhra Pradesh.

Q29. Answer: (a) Son

Family Chart:

Given: Looking at a photo Sachit said, “This woman gave birth to the brother of my father’s only daughter.”

So, Sachit is the "Son" of the husband of the woman.

Hence, the correct answer is "Son".

Q30. Answer: (a) We are Displaced

The correct answer is We are Displaced.

Key Points

• We are Displaced is a book authored by Malala Yousafzai.

• The book highlights the stories of refugee girls from various parts of the world.

• It showcases the resilience and courage of these girls in the face of displacement and adversity.

• Malala, being a Nobel Peace Prize laureate, uses her platform to bring attention to the plight of refugee girls globally.

Additional Information

• Malala Yousafzai

• Malala Yousafzai is a Pakistani activist for female education and the youngest Nobel Prize laureate.

• She is known for her advocacy of education for girls in her native Swat Valley in Khyber Pakhtunkhwa, northwest Pakistan, where the local Taliban had at times banned girls from attending school.

• Her advocacy has grown into an international movement, and she co-authored the memoir "I Am Malala", which became an international bestseller.

• In recognition of her efforts, she was awarded the Nobel Peace Prize in 2014 at the age of 17.

• We are Displaced

• Published in 2019, "We are Displaced" is a narrative non-fiction book by Malala Yousafzai.

• The book weaves together her own story of displacement alongside the personal accounts of other refugee girls.

• It aims to humanize the refugee crisis by sharing individual stories rather than just statistics.

• The book also discusses the reasons behind displacement and the impact it has on young girls around the world.

• Refugee Crisis

• The refugee crisis refers to the large number of people who are forced to leave their countries due to war, persecution, or natural disasters.

• According to the UNHCR, there are millions of refugees and internally displaced people worldwide.

• Refugees often face significant challenges, including lack of access to education, healthcare, and employment opportunities.

• International organizations and governments work together to provide relief and support to refugees, but many still live in precarious conditions.

• Nobel Peace Prize

• The Nobel Peace Prize is one of the five Nobel Prizes established by the will of Alfred Nobel, the inventor of dynamite.

• It is awarded annually to individuals or groups who have made significant contributions to peace.

• Past laureates include notable figures such as Martin Luther King Jr., Mother Teresa, and Nelson Mandela.

• The Nobel Peace Prize is awarded by the Norwegian Nobel Committee and is considered one of the most prestigious awards in the world.

Q31. Answer: (d) 36 days

Given:

A, B and C together can complete a task in 16 days.

After 2 days, A left. B and C continued for 9 more days and then B left.

C completed the remaining work in 6 days.

C alone can complete the task in 24 days.

Formula used:

Work rate of A, B, and C together = 1/16 work/day

Work rate of C = 1/24 Let work rate of A be A, B be B, and C be C.

work/day

Calculation:

A + B + C = 1/16

C = 1/24

Work done by A, B, and C in 2 days:

2 × (A + B + C) = 2/16 = 1/8

Work done by B and C in 9 days:

9 × (B + C) = 9 × (B + 1/24)

Work done by C in 6 days:

6 × 1/24 = 1/4

Total work done by A, B, and C:

1/8 + 9(B + 1/24) + 1/4 = 1

=> 1/8 + 9B + 9/24 + 1/4 = 1

=> 1/8 + 9B + 3/8 + 1/4 = 1

=> 4/8 + 9B + 2/8 = 1

=> 6/8 + 9B = 1

=> 3/4 + 9B = 1

=> 9B = 1 - 3/4

=> 9B = 1/4

=> B = 1/36

Therefore B alone can complete the task in 36 days.

Q32. Answer: (d) Henry Vivian Derozio

The correct answer is Henry Vivian Derozio.

Key Points

• Henry Vivian Derozio was an Indian poet and teacher of Anglo-Indian descent, and he is known for his influential role in the Young Bengal Movement.

• Derozio was a radical thinker, poet, and a teacher at Hindu College in Calcutta (now Kolkata) who inspired his students to question traditional societal norms and values.

• The Young Bengal Movement, initiated by Derozio, was characterized by its emphasis on rational thinking, freedom of expression, and the advocacy for social reforms.

• Derozio's followers, known as Derozians, played a significant role in spreading progressive ideas and promoting the spirit of nationalism among the youth of Bengal during the early 19th century.

Additional Information

• Young Bengal Movement:

• The Young Bengal Movement was a group of radical Bengali free thinkers emerging from Hindu College, Calcutta, in the early 19th century.

• They were inspired by the teachings of Henry Vivian Derozio, who encouraged them to challenge conventional practices, caste distinctions, and social injustices.

• The movement was marked by its emphasis on rationalism, secularism, and scientific thought.

• Despite facing opposition from conservative sections of society, the movement significantly influenced the intellectual and social landscape of Bengal.

• Henry Vivian Derozio:

• Derozio was born in 1809 in Kolkata to an Indo-Portuguese father and an English mother.

• He was a brilliant student and later became a teacher at Hindu College, where his progressive ideas left a lasting impact on his students.

• Derozio's poetry reflected his passion for freedom and reform, with notable works including "To India - My Native Land" and "The Harp of India".

• He passed away at a young age of 22 in 1831, but his legacy continued to inspire future generations of reformers and intellectuals in Bengal.

• Hindu College (now Presidency University):

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• Hindu College was established in 1817 in Kolkata and became a leading center for Western education in India.

• The college played a pivotal role in the Bengal Renaissance, a period of cultural, social, and intellectual awakening in Bengal.

• It produced many notable alumni who went on to become prominent figures in various fields, including literature, science, and politics.

• In 1855, the college was renamed Presidency College and later achieved university status in 2010, becoming Presidency University.

Q33. Answer: (d) D

Given: Five members A, B, C, D and E have different heights. They play one among different games namely cricket, football, chess, tennis and volley ball. No two members play same game.

1) A is shorter than only two members and plays football.

2) The tallest member among them plays chess.

3) E plays Tennis and he is not the shortest.

4) B is taller than E but shorter than D.

Thus, final arrangement:

Thus, D among them plays chess.

Hence, the correct answer is "D".

Q34. Answer: (b) Rs. 1,75,000

Given:

Price of the car = Rs. 6,25,000

Insurance coverage = 80%

Amount paid by insurance = 90% of the insured amount

Formula used:

Insurance amount = Price of the car × Insurance coverage

Amount paid by insurance = Insurance amount × Amount paid by insurance percentage

Difference = Price of the car - Amount received from insurance

Calculation:

Insurance amount = Rs. 6,25,000 × 80%

=> Insurance amount = Rs. 6,25,000 × 0.8

=> Insurance amount = Rs. 5,00,000

Amount paid by insurance = Rs. 5,00,000 × 90%

=> Amount paid by insurance = Rs. 5,00,000 × 0.9

=> Amount paid by insurance = Rs. 4,50,000

Difference = Rs. 6,25,000 - Rs. 4,50,000

=> Difference = Rs. 1,75,000

Therefore The correct answer is option 2.

Q35. Answer: (c) 19.5 cm

Given:

AB is the diameter of a semicircle.

AC = 6 cm

CD is perpendicular to AB.

CD = 9 cm

Formula used:

Using Pythagoras theorem in ΔACD:

$AC^2 + CD^2 = AD^2$

Calculation:

=> $AD^2 = AC^2 + CD^2$

=> $AD^2 = 6^2 + 9^2$

=> $AD^2 = 36 + 81 = 117$

=> $AD = \sqrt{117}$

In ΔCBD,

=> $BD^2 = CD^2 + CB^2$

=> $BD^2 = 81 + x^2$

In ΔABD,

=> $AB^2 = AD^2 + BD^2$

=> $(6 + x)^2 = 117 + 81 + x^2$

=> $36 + 12x + x^2 = 198 + x^2$

=> $12x = 162$

=> $x = 13.5$

=> AB = 6 + 13.5 = 19.5 cm

Therefore The diameter of the semicircle is 19.5 cm.

Q36. Answer: (c) 250

Given:

A bag contains 50 paise, 25 paise and 10 paise coins in the ratio 9 : 5 : 6 amounting to Rs. 317.5.

Formula used:

Let the number of 50 paise coins be 9x.

Let the number of 25 paise coins be 5x.

Let the number of 10 paise coins be 6x.

The total amount in paise = 317.5 × 100 = 31750 paise

50 × 9x + 25 × 5x + 10 × 6x = 31750

Calculation:

50 × 9x + 25 × 5x + 10 × 6x = 31750

450x + 125x + 60x = 31750

=> 635x = 31750

=> x = 31750 / 635

=> x = 50

Number of 25 paise coins = 5x

=> 5 × 50 = 250

Therefore The correct answer is option (3).

Q37. Answer: (c) Punjab

The correct answer is Punjab.

Key Points

• Miyan Mir was a famous Sufi saint from Lahore, which is in present-day Punjab, Pakistan.

• He was born in 1550 and died in 1635, making him a contemporary of the Mughal emperors Akbar, Jahangir, and Shah Jahan.

• Miyan Mir is known for his spiritual teachings and was highly respected by both Hindus and Muslims.

• He was invited to lay the foundation stone of the Golden Temple (Harmandir Sahib) in Amritsar by Guru Arjan Dev, the fifth Sikh Guru.

Additional Information

• Sufism

• Sufism, or Tasawwuf, is the inner mystical dimension of Islam.

• Practitioners of Sufism are known as Sufis and belong to different orders or tariqas, each following a particular spiritual path.

• Sufis aim to achieve a closer connection with God through practices such as meditation, chanting (dhikr), and asceticism.

• Sufi saints like Miyan Mir are often revered for their piety, spiritual wisdom, and miraculous deeds.

• Golden Temple

• The Golden Temple, also known as Harmandir Sahib, is the holiest Gurdwara of Sikhism, located in Amritsar, Punjab, India.

• It was founded by Guru Ram Das, the fourth Sikh Guru, and completed by his successor, Guru Arjan Dev.

• The temple is built around a man-made pool that was completed by Guru Ram Das in 1577.

• The Golden Temple represents openness and inclusivity, welcoming people of all religions and backgrounds.

• Mughal Empire

• The Mughal Empire was a prominent and influential empire in the Indian subcontinent, established in 1526 by Babur.

• It reached its zenith under emperors such as Akbar, Jahangir, and Shah Jahan, who were contemporaries of Miyan Mir.

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• The Mughals are known for their contributions to art, architecture, and culture, including the construction of landmarks such as the Taj Mahal and the Red Fort.

• The empire's decline began in the late 17th century and it eventually dissolved in the mid-19th century.

Q38. Answer: (d) 3 : 2

Given:

A is the filling pipe and B can be used for filling or emptying at the same rate. When B is used for filling, it takes time 't' along with A to fill the tank. If it is used for emptying when A is filling the tank, the time taken for the tank to fill up would be '5t'.

Formula used:

Let the rate of pipe A be 'a' and the rate of pipe B be 'b'.

When both pipes are filling:

(a + b) × t = 1 (tank full)

When pipe A is filling and pipe B is emptying:

(a - b) × 5t = 1 (tank full)

Calculation:

(a + b) × t = 1

=> a + b = 1/t

(a - b) × 5t = 1

=> a - b = 1/(5t)

Adding the two equations:

(a + b) + (a - b) = 1/t + 1/(5t)

=> 2a = 1/t + 1/(5t)

=> 2a = 6/(5t)

=> a = 3/(5t)

Subtracting the two equations:

(a + b) - (a - b) = 1/t - 1/(5t)

=> 2b = 1/t - 1/(5t)

=> 2b = 4/(5t)

=> b = 2/(5t)

Ratio of the rates of A and B:

a : b = (3/(5t)) : (2/(5t))

=> a : b = 3 : 2

Therefore The correct answer is option (4).

Q39. Answer: (b) David Hare

The correct answer is David Hare.

Key Points

• David Hare was a Scottish watchmaker and educator in Bengal, India.

• He was a pioneer in promoting modern education in India and collaborated closely with Indian reformer Raja Ram Mohan Roy.

• David Hare founded several key educational institutions including the Hare School and the Hindu College (now Presidency University) in Kolkata.

• His contributions were instrumental in setting the foundation for modern education and social reform in Bengal during the early 19th century.

Additional Information

• Raja Ram Mohan Roy

• He was a prominent Indian social reformer and the founder of the Brahmo Samaj movement in 1828.

• He worked tirelessly against social evils like Sati, child marriage, and caste discrimination.

• Raja Ram Mohan Roy is often hailed as the "Father of the Indian Renaissance" for his efforts to modernize Indian society.

• He was also a strong advocate for women's rights and education.

• Hare School

• Established in 1818 by David Hare, it is one of the oldest schools in Kolkata, India.

• The school played a significant role in spreading Western education and modern scientific ideas in Bengal.

• It has produced many notable alumni who have contributed significantly to Indian society in various fields.

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• Hindu College (now Presidency University)
• Founded in 1817, it was one of the first institutions of higher education in India.
• The college was established with the aim of providing modern education in the English language to Indian students.
• It has a rich legacy of producing leaders, thinkers, and reformers who have shaped modern India.
• Modern Education in India
• Modern education in India began during the British colonial period, with an emphasis on English language and Western sciences.
• Institutions like Fort William College, Hindu College, and the University of Calcutta were established to promote higher education.
• Education reformers like David Hare, Alexander Duff, and Ishwar Chandra Vidyasagar played significant roles in expanding educational opportunities.
• The spread of modern education laid the foundation for social and political movements that eventually led to India's independence.

Q40. Answer: (d) Echinodermata

The correct answer is Echinodermata.

Key Points

• The members of phylum Echinodermata are exclusively free-living marine animals.
• Echinoderms are characterized by their radial symmetry and a calcareous endoskeleton.
• This phylum includes starfish, sea urchins, sand dollars, and sea cucumbers.
• Echinoderms have a unique water vascular system which aids in locomotion, feeding, and respiration.

Additional Information

• Mollusca
• Mollusca is the second-largest phylum of invertebrate animals.
• It includes snails, clams, and squids, which are found in both marine and terrestrial environments.
• Mollusks have a soft body, usually protected by a hard shell.
• Nematoda
• Nematoda, or roundworms, are a diverse animal phylum inhabiting a broad range of environments.
• They can be found in marine, freshwater, and terrestrial habitats.
• Some nematodes are free-living, while others are parasitic.
• Arthropoda
• Arthropoda is the largest phylum in the animal kingdom, including insects, arachnids, myriapods, and crustaceans.
• They have an exoskeleton, segmented body, and jointed appendages.
• Arthropods are found in virtually every habitat on Earth.
• Echinodermata
• Echinodermata consists of marine animals with a unique water vascular system.
• They exhibit pentaradial symmetry as adults.
• The phylum includes starfish, sea urchins, and sea cucumbers.
• They have a calcareous endoskeleton made up of ossicles.

Q41. Answer: (d) 3.5 m

Given:

Capacity of cylindrical tank (V) = 38,500 litres = 38.5 m^3

Height (h) = 4 metres

Formula used:

Volume of cylinder $V = \pi r^2 h$

Where, r = radius

Calculation:

$38.5 = \pi r^2 \times 4$

$\Rightarrow r^2 = 38.5/4\pi$

$\Rightarrow r^2 = 3.07$

$\Rightarrow r = \sqrt{3.07}$

$\Rightarrow r = 1.75$ m

Diameter = 2 × r
=> Diameter = 2 × 1.75
=> Diameter = 3.5 m
Therefore The correct answer is option (4).

Q42. Answer: (a) 22,44,004

Given:
1498 × 1498 = _____
Formula used:
$(a + b)^2 = a^2 + 2ab + b^2$
Calculation:
Let a = 1500 and b = 2, then a - b = 1498
1498 × 1498 = (1500 - 2) × (1500 - 2)
=> $(1500 - 2)^2 = 1500^2 - 2 \times 1500 \times 2 + 2^2$
=> $1500^2 - 6000 + 4$
=> 2250000 - 6000 + 4
=> 2244004
Therefore The correct answer is option (1).

Q43. Answer: (a) mangrove forests

The correct answer is mangrove forests.
Key Points
• The Sundarbans is the largest mangrove forest in the world, spanning across India and Bangladesh.
• It is home to the famous Royal Bengal Tigers and a diverse range of flora and fauna.
• Mangrove forests are critical for coastal protection, providing a buffer against storm surges, erosion, and rising sea levels.
• The Sundarbans are a UNESCO World Heritage Site, recognized for their unique biodiversity and ecological significance.
Additional Information
• Mangrove Forests
• Mangrove forests are coastal ecosystems found in tropical and subtropical regions.
• They are characterized by salt-tolerant trees and shrubs that thrive in intertidal zones.
• Mangroves play a crucial role in coastal protection, water filtration, and providing habitat for marine life.
• They are also important for carbon sequestration, helping to mitigate climate change.
• Tropical Evergreen Forests
• These forests are found in regions with heavy rainfall throughout the year.
• They are characterized by dense, multi-layered vegetation and a high level of biodiversity.
• Tropical evergreen forests are primarily located near the equator, such as in the Amazon Basin and parts of Southeast Asia.
• These forests play a vital role in maintaining global climate patterns and supporting a wide range of species.
• Tropical Deciduous Forests
• Also known as monsoon forests, these forests are found in regions with a distinct dry and wet season.
• They shed their leaves during the dry season to conserve water.
• Tropical deciduous forests are common in parts of India, Africa, and Central America.
• These forests are important for timber production and support various wildlife species.
• Montane Forests
• Montane forests are found in mountainous regions with cooler temperatures.
• They are characterized by a mix of coniferous and broadleaf trees.
• Montane forests are important for water regulation, soil conservation, and providing habitat for unique species.
• These forests are found in regions such as the Himalayas, the Andes, and the Rocky Mountains.

Q44. Answer: (c) W.C. Bannerjee

The correct answer is W.C. Bannerjee.
Key Points
• Womesh Chunder Bannerjee, often referred to as W.C. Bannerjee, was a prominent lawyer and politician in British India.
• He presided over the first session of the Indian National Congress, which was held in Bombay (now Mumbai) in December 1885.

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• W.C. Bannerjee was one of the founding members of the Indian National Congress, a party that played a crucial role in India's struggle for independence.

• His presidency of the first session of Congress marked the beginning of a national movement that aimed to address the grievances of Indians under British rule.

Additional Information

• Indian National Congress (INC)

• The Indian National Congress was founded in 1885 by Allan Octavian Hume, Dadabhai Naoroji, and Dinshaw Wacha.

• It was created to form a platform for civil and political dialogue among educated Indians and to address issues faced by the Indian populace under British rule.

• The first session of the Indian National Congress was held from 28-31 December 1885 in Bombay.

• The INC played a significant role in the Indian independence movement, leading the country to freedom in 1947.

• W.C. Bannerjee

• W.C. Bannerjee was born on December 29, 1844, in Calcutta (now Kolkata), Bengal Presidency, British India.

• He was educated at the Oriental Seminary and the Hindu School in Calcutta, and later studied law in England.

• Upon returning to India, he became a successful barrister and took an active interest in political and social issues.

• His leadership in the first session of the INC set a precedent for future sessions and established the Congress as a major political force in India.

• Significance of the First Session of INC

• The first session of the INC was attended by 72 delegates from different parts of India.

• It marked the beginning of an organized, all-India political movement against British colonial rule.

• The session focused on various issues including civil rights, administrative reforms, and the need for greater representation of Indians in government services.

• The resolutions passed during the session laid the foundation for future political strategies and demands for self-governance.

Q45. Answer: (b) Second to the left

Given: Six boys B1, B2, B3, B4, B5 and B6 are sitting around a circular table facing towards the centre.

1) B1 sits second to the right of B4.

2) B4 is neighbour of B6.

3) B3 sits third to the left of B6.

4) B2 is not neighbour of B1.

Then final arrangement:

So, Second to the left is the position of B5 with respect to B2.

Hence, the correct answer is "Second to the left".

Q46. Answer: (b) 168

Given:

The LCM of two numbers is 315 and their HCF is 21, and the difference of the numbers is 42.

Formula used:

LCM × HCF = Product of the numbers

Let the numbers be x and y. Given:

LCM(x, y) = 315

HCF(x, y) = 21

x - y = 42

Calculations:

Let the numbers be 21a and 21b, where a and b are co-prime numbers.

=> 21a - 21b = 42

=> 21(a - b) = 42

=> a - b = 2

Also, LCM(21a, 21b) = 21ab

=> 21ab = 315

=> ab = 15

We have two equations:

1) a - b = 2

2) ab = 15

Solving these equations:

From equation 1, we have b = a - 2

Substituting in equation 2:

=> a(a - 2) = 15

=> a^2 - 2a - 15 = 0

Solving the quadratic equation:

=> a = 5 or a = -3

Since a is positive, a = 5

=> b = 3

Thus, the numbers are 21a and 21b:

=> 21×5 and 21×3

=> 105 and 63

The sum of the numbers:

=> 105 + 63 = 168

Therefore The correct answer is option 2.

Q47. Answer: (c) Radial

The correct answer is Radial.

Key Points

• The radial drainage pattern is characterized by streams radiating outwards from a central high point, like spokes on a wheel.

• This pattern is typically found around volcanic cones, domes, and other types of isolated hills or mountains.

• The central high point causes the water to flow in all directions away from the peak, forming a circular pattern.

• Radial drainage is indicative of a symmetrical topography where the central high point is relatively isolated from other features.

Additional Information

• Trellis Drainage Pattern

• This pattern develops in areas of alternating hard and soft rock, where tributary streams enter the main stream at nearly right angles.

• It resembles a garden trellis and is common in folded mountain regions.

• Dendritic Drainage Pattern

• This is the most common drainage pattern and resembles the branches of a tree.

• It develops in regions where the river channel follows the slope of the terrain.

• Rectangular Drainage Pattern

• This pattern occurs in regions with a rectangular grid of faults or joints that guide the streams.

• It is characterized by right-angle bends and tributaries joining the main stream at right angles.

Q48. Answer: (d) 10 √3

Given:

The roots of the equation $12x^2 + mx + 6 = 0$ are in the ratio 2 : 3.

Formula used:

Let the roots be 2k and 3k.

For a quadratic equation $ax^2 + bx + c = 0$:

Sum of roots = -b/a

Product of roots = c/a

Calculation:

Sum of roots = 2k + 3k = 5k

Product of roots = 2k × 3k = $6k^2$

For the given equation $12x^2 + mx + 6 = 0$:

Sum of roots = -m/12

Product of roots = 6/12 = 1/2

=> 5k = -m/12

=> $6k^2$ = 1/2

=> $k^2 = 1/12$

=> $k = 1/\sqrt{12} = 1/(2\sqrt{3}) = \sqrt{3}/6$

=> $5k = -m/12$

=> $5 \times (\sqrt{3}/6) = -m/12$

=> $5\sqrt{3}/6 = -m/12$

=> $m = -5\sqrt{3}/6 \times 12$

=> $m = -10\sqrt{3}$

Since we need the positive value:

=> $m = 10\sqrt{3}$

Therefore The correct answer is option (4).

Q49. Answer: (d) Manabendra Nath Roy

The correct answer is Manabendra Nath Roy.

Key Points

• Manabendra Nath Roy was an Indian revolutionary, radical activist and political theorist.

• He was one of the founders of the Communist Party of India and the Communist Party of Mexico.

• Manabendra Nath Roy was elected to the leadership of the Communist International in 1924.

• He played a significant role in the Indian independence movement and contributed to the spread of communist ideology in India.

Additional Information

• Communist International (Comintern)

• The Communist International, also known as the Comintern or the Third International, was an international organization that advocated for world communism.

• Founded in 1919 by Vladimir Lenin and the Bolshevik Party of Russia, it aimed to unite all communist parties worldwide under a single, centralized leadership.

• The Comintern played a crucial role in coordinating communist activities across different countries and supporting revolutionary movements.

• It was dissolved in 1943 by Joseph Stalin to facilitate better relations with Western allies during World War II.

• Indian Independence Movement

• The Indian independence movement was a series of activities and efforts aimed at ending British colonial rule in India.

• It spanned over a century, from the mid-19th century to 1947, when India finally gained independence.

• Key figures in the movement included Mahatma Gandhi, Jawaharlal Nehru, Subhash Chandra Bose, and many others.

• The movement employed various strategies, including non-violent resistance, civil disobedience, and armed struggle.

• Communist Party of India (CPI)

• The Communist Party of India (CPI) is one of the oldest political parties in India, founded in 1925.

• It was initially influenced by the Bolshevik Revolution in Russia and aimed to establish a socialist state in India.

• The CPI played an active role in the Indian independence movement and post-independence political landscape.

• Over the years, the party has experienced splits and the formation of breakaway factions, including the Communist Party of India (Marxist) (CPI-M).

• Communist Party of Mexico

• The Communist Party of Mexico (Partido Comunista Mexicano, PCM) was founded in 1919 and was the first communist party in Mexico.

• It played a significant role in the labor movement and various social struggles in Mexico.

• The PCM was dissolved in 1981 and merged into the Unified Socialist Party of Mexico (PSUM).

• Manabendra Nath Roy was instrumental in its formation and early development.

Q50. Answer: (d) Prime Meridian

The logic followed here is:

Equator	Imaginary line around the Earth
Tropic of Capricorn	Imaginary line around the Earth
Tropic of Cancer	Imaginary line around the Earth
Prime Meridian	Imaginary line dividing the Earth into Eastern and Western hemispheres

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Equator, Tropic of Cancer, Tropic of Capricorn all are Imaginary lines around the Earth,

Whereas, Prime Meridian is an Imaginary line dividing the Earth into Eastern and Western hemispheres.

Hence, the correct answer is "Prime Meridian".

Q51. Answer: (a) [figure]

Given: Real Numbers, Rational Numbers, Integers, Whole Numbers, and Natural Numbers.

Natural Numbers: Positive counting numbers starting from 1 (e.g., 1, 2, 3, ...).

Whole Numbers: Natural numbers including 0 (e.g., 0, 1, 2, 3, ...).

Integers: Whole numbers and their negatives (e.g., ..., -2, -1, 0, 1, 2, ...).

Rational Numbers: All numbers that can be expressed as a ratio of two integers (includes integers, fractions, and terminating/repeating decimals).

Real Numbers: All rational and irrational numbers (irrational numbers cannot be expressed as fractions, e.g., √2, π).

The best possible Venn diagram:

Hence, the correct answer is "Option 1".

Q52. Answer: (b) 73^(rd) Amendment

The correct answer is 73rd Amendment.

Key Points

• The 73rd Amendment Act, 1992, is a significant step towards the decentralization of power and strengthening local self-governments in rural areas.

• This amendment provided constitutional status to the Panchayati Raj institutions and recognized them as the third tier of governance.

• It mandated the establishment of Panchayats at the village, intermediate, and district levels, ensuring a three-tier system of Panchayati Raj for all states having a population of over 20 lakhs.

• The 73rd Amendment Act also introduced provisions for financial powers and responsibilities of Panchayats, including the creation of a State Finance Commission to recommend measures to improve their financial situation.

Additional Information

• 63rd Amendment:

• The 63rd Amendment Act, 1989, repealed the 59th Amendment Act, 1988, which had empowered the President to declare a national emergency in Punjab.

• 74th Amendment:

• The 74th Amendment Act, 1992, aimed at strengthening urban local bodies (Municipalities) by providing them constitutional status and empowering them with necessary functions and finances.

• This amendment provided for the constitution and composition of Municipalities, ensuring regular elections, and the establishment of State Election Commissions and State Finance Commissions.

• 64th Amendment:

• The 64th Amendment Bill was introduced in 1989 but was not passed. It aimed at decentralizing power to local bodies but was not successful in becoming an Act.

Q53. Answer: (c) 92%

Given:

A milk vendor sells milk at 20% more than the cost price. Also, he adds 3 litres of water to every 5 litres of milk.

Formula used:

Overall Gain Percent = (Gain / Cost Price) × 100

Calculation:

Let the cost price of 1 litre of milk be Rs. 100.

Cost price of 5 litres of milk = 5 × 100 = Rs. 500

Selling price of 1 liter milk = 100 × 120/100 = Rs. 120

He adds 3 litres of water to 5 litres of milk,

total volume = 5 + 3 = 8 litres

So, Selling price of 8 liter milk = 8 × 120 = Rs. 960

Thus, total profit = 960 - 500 = Rs. 460

So, gain% = 460/500 × 100 = 460/5 = 92%

Therefore The correct answer is option (3).

Q54. Answer: (a) Arunachal Pradesh

The correct answer is Arunachal Pradesh.

Key Points

• Arunachal Pradesh is not governed by the 6th Schedule of the Indian Constitution.

• The 6th Schedule of the Indian Constitution deals with the administration of tribal areas in the states of Assam, Meghalaya, Tripura, and Mizoram.

• These areas are provided with a certain degree of autonomy through Autonomous District Councils (ADCs).

• Arunachal Pradesh, though it has a significant tribal population, is not covered under the 6th Schedule but has other mechanisms for tribal administration.

Additional Information

• 6th Schedule of the Indian Constitution

• The 6th Schedule was included in the Indian Constitution to provide for the administration of tribal areas in the northeastern states of Assam, Meghalaya, Tripura, and Mizoram.

• It provides for the establishment of Autonomous District Councils (ADCs) which have legislative, judicial, and administrative autonomy within their jurisdictions.

• The ADCs can make laws on subjects like land, forest, water, agriculture, village administration, and inheritance of property, among others, subject to the approval of the Governor.

• The aim of the 6th Schedule is to protect the interests of the indigenous tribal people through self-governance and to preserve their distinct culture and traditions.

• Autonomous District Councils (ADCs)

• ADCs are administrative bodies constituted in accordance with the 6th Schedule of the Indian Constitution.

• They are empowered to make laws, levy taxes, and manage resources in their respective areas.

• ADCs consist of members elected by the people living in the council areas and members nominated by the Governor.

• The primary purpose of ADCs is to ensure self-governance for tribal communities and to address issues specific to these regions.

• Tribal Administration in Arunachal Pradesh

• Arunachal Pradesh has a significant tribal population but is not governed by the 6th Schedule.

• The state has its own mechanisms for the administration of tribal areas, which include the establishment of various tribal councils and committees.

• The state government has taken various measures to protect the rights and interests of tribal communities, including the implementation of the Arunachal Pradesh Panchayati Raj Act.

• This act provides for a three-tier system of Panchayati Raj institutions which include Gram Panchayats, Anchal Samitis, and Zilla Parishads.

Q55. Answer: (c) Farming

The correct answer is Farming.

Key Points

• Farming is considered an unorganised sector because it does not follow systematic rules and regulations like the organised sector.

• Workers in the farming sector often do not have formal employment contracts, social security benefits, or fixed wages.

• Farming is predominantly characterized by informal employment, where labour laws and standards are not strictly enforced.

• The unorganised nature of farming makes workers vulnerable to economic instability, lack of job security, and poor working conditions.

Additional Information

• Unorganised Sector

• The unorganised sector refers to a segment of the economy that is not regulated by the government and where employment terms are not standardized.

• This sector includes small-scale enterprises, self-employed individuals, casual labourers, and agriculture workers.

• Workers in the unorganised sector generally lack job security, stable income, and social benefits like pensions, health insurance, and provident funds.

• Examples of the unorganised sector include street vendors, construction workers, domestic helpers, and small shop owners.

• Organised Sector

• The organised sector is characterized by formal employment practices, adherence to labour laws, and regulatory oversight.

• Employees in this sector usually have formal contracts, fixed working hours, and access to social security benefits.

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• Examples of the organised sector include government jobs, banks, multinational companies, and large-scale industries.

• Workers in the organised sector are often protected by laws that ensure minimum wages, safe working conditions, and other employee rights.

• Key Differences between Organised and Unorganised Sectors

• Regulation: The organised sector is regulated by the government, while the unorganised sector is largely unregulated.

• Employment Terms: Organised sector jobs come with formal contracts and defined employment terms, whereas the unorganised sector lacks such standardisation.

• Social Security: Employees in the organised sector have access to social security benefits, unlike those in the unorganised sector.

• Job Security: The organised sector offers more job security compared to the unorganised sector, where employment is often informal and unstable.

Q56. Answer: (d) Control unit and ALU

The correct answer is Control unit and ALU.

Key Points

• The CPU (Central Processing Unit) is often referred to as the brain of the computer.

• The two main components of the CPU are the Control Unit (CU) and the Arithmetic Logic Unit (ALU).

• The Control Unit directs the operation of the processor. It tells the computer's memory, arithmetic/logic unit, and input and output devices how to respond to the instructions that have been sent to the processor.

• The Arithmetic Logic Unit (ALU) is responsible for performing all arithmetic and logic operations, such as addition, subtraction, multiplication, division, and logical operations like AND, OR, and NOT.

Additional Information

• Control Unit (CU):

• The Control Unit is a crucial component of the CPU that manages the execution of instructions by directing the coordinated operations of the computer's hardware.

• It interprets the instructions from the computer's memory and converts them into signals that activate other parts of the computer, such as the ALU and I/O devices.

• The CU does not execute program instructions; instead, it directs other parts of the system to do so.

• It manages the flow of data within the CPU, ensuring that the correct operations are performed at the right time.

• Arithmetic Logic Unit (ALU):

• The ALU is the part of the CPU where all arithmetic (addition, subtraction, multiplication, division) and logic (AND, OR, NOT, XOR) operations take place.

• It is a fundamental building block of the CPU, performing the essential operations that enable the computer to process information.

• The ALU operates on binary data and produces results that are then stored in the computer's memory or registers for further use or output.

• Its efficiency and speed are critical for the overall performance of the CPU and the computer system as a whole.

• Other Components:

• While the CU and ALU are the primary components of the CPU, other important components include registers and the cache.

• Registers are small storage locations within the CPU that hold data temporarily during processing. They are used for quick data access and manipulation.

• The cache is a small, fast memory that stores frequently accessed data to speed up processing. It acts as a buffer between the CPU and the main memory (RAM).

Q57. Answer: (a) 6 m

Given:

Inner circumference = 564/7 m

Outer circumference = 942/7 m

Formula used:

Circumference of a circle = 2πr

Width of the path = Outer radius - Inner radius

Calculations:

564/7 = 56.5714

942/7 = 94.2857

Inner radius (r1)

=> 2πr1 = 56.5714

=> r1 = 56.5714/(2π)

=> r1 = 9

Outer radius (r2)

=> 2πr2 = 94.2857

=> r2 = 94.2857/(2π)

=> r2 = 15

Width of the path

=> r2 - r1 = 15 - 9

=> Width = 6 m

Therefore The correct answer is option 1.

Q58. Answer: (a) 64

The logic followed here is:

Hence, the correct answer is "64".

Q59. Answer: (b) 157

The logic followed here is:

Hence, the correct answer is "157".

Q60. Answer: (a) Linux

The correct answer is Linux.

Key Points

• Linux is an open-source operating system that was first released by Linus Torvalds in 1991.

• It is widely used for servers, desktops, smartphones, and other devices due to its stability and security.

• Linux distributions (distros) such as Ubuntu, Mint, and Fedora are different versions built on the Linux kernel, each offering unique features and user interfaces.

• These distributions are popular choices for both personal use and professional environments due to their flexibility and extensive support communities.

Additional Information

• Windows 10

• It is a proprietary operating system developed by Microsoft and released in 2015.

• Windows 10 is designed to work across various devices including PCs, tablets, and smartphones.

• It offers features like the Start Menu, Cortana digital assistant, and Microsoft Edge web browser.

• Windows 10 is known for its user-friendly interface and extensive software compatibility.

• MS DOS

• MS-DOS stands for Microsoft Disk Operating System, and it was an early operating system for IBM PCs.

• It was first released in 1981 and was the primary operating system for IBM-compatible PCs during the 1980s and early 1990s.

• MS-DOS uses a command-line interface, which requires users to type commands to perform tasks.

• It has largely been phased out in favor of graphical user interface (GUI) based operating systems like Windows.

• Apple MAC OS X

• It is an operating system developed by Apple Inc. for Mac computers.

• Mac OS X, now known as macOS, was first released in 2001 and is known for its sleek design and robust performance.

• It features a UNIX-based core, providing strong stability and security.

• macOS is known for its intuitive user interface and seamless integration with other Apple products and services.

Q61. Answer: (b) Afghanistan

The correct answer is Afghanistan.

Key Points

• India and Afghanistan signed an agreement to build the Shahtoot Dam in February 2021.

• The Shahtoot Dam is to be constructed on the Maidan River, a tributary of the Kabul River in Afghanistan.

• The project aims to provide clean drinking water to approximately 2 million residents of Kabul city.

• This agreement is a part of India’s ongoing efforts to assist Afghanistan in its reconstruction and development initiatives.

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Additional Information

• Shahtoot Dam:

• It is a proposed dam to be constructed on the Maidan River in the Chahar Asiab district of Afghanistan.

• The primary purpose of the dam is to provide drinking water to Kabul city, which faces severe water shortages.

• The project is expected to cost around $236 million and is funded by the Indian government.

• The dam will also help in irrigation and provide water for agricultural activities in the surrounding areas.

• India-Afghanistan Relations:

• India has been a key partner in Afghanistan's reconstruction efforts, contributing over $3 billion in development assistance.

• Projects include the construction of roads, dams, schools, and hospitals, as well as providing scholarships for Afghan students to study in India.

• India's development assistance is aimed at promoting stability and economic development in Afghanistan.

• The relationship between the two countries is built on historical and cultural ties, mutual interests, and a shared vision for a peaceful and prosperous Afghanistan.

• Kabul River:

• The Kabul River is a significant river in Afghanistan, flowing through the capital city of Kabul.

• It originates in the Sanglakh Range and flows eastwards to join the Indus River in Pakistan.

• The river is crucial for the water supply and irrigation needs of the Kabul region.

• Several dams and hydroelectric projects are planned or underway to harness the river's potential for energy and water resources.

• India's Development Assistance in Afghanistan:

• India has undertaken various infrastructure projects in Afghanistan, including the construction of the Afghan Parliament building and the Salma Dam.

• The Zaranj-Delaram Highway, built by India, connects Afghanistan to Iran, providing access to the Persian Gulf.

• India has also provided support in the fields of education, healthcare, and capacity building for Afghan institutions.

• The development assistance reflects India's commitment to supporting Afghanistan's sovereignty, peace, and development.

Q62. Answer: (c) 28

Given:

If $x = 3 + \sqrt{5}$ and $y = 3 - \sqrt{5}$, then find the value of $x^2 + y^2$.

Formula used:

$(a + b)^2 + (a - b)^2 = 2(a^2 + b^2)$

Calculation:

$x = 3 + \sqrt{5}$

$y = 3 - \sqrt{5}$

$x^2 + y^2 = (3 + \sqrt{5})^2 + (3 - \sqrt{5})^2$

$\Rightarrow x^2 + y^2 = (3^2 + 2\times3\times\sqrt{5} + (\sqrt{5})^2) + (3^2 - 2\times3\times\sqrt{5} + (\sqrt{5})^2)$

$\Rightarrow x^2 + y^2 = (9 + 6\sqrt{5} + 5) + (9 - 6\sqrt{5} + 5)$

$\Rightarrow x^2 + y^2 = 14 + 14$

$\Rightarrow x^2 + y^2 = 28$

Therefore The correct answer is option (3).

Q63. Answer: (d) 36 cm

Given:

The perimeters of two squares are 48 cm and 60 cm.

Formula used:

Perimeter of a square = 4 × side

Area of a square = $side^2$

Calculation:

First square:

Perimeter = 48 cm

$\Rightarrow 4 \times side1 = 48$

$\Rightarrow side1 = 48 / 4 = 12$ cm

$Area1 = 12^2 = 144$ cm^2

Second square:

Perimeter = 60 cm

=> 4 × side2 = 60

=> side2 = 60 / 4 = 15 cm

Area2 = 15^2 = 225 cm^2

Third square:

Area3 = Area2 - Area1 = 225 - 144 = 81 cm^2

Side3 = √81 = 9 cm

Perimeter3 = 4 × side3 = 4 × 9 = 36 cm

Therefore The correct answer is option (4).

Q64. Answer: (b) elements having same atomic number but different mass number

The correct answer is elements having same atomic number but different mass number.

Key Points

• Isotopes are variants of a particular chemical element which differ in neutron number.

• While all isotopes of a given element have the same number of protons, they have different numbers of neutrons.

• This difference in neutron number means that isotopes of the same element have different mass numbers.

• For example, Carbon-12, Carbon-13, and Carbon-14 are isotopes of the element Carbon, with mass numbers 12, 13, and 14 respectively.

Additional Information

• Atomic Number

• The atomic number of an element is the number of protons in the nucleus of an atom of that element.

• It determines the chemical properties of the element and its place in the periodic table.

• For example, the atomic number of Hydrogen is 1 because it has one proton in its nucleus.

• Mass Number

• The mass number is the total number of protons and neutrons in an atom's nucleus.

• It is not the same as the atomic mass, which is the weighted average mass of an atom based on the abundance of its isotopes.

• For example, the mass number of an isotope of Carbon with 6 protons and 7 neutrons (Carbon-13) is 13.

• Isotopes

• Isotopes are important in various scientific applications, including radiometric dating, medical diagnostics and treatment, and nuclear energy.

• Radioactive isotopes, or radioisotopes, are isotopes that are unstable and decay over time, releasing radiation.

• Stable isotopes do not decay over time and remain unchanged.

Q65. Answer: (d) Nuclear fusion

The correct answer is Nuclear fusion.

Key Points

• Nuclear fusion is the process in which two light atomic nuclei combine to form a heavier nucleus, releasing a significant amount of energy.

• China's 'artificial sun', known as the Experimental Advanced Superconducting Tokamak (EAST), uses nuclear fusion technology to replicate the processes that occur in the sun.

• The goal of EAST is to create a sustainable and clean source of energy that can potentially solve the global energy crisis.

• In nuclear fusion, isotopes of hydrogen, such as deuterium and tritium, are used as fuel. When these isotopes fuse, they produce helium and a neutron, releasing energy in the process.

Additional Information

• Nuclear Fusion vs. Nuclear Fission

• Nuclear fusion involves combining two light atomic nuclei to form a heavier nucleus, releasing energy. This is the process that powers stars, including the sun.

• Nuclear fission, on the other hand, involves splitting a heavy atomic nucleus into two lighter nuclei, releasing energy. This is the process used in nuclear reactors and atomic bombs.

• Fusion has the potential to provide a nearly limitless source of energy with minimal environmental impact, whereas fission produces radioactive waste that needs to be managed carefully.

• Electromagnetic Induction

• This is the process of generating an electric current by changing the magnetic field. It was discovered by Michael Faraday.

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• It is widely used in electrical generators, transformers, and inductors.

• Gravitational Force

• It is a natural phenomenon by which all things with mass or energy are brought toward one another.

• On Earth, it gives weight to physical objects and causes the ocean tides.

Q66. Answer: (c) E3H7

The logic followed here is:

Hence, the correct answer is "E3H7".

Q67. Answer: (b) Nanaji Deshmukh

The correct answer is Nanaji Deshmukh.

Key Points

• Nanaji Deshmukh was a notable social activist and politician of India.

• He was awarded the Bharat Ratna, India's highest civilian award, in 2019 for his immense contributions to the field of education, health, and rural self-reliance.

• Nanaji Deshmukh played a significant role in the upliftment of rural areas and the establishment of self-reliant villages.

• He was deeply involved in the establishment and expansion of the Deendayal Research Institute, which focuses on rural development and self-reliance.

Additional Information

• Bharat Ratna

• The Bharat Ratna is the highest civilian award of the Republic of India.

• It was instituted in 1954 and is awarded in recognition of exceptional service or performance of the highest order, without distinction of race, occupation, position, or sex.

• The award was originally limited to achievements in the arts, literature, science, and public services, but the government expanded the criteria to include "any field of human endeavour" in December 2011.

• The award does not carry any monetary grant; it consists of a certificate (Sanad) signed by the President of India and a medallion.

• Nanaji Deshmukh's Contributions

• He was a prominent leader of the Bharatiya Janata Party (BJP) and the Rashtriya Swayamsevak Sangh (RSS).

• Nanaji Deshmukh was instrumental in the social restructuring of rural areas, primarily through his work with the Deendayal Research Institute (DRI).

• His efforts in the field of education include the establishment of various educational institutions and initiatives aimed at improving the educational infrastructure in rural India.

• Nanaji's work in health involved the promotion of health awareness and the establishment of health care facilities in rural areas, focusing on preventive and curative health care.

Q68. Answer: (a) Forehead-8, Facial-14, Ear-6, Hyoid-1

The correct answer is Option 1: Forehead-8, Facial-14, Ear-6, Hyoid-1.

Key Points

• The human skull is made up of a total of 29 bones.

• These bones are categorized into four main groups: Forehead (Cranial), Facial, Ear (Auditory Ossicles), and Hyoid.

• The Forehead (Cranial) bones include 8 bones: frontal, parietal (2), temporal (2), occipital, sphenoid, and ethmoid.

• The Facial bones consist of 14 bones: nasal (2), maxilla (2), zygomatic (2), palatine (2), lacrimal (2), inferior nasal concha (2), vomer, and mandible.

Additional Information

• Cranial Bones

• The cranial bones form the protective case around the brain and include the frontal, parietal, temporal, occipital, sphenoid, and ethmoid bones.

• Facial Bones

• The facial bones form the structure of the face and include the nasal, maxilla, zygomatic, palatine, lacrimal, inferior nasal concha, vomer, and mandible bones.

• Ear (Auditory Ossicles)

• The auditory ossicles are small bones found in the middle ear that include the malleus (2), incus (2), and stapes (2), totaling 6 bones.

• Hyoid Bone

• The hyoid bone is a unique bone in the neck that supports the tongue and is not directly attached to any other bones in the skeleton. It is a single bone.

Q69. Answer: (c) Argentina – Prairies

The correct answer is Argentina – Prairies.

Key Points

• The grassland in Argentina is known as Pampas, not Prairies.

• Prairies are the grasslands found in North America, particularly in the USA and Canada.

• The Pampas are fertile South American lowlands that cover more than 750,000 km2 and include the Argentine provinces of Buenos Aires, La Pampa, Santa Fe, Entre Ríos, and Córdoba.

• The term "Pampas" comes from the Quechua word for "plain".

Additional Information

• Steppe

• Steppes are large areas of flat, unforested grassland, especially in southeastern Europe or Siberia.

• They are characterized by semi-arid and continental climates, which means they have hot summers and cold winters.

• The Eurasian Steppe is the most famous, stretching from Ukraine to Mongolia.

• Veld

• The Veld is a type of wide open rural landscape in Southern Africa.

• It is mainly found in South Africa, Zimbabwe, Swaziland, Lesotho, and Botswana.

• The term 'veld' refers to a geographic region defined by the type of vegetation found there, including grasslands and savannas.

• Downs

• Downs are areas of open, chalk hills, such as the North Downs and South Downs in southern England.

• They are characterized by rolling hills and are typically used for grazing sheep and other livestock.

• Prairies

• Prairies are ecosystems considered part of the temperate grasslands, savannas, and shrublands biome.

• They are found in the interior lowlands of North America, including parts of the USA and Canada.

• Prairies are characterized by tall grasses and are a crucial part of the agricultural sector in these regions.

• Pampas

• The Pampas are fertile South American lowlands that cover parts of Argentina, Uruguay, and Brazil.

• They are known for their rich soil, making them ideal for agriculture, especially for growing wheat and corn and for cattle ranching.

• The climate in the Pampas is typically mild, with well-distributed rainfall throughout the year.

Q70. Answer: (d) Mother’s Father

Family Chart:

Given: Raj told Rahul, “Yesterday, I defeated the father of the only sister of my maternal uncle.”

So, Raj defeated 'Mother’s father'.

Hence, the correct answer is "Mother’s father".

Q71. Answer: (b) 830.73

Given:

$(515.86 \times 515.86 - 314.87 \times 314.87)/200.99 = ?$

Formula used:

$(a^2 - b^2) = (a + b)(a - b)$

Calculation:

$(515.86 \times 515.86 - 314.87 \times 314.87)/200.99 = ?$

$(515.86^2 - 314.87^2) = (515.86 + 314.87)(515.86 - 314.87)$

$\Rightarrow ? = (830.73 \times 200.99)/200.99$

$\Rightarrow ? = 830.73$

Therefore The correct answer is option 2.

Q72. Answer: (b) 900

Given:

Interest (I) = Rs. 630

Rate (r) = 10% p.a.

Time (t) = 2 years

Formula used:

Compound Interest (CI) = P(1 + r/100)^t - P

Simple Interest (SI) = P × r × t / 100

Calculations:

630 = P(1 + 10/100)² - P

=> 630 = P(1.1)² - P

=> 630 = P(1.21 - 1)

=> 630 = P(0.21)

=> P = 630 / 0.21

=> P = Rs. 3000

Simple Interest Calculation:

SI = P × r × t / 100

SI = 3000 × 10 × 3 / 100

=> SI = 3000 × 0.3

=> SI = Rs. 900

Therefore The correct answer is option 2.

Q73. Answer: (a) 3

The correct answer is 3.

Key Points

• The Industrial Policy Resolution of 1956 was a key policy document that guided the development of industries in India.

• It classified industries into three categories: Schedule A, Schedule B, and Schedule C.

• Schedule A comprised industries that would be exclusively owned by the state.

• Schedule B included industries that would be progressively state-owned, with the private sector supplementing the efforts of the state.

Additional Information

• Industrial Policy Resolution 1956

• The Industrial Policy Resolution of 1956 was crucial in shaping India's industrial development and laid down the framework for the economic policies.

• It emphasized the importance of public sector enterprises in the development of the economy.

• Schedule A industries included critical sectors such as defense, atomic energy, and railways.

• Schedule B industries included sectors where both the state and private enterprises could operate, such as machine tools, fertilizers, and road transport.

• Schedule C included all other industries that were left to the private sector but subject to regulation and control by the state.

• This resolution also aimed at reducing income disparities and promoting balanced regional development.

• Second Five Year Plan (1956-1961)

• The Second Five Year Plan was based on the Mahalanobis model, which emphasized the importance of heavy industries and aimed at building a strong industrial base for the country.

• The plan allocated significant resources to the development of public sector enterprises and infrastructure.

• It aimed at achieving a rapid expansion of the public sector and increasing the production capacity of industries.

• The plan also focused on the development of heavy industries such as steel, machinery, and chemical industries.

• Public Sector Enterprises (PSEs)

• PSEs are government-owned corporations or state-owned enterprises created to undertake commercial activities on behalf of the government.

• They play a significant role in the economic development of the country by providing employment, contributing to GDP, and ensuring the availability of essential goods and services.

• Examples of PSEs include Bharat Heavy Electricals Limited (BHEL), Steel Authority of India Limited (SAIL), and Indian Oil Corporation (IOC).

Q74. Answer: (d) Minimum Support Price

The correct answer is Minimum Support Price.

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Key Points

• The Minimum Support Price (MSP) is a form of market intervention by the Government of India to insure agricultural producers against any sharp fall in farm prices.

• MSP is announced by the Government of India at the beginning of the sowing season for certain crops based on the recommendations of the Commission for Agricultural Costs and Prices (CACP).

• The major objective of MSP is to support the farmers from distress sales and to procure food grains for public distribution.

• MSP ensures farmers are given a minimum profit for their harvest, safeguarding their investment against fluctuating market prices.

Additional Information

• Commission for Agricultural Costs and Prices (CACP)

• The CACP is an attached office of the Ministry of Agriculture and Farmers Welfare, Government of India.

• It was established in 1965 and provides pricing policy recommendations to the Government of India for major agricultural commodities.

• The CACP takes into account various factors like cost of production, changes in input prices, input-output price parity, trends in market prices, demand and supply, and a reasonable margin for farmers.

• Public Distribution System (PDS)

• The PDS is an Indian food security system established under the Ministry of Consumer Affairs, Food, and Public Distribution.

• PDS distributes subsidized food and non-food items to India's poor.

• Major commodities distributed include staple food grains, such as wheat, rice, sugar, and kerosene through a network of Fair Price Shops (FPS) established in several states across the country.

• Food Corporation of India (FCI)

• The FCI is a statutory body created and run by the Government of India.

• It was established in 1965 under the Food Corporations Act 1964 to ensure food security for the nation.

• FCI is responsible for the procurement and distribution of food grains across India.

• It ensures that farmers are paid the MSP and that food grains are distributed to the poor and needy at subsidized rates through the PDS.

Q75. Answer: (b) Only conclusion II follows

Statements:

1. All doctors are good.

2. Some men are doctors.

The least possible Venn diagram:

Conclusion:

I. All good doctors are men. - False (because, All doctors are good and Some men are doctors. So, All good doctors cannot be men)

II. Some men are good. - True (because, All doctors are good and Some men are doctors. So, Some men are good. It is definite)

So, Only conclusion II follows.

Hence, the correct answer is "Only conclusion II follows".

Q76. Answer: (d) May 2005, June 2005

The correct answer is May 2005, June 2005.

Key Points

• The Right to Information (RTI) Act was passed by the Indian Parliament in May 2005.

• It received the Presidential assent on June 15, 2005.

• The RTI Act was enacted to promote transparency and accountability in the working of every public authority.

• The RTI Act mandates timely response to citizen requests for government information.

Additional Information

• Right to Information (RTI) Act:

• The RTI Act is a law enacted by the Parliament of India to provide for setting out the practical regime of right to information for citizens.

• Under the provisions of the Act, any citizen may request information from a "public authority" (a body of Government or "instrumentality of State") which is required to reply expeditiously or within thirty days.

• The Act also requires every public authority to computerize their records for wide dissemination and to proactively publish certain categories of information so that the citizens need minimum recourse to request for information formally.

• Importance of RTI Act:

• The RTI Act promotes transparency and accountability in the working of every public authority.

• It empowers citizens to seek information from the government, thereby promoting openness and transparency.

• The Act helps in making the government more accountable and reduces corruption by ensuring that the decisions and actions of public authorities are subject to scrutiny.

• It also encourages public participation in governance by providing citizens with the information they need to make informed decisions.

• Implementation of RTI Act:

• The Central Information Commission (CIC) and State Information Commissions (SICs) have been established to enforce the RTI Act.

• These commissions are responsible for handling complaints and appeals related to the denial of information under the Act.

• Public authorities are required to appoint Public Information Officers (PIOs) to handle requests for information from citizens.

• Citizens can file RTI applications either in writing or electronically, and they are entitled to receive the requested information within the stipulated time frame.

Q77. Answer: (d) 364

Shortcut Trick

Identify prime numbers in the range (9 to 58) and group them for faster addition.

Primes: (11+19) + (13+17) + (23+37) + (29+31) + (41+43+47+53)

=> 30 + 30 + 60 + 60 + 184 = 364

Therefore The correct answer is 364.

Alternate Method

Given: Integers greater than 8 and less than 59.

Formula: Sum of primes = S = p1 + p2 + ... + p_n

=> Prime numbers between 8 and 59 are: 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53.

=> Sum = 11 + 13 + 17 + 19 + 23 + 29 + 31 + 37 + 41 + 43 + 47 + 53

=> Sum = (11 + 13 + 17 + 19) + (23 + 29 + 31 + 37) + (41 + 43 + 47 + 53)

=> Sum = 60 + 120 + 184

=> Sum = 364

Therefore The correct answer is 364.

Additional Information

Definition of Prime Number

A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself.

Primes from 1 to 100

There are exactly 25 prime numbers between 1 and 100: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97.

Twin Primes

Twin primes are pairs of prime numbers that have a difference of 2, such as (11, 13) and (17, 19).

Co-prime Numbers

Two numbers are co-prime if their Highest Common Factor (HCF) is 1, regardless of whether they are prime themselves.

Q78. Answer: (a) Bering Strait

The correct answer is Bering Strait.

Key Points

• The Bering Strait is a narrow passage of water that connects the Arctic Ocean with the Pacific Ocean.

• It lies between the easternmost point of the Asian continent (Russia) and the westernmost point of the North American continent (Alaska, USA).

• The strait is named after the Danish explorer Vitus Bering, who sailed the waters in the early 18th century.

• The Bering Strait has significant geographical and ecological importance as it is a natural boundary between two major oceans and supports a diverse range of marine life.

Additional Information

• Arctic Ocean

• The Arctic Ocean is the smallest and shallowest of the world's five major oceans.

• It is located mostly within the Arctic Circle and surrounds the North Pole.

• The Arctic Ocean is known for its extreme conditions, including long periods of darkness in winter and continuous daylight in summer.

• It plays a crucial role in global climate regulation and is home to unique wildlife such as polar bears, walruses, and various species of seals and whales.

• Pacific Ocean

• The Pacific Ocean is the largest and deepest ocean on Earth, covering more than 63 million square miles.

• It extends from the Arctic Ocean in the north to the Southern Ocean in the south and is bounded by Asia and Australia to the west and the Americas to the east.

• The Pacific Ocean is known for its vast array of marine species, coral reefs, and significant geological features like the Pacific Ring of Fire.

• It has a profound impact on the world's weather patterns and climates.

• Vitus Bering

• Vitus Bering was a Danish explorer and officer in the Russian Navy.

• He is best known for his explorations of the northeastern coast of Asia and the western coast of North America, which led to the discovery of the Bering Strait.

• His voyages were instrumental in mapping the geography of the region and establishing connections between the continents.

• He died during his second expedition in 1741, but his legacy lives on through the strait and the sea named after him.

Q79. Answer: (c) France

The correct answer is France.

Key Points

• The Rafale is a French twin-engine, multirole fighter aircraft designed and built by Dassault Aviation.

• India signed a deal with France to procure 36 Rafale fighter jets in September 2016.

• The Rafale jets are known for their advanced avionics, radars, and weapon systems, making them a significant addition to the Indian Air Force.

• The first batch of Rafale jets was formally inducted into the Indian Air Force in September 2020 at the Ambala Air Force Station.

Additional Information

• Dassault Aviation

• Dassault Aviation is a French aerospace company that designs and manufactures military aircraft, business jets, and unmanned aerial vehicles (UAVs).

• The company was founded in 1929 by Marcel Dassault.

• It is known for producing a range of combat aircraft, including the Mirage series and the Rafale.

• Features of Rafale

• The Rafale is capable of performing multiple roles such as air supremacy, interdiction, aerial reconnaissance, ground support, in-depth strike, anti-ship strike, and nuclear deterrence missions.

• It is equipped with a wide range of weapons, including the MICA air-to-air missile, SCALP cruise missile, and Meteor long-range missile.

• The aircraft features advanced avionics, including an active electronically scanned array (AESA) radar, electronic warfare systems, and a state-of-the-art cockpit.

• Indo-French Defense Cooperation

• India and France have a long history of defense cooperation and strategic partnership.

• Both countries conduct joint military exercises, share intelligence, and collaborate on defense technology and equipment.

• The procurement of Rafale jets is a significant milestone in strengthening the defense ties between the two nations.

• Strategic Importance for India

• The induction of Rafale jets enhances India's air combat capabilities and provides a strategic edge over potential adversaries.

• The advanced technology and weaponry of the Rafale play a crucial role in modernizing the Indian Air Force.

• The jets are expected to be a key asset in safeguarding India's national security and maintaining regional stability.

Q80. Answer: (c) a = 47/76 ; b = 1/76

Given:

If $(7 + 2\sqrt{5})/(11 + 3\sqrt{5}) = a + b\sqrt{5}$, then:

Formula used:

To rationalize the denominator, we multiply by the conjugate of the denominator.

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(7 + 2√5)/(11 + 3√5) × (11 - 3√5)/(11 - 3√5)

Calculation:

(7 + 2√5)(11 - 3√5)/(11 + 3√5)(11 - 3√5)

=> (7 × 11 + 7 × (-3√5) + 2√5 × 11 + 2√5 × (-3√5))/(11² - (3√5)²)

=> (77 - 21√5 + 22√5 - 30)/(121 - 45)

=> (47 + √5)/76

=> 47/76 + 1/76√5

Therefore The correct answer is option (3).

Q81. Answer: (b) 90(√3 + 1) m

Given:

Height of lighthouse (h) = 90 m

Angle of elevation from first ship (θ1) = 30º

Angle of elevation from second ship (θ2) = 45º

Formula used:

tan(θ) = Perpendicular / Base

Calculations:

For the first ship (distance from lighthouse = x):

tan(30º) = h / x

=> 1/√3 = 90 / x

=> x = 90√3

For the second ship (distance = y):

tan(45º) = h / y

=> 1 = 90 / y

=> y = 90

Distance between the two ships = x + y

=> Distance = 90√3 + 90

=> Distance = 90(√3 + 1)

Therefore The correct answer is option (2).

Q82. Answer: (c) Ostrich

The logic followed here is:

Vulture	Can Fly
Kite	Can Fly
Ostrich	Flightless Bird
Eagle	Bird of Prey

Vulture, Kite, Eagle all can fly.

Whereas, Ostrich is a Flightless Bird.

Hence, the correct answer is "Ostrich".

Q83. Answer: (d) Hague

The correct answer is Hague.

Key Points

• The Hague is the seat of the International Court of Justice (ICJ), the principal judicial organ of the United Nations.

• The International Court of Justice was established in June 1945 by the Charter of the United Nations and began work in April 1946.

• The ICJ settles legal disputes submitted by states and gives advisory opinions on legal questions referred to it by authorized international organs and agencies.

• The Peace Palace in The Hague, Netherlands, is the official seat of the ICJ.

Additional Information

• International Court of Justice (ICJ)

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• The ICJ is one of the six principal organs of the United Nations.
• It is the only one not located in New York, United States.
• The ICJ's primary functions are to settle legal disputes between states and to give advisory opinions on legal questions.
• Its official languages are English and French.
• Peace Palace
• The Peace Palace is an international law administrative building in The Hague, Netherlands.
• It houses the International Court of Justice, the Permanent Court of Arbitration, the Hague Academy of International Law, and the Peace Palace Library.
• The Peace Palace was officially opened on 28 August 1913.
• Charter of the United Nations
• The Charter of the United Nations is the foundational treaty of the United Nations.
• It was signed on 26 June 1945 in San Francisco, California, United States, at the conclusion of the United Nations Conference on International Organization, and came into force on 24 October 1945.
• The Charter consists of a preamble and 111 articles grouped into 19 chapters.
• Advisory Opinions
• Advisory opinions are legal advice provided by the ICJ to the United Nations General Assembly, the Security Council, or other UN organs and specialized agencies.
• These opinions are not binding but carry significant legal weight and moral authority.

Q84. Answer: (d) Ascorbic acid – Tamarind

The correct answer is Ascorbic acid – Tamarind.

Key Points

• Acetic acid is correctly matched with Vinegar. Vinegar is a solution of acetic acid in water, typically containing 5-8% acetic acid by volume.
• Oxalic acid is correctly matched with Spinach. Spinach contains oxalic acid, which can bind to minerals like calcium and form oxalates, potentially affecting mineral absorption.
• Lactic acid is correctly matched with Curd. Lactic acid is produced during the fermentation of lactose (milk sugar) by lactic acid bacteria, giving curd its characteristic tangy taste.
• Ascorbic acid is incorrectly matched with Tamarind. Ascorbic acid, also known as Vitamin C, is not significantly present in tamarind. Tamarind is more known for its tartaric acid content.

Additional Information

• Acetic Acid (CH_3COOH):
• It is a colorless liquid organic compound with a pungent smell and a sour taste.
• It is a key component of vinegar and is used as a condiment and preservative.
• In addition to its culinary uses, acetic acid is also used in chemical synthesis and industrial applications.
• Oxalic Acid ($C_2H_2O_4$):
• It is an organic compound found in many plants, including spinach, rhubarb, and beetroot.
• Oxalic acid can form soluble or insoluble salts with minerals such as calcium, affecting their bioavailability.
• In high amounts, oxalic acid can contribute to the formation of kidney stones.
• Lactic Acid ($C_3H_6O_3$):
• It is produced during anaerobic respiration in muscles and during the fermentation of lactose in dairy products.
• Lactic acid is responsible for the sour taste of fermented foods like yogurt, kefir, and sauerkraut.
• It is also used in the food industry as a preservative and flavoring agent.
• Ascorbic Acid ($C_6H_8O_6$):
• Also known as Vitamin C, it is an essential nutrient for humans and certain other animal species.
• It is important for the biosynthesis of collagen, L-carnitine, and certain neurotransmitters.
• Ascorbic acid is a potent antioxidant and plays a role in immune function.
• Rich sources of Vitamin C include citrus fruits, strawberries, kiwi, bell peppers, and broccoli.

Q85. Answer: (b) 3.5

Given:

The HCF of 17.5, 42, and 14

Formula used:

HCF of fraction = HCF of numerator / LCM of denominator

Calculation:

17.5 = 175/10 = 35/2

42 = 42/1

14 = 14/1

So, HCF of {35/2, 42/1, 14/1}

=> HCF of {35, 42, 14} / LCM of {2, 1, 1}

=> 7 / 2 = 3.5

Therefore The correct answer is option (2).

Q86. Answer: (b) Accountants

Given:

Managers (2000) = 19, Managers (2002) = 19

Accountants (2000) = 115, Accountants (2002) = 154

Programmers (2000) = 134, Programmers (2002) = 173

Technicians (2000) = 116, Technicians (2002) = 120

Formula used:

(Number in 2002 - Number in 2000)/(Number in 2000) × 100

Calculations:

Managers: (19 - 19)/19 × 100 = 0%

Accountants: (154 - 115)/115 × 100 = 39/115 × 100 ≈ 33.91%

Programmers: (173 - 134)/134 × 100 = 39/134 × 100 ≈ 29.10%

Technicians: (120 - 116)/116 × 100 = 4/116 × 100 ≈ 3.45%

Therefore The category with the highest growth is Accountants with 33.91%.

Q87. Answer: (c) The number of Programmers, Technicians and Analysts together was more than 50% of the total employees in 2000.

Given:

Managers (2000) = 19, Managers (2002) = 19

Accountants (2000) = 115, Accountants (2002) = 154

Programmers (2000) = 134, Programmers (2002) = 173

Technicians (2000) = 116, Technicians (2002) = 120

Analysts (2000) = 32, Analysts (2002) = 133

Peons (2000) = 96, Peons (2002) = 149

Formula used:

(Number in 2002 - Number in 2000)/(Number in 2000) × 100

Calculations:

Accountants: (154 - 115)/115 × 100 = 39/115 × 100 ≈ 33.91%

Programmers: (173 - 134)/134 × 100 = 39/134 × 100 ≈ 29.10%

Technicians: (120 - 116)/116 × 100 = 4/116 × 100 ≈ 3.45%

Analysts: (133 - 32)/32 × 100 = 101/32 × 100 ≈ 315.63%

Peons: (149 - 96)/96 × 100 = 53/96 × 100 ≈ 55.21%

Now, let's evaluate each statement:

Option 1: The second highest increase in numbers from 2000 to 2002 was in the category of Accountants.

We see the percentage increases: Analysts (315.63%), Peons (55.21%), Accountants (33.91%), Programmers (29.10%), Technicians (3.45%). The second highest increase is indeed in Peons, not Accountants.

So, this statement is false.

Option 2: The total number of Programmers and Technicians in 2000 was less than 50% of the number of employees in these two categories in 2002.

Programmers and Technicians in 2000: 134 + 116 = 250

Programmers and Technicians in 2002: 173 + 120 = 293

250/293 × 100 ≈ 85.3%

Since 250 is more than 50% of 293, this statement is false.

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Option 3: The number of Programmers, Technicians, and Analysts together was more than 50% of the total employees in 2000.

Programmers + Technicians + Analysts in 2000: 134 + 116 + 32 = 282

Total employees in 2000: 19 + 115 + 134 + 116 + 32 + 96 = 512

282/512 × 100 ≈ 55.5%

Since 282 is more than 50% of 512, this statement is true.

Option 4: The percentage increase in the number of Programmers is higher than the percentage increase in the number of Peons.

The percentage increase in Programmers is 29.10%, while in Peons, it is 55.21%. Thus, the percentage increase in Programmers is less than that in Peons.

So, this statement is false.

Therefore The correct answer is option (3).

Q88. Answer: (c) 46%

Given:

Managers (2000) = 19, Managers (2002) = 19

Accountants (2000) = 115, Accountants (2002) = 154

Programmers (2000) = 134, Programmers (2002) = 173

Technicians (2000) = 116, Technicians (2002) = 120

Analysts (2000) = 32, Analysts (2002) = 133

Peons (2000) = 96, Peons (2002) = 149

Formula used:

(Total in 2002 - Total in 2000)/(Total in 2000) × 100

Calculations:

Total in 2000: 19 + 115 + 134 + 116 + 32 + 96 = 512

Total in 2002: 19 + 154 + 173 + 120 + 133 + 149 = 748

(748 - 512)/512 × 100 = 236/512 × 100 = 46%

Therefore The approximate percentage increase in the total strength of all employees from 2000 to 2002 is 46%.

Q89. Answer: (a) 31%

Given:

Accountants (2000) = 115, Accountants (2002) = 154

Technicians (2000) = 116, Technicians (2002) = 120

Formula used:

(Number in 2002 - Number in 2000)/(Number in 2000) × 100

Calculations:

Accountants: (154 - 115)/115 × 100 = 39/115 × 100 ≈ 33.91%

Technicians: (120 - 116)/116 × 100 = 4/116 × 100 ≈ 3.45%

Difference in percentage increase:

33.91% - 3.45% ≈ 31%

Therefore The approximate difference in the percentage increase of Accountants and Technicians between 2000 to 2002 is 31%.

Q90. Answer: (b) Cloth

The logic followed here is:

Logic: Occupation and Object of Work.

Here,

Barber : Hair → A barber is a person whose occupation is to cut, trim, or style hair.

Similarly,

Tailor : Cloth → A tailor is a person whose occupation is to make, alter, or repair clothes made of cloth.

Hence, the correct answer is "Option 2".

Q91. Answer: (a) E06Q

The logic followed here is:

Hence, the correct answer is "E06Q".

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Q92. Answer: (a) Mint

The logic followed here is:
Logic: Manufacturing process.
Here,
Bricks : Kiln → Bricks are produced in a Kiln.
Similarly,
Coins : Mint → Coins are produced in a Mint.
Hence, the correct answer is "Option 1".

Q93. Answer: (b) 10

Let the number of buffalos be x.
So, the total number of heads is 20 (pigeons) + 10 (cows) + 15 (dogs) + x (buffalos) = 45 + x
and the total number of legs is
= (20 x 2) + (10 x 4) + (15 x 4) + (x x 4)
= 40 + 40 + 60 + 4x
= 140 + 4x
As per question,
the total number of feet is 125 more than the heads
140 + 4x = (45 + x) + 125
= 140 + 4x = 170 + x
= 3x = 30
= x = 10
Hence, the correct answer is "10".

Q94. Answer: (c) Cargo

The logic followed here is:

Railways	Mode of transportation
Roadways	Mode of transportation
Cargo	Goods or merchandise
Shipping	Mode of transportation

Railways, Roadways, Shipping all are Modes of transportation,
Whereas, Cargo refers to Goods or merchandise.
Hence, the correct answer is "Cargo".

Q95. Answer: (c) 35

The logic followed here is:
Hence, the correct answer is "35".

Q96. Answer: (a) D, P, R, C, Q

Given: Group captain is selecting 5 members out of A, B, C, D, E, F, P, Q, R and T for his team.
1) A, E and F can only be selected together.
2) If B is selected, then neither Q nor D can be selected.
3) C cannot be selected with E or F.
4) Only one can be selected from B or T.
Lets check option one by one:
Option 1) D, P, R, C, Q → Correct (As it satisfies all conditions)
Option 2) A, B, E, P, R → Does not Correct (As F is missing, and A, E and F can only be selected together.)
Option 3) B, P, R, C, T → Does not Correct (As Only one can be selected from B or T. Here B and T both are present)
Option 4) A, B, C, E, F → Does not Correct (As C cannot be selected with E or F.)
Hence, the correct answer is "D, P, R, C, Q".

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Q97. Answer: (c) Only conclusion II follows.

Statements:

1. All dogs are pets.

2. No pets is a tiger.

The least possible Venn diagram:

Conclusion:

I. All pets are dogs. - False (Because All dogs are pets. So, some pets are dogs it is definite but All pets are dogs it cannot be possible)

II. No dog is a tiger. - True (Because All dogs are pets and No pets is a tiger. So, No dog is a tiger. It is definite)

Hence, the correct answer is "Only conclusion II follows".

Q98. Answer: (a) SQPLJLM

The logic followed here is:

PROBLEM is written as PSMEHJG.

Similarly, SPRINGS will be written as:

Hence, the correct answer is "SQPLJLM".

Q99. Answer: (a) AK

The logic followed here is:

Hence, the correct answer is "AK".

Q100. Answer: (b) Mother’s Brother’s Son

Family Chart:

Given: Pointing to a photograph, a woman said to a man, “She is the only child of the sister of the only son of your paternal grandfather”.

So, the man is the 'Mother’s Brother’s Son' of the person in the picture.

Hence, the correct answer is "Mother’s Brother’s Son".

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