RRB NTPC CBT-I Official Paper (Held On: 15 Feb 2021 Shift 1) (Previous Year Paper)

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

Take this paper as a timed mock test

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

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

Q1. ABC is a right-angled triangle. If the lengths of the two sides forming the right angle are 4 cm and 3 cm, what will be the radius of its incircle?

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

Q2. If √x + 2/5 × 70 = 20 × 1/4 × 7, then what will be the value of x?

(a) 49
(b) 48
(c) 50
(d) 46

Q3. The asthenosphere is the extremely viscous, mechanically weak, and ductile-deformable region of the upper _____ of the Earth.

(a) crust
(b) core
(c) mantle
(d) crust and core

Q4. Read the given statement and course of action carefully. Decide which of the following courses of action logically follows the statement?

Statement:

The weather bureau has released the weather forecast for Kashmir for the next week, in which they have said that there is going to be heavy snowfall throughout the week.

Courses:

I. The weather bureau should broadcast this information throughout Kashmir through various means.

II. The municipal bodies should make arrangements to clear the snow from the roads.

III. This news should be prevented from spreading outside the state.

(a) Only course of action (III) follows.
(b) Only courses of action (II) and (III) follow.
(c) All the courses of action (I), (II) and (III) follow.
(d) Only courses of action (I) and (II) follow.

Q5. Who started a special program called 'Young Scientist Program (YUVIKA - 2019)' for school children?

(a) DRDO
(b) ISRO
(c) NABARD
(d) IRDA

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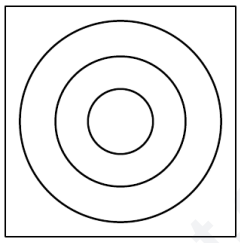
Q6. Vijaya Mulye, who passed away in May, 2019, was a prominent figure in the field of education. She can be credited with several innovative educational animation films on Doordarshan. Which of the following films is one of them?

(a) one many and unity
(b) Better than rest of the world
(c) Music plays from every side
(d) When my tune and your tune merge

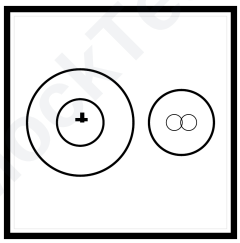
Q7. Select the Venn diagram that best represents the relationship between the following group of classes.

Male, Father, Doctor

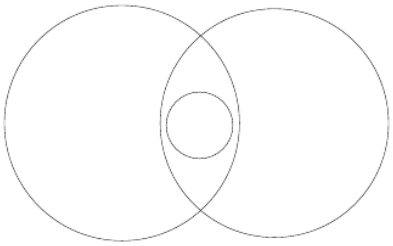
(a)

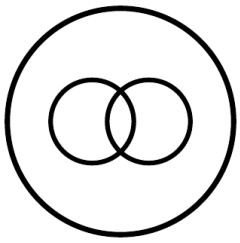


(b)

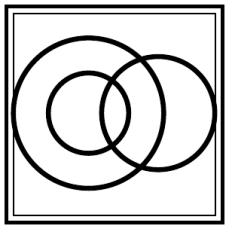


(c)





(d)



Q8. Megaloblastic anaemia is caused by the deficiency of which vitamin?

(a) Vitamin B2
(b) Vitamin C
(c) Vitamin B9
(d) Vitamin - A

Q9. Which of the following options is related to the 124th Constitutional Amendment Bill?

(a) National Commission for Backward Classes
(b) Right to free and compulsory education up to the age of fourteen years
(c) GST Bill
(d) 10% reservation for economically weaker sections of general category

Q10. If the numerator of a fraction is reduced by 80% and the denominator by 60%, then the fraction obtained is equal to 5/6. Find the original fraction.

(a) 5/3
(b) 7/3
(c) 6/5
(d) 3/5

Q11. The 'DigiGaon' initiative was launched by the _____ Department.

(a) Ministry of Social Justice and Empowerment
(b) Ministry of Health and Family Welfare
(c) Ministry of Electronics and Information Technology
(d) Ministry of Agriculture and Farmers Welfare

Q12. One fourth of the pencil is black, half of the remaining part is green and the remaining part of the pencil is yellow. If the length of the yellow part is 1(1)/(2) cm, then what will be the length of the pencil?

(a) 5 cm
(b) 6 cm
(c) 7 cm
(d) 4 cm

Q13. Name the enzyme which is used to convert proteins into peptides.

(a) Lactase
(b) Invertase
(c) Pepsin
(d) Zymase

Q14. Which is the most available and most intensively used soil for agriculture in India?

(a) Alluvial soil
(b) Red Soil
(c) Desert Soil
(d) black soil

Q15. Which Prime Minister was born after India gained independence?

(a) Manmohan Singh
(b) Narendra Modi
(c) IK Gujral
(d) Atal Bihari Vajpayee

Q16. Two trains, 200 m and 400 m long, are running on parallel tracks. When both trains move in the same direction, the faster train takes 30 seconds to pass the other train, and when both trains are moving towards each other, they take 6 seconds to pass each other. What will be the speed (in km/h) of both the trains?

(a) 216 and 144
(b) 190 and 260
(c) 184 and 144
(d) 280 and 140

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Q17. A person bought 20 dozen mangoes for Rs. 1,000. Out of them, 40 mangoes turned out to be rotten and could not be sold. At what price per dozen should he sell the remaining mangoes to make a profit of 30%?

(a) Rs. 78
(b) Rs. 72
(c) Rs. 70
(d) Rs. 80

Q18. In which year Dadabhai Naoroji became the first Indian member of the House of Commons in the United Kingdom?

(a) 1893
(b) 1891
(c) 1892
(d) 1896

Q19. Who was posthumously awarded the Dadasaheb Phalke Award at the 65th National Film Awards?

(a) kader khan
(b) Shammi Kapoor
(c) Vinod Khanna
(d) Sridevi

Q20. If $\tan\theta - \cot\theta = x$ and $\cos\theta - \sin\theta = y$, then find the value of $(x^2 + 4)(y^2 - 1)^2$.

(a) 3
(b) 4
(c) 9
(d) 2

Q21. In a certain code language, 'Sharks are fish' is written as '@ # mt', 'Fish eat food' is written as 'lu mt ak', 'Sharks eat fish' is written as 'mt ak @'. What is the code word used for 'Sharks' in that code language?

(a) ak
(b) @
(c) mt
(d) lu

Q22. The greatest common factor of two numbers is 20 and their least common multiple is 400. If one of the numbers is 80, then what is the other number?

(a) 100
(b) 80
(c) 120
(d) 150

Q23. If one angle of a parallelogram is 30^o less than twice the smallest angle, then find the measure of the largest angle of the parallelogram.

(a) 120^o
(b) 90^o
(c) 105^o
(d) 110^o

Q24. The mean of 6 numbers is 18. By including another number in it, the mean of 7 numbers becomes 20. Find the number included.

(a) 20
(b) 10
(c) 30
(d) 32

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Q25. What is the symbol of RBI?

(a) Ashoka Pillar
(b) dog in defensive position
(c) pyramid and an eagle
(d) Bengal tiger in front of a palm tree

Q26. Which of the following satellite has been dedicated as India's first educational satellite?

(a) HAMSAT
(b) CARTOSAT - 1
(c) INSAT - 4A
(d) GSAT - 3

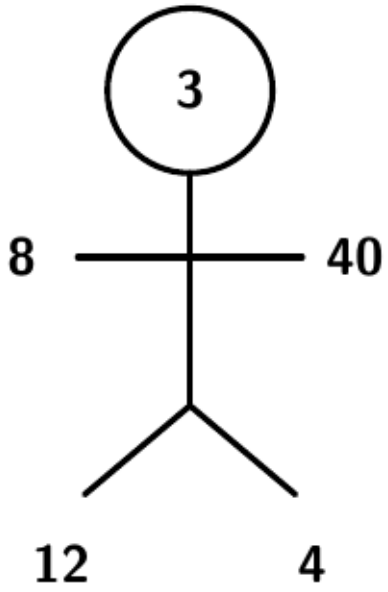
Q27. Which of the following pairs is not correctly matched (UNESCO Natural Heritage Site and its location)?

(a) Sun Temple - Odisha
(b) Elephanta Caves - Karnataka
(c) Fatehpur Sikri - Uttar Pradesh
(d) Sunderbans National Park - West Bengal

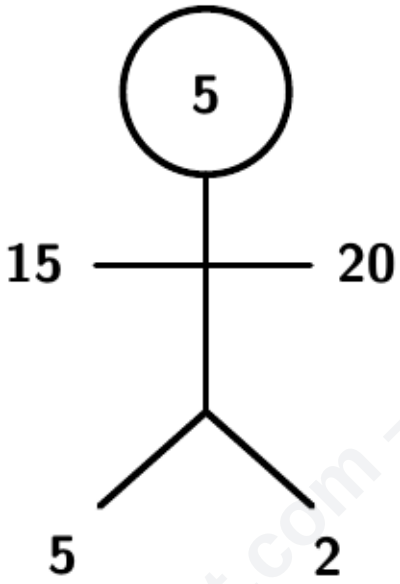
Q28. When was the 78th anniversary of the Quit India Movement celebrated?

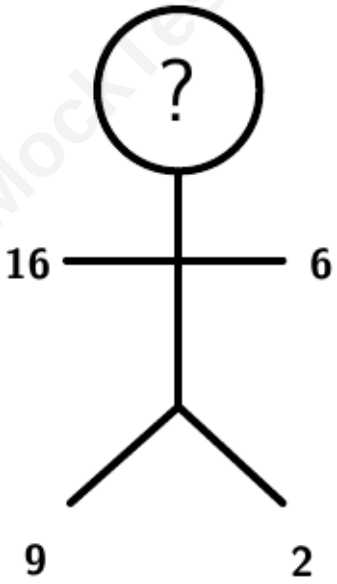
(a) 8 August 2020
(b) 5 August 2020
(c) 15 August 2018
(d) 7 August 2019

Q29. Read the given pattern carefully and select the number that can replace the question mark (?) in it.



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(a) 2
(b) 4
(c) 18
(d) 22

Q30. A can type 50 words in 1 minute and B can type 40 words in 1 minute. First A types for 1 minute, and then B types for the next 1 minute and so on. Typing in this manner alternately, they typed 980 words. How much time did they take to type 980 words?

(a) 21 minutes 45 seconds
(b) 21 minutes 80 seconds
(c) 20 minutes 35 seconds
(d) 20 minutes 15 seconds

Q31. Read the given statements and conclusions carefully and decide which of the given conclusions logically follow from these statements.

Statements:

I. I have not read all the seven Harry Potter books yet.

II. I have read all the books of Jane Austen.

III. I do not like reading self-help books, though I have read some of them for novelty.

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Conclusions:

i. Though reading books is my hobby, I read only selective books.

ii. I have read some of the Harry Potter books.

iii. I like to experiment in choosing my next book.

(a) Only conclusion (i) follows.
(b) Only conclusions (i) and (iii) follow.
(c) Only conclusion (iii) follows.
(d) Only conclusions (ii) and (iii) follow.

Q32. In Tahngka Paintings, pictures of God _____ are drawn on clothes made of cotton or silk.

(a) Shiva
(b) Buddha
(c) Mahavir
(d) Vishnu

Q33. Where did the first confirmed death due to COVID-19 occur in India?

(a) Karnataka
(b) Kerala
(c) Maharashtra
(d) Delhi

Q34. 1. X is the father of Y and Z.

2. P is the mother of Q.

3. Q is the sister of Y.

So what is the relationship between X and P?

(a) X and P are husband and wife.
(b) X and P are father - daughter.
(c) X and P are siblings.
(d) X and P are parents.

Q35. Who is the first Indian to create a record by winning two gold medals in Para-Olympic Games?

(a) Devendra Jhajharia
(b) Pradeep
(c) Neeraj Yadav
(d) sandeep choudhary

Q36. Select the option that has the same relation with the third word as the second word has with the first word.

Argue : Fight :: Sad : ?

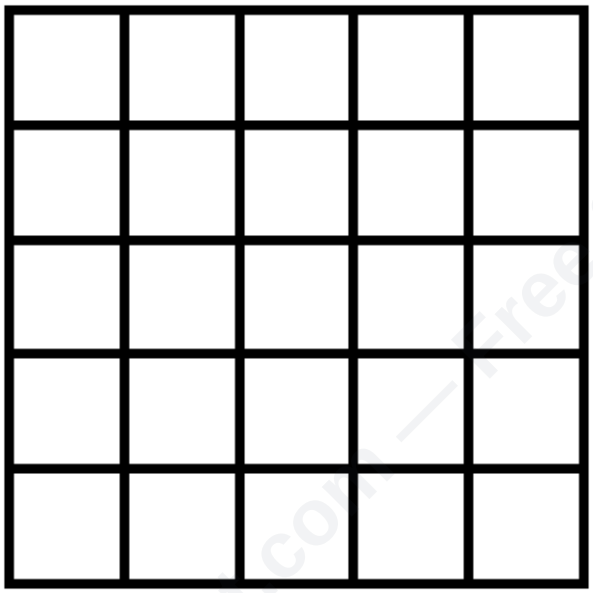
(a) Serious
(b) Jealousy
(c) Depressed
(d) Hurt

Q37. How many digits are contained in the square root of 18769?

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

Q38. How many squares are there in this figure?

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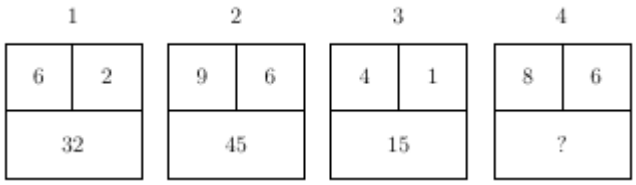


(a) 55
(b) 30
(c) 45
(d) 20

Q39. In a code language, NEPAL is written as PGRCN, and CHINA is written as EJKPC, then how will KOREA be written in the same code language?

(a) MQTGC
(b) NCEGC
(c) LPSGC
(d) JNQGC

Q40. Read the given pattern carefully and select the number that can replace the question mark (?) in it.



(a) 28
(b) 48
(c) 14
(d) 2

Q41. What is the full form of BHIM?

(a) Bharat Intraface for Money
(b) Bheem Intraface for Mobile
(c) Bharat Interface for Money
(d) Bheem Interface for Mobile

Q42. A and B walk around a circular path of circumference 10 km. Both start from the same point in the same direction. If their speeds are 3 km/h and 2 km/h respectively, then after how much time will they be together again at the starting point?

(a) 5 h
(b) 10 h
(c) 2 h
(d) 3 h

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Q43. The ratio of two numbers is 4 : 5. If on adding 6 to these two numbers, their ratio becomes 6 : 7, then what will be the smallest original number (before addition)?

(a) 6
(b) 7
(c) 12
(d) 24

Q44. If 25% of the first number is thrice 50% of the second number, then what will be the ratio of the first number and the second number?

(a) 1 : 6
(b) 3 : 1
(c) 6 : 1
(d) 2 : 3

Q45. Who is the founder of 'Youth Strike 4 Climate' movement which was also nominated for the Nobel Peace Prize?

(a) Malala Yousafzai
(b) Greta Thunberg
(c) Nadia Murad
(d) Savita Halappanavar

Q46. What is 'EyeROV Tuna'?

(a) Heliport
(b) Missile
(c) Monorail
(d) Underwater Drone

Q47. Which revolutionary organisation was Barindra Kumar Ghosh a key leader of in Bengal?

(a) Brati Samiti
(b) Anushilan Samiti
(c) Swadesh Bandhab Samiti
(d) Sadhana Samaj

Q48. Which of the following diseases is caused by bacteria?

(a) Small pox
(b) Rabies
(c) Anthrax
(d) AIDS

Q49. Which is the world's first handwritten needle book?

(a) Figure
(b) Devdas
(c) Moti Mahal
(d) Tavern

Q50. Choose the odd one out.

(a) Kingfisher Airlines
(b) Air Deccan
(c) Indigo Airlines
(d) Jet Airways

Q51. What is the shining surface of the Sun called?

(a) lithosphere
(b) chromosphere
(c) corona
(d) photosphere

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Q52. In which year was the first World Environment Day (WED) celebrated?

(a) 1972
(b) 1980
(c) 1974
(d) 1979

Q53. Which programme was launched to trace missing and abandoned children and reunite them with their families?

(a) Operation Rahat
(b) Operation Kilkari
(c) Operation Smile
(d) Operation Bachpan

Q54. What is the duplicate ratio of 15 : 12?

(a) 45 : 36
(b) 225 : 144
(c) 150 : 120
(d) 212 : 154

Q55. Who among the following referred to the "Sepoy Mutiny and the Revolt of 1857" as "neither the First, nor the National, nor the Freedom Struggle"?

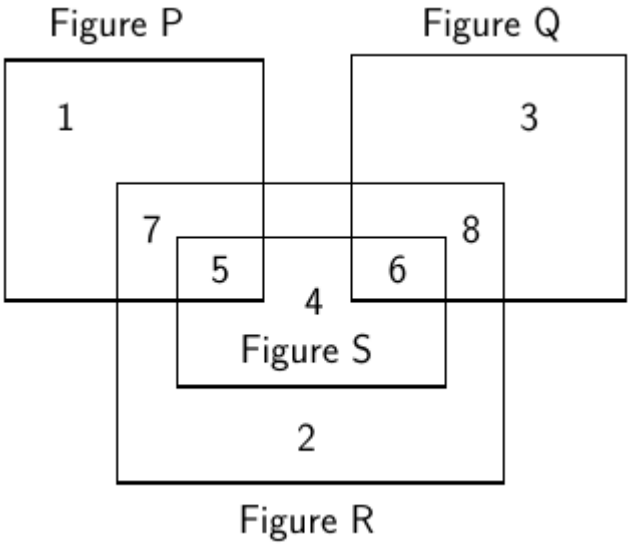
(a) Veer Savarkar
(b) Jawaharlal Nehru
(c) RC Majumdar
(d) S.N. Sen

Q56. Find the remainder of the expression 273/4.

(a) 6
(b) 4
(c) 8
(d) 3

Q57. The following figure consists of 4 figures P, Q, R and S. Figure P represents people who are swimmers and figure Q represents acrobats. Figures R and S represent painters and cooks respectively.

In the figure given below, region 8 represents what?



(a) People who are cooks and swimmers.
(b) People who are cooks, painters, and acrobats.
(c) People who are swimmers and acrobats.
(d) Those people who are painters and acrobats.

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Q58. Which radioisotope is used for the treatment of metastatic bone cancer?

(a) Carbon - 14
(b) Iodine - 131
(c) Phosphorous - 32
(d) Strontium - 89

Q59. Find the value of the sum of first 12 multiples of 6.

(a) 844
(b) 468
(c) 648
(d) 546

Q60. What will be the simple interest on a sum of Rs. 2,000 at the rate of 1 paisa per rupee per month for 4 years?

(a) Rs. 690
(b) Rs. 960
(c) Rs. 609
(d) Rs. 900

Q61. Kolhati language is spoken by people living in _____.

(a) Andhra Pradesh
(b) Odisha
(c) Maharashtra
(d) Bihar

Q62. Select the option that expresses 5.overline 6 as a fraction.

(a) 50/90
(b) 17/3
(c) 57/90
(d) 61/90

Q63. In 2018, the Uttar Pradesh government launched the ODOP scheme to promote competitive and important products from a region so as to develop an economic geographical model. What is the full form of ODOP?

(a) One Department One Producer
(b) One Domain One Product
(c) One District One Product
(d) One Division One Producer

Q64. The height of a trapezoidal object is 5 m and its parallel sides are 4 m and 6 m. If the cost of paint is Rs. 50 per square meter, find the cost of painting the object.

(a) Rs. 800/-
(b) Rs. 1,000/-
(c) Rs. 1,250/-
(d) Rs. 1,200/-

Q65. The radius of a circle is equal to the diagonal of a square. If the area of the square is 32 square units, what is the area of the circle?

(a) 36 π square units
(b) 9 π square units
(c) 64π square units
(d) 62 π square units

Q66. If cosec^4θ = 49 + cot^4θ, Then find the value of sin θ.

(a) 1/8
(b) 1/7
(c) 1/5

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(d) 1/6

Q67. What is the full form of NRHM?

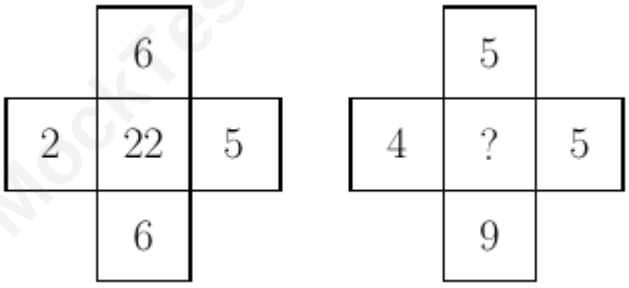
(a) National Rural Health Mission
(b) New Rural Health Mission
(c) National Rapid Health Mission
(d) National Rights Human Mission

Q68. Jagdish walks 200 steps east from his house, and he turns right and walks 40 steps to a tea stall. Then he turns right and walks 40 steps to a bus stand. After that, he again turns right and walks 40 steps. From there, he again turns right and walks 140 steps to reach the post office.

How far and in which direction is the post office from Jagdish's house?

(a) 380 Steps, East
(b) 220 Steps, North
(c) 300 Steps, West
(d) 300 Steps, East

Q69. Read the given pattern carefully and select the number that can replace the question mark (?) in it.



(a) 24
(b) 5
(c) 22
(d) 34

Q70. Who was the first woman judge to be appointed in the Supreme Court of India?

(a) Fatima Beevi
(b) R. Pandora
(c) Indira Banerjee
(d) Gyan Sudha Mishra

Q71. Select the option that is related to the third term in the same way as the second term is related to the first term.

Car : Automobile :: Laptop : ?

(a) Computer
(b) Keyboard
(c) Processor
(d) Screen

Q72. Which UN organisation is concerned with illicit trafficking and drug abuse?

(a) UNODC
(b) UNFPA
(c) UNICEF
(d) UNEP

Q73. If the median and mean are 36 and 35 respectively, find the mode.

(a) 38
(b) 32
(c) 30

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(d) 34

Q74. A sum of money is invested for 3 years at the rate of compound interest of 6%, 12% and 18% for the first, second and third year respectively. If the amount received in 3 years is Rs. 20,000, find the principal.

(a) Rs. 13,572.46
(b) Rs. 14,276.58
(c) Rs. 10,276.43
(d) Rs. 12,276.12

Q75. Arrange the fractions given here in descending order.

7/8,8/9,9/10

(a) 8/9,7/8,9/10
(b) 9/10,7/8,8/9
(c) 7/8,8/9,9/10
(d) 9/10,8/9,7/8

Q76. What type of satellite is APPLE?

(a) Earth observation satellite
(b) Meteorology satellite
(c) Communication satellite
(d) Remote sensing satellite

Q77. Which of the following is not a type of social networking application?

(a) LinkedIn
(b) Haptik
(c) Facebook
(d) Twitter

Q78. Synapse is the point at which a nerve impulse passes _____.

(a) from one neuron to the next
(b) from the brain to the spinal cord
(c) from one epithelial cell to another
(d) from one endocrine gland to another

Q79. A person bought a book for Rs. 60 and sold it for Rs. 90. What percentage of profit did that person get?

(a) 20%
(b) 60%
(c) 50%
(d) 30%

Q80. Involuntary actions like breathing, salivation and peristalsis are controlled by _____.

(a) hypothalamus
(b) cerebrum
(c) cerebellum
(d) medulla oblongata

Q81. In which year a team of German and Italian archaeologists started surface exploration at Mohenjodaro?

(a) 1970
(b) 1990
(c) 1955
(d) 1980

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Q82. A shopkeeper has 50 liters of oil in a can and 35 liters of oil in another can. Find the capacity of the largest container that can measure the quantity of oil in either can completely?

(a) 5 liters
(b) 15 liters
(c) 10 liters
(d) 35 liters

Q83. If x^4 + 1/(x^4) = 322, then find the value of $x^3 - 1/(x^3)$.

(a) 84
(b) 67
(c) 70
(d) 76

Q84. What is the full form of MB?

(a) Microbyte
(b) Macrobyte
(c) Megabyte
(d) Minibyte

Q85. If (x - y)/3 = (x + y)/5 = xy/8, then find the value of xy.

(a) 12
(b) 16
(c) 14
(d) 18

Q86. Read the following table carefully and answer the given question.

The table shows the number of candidates who appeared for the interview for the post of officer in ABC Bank from five different states of India.

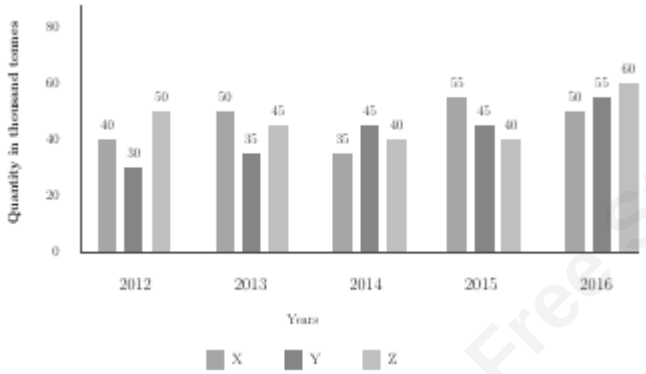
State→ Year↓	Bihar	Uttar Pradesh	Madhya Pradesh	Punjab	Kerala
2012	410	300	250	280	440
2013	500	400	280	320	400
2014	450	450	240	260	350
2015	320	500	400	400	380
2016	500	430	540	350	420

The number of candidates who came from Bihar in 2012 is approximately what percent of the total number of candidates who came from all the states in that year?

(a) 24%
(b) 50%
(c) 30%
(d) 10%

Q87. In the given bar graph, the data of production of milk chocolate (in thousand tons) by three companies X, Y and Z in different years is shown.

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(Reference - Quantity in thousand tonnes)

During which of the following years, the percentage increase/decline in the production of Company Y as compared to the previous year was the maximum?

(a) 2016
(b) 2012
(c) 2014
(d) 2015

Q88. The given table shows the number of students who graduated from 4 different departments namely Mathematics, History, Urdu and English during 5 successive years.

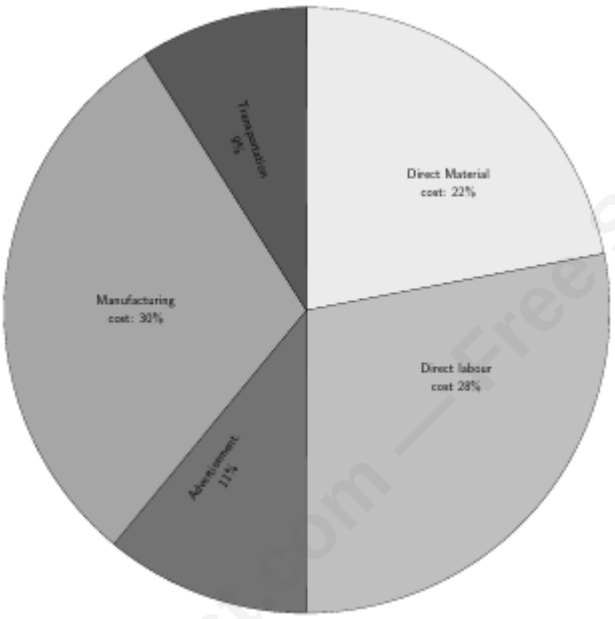
Names of departments	**Year**				
2014	2015	2016	2017	2018	
Math	250	150	275	255	310
History	80	60	55	85	75
Urdu	58	64	50	60	55
English	40	35	52	38	30

What is the ratio of the number of students who graduated from Urdu department in the year 2015 to the number of students who graduated from Urdu department in all the years?

(a) 46 : 287
(b) 13 : 111
(c) 64 : 287
(d) 14 : 102

Q89. The following pie - chart shows the percentage distribution of expenditure incurred in manufacturing a certain product X. Study the given pie - chart and answer the given question.

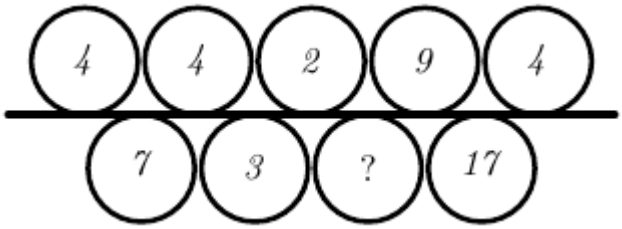
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This product is marked 20% above the cost price. If the marked price on the product is Rs. 150, what is the direct material cost used in manufacturing one unit of the product?

(a) Rs. 30
(b) Rs. 27.5
(c) Rs. 20
(d) Rs. 22.5

Q90. Read the given pattern carefully and select the number that can replace the question mark (?) in it.



(a) 11
(b) 10
(c) 8
(d) 5

Q91. In the given equation, the functions of

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and



remain unchanged. What comes in place of question mark (?) in the third equation?

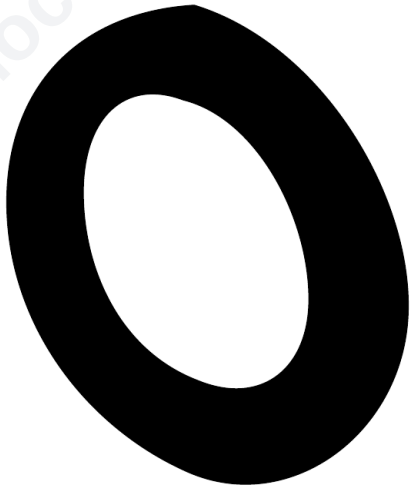
1. A

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B = A2 ÷ B

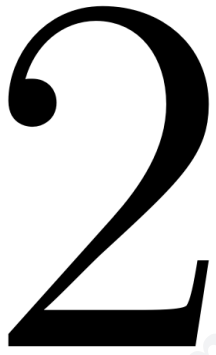
2. A



B = A + B2

3. (4

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2)



2 = ?

(a) 14
(b) 12
(c) 16
(d) 18

Q92. Select the number that can replace the question mark (?) in the series given below.

112, 136, 160, 184, ?

(a) 210
(b) 208
(c) 202
(d) 200

Q93. The sum of two numbers is 20 and the difference of their squares is 80. Select the two numbers from the given options.

(a) 12, 8
(b) 13, 7
(c) 11, 9
(d) 15, 5

Q94. Select the number that can replace the question mark (?) in the series given below.

7, 12, (?), 37, 57

(a) 22
(b) 19
(c) 17
(d) 27

Q95. In a certain code language, IDIOT is written as RWRLG. How will RAIN be written in the same code language?

(a) IZRL
(b) GERM
(c) GFRO
(d) IZRM

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Q96. Choose the odd one out.

(a) LP
(b) RI
(c) PK
(d) HS

Q97. Choose the odd one out.

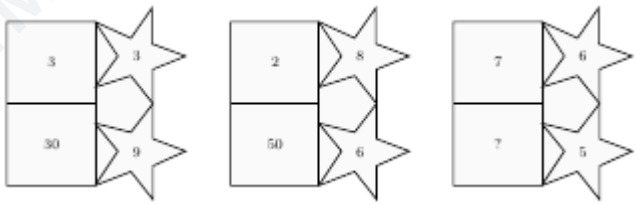
(a) Cucumber
(b) Tomato
(c) Cabbage
(d) ladyfinger

Q98. Select the option which cannot be concluded from the given statements.

Statement 1. All slippers are shoes.
Statement 2. Some heels are slippers.
Statement 3. All canvases are heels.
Statement 4. All heels are shoes.

(a) Some heels are canvas.
(b) All slippers are heels.
(c) All canvases are shoes.
(d) Some shoes are canvas.

Q99. Study the given pattern carefully and select the number that can replace the question mark (?) in it.



(a) 21
(b) 12
(c) 11
(d) 37

Q100. Mohit's son is Rohit, who is married to Geeta. Geeta's husband's only brother - Dev, is Babita's son. Babita and Jamita are sisters and the only two children of their parents. How is Babita related to Geeta?

(a) Husband's sister
(b) Mother in law
(c) Mother
(d) Sister

ANSWER KEY

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

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81	d	82	a	83	d	84	c	85	b	86	a	87	c	88	c	89	b	90	c
91	b	92	b	93	a	94	a	95	d	96	a	97	c	98	b	99	d	100	b

SOLUTIONS

Q1. Answer: (a) 1 cm

Shortcut Trick

For any right-angled triangle with sides forming the right angle as a and b, and hypotenuse h, the inradius (r) is given by:

$r = (a + b - h) \div 2$

Given: a = 3 cm, b = 4 cm. Hypotenuse $h = \sqrt{(3^2 + 4^2)} = 5$ cm (Pythagorean Triplet: 3, 4, 5).

$r = (3 + 4 - 5) \div 2 = 2 \div 2 = 1$ cm.

Therefore The correct answer is 1 cm.

Alternate Method

Given:

Lengths of sides forming the right angle are 3 cm and 4 cm.

Formula Used:

1. Pythagoras Theorem: $\text{Hypotenuse}^2 = \text{Base}^2 + \text{Perpendicular}^2$

2. Inradius (r): r = Area ÷ Semi-perimeter (s)

Calculations:

=> Hypotenuse (AC) = $\sqrt{(3^2 + 4^2)} = \sqrt{(9 + 16)} = \sqrt{25} = 5$ cm

=> Area of triangle (A) = 1/2 × Base × Height = 1/2 × 4 × 3 = 6 cm^2

=> Semi-perimeter (s) = (Side1 + Side2 + Side3) ÷ 2 = (3 + 4 + 5) ÷ 2 = 12 ÷ 2 = 6 cm

=> Inradius (r) = Area ÷ s = 6 ÷ 6 = 1 cm

Therefore The correct answer is 1 cm.

Additional Information

Circumradius of Right Triangle

The radius of the circumcircle (R) of a right-angled triangle is always half of its hypotenuse (R = h ÷ 2).

General Inradius Formula

For any triangle, the inradius r = Δ ÷ s, where Δ is the area and s is the semi-perimeter.

Relation between Inradius and Circumradius

For a right-angled triangle, the relationship is 2R + 2r = a + b, where a and b are the perpendicular sides.

Q2. Answer: (a) 49

Given:

$\sqrt{x} + 2/5 \times 70 = 20 \times 1/4 \times 7$

Formula used:

Simplification of the equation to solve for x.

Calculation:

$\sqrt{x} + 2/5 \times 70 = 20 \times 1/4 \times 7$

=> $\sqrt{x} + 2/5 \times 70 = 5 \times 7$

=> $\sqrt{x} + 2/5 \times 70 = 35$

=> $\sqrt{x} + 28 = 35$

=> $\sqrt{x} = 35\text{-}28 = 7$

Now squaring on both side

=> $(\sqrt{x})^2 = 7^2$

=> x = 49

Q3. Answer: (c) mantle

The correct answer is mantle

Key Points

• The asthenosphere is the extremely viscous, mechanically weak, and ductile-deformable region of the upper mantle of the Earth.

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• It lies below the lithosphere, which includes the crust and the uppermost part of the mantle.

• The asthenosphere is critical for plate tectonics because it allows the rigid lithospheric plates to move on top of it.

• It is composed of partially molten rock that flows very slowly, which facilitates the movement of tectonic plates.

• This layer is located approximately 100 to 200 kilometers below the Earth's surface.

Additional Information

• The concept of the asthenosphere was first proposed by the American geologist Joseph Barrell in 1914.

• The term "asthenosphere" comes from the Greek word "asthenes," meaning weak, indicating its mechanically weak nature.

• The temperature in the asthenosphere ranges from approximately 1,300 to 2,500 degrees Celsius.

• Seismic waves travel more slowly through the asthenosphere than through the lithosphere, indicating its partially molten state.

• Understanding the properties and behavior of the asthenosphere is essential for studying geological phenomena such as earthquakes, volcanic activity, and mountain building.

Q4. Answer: (d) Only courses of action (I) and (II) follow.

Given:

Statement: The weather bureau has released the weather forecast for Kashmir for the next week, in which they have said that there is going to be heavy snowfall throughout the week.

Course of Action:

I. The weather bureau should broadcast this information throughout Kashmir through various means - True (Because, Informing the public about the weather forecast will help them prepare for the heavy snowfall.)

II. The municipal bodies should make arrangements to clear the snow from the roads - True (Because, Clearing snow from the roads is essential to ensure smooth transportation and prevent accidents.)

III. This news should be prevented from spreading outside the state - False (Because, There is no logical reason to prevent this information from spreading outside the state; it could be useful for travelers and other stakeholders.)

So, Only courses of action I and II follow.

Hence, the correct answer is "Option 4".

Q5. Answer: (b) ISRO

The correct answer is ISRO

Key Points

• ISRO (Indian Space Research Organisation) initiated the special program called 'Young Scientist Program (YUVIKA - 2019)' for school children.

• The program aims to impart basic knowledge on space technology, space science, and space applications to younger students, especially those from rural areas.

• YUVIKA stands for 'YUva VIgyani KAryakram', which translates to 'Young Scientist Program'.

• The initiative is part of ISRO's outreach program to create awareness about its space activities and to inspire students to pursue a career in science and technology.

• Selected students get the opportunity to visit ISRO facilities and interact with top scientists.

Additional Information

• ISRO was founded in 1969 and is headquartered in Bengaluru, India.

• ISRO's vision is to "harness space technology for national development while pursuing space science research and planetary exploration".

• The organization is known for its cost-effective space missions, including the Mars Orbiter Mission (Mangalyaan) and the Chandrayaan missions to the Moon.

• ISRO has significantly contributed to India's telecommunications, meteorology, and satellite-based navigation systems.

Q6. Answer: (a) one many and unity

The correct answer is one many and unity

Key Points

• Vijaya Mulye was a renowned figure in the field of education and contributed significantly to educational animation films on Doordarshan.

• One of her notable works is the film "one many and unity".

• This film is recognized for its innovative approach to educational content and has been instrumental in promoting educational values through animation.

• Her work has left a lasting impact on educational media in India, particularly in the way educational content is delivered to children.

Additional Information

• Doordarshan is India's public service broadcaster, which played a pivotal role in the dissemination of educational content during the pre-internet era.

• Educational animation films like "one many and unity" were part of the initiatives to make learning more engaging and accessible to children across the country.

• Vijaya Mulye's contributions to this field are celebrated and remembered for their innovative and impactful nature.

Q7. Answer: (d) [figure]

The venn diagram representing the relation between Male, Father, Doctor is shown below,

→ All fathers are male. Some fathers are doctor.

Hence, the correct answer is "Option 4".

Q8. Answer: (c) Vitamin B9

The correct answer is Vitamin B9

Key Points

• Vitamin B9, also known as folic acid, is essential for the production and maintenance of new cells, particularly during periods of rapid cell division and growth such as infancy and pregnancy.

• Deficiency of Vitamin B9 leads to the development of megaloblastic anaemia, a condition characterized by the production of abnormally large and immature red blood cells.

• Symptoms of megaloblastic anaemia include fatigue, weakness, pale skin, and shortness of breath.

• Folic acid can be obtained through dietary sources such as leafy green vegetables, citrus fruits, beans, and fortified cereals.

Additional Information

• Vitamin B12 deficiency can also cause megaloblastic anaemia, but it is specifically due to the deficiency of Vitamin B9 in this context.

• Folic acid supplements are often recommended for pregnant women to prevent neural tube defects in the developing fetus.

• Regular intake of folic acid is crucial for maintaining overall health and preventing folate-deficiency anemia.

• It is important to consult a healthcare provider for proper diagnosis and treatment if symptoms of anaemia are observed.

Q9. Answer: (d) 10% reservation for economically weaker sections of general category

The correct answer is 10% reservation for economically weaker sections of general category

Key Points

• The 124th Constitutional Amendment Bill pertains to providing a 10% reservation for economically weaker sections (EWS) of the general category.

• This amendment was aimed at addressing economic inequalities by extending reservation benefits to economically disadvantaged individuals who do not belong to any other reserved category.

• The bill was passed by both houses of Parliament in January 2019 and subsequently received the President's assent.

• This reservation is in addition to the existing reservations provided to Scheduled Castes, Scheduled Tribes, and Other Backward Classes.

• The criteria for eligibility under this reservation include factors such as household income, land ownership, and other economic indicators.

Additional Information

• The 124th Constitutional Amendment led to the introduction of Articles 15(6) and 16(6) in the Constitution of India.

• Article 15(6) allows for the reservation of seats in educational institutions, while Article 16(6) allows for reservation in government jobs for EWS.

• This amendment was a significant step towards promoting social justice and inclusivity for economically weaker sections of society.

• The reservation is applicable to both central and state government institutions, as well as private educational institutions, except minority educational institutions.

• The amendment has been subject to various debates and legal challenges, but it reflects the government's commitment to addressing economic disparities.

Q10. Answer: (a) 5/3

Given:

If the numerator of a fraction is reduced by 80% and the denominator by 60%, then the fraction obtained is equal to 5/6.

Formula used:

Let the original fraction be x/y.

New numerator = x - 0.8x = 0.2x

New denominator = y - 0.6y = 0.4y

New fraction = (0.2x) / (0.4y) = 5 / 6

Calculations:

Given:

(0.2x) / (0.4y) = 5 / 6

=> 6 × 0.2x = 5 × 0.4y

=> 1.2x = 2y

=> x / y = 2 / 1.2

=> x / y = 5 / 3

Therefore The original fraction is 5/3.

Q11. Answer: (c) Ministry of Electronics and Information Technology

The correct answer is Ministry of Electronics and Information Technology

Key Points

• The 'DigiGaon' initiative was launched by the Ministry of Electronics and Information Technology.

• This initiative aims to provide various digital services such as telemedicine, education, and skills through digital means to rural areas.

• The primary objective is to bridge the digital divide and enhance the quality of life in rural regions by leveraging technology.

• The initiative is part of the broader Digital India program which seeks to transform India into a digitally empowered society and knowledge economy.

Additional Information

• The Digital India program was launched by the Government of India in July 2015.

• It aims to ensure that government services are made available to citizens electronically by improving online infrastructure and increasing Internet connectivity.

• One of the major components of the Digital India initiative is to connect rural areas with high-speed internet networks.

• The Ministry of Electronics and Information Technology is responsible for formulating and implementing policies related to information technology, electronics, and the internet.

• The 'DigiGaon' initiative is a step towards achieving the vision of Digital India by ensuring that the benefits of technology reach the remotest parts of the country.

Q12. Answer: (d) 4 cm

Given:

Length of the yellow part = 1½ cm

One fourth of the pencil is black.

Half of the remaining part is green.

Calculation:

Let the total length of the pencil be L cm.

Black part = L × (1⁄4)

Remaining part after black = L - L × (1⁄4) = (3L⁄4)

Green part = (1⁄2) × (3L⁄4) = (3L⁄8)

Yellow part = Remaining part after black and green

Yellow part = (3L⁄4) - (3L⁄8)

Yellow part = 1½ cm = (3⁄2) cm

Remaining part after black and green:

=> (3L⁄4) - (3L⁄8)

=> (6L⁄8) - (3L⁄8)

=> (3L⁄8)

Given that (3L⁄8) = (3⁄2)

=> 3L = 12

=> L = 4 cm

Therefore The length of the pencil is 4 cm.

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Q13. Answer: (c) Pepsin

The correct answer is Pepsin

Key Points

• Pepsin is an enzyme that breaks down proteins into smaller peptides.

• It is produced in the stomach and is one of the main digestive enzymes in the digestive systems of humans and many other animals.

• Pepsin is most effective in acidic environments, such as the stomach, where it helps in the digestion of dietary proteins into peptides, which can then be further broken down into amino acids.

• The enzyme is initially secreted as pepsinogen, an inactive zymogen, which is then activated by the acidic pH of the stomach.

Additional Information

• Pepsinogen is converted into pepsin when it comes in contact with hydrochloric acid in the stomach.

• Pepsin plays a crucial role in the digestive process by breaking down proteins into peptides, which are further digested by other proteases in the small intestine.

• The discovery of pepsin dates back to the early 19th century and has been fundamental in understanding the biochemical processes of digestion.

• Pepsin is one of the first enzymes to be discovered and studied, making it a significant milestone in the field of biochemistry.

Q14. Answer: (a) Alluvial soil

The correct answer is Alluvial soil

Key Points

• Alluvial soil is the most available and most intensively used soil for agriculture in India.

• It is predominantly found in the river basins, especially in the Indo-Gangetic plain, which covers the states of Punjab, Haryana, Uttar Pradesh, Bihar, and West Bengal.

• This soil is highly fertile and supports a wide range of crops including rice, wheat, sugarcane, and pulses.

• Alluvial soil is rich in potash and lime but poor in nitrogen and organic matter, making it suitable for diverse agricultural activities.

Additional Information

• Red soil is found in regions such as Tamil Nadu, Karnataka, and parts of Maharashtra but is less fertile compared to alluvial soil.

• Black soil, also known as Regur soil, is ideal for cotton cultivation and found in the Deccan Plateau.

• Desert soil is found in arid regions like Rajasthan and parts of Gujarat and is not as suitable for intensive agriculture without significant irrigation.

• India's diverse soil types support a variety of crops, making agriculture a key component of the country's economy.

Q15. Answer: (b) Narendra Modi

The correct answer is Narendra Modi

Key Points

• Narendra Modi was born on 17th September 1950, after India gained independence on 15th August 1947.

• He became the Prime Minister of India on 26th May 2014.

• Modi is the first Prime Minister of India to be born after the country gained independence.

• He has served as the Chief Minister of Gujarat from 2001 to 2014 before becoming the Prime Minister.

• Under his leadership, various initiatives like Digital India, Make in India, and Swachh Bharat Abhiyan have been launched.

Additional Information

• Manmohan Singh (born 26th September 1932), IK Gujral (born 4th December 1919), and Atal Bihari Vajpayee (born 25th December 1924) were all born before India gained independence.

• India achieved independence from British rule on 15th August 1947.

• The role of the Prime Minister of India is crucial as the head of the government, responsible for running the country's administration and implementing policies.

• The Prime Minister is appointed by the President of India and is usually the leader of the party that has the majority in the Lok Sabha, the lower house of India's Parliament.

Q16. Answer: (a) 216 and 144

Shortcut Trick

Total Distance to cover = 200 + 400 = 600 m

Sum of speeds (V1 + V2) = 600 ÷ 6 = 100 m/s

Difference of speeds (V1 − V2) = 600 ÷ 30 = 20 m/s

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V1 = (100 + 20) ÷ 2 = 60 m/s = 60 × 18/5 = 216 km/h
V2 = (100 − 20) ÷ 2 = 40 m/s = 40 × 18/5 = 144 km/h
Therefore The correct answer is 216 and 144 km/h.
Alternate Method
Given:
Length of Train A = 200 m, Length of Train B = 400 m
Time in same direction = 30 sec, Time in opposite direction = 6 sec
Formula Used:
Relative Speed = Total Distance ÷ Total Time
To convert m/s to km/h, multiply by 18/5.
Calculations:
=> Total distance = 200 + 400 = 600 m
=> Let speeds be x and y (m/s), where x > y.
=> Case 1 (Opposite direction): x + y = 600 ÷ 6 = 100 m/s --- (Eq 1)
=> Case 2 (Same direction): x − y = 600 ÷ 30 = 20 m/s --- (Eq 2)
=> Adding (1) and (2): 2x = 120 => x = 60 m/s
=> Subtracting (2) from (1): 2y = 80 => y = 40 m/s
=> Speed of faster train = 60 × 18/5 = 12 × 18 = 216 km/h
=> Speed of slower train = 40 × 18/5 = 8 × 18 = 144 km/h
Therefore The correct answer is 216 and 144 km/h.
Additional Information
Relative Speed Concept
When two objects move in the same direction, relative speed is |V1 − V2|. In the opposite direction, it is (V1 + V2).
Total Distance for Crossing
Regardless of direction, the total distance to cover while two trains cross each other is always the sum of their lengths (L1 + L2).
Unit Conversion Factor
To convert speed from m/s to km/h, multiply by 18/5. To convert from km/h to m/s, multiply by 5/18.

Q17. Answer: (a) Rs. 78

Given:
Total mangoes bought = 20 dozen = 20 × 12 = 240 mangoes
Cost Price (CP) = Rs. 1,000
Rotten mangoes = 40
Profit = 30%
Formula used:
Selling Price (SP) = CP + Profit
SP per dozen = Total SP / Number of dozens sold
Calculation:
Number of mangoes left = 240 - 40 = 200
Number of dozens left = 200 / 12
Number of dozens left ≈ 16.67
Desired Selling Price (SP) = CP + 30% of CP
Desired SP = Rs. 1,000 + 0.30 × Rs. 1,000
Desired SP = Rs. 1,000 + Rs. 300
Desired SP = Rs. 1,300
SP per dozen = Rs. 1,300 / 16.67
=> SP per dozen ≈ Rs. 78
Therefore The price per dozen should be Rs. 78 to make a profit of 30%.

Q18. Answer: (c) 1892

The correct answer is 1892
Key Points

• Dadabhai Naoroji became the first Indian member of the House of Commons in the United Kingdom in the year 1892.

• He contested the election as a candidate of the Liberal Party and won the seat for Central Finsbury.

• Naoroji's election to the British Parliament was a significant milestone in the Indian independence movement, as he advocated for Indian rights and self-governance.

• He is also known as the "Grand Old Man of India" and was a key figure in the early Indian National Congress.

Additional Information

• Dadabhai Naoroji was one of the founding members of the Indian National Congress in 1885.

• He is known for his work on the economic impact of British rule in India, particularly through his book "Poverty and Un-British Rule in India."

• Naoroji's efforts laid the groundwork for future leaders in the Indian independence movement, including Mahatma Gandhi and Jawaharlal Nehru.

• He was also a professor of mathematics and natural philosophy and was actively involved in social reforms.

Q19. Answer: (c) Vinod Khanna

The correct answer is Vinod Khanna

Key Points

• Vinod Khanna was posthumously awarded the Dadasaheb Phalke Award at the 65th National Film Awards.

• The Dadasaheb Phalke Award is India's highest award in cinema, presented annually at the National Film Awards ceremony by the Directorate of Film Festivals, an organization set up by the Ministry of Information and Broadcasting.

• It is given to individuals for their outstanding contribution to the growth and development of Indian cinema.

• Vinod Khanna was a prominent actor in Indian cinema, known for his performances in numerous films during the 1970s and 1980s.

Additional Information

• The Dadasaheb Phalke Award was instituted in 1969, the birth centenary year of Dadasaheb Phalke, who is considered the father of Indian cinema.

• The award comprises a Swarna Kamal (Golden Lotus) medallion, a shawl, and a cash prize.

• Vinod Khanna's illustrious career spanned over four decades, with notable films such as "Mere Apne," "Mera Gaon Mera Desh," "Amar Akbar Anthony," "Muqaddar Ka Sikandar," and "The Burning Train."

• He also served as a Member of Parliament and was a respected politician.

Q20. Answer: (b) 4

Given:

If $\tan\theta - \cot\theta = x$ and $\cos\theta - \sin\theta = y$, find the value of $(x^2 + 4)(y^2 - 1)^2$.

Calculation:

Let's first simplify x and y:

1. Simplify $x = \tan\theta - \cot\theta$:

$\tan\theta = \sin\theta / \cos\theta$, $\cot\theta = \cos\theta / \sin\theta$

$x = (\sin\theta / \cos\theta) - (\cos\theta / \sin\theta)$

$x = (\sin^2\theta - \cos^2\theta) / (\sin\theta \cos\theta)$

$x = (\sin\theta + \cos\theta)(\sin\theta - \cos\theta) / (\sin\theta \cos\theta)$

2. Now simplify $y = \cos\theta - \sin\theta$:

$y = \cos\theta - \sin\theta$

3. Square y:

$y^2 = (\cos\theta - \sin\theta)^2$

$y^2 = \cos^2\theta + \sin^2\theta - 2\cos\theta \sin\theta$

$y^2 = 1 - 2\sin\theta \cos\theta$

4. Now calculate $y^2 - 1$:

$y^2 - 1 = -2\sin\theta \cos\theta$

5. The expression to find is $(x^2 + 4)(y^2 - 1)^2$:

$x^2 = [(\sin^2\theta - \cos^2\theta) / (\sin\theta \cos\theta)]^2$

$x^2 + 4 = [(\sin^2\theta - \cos^2\theta)^2 / (\sin^2\theta \cos^2\theta)] + 4$

$(y^2 - 1)^2 = (4\sin^2\theta \cos^2\theta)$

Therefore:

$(x^2 + 4)(y^2 - 1)^2 = [(\sin^2\theta - \cos^2\theta)^2 / (\sin^2\theta \cos^2\theta) + 4] \times 4 \sin^2\theta \cos^2\theta$

Using the identity $(\sin^2\theta - \cos^2\theta) = -(\cos 2\theta)$:

$(x^2 + 4)(y^2 - 1)^2 = [\cos^2(2\theta) / (\sin^2\theta \cos^2\theta)] \times 4 \sin^2\theta \cos^2\theta$

Finally, simplifying gives:

$(x^2 + 4)(y^2 - 1)^2 = 4$

Therefore The correct value is 4.

Q21. Answer: (b) @

According to the given information,

Here, we can see that the code for 'sharks' is '@'.

Hence, the correct answer is "@".

Q22. Answer: (a) 100

Given:

Greatest common factor (GCF) = 20

Least common multiple (LCM) = 400

One of the numbers = 80

Formula used:

GCF × LCM = Product of the two numbers

Calculation:

Let the other number be x.

20 × 400 = 80 × x

=> 8000 = 80 × x

=> x = 8000 / 80

=> x = 100

Therefore The correct answer is option (1).

Q23. Answer: (d) 110º

Given:

If one angle of a parallelogram is 30º less than twice the smallest angle.

Formula used:

Sum of adjacent angles in a parallelogram = 180º

Calculation:

Let the smallest angle be x degrees.

One angle of the parallelogram = 2x - 30º

x + (2x - 30º) = 180º

=> 3x - 30º = 180º

=> 3x = 210º

=> x = 70º

One angle of the parallelogram = 2x - 30º

=> 2(70º) - 30º = 110º

The largest angle of the parallelogram = 180º - smallest angle

=> 180º - 70º = 110º

Therefore The measure of the largest angle of the parallelogram is 110º

Q24. Answer: (d) 32

Given:

Mean of 6 numbers = 18

Mean of 7 numbers = 20

Formula used:

Mean = Sum of numbers / Number of numbers

Calculation:

Sum of 6 numbers = 18 × 6

=> Sum of 6 numbers = 108

Let the number included be x.

Sum of 7 numbers = 108 + x

=> Mean of 7 numbers = (108 + x) / 7

Given mean of 7 numbers is 20:

=> (108 + x) / 7 = 20

=> 108 + x = 20 × 7

=> 108 + x = 140

=> x = 140 - 108

=> x = 32

Therefore The number included is 32.

Q25. Answer: (d) Bengal tiger in front of a palm tree

The correct answer is Bengal tiger in front of a palm tree

Key Points

• The symbol of the Reserve Bank of India (RBI) is a Bengal tiger in front of a palm tree.

• The RBI, established in 1935, is India's central banking institution, which controls the issuance and supply of the Indian rupee.

• The symbol reflects the authority and the economic strength of the RBI in managing the country's monetary policy and ensuring financial stability.

• The emblem signifies the bank's commitment to fostering economic growth while maintaining financial discipline.

Additional Information

• The Reserve Bank of India was nationalized in 1949, and it plays a crucial role in the development strategy of the government.

• The RBI's primary functions include regulating the issue of banknotes, maintaining reserves to secure monetary stability, and operating the credit and currency system of the country.

• The RBI also acts as the regulator of the financial system, ensuring the country's economic health and stability.

• The central bank's headquarters is located in Mumbai, Maharashtra.

• The RBI is responsible for the formulation and implementation of monetary policy, regulation, and supervision of the financial sector, management of foreign exchange, and issuance of currency.

Q26. Answer: (d) GSAT - 3

The correct answer is GSAT - 3

Key Points

• GSAT - 3 is dedicated as India's first educational satellite.

• GSAT - 3, also known as EDUSAT, was launched by the Indian Space Research Organisation (ISRO) to meet the demands of the educational sector.

• It aims to provide educational opportunities to remote and rural areas across India through satellite-based communication.

• EDUSAT facilitates distance learning, tele-education, and supports various educational programs and services.

• It plays a crucial role in enhancing the quality of education and bridging the digital divide in the country.

Additional Information

• ISRO is the space agency of the Government of India, headquartered in Bengaluru.

• ISRO is responsible for the development and deployment of satellite technology and space exploration.

• GSAT - 3 (EDUSAT) was launched on 20th September 2004 using the GSLV-F01 launch vehicle.

• The satellite operates in the Ku-band and C-band frequencies, covering a wide geographical area.

• EDUSAT has multiple transponders to cater to different regions and educational requirements.

Q27. Answer: (b) Elephanta Caves - Karnataka

The correct answer is Option 2

Key Points

• Elephanta Caves are incorrectly matched with Karnataka. They are actually located in Maharashtra.

• The Sun Temple is correctly matched with Odisha.

• Fatehpur Sikri is correctly matched with Uttar Pradesh.

• Sunderbans National Park is correctly matched with West Bengal.

Additional Information

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• UNESCO World Heritage Sites are landmarks or areas with legal protection by an international convention administered by the United Nations Educational, Scientific and Cultural Organization.

• These sites are designated as having cultural, historical, scientific, or other forms of significance.

• India has a rich heritage with several sites listed under UNESCO, reflecting its diverse culture and history.

Q28. Answer: (a) 8 August 2020

The correct answer is 8 August 2020.

Key Points

• The 78th anniversary of the Quit India Movement was celebrated on 8th August 2020.

• The Quit India Movement, also known as the Bharat Chodo Andolan, was launched at the Bombay session of the All India Congress Committee by Mahatma Gandhi on 8th August 1942, during World War II, demanding an end to British rule in India.

• The movement is a significant milestone in the Indian freedom struggle, symbolizing the collective determination of the Indian people to achieve independence from British colonial rule.

• The slogan "Do or Die" became the rallying cry for the movement, inspiring millions of Indians to participate in acts of civil disobedience and non-violent resistance.

• The 78th anniversary was marked by various events and tributes across the country, remembering the sacrifices and contributions of freedom fighters.

Additional Information

• The Quit India Movement led to mass arrests and widespread protests, with the British authorities responding with severe repression, including the imprisonment of many leaders of the Indian National Congress.

• Despite the crackdown, the movement intensified the demand for independence and set the stage for India's eventual freedom on 15th August 1947.

• The movement highlighted the power of non-violent resistance and mass mobilization in challenging colonial rule and achieving political goals.

• Anniversaries of the Quit India Movement continue to be observed as a reminder of the enduring spirit of the Indian freedom struggle and the values of courage, unity, and resilience.

Q29. Answer: (a) 2

The logic followed here is:

Logic: Number in the circle = (Sum of the two numbers on the horizontal line) ÷ (Sum of the two number on slant line)

→ 3 = (8 + 40) ÷ (12 + 4)

→ 3 = 48 ÷ 16

→ 5 = (15 + 20) ÷ (5 + 2)

→ 5 = 35 ÷ 7

Similarly,

→ ? = (16 + 6) ÷ (9 + 2)

→ ? = 22 ÷ 11 = 2

Hence, the correct answer is "Option 1".

Q30. Answer: (a) 21 minutes 45 seconds

Given:

Speed of A = 50 words/minute

Speed of B = 40 words/minute

They type alternately for 1 minute each

Total words typed = 980 words

Formula used:

Total words typed in 2 minutes = Speed of A + Speed of B

Calculation:

Total words typed in 2 minutes = 50 + 40 = 90 words

Number of complete 2-minute cycles = Total words / Words typed in 2 minutes

=> Number of complete 2-minute cycles = 980 / 90

=> 10 cycles with a remainder of 80 words

Words typed in 10 cycles = 10 × 90 = 900 words

Remaining words = 980 - 900 = 80 words

Time to type the remaining 80 words:

A types for 1 minute = 50 words

Remaining words = 80 - 50 = 30 words

B types for next 3/4 minute = 30 words

Total time taken = (10 cycles × 2 minutes) + 1 minutes + 3/4 minutes

=> Total time taken = 21 minutes + 3/4 minutes

Converting 3/4 minutes to seconds:

=> 3/4 minutes = 3/4 × 60 = 45 seconds

Therefore The correct answer is option 1: 21 minutes 45 seconds.

Q31. Answer: (d) Only conclusions (ii) and (iii) follow.

Given,

Statements:

I. I have not read all the seven Harry Potter books yet.

II. I have read all the books of Jane Austen.

III. I do not like reading self-help books, though I have read some of them for novelty.

Conclusions:

i. Though reading books is my hobby, I read only selective books - False (Because, the statements does not indicate the preference for certain books while avoiding others, suggesting selective reading habits).

ii. I have read some of the Harry Potter books - True (Because, the statement "I have not read all the seven Harry Potter books yet" implies that some of the Harry Potter books have been read).

iii. I like to experiment in choosing my next book - True (Because, the statement "I do not like reading self-help books, though I have read some of them for novelty" suggests a willingness to experiment with different genres).

So, Only conclusions (ii) and (iii) follow.

Hence, the correct answer is "Option 4".

Q32. Answer: (b) Buddha

The correct answer is Buddha

Key Points

• Buddha is the correct answer for the deity depicted in Thangka paintings.

• Thangka paintings are a Tibetan Buddhist art form that often features images of the Buddha, bodhisattvas, and other deities.

• These paintings are typically created on cotton or silk fabric and are used for religious purposes, meditation, and to convey Buddhist teachings.

• Thangka paintings are known for their intricate detail and vibrant colors, and they play a significant role in Tibetan culture and spirituality.

Additional Information

• Thangka paintings date back to the 7th century and are an important part of Tibetan Buddhist practice.

• They are often used as teaching tools, depicting the life of the Buddha, various influential lamas, and other deities and mandalas.

• Thangkas are typically kept unframed and rolled up when not on display, to protect them from damage.

• The creation of a Thangka is a meticulous process that requires a deep understanding of Buddhist iconography and symbolism.

• Thangka paintings are also a means of preserving and promoting Buddhist culture and heritage.

Q33. Answer: (a) Karnataka

The correct answer is Karnataka

Key Points

• The first confirmed death due to COVID-19 in India occurred in Karnataka.

• The patient was a 76-year-old man from Kalaburagi in Karnataka who had returned from Saudi Arabia.

• This death was reported on March 12, 2020, marking a significant moment in India's battle against the COVID-19 pandemic.

• The incident led to increased awareness and the implementation of stricter measures to combat the spread of the virus.

Additional Information

• COVID-19, caused by the novel coronavirus SARS-CoV-2, was first identified in Wuhan, China, in December 2019.

• The World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020.

• India reported its first COVID-19 case on January 30, 2020, in Kerala.

• In response to the pandemic, India implemented a nationwide lockdown starting on March 25, 2020, to curb the spread of the

virus.

• Various measures including social distancing, wearing masks, and vaccination drives have been crucial in managing the pandemic in India.

Q34. Answer: (a) X and P are husband and wife.

Preparing the family tree using the following symbols,

The family tree can be drawn as per the given information,

Here, we can see that X and P are husband and wife.

Hence, the correct answer is "Option 1".

Q35. Answer: (a) Devendra Jhajharia

The correct answer is Devendra Jhajharia

Key Points

• Devendra Jhajharia is the first Indian to create a record by winning two gold medals in the Para-Olympic Games.

• He won his first gold medal in javelin throw at the 2004 Athens Paralympics.

• Jhajharia clinched his second gold medal in the same event at the 2016 Rio Paralympics, setting a new world record.

• His achievements have made him a prominent figure in Indian sports, especially in the field of para-athletics.

Additional Information

• Devendra Jhajharia was born on 10th June 1981 in Rajasthan, India.

• He lost his left hand after accidentally touching a live electric cable at the age of eight.

• Despite his disability, he pursued sports and became a successful javelin thrower.

• Jhajharia has been honored with several awards, including the Padma Shri and the Arjuna Award.

• He continues to inspire many aspiring athletes with his determination and achievements.

Q36. Answer: (c) Depressed

The logic followed here is:

Logic: Synonym relationship with varying intensity.

Here,

Argue : Fight → Fight is a more intense form of argue.

Similarly,

Sad : ? → Depressed is a more intense form of sad.

Hence, the correct answer is "Option 3".

Q37. Answer: (b) 3

Given:

Number = 18769

Formula used:

If a perfect square is of n digits then its square root will have n/2 digits if n is even and (n + 1)/2 if n is odd

Calculation:

Number of digits in 18769 = 5

here, n is odd

Now,

Number of digit in square root = (n + 1)/2

Number of digit in square root = 6/2 =3

Therefore The number of digits contained in the square root of 18769 is 3

Q38. Answer: (a) 55

Let's count the number of squares in the given figure,

We know in a symmetric figure, where number of row and column is equal,

Number of squares can be counted as the sum of the squares of numbers assigned to each row or column.

As per the logic, number of squares:

→ $(1)^2$ + (2)2 + (3)2 + (4)2 + (5)2

= 1 + 4 + 9 + 16 + 25 = 55

Hence, the correct answer is "Option 1".

Q39. Answer: (a) MQTGC

The logic followed here is,

NEPAL is written as PGRCN,

CHINA is written as EJKPC,

Similarly,

KOREA can be written as,

Hence, the correct answer is "Option 1".

Q40. Answer: (a) 28

The logic followed here is:

Logic: The number at the bottom is the difference of the square of both the upper numbers.

→ 32 = $(6)^2$ - $(2)^2$ = (36 - 4)

→ 45 = (9)2 - (6)2 = (81 - 36)

→ 15 = (4)2 - (1)2 = (16 - 1)

Similarly,

→ ? = (8)2 - (6)2 = (64 - 36) = 28

Hence, the correct answer is "Option 1".

Q41. Answer: (c) Bharat Interface for Money

The correct answer is Bharat Interface for Money

Key Points

• Bharat Interface for Money (BHIM) is a mobile payment app developed by the National Payments Corporation of India (NPCI), based on the Unified Payments Interface (UPI).

• BHIM was launched on 30th December 2016 by Prime Minister Narendra Modi to facilitate e-payments directly through banks and encourage cashless transactions.

• The app supports multiple Indian languages and is designed to be simple and user-friendly to ensure financial inclusion.

• Users can make instant bank-to-bank payments and collect money using their Mobile number or Payment address.

• BHIM is interoperable with other UPI applications and bank accounts across India.

Additional Information

• The Unified Payments Interface (UPI) is a real-time payment system that allows instant transfer of funds between two bank accounts on a mobile platform.

• UPI eliminates the need to enter bank details or other sensitive information every time a transaction is made, ensuring a secure and seamless payment experience.

• BHIM app requires users to register their bank account with UPI and set a UPI PIN for the bank account.

• Transactions can be performed 24x7, including on public holidays.

• BHIM also supports QR code-based payments for easy and quick transactions.

Q42. Answer: (b) 10 h

Given:

Circumference of the circular path = 10 km

Speed of A = 3 km/h

Speed of B = 2 km/h

Formula used:

Time to meet at starting point = Circumference / Relative speed

Calculation:

Relative speed of A and B = Speed of A - Speed of B

Relative speed = 3 km/h - 2 km/h

Relative speed = 1 km/h

=> Time to meet at starting point = 10 km / 1 km/h

=> Time to meet at starting point = 10 h

Therefore The correct answer is option (2).

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Q43. Answer: (c) 12

Shortcut Trick

Initial Ratio of the numbers = 4 : 5

Final Ratio after adding 6 = 6 : 7

Increase in ratio for both numbers = 6 − 4 = 2 parts

Since the same value (6) is added to both, 2 parts = 6 => 1 part = 3

Smallest original number = 4 parts = 4 × 3 = 12

Therefore The correct answer is 12.

Alternate Method

Given:

The original ratio of the two numbers is 4 : 5.

When 6 is added to both numbers, the new ratio becomes 6 : 7.

Initial Ratio

Final Ratio

Number A

4 parts

6 parts

• 6

(+2 parts)

Number B

5 parts

7 parts

• 6

(+2 parts)

2 parts = 6 → 1 part = 3 → Smallest = 4 × 3 = 12

Calculations:

Let the original numbers be 4x and 5x.

According to the given condition:

=> (4x + 6) / (5x + 6) = 6 / 7

=> 7 × (4x + 6) = 6 × (5x + 6)

=> 28x + 42 = 30x + 36

=> 30x − 28x = 42 − 36

=> 2x = 6

=> x = 3

Smallest original number = 4x

=> 4 × 3 = 12

Therefore The correct answer is 12.

Additional Information

Cross-Multiplication Rule

When a ratio a : b changes to c : d by adding x and y respectively, the common multiplier for the initial parts can be found directly using the relation: Multiplier × (a × d − b × c) = (y × c − x × d).

Compound Ratio

The compound ratio of two individual ratios a : b and c : d is calculated by multiplying the antecedents and consequents together, which results in the combined ratio ac : bd.

Duplicate and Triplicate Ratios

The duplicate ratio of a : b is given by $a^2 : b^2$, while the triplicate ratio is represented by $a^3 : b^3$. Conversely, the sub-duplicate ratio is $\sqrt{a} : \sqrt{b}$.

Q44. Answer: (c) 6 : 1

Shortcut Trick

Let the first number be A and the second number be B.

According to the logic: 25% × A = 3 × (50% × B)

=> 25A = 3 × 50B

=> 25A = 150B

=> A / B = 150 / 25 = 6 / 1

Therefore The correct answer is 6 : 1.

Alternate Method

Given:

25% of the first number = 3 × 50% of the second number.

Formula Used:

Percentage (%) = Value / 100

Ratio of A and B = A : B or A/B

Calculations:

Let the first number be x and the second number be y.

=> (25/100) × x = 3 × (50/100) × y

=> 0.25x = 3 × 0.50y

=> 0.25x = 1.5y

=> x / y = 1.5 / 0.25

=> x / y = 150 / 25

=> x / y = 6 / 1

=> x : y = 6 : 1

Therefore The correct answer is 6 : 1.

Additional Information

Relationship between Ratio and Percentage

A percentage is a fraction with a denominator of 100. To find the ratio of two numbers from their percentages, equate the expressions and solve for the variable fraction A/B.

Inverse Variation in Ratios

If a × A = b × B, then the ratio A : B is always equal to b : a. In this problem, 25A = 150B resulted in A : B = 150 : 25.

Fractional Equivalents

Using fractions can speed up calculations: 25% = 1/4 and 50% = 1/2. The equation becomes (1/4)A = 3 × (1/2)B.

Q45. Answer: (b) Greta Thunberg

The correct answer is Greta Thunberg

Key Points

• Greta Thunberg is the founder of the 'Youth Strike 4 Climate' movement.

• She started this movement by striking outside the Swedish parliament in August 2018 to demand stronger action on climate change.

• The movement has inspired millions of students around the world to participate in climate strikes and protests.

• Greta Thunberg was nominated for the Nobel Peace Prize for her efforts to bring global attention to climate change and the urgency of addressing it.

Additional Information

• Greta Thunberg was born on 3rd January 2003 in Stockholm, Sweden.

• She has received numerous awards and recognitions for her climate activism, including being named Time Magazine's Person of the Year in 2019.

• Greta has addressed the United Nations, the European Parliament, and various other international forums, urging leaders to take immediate and substantial action to combat climate change.

• Her activism has sparked a global movement, with students and activists around the world joining her in demanding climate justice.

• In addition to her activism, Greta has authored a book titled "No One Is Too Small to Make a Difference", which is a collection of her speeches.

Q46. Answer: (d) Underwater Drone

The correct answer is Underwater Drone

Key Points

• EyeROV Tuna is an underwater drone designed for various underwater inspection and research purposes.

• This drone is developed by a Kerala-based startup, EyeROV, which focuses on underwater robotics.

• It is used for inspecting underwater structures such as dams, bridges, and ship hulls, providing a safer and more efficient method than traditional means.

• EyeROV Tuna is equipped with advanced sensors and cameras to capture high-quality underwater footage and data.

• The drone can be remotely operated, making it a valuable tool for underwater exploration and maintenance tasks.

Additional Information

• Underwater drones like EyeROV Tuna are becoming increasingly important in industries such as marine research, oil and gas, and underwater archaeology.

• They provide a cost-effective and safer alternative to traditional diving operations, reducing the risk to human divers.

• Technological advancements in underwater drones are enabling more detailed and extensive underwater explorations and inspections.

• These drones are also being used in environmental monitoring, helping to study and protect marine ecosystems.

Q47. Answer: (b) Anushilan Samiti

The correct answer is Anushilan Samiti

Key Points

• Anushilan Samiti was a prominent revolutionary organization in Bengal, with which Barindra Kumar Ghosh was closely associated.

• The organization played a crucial role in the Indian independence movement, focusing on the armed struggle against British rule.

• Anushilan Samiti was involved in various revolutionary activities, including bombings, assassinations of British officials, and other forms of militant resistance.

• The organization had a widespread network and inspired many young revolutionaries in Bengal and other parts of India to join the freedom struggle.

• Barindra Kumar Ghosh, also known as Barin Ghosh, was a key figure in the revolutionary movement and was deeply influenced by his brother Aurobindo Ghosh, a renowned freedom fighter and philosopher.

Additional Information

• Barindra Kumar Ghosh was arrested in connection with the Alipore Bomb Case in 1908 and was sentenced to life imprisonment, though he was released in 1920.

• The activities of Anushilan Samiti had a significant impact on the Indian independence movement, inspiring future generations of revolutionaries.

• Despite the British crackdown on revolutionary activities, the spirit of Anushilan Samiti continued to influence the freedom struggle until India gained independence in 1947.

Q48. Answer: (c) Anthrax

The correct answer is Anthrax

Key Points

• Anthrax is a serious infectious disease caused by gram-positive, rod-shaped bacteria known as Bacillus anthracis.

• It is primarily a disease of herbivorous animals, but humans can become infected through direct or indirect contact with sick animals.

• The disease can manifest in three forms: cutaneous (skin), inhalational (lungs), and gastrointestinal (digestive system).

• Anthrax is not contagious and cannot be spread directly from person to person.

• The bacteria can form spores that can survive in harsh conditions for decades, making it a potential bioterrorism agent.

Additional Information

• Smallpox is caused by the variola virus, not bacteria.

• Rabies is caused by the rabies virus, not bacteria.

• AIDS is caused by the Human Immunodeficiency Virus (HIV), not bacteria.

• Bacterial infections are typically treated with antibiotics, whereas viral infections require antiviral medications or other treatments.

Q49. Answer: (d) Tavern

The correct answer is Tavern

Key Points

• Tavern is recognized as the world's first handwritten needle book.

• The needle book contains a collection of sewing needles of various sizes and types, all meticulously handwritten with descriptions and uses.

• This unique artifact reflects the craftsmanship and attention to detail of its creator, making it a significant piece in the history of

sewing and needlework.

• It serves as a valuable resource for understanding the historical context and evolution of sewing tools and techniques.

Additional Information

• The needle book is a testament to the artistry and skill involved in traditional needlework.

• Handwritten needle books are rare and often considered collector's items due to their historical and cultural significance.

• Such books not only provided practical information for users but also showcased the aesthetic and artistic sensibilities of their time.

• The tradition of creating needle books has evolved, but the essence of preserving and organizing sewing needles remains an important aspect of the craft.

Q50. Answer: (c) Indigo Airlines

The logic followed here is:

Kingfisher Airlines	Defunct
Air Deccan	Defunct
Indigo Airlines	Operational
Jet Airways	Defunct

Kingfisher Airlines, Air Deccan, Jet Airways all are Defunct airlines,

Whereas,

Indigo Airlines is an Operational airline.

Hence, the correct answer is "Indigo Airlines".

Q51. Answer: (d) photosphere

The correct answer is photosphere

Key Points

• The photosphere is the shining surface of the Sun that we can observe from Earth.

• The photosphere is the lowest visible layer of the Sun's atmosphere, and it is where most of the Sun's light is emitted.

• The temperature of the photosphere is approximately 5,500 degrees Celsius (5,773 Kelvin).

• Features such as sunspots, which are cooler regions, can be observed on the photosphere.

• The photosphere is crucial for solar observations and helps scientists study the Sun's structure and behavior.

Additional Information

• The Sun is composed of several layers, including the core, radiative zone, convective zone, photosphere, chromosphere, and corona.

• The chromosphere is the layer above the photosphere and can be seen during solar eclipses as a reddish glow.

• The corona is the outermost layer of the Sun's atmosphere, extending millions of kilometers into space and visible during total solar eclipses.

• The Sun's energy is produced in its core through the process of nuclear fusion.

• The study of the Sun and its various layers is known as heliophysics.

Q52. Answer: (c) 1974

The correct answer is 1974

Key Points

• The first World Environment Day (WED) was celebrated in the year 1974.

• World Environment Day is celebrated every year on June 5, and it is the United Nations' principal vehicle for encouraging awareness and action for the protection of the environment.

• The day was established by the UN General Assembly in 1972 on the first day of the Stockholm Conference on the Human Environment, leading to the establishment of the United Nations Environment Programme (UNEP).

• Each year, WED is hosted by a different country, in which official celebrations take place, and the event has a specific theme that focuses on pressing environmental issues.

• The day provides a global platform for public outreach, with participation from over 143 countries annually.

Additional Information

• The theme for World Environment Day 2021 was "Ecosystem Restoration", focusing on resetting our relationship with nature.

• World Environment Day has grown to become a global platform for public outreach, with participation from over 143 countries

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annually.

• UNEP uses the day to promote worldwide awareness and action for the environment, addressing issues such as marine pollution, human overpopulation, global warming, sustainable consumption, and wildlife crime.

• The day is celebrated in various ways worldwide, including street rallies, parades, concerts, school competitions, tree planting, and clean-up campaigns.

Q53. Answer: (c) Operation Smile

The correct answer is Operation Smile

Key Points

• Operation Smile is a programme launched to trace missing and abandoned children and reunite them with their families.

• The programme involves coordinated efforts by police departments across various states in India.

• It aims to identify, track, and recover missing children, ensuring their safety and well-being.

• Operation Smile is part of a broader initiative to protect vulnerable children and address issues of child trafficking and exploitation.

Additional Information

• Other operations with similar goals include Operation Muskaan, which also focuses on rescuing and rehabilitating missing children.

• These initiatives often involve collaboration with NGOs, child welfare organizations, and government agencies.

• Public awareness campaigns are also a crucial component of these operations to educate communities about child safety and reporting mechanisms.

• Both Operation Smile and Operation Muskaan have been successful in reuniting thousands of children with their families.

Q54. Answer: (b) 225 : 144

Given:

Ratio: 15 : 12

Formula used:

Duplicate ratio = $(a^2 : b^2)$

Calculation:

Given ratio is 15 : 12

Here, a = 15 and b = 12

Duplicate ratio = $(15^2 : 12^2)$

=> (225 : 144)

Therefore The duplicate ratio of 15 : 12 is 225 : 144.

Q55. Answer: (c) RC Majumdar

The correct answer is RC Majumdar

Key Points

• RC Majumdar referred to the "Sepoy Mutiny and the Revolt of 1857" as "neither the First, nor the National, nor the Freedom Struggle".

• The Revolt of 1857 is often seen as a significant event in Indian history, marking the end of the East India Company's rule and the beginning of direct British governance.

• Different historians have interpreted the revolt in various ways, ranging from a national struggle for independence to a mere mutiny.

• Majumdar's interpretation suggests a more critical view of the revolt's impact and significance in the broader context of Indian history.

Additional Information

• The Revolt of 1857, also known as the First War of Indian Independence, was a widespread but unsuccessful rebellion against British rule in India.

• It began on 10 May 1857 in the form of a mutiny of sepoys of the British East India Company's army in the garrison town of Meerut and soon escalated into other mutinies and civilian rebellions.

• The revolt was marked by various battles, sieges, and acts of violence on both sides, leading to significant loss of life and property.

• The aftermath of the revolt saw the end of the East India Company's rule and the establishment of direct control by the British Crown over India.

• Historians continue to debate the causes, nature, and impact of the revolt, with varying perspectives on its significance in the

history of India's struggle for independence.

Q56. Answer: (d) 3

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Given:

Expression: 273/4

Formula used:

To find the remainder of a division operation, use the modulus operator.

Calculation:

(27 × 4 +3)/4 = 111/4

=> 3

Therefore The remainder of the expression 273/4 is 3.

Q57. Answer: (d) Those people who are painters and acrobats.

According to the given information,

→ Figure P represents people who are swimmers and figure Q represents acrobats. Figures R and S represent painters and cooks respectively.

Here, we can see that region 8 represents those people who are painters and acrobats.

Hence, the correct answer is "Option 4".

Q58. Answer: (d) Strontium - 89

The correct answer is Strontium - 89

Key Points

• Strontium - 89 is a radioisotope used in the treatment of metastatic bone cancer.

• It works by targeting and accumulating in the bone, particularly in areas with high bone turnover, which is common in metastatic bone disease.

• The radiation emitted by Strontium - 89 helps to relieve pain and control the growth of cancer in the bones.

• It is administered intravenously and has a half-life of approximately 50.5 days.

• Strontium - 89 is particularly useful for patients who have multiple bone metastases and are experiencing significant pain.

Additional Information

• Other radioisotopes used in medical treatments include Iodine - 131 for thyroid cancer and hyperthyroidism, and Phosphorous - 32 for certain blood disorders.

• Radioisotope therapy is a form of internal radiation therapy, which allows for targeted treatment of cancer cells while minimizing damage to surrounding healthy tissues.

• The use of radioisotopes in medicine is a critical component of nuclear medicine, providing valuable tools for both diagnosis and treatment of various diseases.

• Patients receiving radioisotope therapy are usually monitored for radiation exposure and may need to follow specific safety guidelines to protect themselves and others.

Q59. Answer: (b) 468

Given:

We need to find the value of the sum of the first 12 multiples of 6.

Formula used:

Sum of the first n multiples of a number a = a × (n(n + 1) / 2)

Calculation:

a = 6

n = 12

Sum = 6 × (12(12 + 1) / 2)

=> Sum = 6 × (12 × 13 / 2)

=> Sum = 6 × (156 / 2)

=> Sum = 6 × 78

=> Sum = 468

Therefore The sum of the first 12 multiples of 6 is 468.

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Q60. Answer: (b) Rs. 960

Given:

Principal (P) = Rs. 2,000

Rate of interest per month (R) = 1 paisa per rupee = 1%

Time (T) = 4 years = 4 × 12 = 48 months

Formula Used:

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

Calculation:

Principal (P) = Rs. 2,000

Rate of interest (R) = 1% per month

Time (T) = 48 months

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

=> SI = (2000 × 1 × 48) / 100

=> SI = (2000 × 48) / 100

=> SI = 96000 / 100

=> SI = Rs. 960

Therefore The simple interest on a sum of Rs. 2,000 at the rate of 1 paisa per rupee per month for 4 years is Rs. 960.

Q61. Answer: (c) Maharashtra

The correct answer is Maharashtra

Key Points

• Kolhati language is primarily spoken by the Kolhati community residing in the state of Maharashtra.

• The Kolhati community is known for their traditional dance forms and cultural heritage which is an integral part of Maharashtra's diverse culture.

• The language and culture of the Kolhati people contribute to the rich tapestry of Maharashtra's social and cultural landscape.

Additional Information

• Maharashtra is a state in the western peninsular region of India occupying a substantial portion of the Deccan Plateau.

• It is the second-most populous state and third-largest state by area in India.

• Maharashtra is known for its diverse culture, historical monuments, and significant contributions to the arts, industry, and economy of India.

• The state capital is Mumbai, which is also the financial capital of India.

Q62. Answer: (b) 17/3

Given:

Express (5.66...) as a fraction.

Formula used:

Let x = (5.6666...)(where 6 is repeating)

Multiply both sides by 10:

10x = 56.6666...

Subtract the original equation from this new equation:

10x - x = 56.6666... - 5.6666...

Calculation:

9x = 51

=> x = 51/9

=> x = 17/3

Therefore The correct answer is 17/3.

Q63. Answer: (c) One District One Product

The correct answer is One District One Product

Key Points

• One District One Product (ODOP) scheme was launched by the Uttar Pradesh government in 2018.

• The scheme aims to promote competitive and important products from each district to develop an economic geographical model.

• It focuses on generating employment and providing support to local artisans and manufacturers, thereby boosting the local

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economy.

• Under this scheme, each district is recognized for a unique product that has the potential for growth and export.

• The initiative is designed to create product-specific traditional industrial hubs across the state.

Additional Information

• The ODOP scheme is part of a broader vision to make Uttar Pradesh a trillion-dollar economy.

• It aligns with the Make in India initiative by focusing on indigenous products and craftsmanship.

• The scheme provides support in terms of training, financial assistance, and marketing to ensure the success of the identified products.

• It also encourages the use of modern technology and innovation to enhance the quality and productivity of these products.

• ODOP has been recognized as a significant step towards preserving and promoting traditional crafts and industries.

Q64. Answer: (c) Rs. 1,250/-

Given:

Height of the trapezoidal object (h) = 5 m

Length of the first parallel side (a) = 4 m

Length of the second parallel side (b) = 6 m

Cost of paint per square meter = Rs. 50

Formula used:

Area of a trapezoid = (1/2) × (a + b) × h

Cost of painting = Area × Cost per square meter

Calculation:

Area of the trapezoidal object:

=> Area = (1/2) × (a + b) × h

=> Area = (1/2) × (4 + 6) × 5

=> Area = (1/2) × 10 × 5

=> Area = 25 m^2

Cost of painting:

=> Cost = Area × Cost per square meter

=> Cost = 25 m^2 × Rs. 50

=> Cost = Rs. 1,250

Therefore The cost of painting the object is Rs. 1,250.

Q65. Answer: (c) 64π square units

Given:

The radius of a circle is equal to the diagonal of a square.

Area of the square = 32 square units.

Formula Used:

1. Area of the square = $side^2$

2. Diagonal of the square = side × √2

3. Area of the circle = π × $radius^2$

Calculations:

Let the side of the square be s.

Area of the square = s^2

=> s^2 = 32

=> s = √32

=> s = 4√2

Diagonal of the square = side × √2

=> Diagonal = 4√2 × √2

=> Diagonal = 4 × 2

=> Diagonal = 8

Since the radius of the circle is equal to the diagonal of the square:

Radius of the circle = 8 units

Area of the circle = π × radius²

=> Area = π × 8²

=> Area = π × 64

=> Area = 64π square units

Therefore The correct answer is option (3).

Q66. Answer: (c) 1/5

Shortcut Trick

Using the identity a^4 − b^4 = (a² − b²)(a² + b²).

Given cosec^4 θ − cot^4 θ = 49.

As cosec² θ − cot² θ = 1, we get 1 × (cosec² θ + cot² θ) = 49.

Adding cosec² θ − cot² θ = 1 to cosec² θ + cot² θ = 49 gives 2 cosec² θ = 50.

Therefore, cosec θ = 5 => sin θ = 1/5.

Therefore The correct answer is 1/5.

Alternate Method

Given: cosec^4 θ = 49 + cot^4 θ

Formula Used: cosec² θ − cot² θ = 1 and sin θ = 1/cosec θ

=> cosec^4 θ − cot^4 θ = 49

=> (cosec² θ − cot² θ)(cosec² θ + cot² θ) = 49

=> 1 × (cosec² θ + cot² θ) = 49

=> cosec² θ + (cosec² θ − 1) = 49

=> 2 cosec² θ − 1 = 49

=> 2 cosec² θ = 50

=> cosec² θ = 25

=> cosec θ = 5

=> sin θ = 1/5

Therefore The correct answer is 1/5.

Additional Information

Standard Trigonometric Identities

1 + cot² θ = cosec² θ, which can be rearranged as cosec² θ − cot² θ = 1.

Algebraic Difference of Squares

The expression x^4 − y^4 can always be factored as (x² − y²)(x² + y²).

Reciprocal Relations

sin θ = 1/cosec θ, cos θ = 1/sec θ, and tan θ = 1/cot θ.

Q67. Answer: (a) National Rural Health Mission

The correct answer is National Rural Health Mission

Key Points

• The National Rural Health Mission (NRHM) was launched by the Government of India in April 2005.

• NRHM aims to provide accessible, affordable, and quality health care to the rural population, especially the vulnerable groups.

• The mission focuses on strengthening the health system, improving maternal and child health, and controlling communicable and non-communicable diseases.

• It also emphasizes the importance of community participation and decentralized planning in the health sector.

Additional Information

• The NRHM was later subsumed under the National Health Mission (NHM) in 2013, which also includes the National Urban Health Mission (NUHM).

• The NHM continues to focus on health system strengthening, reproductive-maternal-newborn-child and adolescent health (RMNCH+A), and communicable and non-communicable diseases.

• The mission is guided by principles of decentralization, community participation, and equity in healthcare access.

• Several initiatives like ASHA (Accredited Social Health Activist), Janani Suraksha Yojana, and Rashtriya Bal Swasthya Karyakram have been launched under NRHM to improve health indicators.

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Q68. Answer: (d) 300 Steps, East

According to the given information,

1) Jagdish walks 200 steps east from his house, and he turns right and walks 40 steps to a tea stall.

2) Then he turns right and walks 40 steps to a bus stand. After that, he again turns right and walks 40 steps.

3) From there, he again turns right and walks 140 steps to reach the post office.

Here, we can see that the post office is 300 Steps, East from the house.

Hence, the correct answer is "Option 4".

Q69. Answer: (d) 34

The logic followed here is:

Logic: Middle number = (Sum of two vertical numbers) + (Product of two horizontal numbers)

→ 22 = (6 + 6) + (2 × 5)

→ 22 = 12 + 10

→ ? = (5 + 9) + (4 × 5)

→ ? = 14 + 20 = 34

Hence, the correct answer is "Option 4".

Q70. Answer: (a) Fatima Beevi

The correct answer is Fatima Beevi

Key Points

• Fatima Beevi was the first woman judge to be appointed to the Supreme Court of India.

• She was appointed on 6 October 1989.

• Her appointment marked a significant milestone in the history of the Indian judiciary.

• Fatima Beevi's appointment paved the way for greater representation of women in the higher judiciary.

Additional Information

• Fatima Beevi was born on 30 April 1927 in Pathanamthitta, Kerala.

• She began her career in the judicial service in Kerala and rose through the ranks due to her dedication and competence.

• Before her appointment to the Supreme Court, she served as a judge in the Kerala High Court.

• After her retirement, she also served as the Governor of Tamil Nadu from 1997 to 2001.

• Her contributions have inspired many women to pursue careers in the judiciary and other fields of public service.

Q71. Answer: (a) Computer

The logic followed here is:

Logic: Synonyms

Here,

Car : Automobile → Automobile is a synonym of Car.

Similarly,

Laptop : Computer → Computer is a synonym of Laptop.

Hence, the correct answer is "Option 1".

Q72. Answer: (a) UNODC

The correct answer is UNODC

Key Points

• UNODC stands for the United Nations Office on Drugs and Crime.

• It is responsible for addressing issues related to illicit trafficking, drug abuse, and organized crime.

• UNODC works globally to combat these issues through research, policy-making, and practical assistance to member states.

• It also deals with terrorism prevention, criminal justice, and corruption, among other areas.

• UNODC's efforts are crucial in promoting health, security, and justice across the world.

Additional Information

• UNODC was established in 1997 through a merger between the United Nations Drug Control Programme and the Centre for International Crime Prevention.

• Headquartered in Vienna, Austria, UNODC operates in all regions of the world through an extensive network of field offices.

• The organization provides legal and technical assistance to countries to strengthen their criminal justice systems and reduce

vulnerabilities to organized crime and drug trafficking.

• UNODC also publishes the annual World Drug Report, which provides comprehensive data and analysis on the global drug situation.

• Through its various programs and initiatives, UNODC aims to achieve a safer and healthier world free from the threats posed by drugs and crime.

Q73. Answer: (a) 38

Given:

Median = 36

Mean = 35

Formula used:

Mode = 3 × Median - 2 × Mean

Calculation:

Mode = 3 × 36 - 2 × 35

=> Mode = 108 - 70

=> Mode = 38

Therefore The correct answer is option (1).

Q74. Answer: (b) Rs. 14,276.58

Given:

Rate of compound interest for the first year = 6%

Rate of compound interest for the second year = 12%

Rate of compound interest for the third year = 18%

Amount received in 3 years = Rs. 20,000

Formula used:

Compound Interest Formula: A = P(1 + r1/100)(1 + r2/100)(1 + r3/100)

Calculation:

Let the principal be P.

20,000 = P(1 + 6/100)(1 + 12/100)(1 + 18/100)

=> 20,000 = P(1.06)(1.12)(1.18)

=> 20,000 = P(1.401696)

=> P = 20,000 / 1.401696

=> P ≈ 14,276.58

Therefore The principal amount is approximately Rs. 14,276.58.

Q75. Answer: (d) 9/10,8/9,7/8

Calculation:

First, find the decimal equivalents of the fractions:

7/8 = 0.875

8/9 = 0.888

9/10 = 0.9

Now, arrange them in descending order:

Therefore Descending order:

9/10, 8/9, 7/8

Q76. Answer: (c) Communication satellite

The correct answer is Communication satellite

Key Points

• APPLE (Ariane Passenger Payload Experiment) was India's first experimental communication satellite.

• It was launched by the European Space Agency's Ariane-1 rocket on 19 June 1981.

• APPLE marked India's entry into the field of space-based communication.

• The satellite was used to demonstrate the capabilities of using satellites for telecommunication and broadcasting services in India.

• The success of APPLE paved the way for subsequent Indian communication satellites such as INSAT and GSAT series.

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Additional Information

• Communication satellites are artificial satellites that relay and amplify radio telecommunications signals via a transponder.

• They create a communication channel between a source transmitter and a receiver at different locations on Earth.

• These satellites are used for various applications including television broadcasting, internet services, and military communications.

• India's space agency, ISRO (Indian Space Research Organisation), has developed a series of communication satellites to enhance the country's telecommunication infrastructure.

• The success of APPLE significantly contributed to the development of India's satellite communication capabilities and self-reliance in space technology.

Q77. Answer: (b) Haptik

The correct answer is Haptik

Key Points

• Haptik is not a type of social networking application.

• LinkedIn, Facebook, and Twitter are well-known social networking applications used for professional networking, social interaction, and microblogging, respectively.

• Haptik is primarily a conversational AI platform that allows businesses to build chatbots and virtual assistants, not a social networking platform.

Additional Information

• Social networking applications are platforms that facilitate social interactions and networking among users through various communication tools like messaging, posting updates, and sharing content.

• Examples of popular social networking platforms include Facebook for social interaction, LinkedIn for professional networking, and Twitter for microblogging and real-time updates.

• Haptik, on the other hand, is used by businesses to enhance customer experience through automated communication and is not designed for social networking.

Q78. Answer: (a) from one neuron to the next

The correct answer is from one neuron to the next

Key Points

• A synapse is a junction where a nerve impulse passes from one neuron to the next.

• The process involves the release of neurotransmitters from the presynaptic neuron, which then cross the synaptic cleft and bind to receptors on the postsynaptic neuron.

• This mechanism is essential for communication between neurons, allowing for the transmission of signals throughout the nervous system.

• Synapses play a critical role in the functioning of neural networks and are involved in various physiological processes, including learning and memory.

Additional Information

• The term synapse was coined by Sir Charles Sherrington in 1897.

• There are two main types of synapses: chemical synapses and electrical synapses.

• In chemical synapses, neurotransmitters are released from the presynaptic neuron and bind to receptors on the postsynaptic neuron.

• In electrical synapses, ions flow directly between cells through gap junctions, allowing for faster transmission of signals.

• Disruptions in synaptic function can lead to neurological disorders such as Alzheimer's disease, epilepsy, and depression.

Q79. Answer: (c) 50%

Given:

Cost Price (C.P.) = Rs. 60

Selling Price (S.P.) = Rs. 90

Formula used:

Profit Percentage = [(Selling Price - Cost Price) / Cost Price] × 100

Calculations:

Profit = Rs. 90 - Rs. 60 = Rs. 30

Profit Percentage = (30 / 60) × 100

=> Profit Percentage = 0.5 × 100 = 50%

Therefore The percentage of profit is 50%.

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Q80. Answer: (d) medulla oblongata

The correct answer is medulla oblongata

Key Points

• Involuntary actions like breathing, salivation, and peristalsis are controlled by the medulla oblongata.

• The medulla oblongata is located in the brainstem, anterior to the cerebellum.

• It plays a critical role in transmitting signals between the spinal cord and higher parts of the brain, and in controlling autonomic functions.

• It regulates essential functions such as heart rate, blood pressure, and respiratory rhythm.

• Damage to the medulla oblongata can result in loss of vital autonomic functions and can be life-threatening.

Additional Information

• The hypothalamus is involved in hormone regulation and maintaining homeostasis but does not directly control involuntary actions like breathing.

• The cerebrum is responsible for higher brain functions such as thought and action.

• The cerebellum coordinates voluntary movements like posture, balance, and coordination.

• The medulla oblongata is part of the brainstem, which also includes the midbrain and pons, all of which are involved in autonomic and reflex activities.

• The brainstem is crucial for the survival of an organism due to its control over essential bodily functions.

Q81. Answer: (d) 1980

The correct answer is 1980

Key Points

• A team of German and Italian archaeologists started surface exploration at Mohenjodaro in 1980.

• Mohenjodaro is one of the main settlements of the ancient Indus Valley Civilization, located in present-day Pakistan.

• The site was first discovered in the 1920s and has been subject to various archaeological studies since then.

• The 1980 exploration aimed to further uncover the urban planning and social organization of this ancient city.

Additional Information

• Mohenjodaro is one of the largest settlements of the ancient Indus Valley Civilization and is a UNESCO World Heritage site.

• The city is known for its advanced urban planning, including sophisticated drainage systems and well-constructed buildings.

• The name Mohenjodaro means "Mound of the Dead" in Sindhi.

• Excavations have revealed a highly developed city with a complex social structure and advanced technology for its time.

• Despite numerous studies, the script of the Indus Valley Civilization remains undeciphered.

Q82. Answer: (a) 5 liters

Given:

Oil in the first can = 50 liters

Oil in the second can = 35 liters

Formula used:

The largest container that can measure the quantity of oil in either can completely is the Greatest Common Divisor (GCD) of the two quantities.

Calculation:

To find the GCD of 50 and 35:

Prime factorization of 50 = 2×5^2

Prime factorization of 35 = 5×7

The common prime factor is 5.

=> GCD(50, 35) = 5

The capacity of the largest container that can measure the quantity of oil in either can completely is 5 liters

Q83. Answer: (d) 76

Given:

x^4 + 1/(x^4) = 322

Formula used:

$x^4 + 1/(x^4) = (x^2 + 1/(x^2))^2 - 2$

$x^3 - 1/(x^3) = (x - 1/x) \times (x^2 + 1/(x^2) + 1)$

Calculations:

$322 = (x^2 + 1/(x^2))^2 - 2$

$\Rightarrow (x^2 + 1/(x^2))^2 = 324$

$\Rightarrow x^2 + 1/(x^2) = \sqrt{324} = 18$

Let $y = x - 1/x$

Then, $y^2 = x^2 - 2 + 1/(x^2)$

$\Rightarrow y^2 = 18 - 2$

$\Rightarrow y^2 = 16$

$\Rightarrow y = 4$

$x^3 - 1/(x^3) = y \times (x^2 + 1/(x^2) + 1)$

$\Rightarrow x^3 - 1/(x^3) = 4 \times (18 + 1)$

$\Rightarrow x^3 - 1/(x^3) = 4 \times 19 = 76$

Therefore The value of $x^3 - 1/(x^3)$ is 76.

Q84. Answer: (c) Megabyte

The correct answer is Megabyte

Key Points

• The full form of MB is Megabyte.

• A Megabyte is a unit of digital information storage, which is commonly used to measure the size of data.

• One Megabyte is equal to 1,024 Kilobytes or approximately 1,000,000 bytes.

• It is often used to specify the size of files, such as documents, images, and software applications.

• The term Megabyte is derived from the SI prefix mega, meaning one million.

Additional Information

• The prefix mega is used in the International System of Units (SI) to denote a factor of one million (10^6).

• In computing, the term Megabyte was originally used to describe 1,048,576 bytes (2^(20)), but it is now commonly used to refer to 1,000,000 bytes.

• The size of a Megabyte can vary depending on the context in which it is used, such as in computer memory or storage.

• Other common units of digital information storage include Kilobyte (KB), Gigabyte (GB), and Terabyte (TB).

Q85. Answer: (b) 16

Given:

If $(x - y)/3 = (x + y)/5 = xy/8$, find the value of xy.

Formula used:

Let $(x - y)/3 = (x + y)/5 = xy/8 = k$ (Assume a common variable k for simplicity)

Calculation:

$x - y = 3k$

$x + y = 5k$

$xy = 8k$

Adding the first two equations:

$(x - y) + (x + y) = 3k + 5k$

$2x = 8k$

$x = 4k$

Substitute $x = 4k$ in the first equation:

$4k - y = 3k$

$y = k$

Now substitute $x = 4k$ and $y = k$ in $xy = 8k$:

$xy = 4k \times k = 4k^2$

Since $xy = 8k$, equate:

$4k^2 = 8k$

Divide both sides by 4k:

$k = 2$

Finally, substitute $k = 2$ in $xy = 8k$:

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xy = 8 × 2 = 16

Therefore The value of xy is 16.

Q86. Answer: (a) 24%

Given:

The number of candidates who appeared for the interview for the post of officer in ABC Bank from Bihar in 2012 is 410.

The total number of candidates from all states in 2012:

• Bihar: 410

• Uttar Pradesh: 300

• Madhya Pradesh: 250

• Punjab: 280

• Kerala: 440

Formula used:

Percentage = (Number of candidates from Bihar / Total number of candidates from all states) × 100

Calculation:

Total candidates from all states in 2012 = 410 + 300 + 250 + 280 + 440 = 1680

Percentage = (410 / 1680) × 100

=> Percentage ≈ 24.4%

Therefore The number of candidates who came from Bihar in 2012 is approximately 24% of the total number of candidates who came from all the states in that year.

Q87. Answer: (c) 2014

Given:

Production data for Company Y (in thousand tonnes):

2012: 30

2013: 35

2014: 45

2015: 45

2016: 55

Formula used:

Percentage change = (New Value - Old Value)/(Old Value) × 100

Calculations:

2013 compared to 2012:

=> (35 - 30)/30 × 100 = 5/30 × 100 = 16.67%

2014 compared to 2013:

=> (45 - 35)/35 × 100 = 10/35 × 100 = 28.57%

2015 compared to 2014:

=> (45 - 45)/45 × 100 = 0/45 × 100 = 0%

2016 compared to 2015:

=> (55 - 45)/45 × 100 = 10/45 × 100 = 22.22%

Therefore The maximum percentage increase for Company Y occurred in 2014, with a 28.57% increase.

Q88. Answer: (c) 64 : 287

Given:

The number of students who graduated from the Urdu department in the year 2015 is 64.

The total number of students who graduated from the Urdu department in all years (2014 to 2018):

• 2014: 58

• 2015: 64

• 2016: 50

• 2017: 60

• 2018: 55

Formula used:

Ratio = (Number of students from Urdu department in 2015) / (Total number of students from Urdu department in all years)

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Calculation:

Total students from Urdu department in all years = 58 + 64 + 50 + 60 + 55 = 287

Ratio = 64 / 287

Therefore The ratio of the number of students who graduated from the Urdu department in the year 2015 to the total number of students who graduated from the Urdu department in all years is 64:287.

Q89. Answer: (b) Rs. 27.5

Given:

The marked price of the product is Rs. 150, and it is marked 20% above the cost price. The direct material cost is 22% of the total cost.

Formula used:

Cost Price (C) = Marked Price / (1 + Markup Percentage)

Direct Material Cost = Percentage of Direct Material Cost × Cost Price

Calculation:

1. Calculate the Cost Price:

Cost Price (C) = 150 / 1.2 = 125

2. Calculate the Direct Material Cost:

Direct Material Cost = 22% of 125

Direct Material Cost = (22/100) × 125 = 27.5

Therefore The direct material cost used in manufacturing one unit of the product is Rs. 27.5.

Q90. Answer: (c) 8

The logic follows here:

Upper side term (1st term × 2nd term) ÷ 2 - 1 = 1st term lower side

Upper side term (2nd term × 3rd term) ÷ 2 - 1 = 2nd term lower side

And so on.

1st term lower side = (4 × 4) ÷ 2 - 1 = 16 ÷ 2 - 1 = 8 - 1 = 7

2nd term lower side = (4 × 2) ÷ 2 - 1 = 8 ÷ 2 - 1 = 4 - 1 = 3

3rd term lower side = (2 × 9) ÷ 2 - 1 = 18 ÷ 2 - 1 = 9 - 1 = 8

4th term lower side = (9 × 4) ÷ 2 - 1 = 36 ÷ 2 - 1 = 18 - 1 = 17

Hence, the correct answer is "Option (3)".

Q91. Answer: (b) 12

According to the given information,

A

B means A2 ÷ B

A

B means A + B2

Using the given relation,

(4

2)

2

→ $(4^2 \div 2) + (2)^2$

= (16 ÷ 2) + 4

= 8 + 4 = 12

Hence, the correct answer is "Option 2".

Q92. Answer: (b) 208

The logic followed here is,

Hence, the correct answer is "Option 2".

Q93. Answer: (a) 12, 8

Given:

The sum of two numbers = 20.

The difference of their squares = 80.
Formula used:
Let the two numbers be x and y.
1. Sum equation: x + y = 20
2. Difference of squares equation: $x^2 - y^2 = 80$
Using the identity $x^2 - y^2 = (x + y)(x - y)$
Calculation:
From the sum equation:
x + y = 20
From the difference of squares equation:
$x^2 - y^2 = 80$
$(x + y)(x - y) = 80$
$20(x - y) = 80$
$\Rightarrow x - y = 80 / 20$
$\Rightarrow x - y = 4$
Now, we have two equations:
1. x + y = 20
2. x - y = 4
Adding these two equations:
$(x + y) + (x - y) = 20 + 4$
$\Rightarrow 2x = 24$
$\Rightarrow x = 24 / 2$
$\Rightarrow x = 12$
Substituting x = 12 in x + y = 20:
12 + y = 20
$\Rightarrow y = 20 - 12$
$\Rightarrow y = 8$
Therefore The two numbers are 12 and 8.
Therefore The correct answer is option 1.

Q94. Answer: (a) 22

The logic followed here is,
Hence, the correct answer is "Option 1".

Q95. Answer: (d) IZRM

The logic followed here is,
IDIOT is written as RWRLG,
Similarly,
RAIN can be written as,
Hence, the correct answer is "Option 4".

Q96. Answer: (a) LP

The logic followed here is:
Logic: Both letters of the cluster are opposite as per the positional value table.
Let's check,
1) LP
2) RI
3) PK
4) HS
Hence, the correct answer is "Option 1".

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Q97. Answer: (c) Cabbage

The logic followed here is:

Cucumber	Vegetable
Tomato	Vegetable
Cabbage	leafy Vegetable
Ladyfinger	Vegetable

Cucumber, Tomato, Ladyfinger all are categorized as vegetables,

Whereas,

Cabbage is a leafy vegetable and stands out from the rest which are not leafy vegetables.

Hence, the correct answer is "Cabbage".

Q98. Answer: (b) All slippers are heels.

The least possible venn diagram is shown below,

Let's check each option,

1) Some heels are canvas → True (All canvases are heels implies that some heels are canvas).

2) All slippers are heels → False (Some heels are slippers implies that it is possible that all slippers can be heels but not definite).

3) All canvases are shoes → True (All canvases are heels and all heels are shoes implies that all canvases are shoes).

4) Some shoes are canvas → True (All canvases are heels and all heels are shoes implies that some shoes are canvas).

Hence, the correct answer is "Option 2".

Q99. Answer: (d) 37

The logic followed here is:

Logic: Number in the bottom left = (Product of two right side numbers) + (Number in the top left)

Let's check,

→ 30 = (9 × 3) + 3

→ 30 = 27 + 3

→ 50 = (6 × 8) + 2

→ 50 = 48 + 2

Similarly,

→ ? = (5 × 6) + 7

→ ? = 30 + 7 = 37

Hence, the correct answer is "Option 4".

Q100. Answer: (b) Mother in law

Preparing the family tree using the following symbols,

The family tree can be drawn as per the given information,

Here, we can see that Babita is the mother-in-law of Geeta.

Hence, the correct answer is "Option 2".

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