RRB NTPC CBT-I Official Paper (Held On: 9 Feb 2021 Shift 2) (Previous Year Paper)

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

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Q1. If cot(A + B).cot(A - B) = 1, then find the value of cot (2A/3) is:

(a) 2/(√3)
(b) √3
(c) 1/(√3)
(d) (√3)/2

Q2. In a certain code language, SPIDER is written as RNHBDP. How will QUESTION be written as in that language?

(a) PSDQSGNL
(b) UQSEITNO
(c) SEUQNOIT
(d) OSCQRGML

Q3. If a + b + c = 8 and both b and c are positive integers greater than zero, then the maximum value 'a' can take is:

(a) 8
(b) 0
(c) 6
(d) 10

Q4. What is the sum of the squares of the numbers from 3 to 18?

(a) 2103
(b) 2101
(c) 2102
(d) 2104

Q5. If √2 sin (5x - 5)° = tan 45°, then the value of x (in degrees) is:

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

Q6. In which year did the Non-Cooperation Movement begin in India?

(a) 1930
(b) 1920
(c) 1940
(d) 1910

Q7. Based on the given information, answer the question given below.

Hardeep, Jagjeet and Rohan are honest. Kamal, Jagjeet and Gaurav are ambitious. Rohan, Jagjeet and Kamal are hard working. Gaurav, Hardeep and Kamal are intelligent.

Who is NEITHER ambitious NOR hard-working?

(a) Hardeep
(b) Rohan

(c) Kamal
(d) Gaurav

Q8. The product of the LCM and HCF of two positive numbers is 36. The difference of the two numbers is 5. Find the numbers.
(a) 4 and 8
(b) 5 and 8
(c) 4 and 9
(d) 5 and 9

Q9. The LCM of two numbers is 26 times their HCF. The sum of the HCF and LCM is 729. If one number is 81, find the other.
(a) 231
(b) 232
(c) 233
(d) 234

Q10. There are 500 students in a school. The boys and girls are in the ratio 7 : 3. If 120 new girls are enrolled in the school, then what will be the ratio of the number of boys to that of girls?
(a) 35 : 26
(b) 35 : 27
(c) 35 : 29
(d) 35 : 28

Q11. _____ describe(s) India as a secular state.
(a) The Preamble of the Constitution
(b) Directive Principles of State Policy
(c) Article 44
(d) Article 475

Q12. Select the option in which the words share the same relationship as that shared by the given pair of words.
Paisa : Rupee
(a) Kilogram : Quintal
(b) Meter : Kilometre
(c) Second : Minute
(d) Rupee : Money

Q13. What is the full form of EVM?
(a) Essential Voting Machine
(b) Electric Voting Machine
(c) Electronic Voting Machine
(d) Election Voting Machine

Q14. Which of the following organisations deals with formulation and implementation of global trade?
(a) IMF
(b) WHO
(c) ILO
(d) WTO

Q15. In a certain code language, LOVE is written as NQXG. How will SWEET be written as in that language?
(a) TXFFU
(b) RVDDS
(c) UYGGV
(d) HGYYR

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Q16. Which of the following is responsible for providing safe, efficient air traffic and aeronautical communication services in the Indian air space?

(a) Airports Association of India
(b) Airports and Aeronautical Authority of India
(c) Airports Authority of India
(d) Aeronautical Authority of India

Q17. Who was the captain of Indian cricket team when India won the Cricket World Cup in 1983?

(a) Mohinder Amarnath
(b) Kapil Dev
(c) Sunil Gavaskar
(d) Ravi Shastri

Q18. A cyclist takes 13 h to cover certain distance. He travels first half of the distance at a speed of 7 km/h and the second half at a speed of 6 km/h. Find the distance.

(a) 86 km
(b) 84 km
(c) 82 km
(d) 80 km

Q19. Which of the following did Rowlatt Act 1919 entail?

(a) Indefinite detention without trial and censorship of the press
(b) Open fire and lathi-charge on Indians
(c) Ban on Indian goods
(d) Levying of heavy taxes

Q20. A woman borrowed some money on simple interest. After 4 years she returned 6/5 of money to the lender. What was the rate of interest?

(a) 5% p.a.
(b) 3% p.a.
(c) 4% p.a.
(d) 2% p.a.

Q21. Which was India’s first venture into interplanetary space?

(a) Chandrayaan-1
(b) GSAT-31
(c) MOM
(d) AstroSat

Q22. Vishal (male) and Radhika (female) are sitting in a room. Vishal's mother-in-law and Radhika's mother-in-law who is the only daughter of her mother, are mother and daughter respectively. How is Vishal related to Radhika?

(a) Father-in -law
(b) Grandfather
(c) Brother
(d) Father

Q23. Ravi and Mohan start moving together from a point in opposite directions on bikes. Ravi's speed is 80 km/h and Mohan's speed is 40 km/h. What will be the distance between them after 15 min?

(a) 36 km
(b) 40 km
(c) 45 km
(d) 30 km

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Q24. Which energy of the wind does a windmill use?

(a) Kinetic energy
(b) Thermal energy
(c) Heat energy
(d) Hydro energy

Q25. The Similipal Biosphere Reserve that promotes conservation of biodiversity and alternative livelihood is located in:

(a) Odisha
(b) Rajasthan
(c) Uttar Pradesh
(d) Madhya Pradesh

Q26. Four pairs have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) Snakes : Hiss
(b) Birds : Chirp
(c) Dogs : Coop
(d) Lion : Roar

Q27. Which state had more than one-third of the total sugar production in India in 2019-2020?

(a) Haryana
(b) Uttar Pradesh
(c) Punjab
(d) Bihar

Q28. Two women walk from a place at the speeds of 6 km/h and 8 km/h respectively. First woman takes 40 min more than the second one to cover the distance. Find the distance.

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

Q29. If '÷' stands for addition, '×' stands for subtraction, '+' stands for division, and '-' stands for multiplication, then which of the following equations is correct?'

(a) 20 × 12 + 4 ÷ 3 - 2 = 12
(b) 20 × 12 + 6 ÷ 5 - 2 = 12
(c) 18 × 12 + 6 ÷ 3 - 2 = 12
(d) 20 ÷ 12 + 6 × 5 - 2 = 12

Q30. Which part of the plant is responsible for transporting water from roots of the plant to the rest of the plant?

(a) Phloem tissue
(b) Xylem tissue
(c) Collenchyma
(d) Parenchyma

Q31. A horse is running at a speed of 40 km/h and it covers its distance in 3 h. If it has to cover that distance in 21/2 h, at what speed should it run?

(a) 42 km/h
(b) 46 km/h
(c) 44 km/h
(d) 48 km\h

Q32. 4 angles of a pentagon are 70°, 110°, 135°, and 95°. Find the measure of the fifth angle of the pentagon.

(a) 130°
(b) 134°
(c) 132°

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(d) 128°

Q33. The price of an article was reduced by 15% and it's daily sale increased by 25%. Find the net percentage effect on daily sale.

(a) 6.35 % increase
(b) 6.15 % increase
(c) 3.1 % increase
(d) 6.25 % increase

Q34. Deficiency of _____ induces a disorder known as kwashiorkor.

(a) Protein
(b) Minerals
(c) Fats
(d) Carbohydrates

Q35. Which of the following was proposed by the British Government with regards to structuring the Indian Government in 1909?

(a) Morley-Minto Reforms
(b) Wavell Plan
(c) Rowlatt Act
(d) Cripps Mission

Q36. What is the unit digit in the following product?

91 × 92 × 93 × ..... × 99

(a) 0
(b) 2
(c) 4
(d) 1

Q37. As per Census of India, 2011, Urban Agglomerations having more than _____ million population are known as Mega Cities.

(a) 10
(b) 5
(c) 20
(d) 15

Q38. Where did the Special Olympics World Games 2019 take place?

(a) Abu Dhabi, UAE
(b) Toronto, Canada
(c) Athens, Greece
(d) Lake Tahoe, US

Q39. 'Agenda 21' was a set of practices recommended at the _____.

(a) Nairobi Earth Summit, 1982
(b) Rio Summit, 1992
(c) WSSD, Johannesburg, 2002
(d) UNCHS, Stockholm, 1972

Q40. Why were stupas built?

(a) To worship the Buddha
(b) To hold religious meetings
(c) They contained sacred relics
(d) To keep Buddhist scriptures

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Q41. Where did Brahmo Samaj originate?

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

Q42. Which Indian personality received the Nobel Peace Prize in 2014?

(a) Rajendra Kumar Pachauri
(b) Har Gobind Khorana
(c) Amartya Sen
(d) Kailash Satyarthi

Q43. Eight friends P, Q, R, S, T, U, V and W are sitting around a circular table facing opposite to the centre (not necessarily in the same order). Q is third to the right of T and second to the left of P. Only two friends are sitting between U and V and V is not the neighbour of P or T. W is second to the right of R. Which of the following statement is correct?

(a) V is to the immediate right of S
(b) P is to the immediate left of R
(c) W is to the immediate right of Q
(d) S is to the immediate left of T

Q44. A side of the triangle is 15 cm and the height of the triangle from this side is 6 cm. Find the area of triangle.

(a) 45 cm^2
(b) 48 cm^2
(c) 46 cm^2
(d) 47 cm^2

Q45. The sum of two angles is 155° and their difference is π/2 The value of the greater angle (in radians) is:

(a) (51 π)/72
(b) (47 π)/72
(c) (49 π)/72
(d) (53 π)/72

Q46. After the Mars Mission, which inter-planetary mission is India eyeing at?

(a) Saturn
(b) Venus
(c) the Sun
(d) Mercury

Q47. What is the full form of WCED (also known as Brundtland Commission) formed by the United Nations for sustainable development?

(a) World Commission on Ecological Development
(b) World Commission on Environment and Development
(c) World Commission on Environmental Delegation
(d) World Commission on Educational Development

Q48. A person has to put each of three liquids, 420 L of diesel, 475 L of petrol and 495 L of oil in bottles of equal size without mixing any of the above three types of liquids such that each bottle is completely filled. What is the least possible number of bottles required?

(a) 282
(b) 280
(c) 278
(d) 284

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Q49. Which two steel plants were set up in collaboration with Russia (former USSR)?

(a) Rourkela Steel Plant and Bokaro Steel Plant
(b) Bokaro Steel Plant and Bhilai Steel Plant
(c) Rourkela Steel Plant and Bhilai Steel Plant
(d) Durgapur Steel Plant and Bokaro Steel Plant

Q50. Terry consumes 1700 mL of milk every day. How many litres of milk will she consume in 5 weeks?

(a) 58.5 L
(b) 60 L
(c) 59.5 L
(d) 59 L

Q51. The areas of two squares are in the ratio 16 : 9. Find the ratio of their respective perimeters.

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

Q52. The cultivation of high value crops such as vegetables, fruits and flowers is called _____.

(a) Pisiculture
(b) Horticulture
(c) Apiculture
(d) Sericulture

Q53. Select the number from the given options that can replace the (?) in the following number series.

40, 48, 41, 16, 42, 8, 43, ?

(a) 8
(b) 16
(c) 9
(d) 71

Q54. While introducing a woman, Raman said, "She is the daughter-in-law of my grandfather's daughter-in-law". Which of the following could be the way in which the woman is related to Raman?

(a) Paternal Aunt
(b) Mother
(c) Sister
(d) Brother's wife

Q55. Eight soldiers A, B, C, D, E, F, G and H are sitting in a row facing towards north (not necessarily in the same order). D sits third to the right of A and second to the left of C. Only three soldiers sit between D and E. Only two solders sit between E and F. F sits second to the left of B. A is the neighbour of G. H sits to the right of D. How many soldiers are sitting between H and G?

(a) Four
(b) One
(c) Zero
(d) Five

Q56. Read the given statement(s) and conclusions carefully and decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

1. Some kites are birds.

2. All birds are black.

Conclusions:

I. All black birds are kites.

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II. Some black things are kites.

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

Q57. Find sum of the smallest and the largest positive numbers of 6 digits which contains only digits 0, 4, 6 and each of these digits appears at least once:

(a) 1066646
(b) 604604
(c) 666666
(d) 666444

Q58. To which Indian state does Madhubani art belong?

(a) Bengal
(b) Punjab
(c) Bihar
(d) Maharashtra

Q59. Name the space shuttle in which Kalpana Chawla, an Indian-American astronaut, died in 2003.

(a) Columbia
(b) Discovery
(c) Challenger
(d) Atlantis

Q60. The sides of a rectangle are 49 m and 35 m respectively. How many square beds can be accommodated in this rectangle if the side of the bed is 7 m ?

(a) 34
(b) 33
(c) 36
(d) 35

Q61. Integrated Tribal Development Project (ITDP) comes into existence as a part of the _____ Five-Year Plan.

(a) Second
(b) First
(c) Sixth
(d) Fifth

Q62. The rate of a certain variety of rice increases by 20%. A man gets that variety of rice 3 kg less for Rs. 630 in comparison with the quantity that he would have got at the old rate. Find the old rate of that variety of rice.

(a) Rs. 35 per kg
(b) Rs. 36 per kg
(c) Rs. 34 per kg
(d) Rs. 37 per kg

Q63. By how much should each term of the ratio 17 : 21 be reduced so that it becomes 7 : 9?

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

Q64. Which of the following is NOT a sub-field of Economic Geography?

(a) Geography of Resources
(b) Demography
(c) Geography of Marketing

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(d) Geography of Tourism

Q65. The HCF of two numbers is 29 and the other two factors of their LCM are 13 and 17. The smallest of the two numbers is:

(a) 387
(b) 373
(c) 377
(d) 493

Q66. A gold ring is sold for Rs. 19,125 at a loss of 15%. What is the cost price of the gold ring?

(a) Rs. 22,500
(b) Rs. 21,500
(c) Rs. 23,500
(d) Rs. 24,500

Q67. Select the number from the given options that can replace the (?) in the following alphanumeric series.

Q, 18, S, 16, U, 13, W, ?

(a) 8
(b) 9
(c) 6
(d) 7

Q68. The first passenger train in India ran between _____ and _____ in the year 1853.

(a) Pune, Goa
(b) Bombay, Thane
(c) Bombay, Pune
(d) Pune, Thane

Q69. Which of the following is NOT a vertebrate class?

(a) Annelida
(b) Cyclostomata
(c) Pisces
(d) Reptilla

Q70. The Gateway of India in Mumbai was built to welcome:

(a) King George V
(b) Sir William Jones
(c) Lord Dalhousie
(d) Portuguese traders

Q71. If $\cos 2\theta = 1/2$ then the value of $\sin(75° - \theta)$ will be:

(a) $\sqrt{2} - 1$
(b) 1/2
(c) $1/(\sqrt{2})$
(d) $\sqrt{2} + 1$

Q72. What is oxidization?

(a) A substance gaining hydrogen during a chemical reaction
(b) A substance losing both oxygen and hydrogen in a chemical reaction
(c) A substance gaining oxygen during a chemical reaction
(d) A substance losing oxygen during a chemical reaction

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Q73. How many times does a GPS satellite circle the earth?

(a) Once every 12 hours
(b) Once every 48 hours
(c) Once every 2 hours
(d) Once every 24 hours

Q74. The earth takes 24 h to rotate about its own axis. Through what angle will it turn in 5 h and 24 min?

(a) 79°
(b) 80°
(c) 82°
(d) 81°

Q75. What is the atomicity of Phosphorous?

(a) Poly-Atomic
(b) Tetra-Atomic
(c) Monoatomic
(d) Diatomic

Q76. In which tear was Rani Lakshmibai of Jhansi killed in battle?

(a) 1858
(b) 1835
(c) 1885
(d) 1853

Q77. Area of an equilateral triangle is $49\sqrt{3}$ cm². Find the side of the triangle.

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

Q78. What kind of a resource is water?

(a) Abiotic
(b) Cyclic
(c) Non-cyclic
(d) Non-renewable

Q79. Which of the following is NOT a type of personal computer?

(a) Mainframe computer
(b) Palmtop computer
(c) Desktop computer
(d) Laptop

Q80. Which is the most important feature of federal government adopted by India?

(a) The state government has more power than the union government.
(b) The jurisdiction of all governments is the same.
(c) The relationship between the state and the center should be based on cooperation.
(d) The center is financially dependent on states.

Q81. If X : Y = 4 : 5, Y : Z = 5 : 7 and Z : W = 7 : 9, then X : W is equal to:

(a) 2 : 9
(b) 4 : 9
(c) 3 : 11
(d) 3 : 7

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Q82. Select the letter cluster that can replace the (?) in the following series.

DKM, FJP, HIS, JHV, ?

(a) IGZ
(b) HGY
(c) LGY
(d) IGY

Q83. What is the full form of ATM?

(a) Automatic Teller Machine
(b) Automated Totalling Machine
(c) Automated Teller Machine
(d) Automatic Totalling Machine

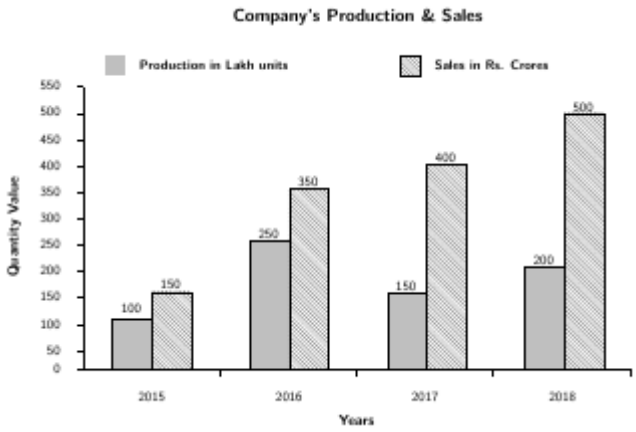
Q84. If the numbers divisible by 3, from 1 to 30, are arranged in descending order, which number will be at the 7^(th) place from the bottom?

(a) 27
(b) 24
(c) 18
(d) 21

Q85. The first sounding rocket, Nike -Apache was launched by India in _____.

(a) 2000
(b) 1950
(c) 1963
(d) 1990

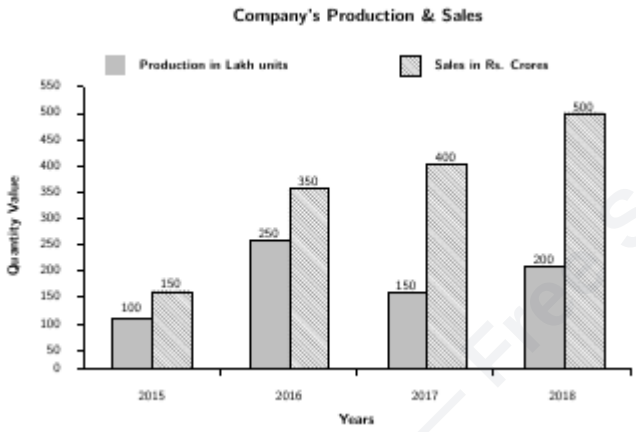
Q86. The given bar graph shows a company's production (in lakhs) and sales (in Rs. crores) over 4 years (2015 to 2018). Answer the question given below based on the bar graph.



In which year was the value per unit Rs. 250?

(a) 2017
(b) 2018
(c) 2015
(d) 2016

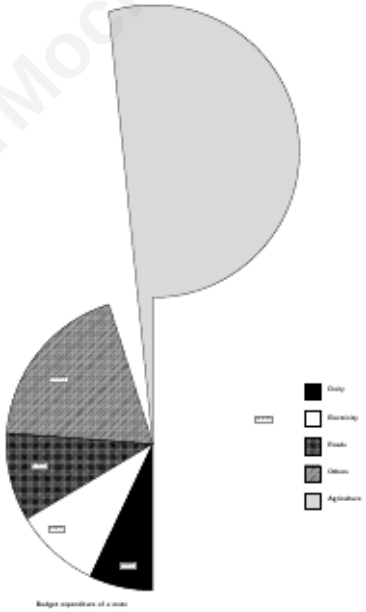
Q87. The given bar graph shows a company's production (in lakhs) and sales (in Rs. crores) over 4 years (2015 to 2018). Answer the question given below based on the bar graph.



If in 2017, the items were sold at the same rate as in 2016, then what would be the value of sale in 2017?

(a) Rs. 210 crore
(b) Rs. 225 crore
(c) Rs. 215 crore
(d) Rs. 220 crore

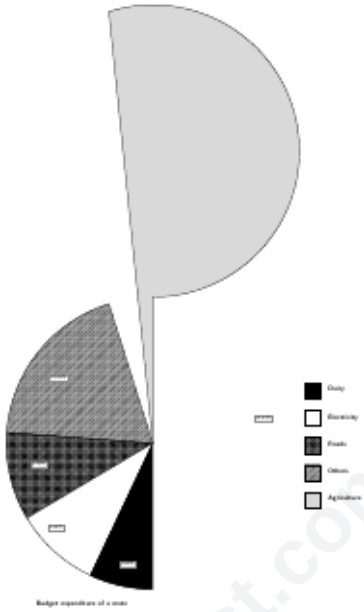
Q88. The given pie diagram shows the budget expenditure of a state on five types of expenses (agriculture, roads, electricity, dairy and others). Answer the question given below based on the pie diagram.



What is the approximate central angle formed by the sector corresponding to expenditure on roads?

(a) 39°
(b) 35°
(c) 37°
(d) 33°

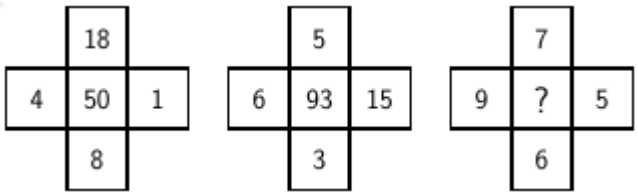
Q89. The given pie diagram shows the budget expenditure of a state on five types of expenses (agriculture, roads, electricity, diary and others). Answer the question given below based on the pie diagram.



If the difference in the expenditure on dairy and on others is Rs. 7.2 million, then what would be the total budget in million?

(a) Rs. 61.5 million
(b) Rs. 60 million
(c) Rs. 62 million
(d) Rs. 63 million

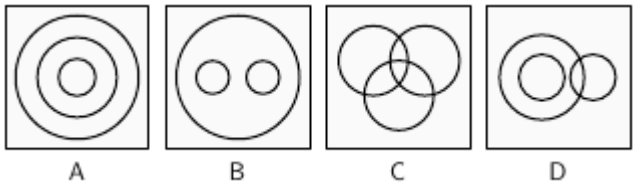
Q90. Study the given pattern carefully and select the number that can replace the (?) in it.



(a) 27
(b) 93
(c) 87
(d) 89

Q91. Select the Venn diagram that best represents the relationship between the following classes:

Cabbage, Food, Vegetables.



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

Q92. Read the given statement and decisions carefully and decide which of the given decisions logically follow(s) from the statement.

Statement:

The sale of a particular product has gone down markedly due to a change in the trend causing great concern to the company.

Decisions:

I. The price of the product should be reduced and the quality should be improved.

II. The company should make a study of customer choices and market competition in the market.

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

Q93. Read the given statement(s) and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statement(s).

Statements:

1. Some brushes are bats.

2. Some bats are balls.

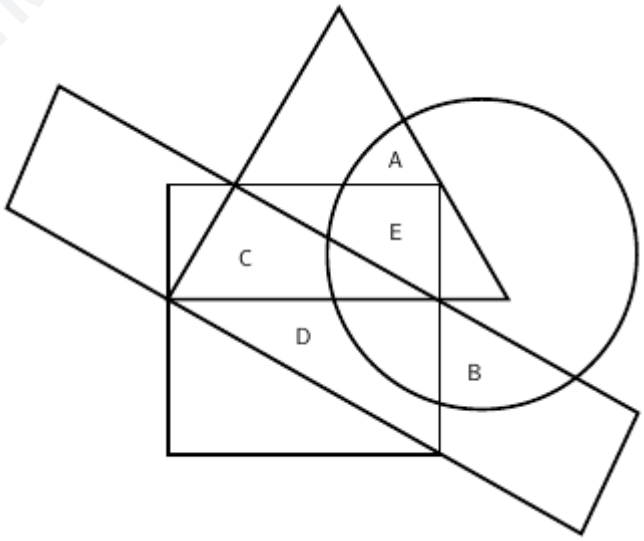
Conclusions:

I. Some brushes are balls.

II. Some brushes are not balls.

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

Q94. In the given diagram, the circle represents ‘educated persons', the triangle represents 'urban persons', the square represents ‘laborious persons’, and the rectangle represents ‘honest persons’.



Which region represents uneducated, honest, laborious persons who are NOT urban?

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

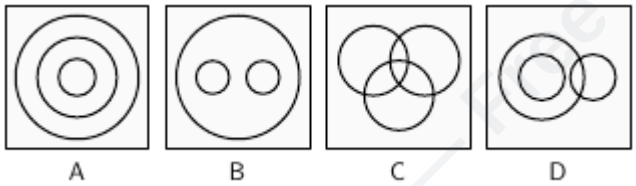
Q95. Four words have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) Motherboard
(b) Hard disk
(c) CD-ROM
(d) Keyboard

Q96. 'Day' is related to 'Night' in the same way as 'Cold' is related to '_____'.

(a) Wet
(b) Fire
(c) Winter
(d) Hot

Q97. Select the Venn diagram that best represents the relationship between the following classes:



Pencil, Stationery, Notebook.

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

Q98. If T means subtract, K means divide, J means multiply, and Q means add, then

18 K 3 Q 4 J 2 T 5 = ?

(a) 14
(b) 3
(c) 9
(d) 15

Q99. In a certain code language, OFFICE is written as FFOECI. How will CIRCLE be written as in that language?

(a) CELCRI
(b) RICELC
(c) ELCRIC
(d) ICCREL

Q100. A question is given followed by two arguments. Decide which of the arguments is/are strong with respect to the question.

Question:

Should the government encourage young entrepreneurs?

Arguments:

I. Yes, they will reduce the burden of unemployment.

II. Yes, they will contribute to the development of the country.

(a) Both arguments I and II are strong.
(b) Only argument I is strong.
(c) Only argument II is strong.
(d) Neither argument I nor II is strong.

ANSWER KEY

1	b	2	a	3	c	4	d	5	c	6	b	7	a	8	c	9	d	10	b
11	a	12	a	13	c	14	d	15	c	16	c	17	b	18	b	19	a	20	a
21	c	22	a	23	d	24	a	25	a	26	c	27	b	28	a	29	d	30	b
31	d	32	a	33	d	34	a	35	a	36	a	37	a	38	a	39	b	40	c
41	c	42	d	43	a	44	a	45	c	46	b	47	b	48	c	49	b	50	c
51	b	52	b	53	a	54	d	55	a	56	b	57	a	58	c	59	a	60	d

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61	d	62	a	63	b	64	b	65	c	66	a	67	b	68	b	69	a	70	a
71	c	72	c	73	a	74	d	75	b	76	a	77	d	78	b	79	a	80	c
81	b	82	c	83	c	84	d	85	c	86	b	87	a	88	b	89	b	90	d
91	a	92	b	93	d	94	b	95	d	96	d	97	b	98	c	99	b	100	a

SOLUTIONS

Q1. Answer: (b) √3

Given:

cot(A + B).cot(A - B) = 1

Concept Used:

tan (A + B) = (tan(A) + tan(B))/(1 - tan(A) tan(B))

tan (A – B) = (tan(A) - tan(B))/(1 + tan(A) tan(B))

Calculation:

=> We have,

=> cot(A + B).cot(A – B) = 1

=> tan(A + B). tan(A – B) = 1

=> Expanding the terms with the help of formula, we get

=> (tan(A) + tan(B))/(1 - tan(A) tan(B)) × (tan(A) - tan(B))/(1 + tan(A) tan(B)) = 1

=> $(\tan^2(A) - \tan^2(B))/(1 - \tan^2(A)\tan^2(B)) = 1$

=> $\tan^2(A) – \tan^2(B) = 1 – \tan2(A)\tan2(B)$

=> tan2(A) + tan2(A) tan2(B) – tan2(B) – 1 = 0

=> tan2(A) (1 + tan2(B)) – 1(1 + tan2(B)) = 0

=> (tan2(A) – 1) (1 + tan2(B)) = 0

=> tan2(A) = 1 or tan2(B) = –1

=> $\tan^2(x)$ can not be negative.

=> So, we will consider, tan2(A) = 1

=> A = π/4

=> Now, cot ((2 A)/3)

=> cot (2/3 x π/4)

=> cot (1/3 x π/2)

=> cot (π/6) = √3

Therefore, the value of cot ((2 A)/3) is √3

Q2. Answer: (a) PSDQSGNL

The positional values of the English alphabet is as follows:

The pattern followed here is:

SPIDER is written as RNHBDP

QUESTION will be written as:

Hence, 'option 1' is the correct answer.

Q3. Answer: (c) 6

Given:

a + b + c = 8

b > 0, c > 0

Calculation:

To obtain the maximum value of 'a' considering b and c are positive integers greater than zero,

Let b = c = 1

=> a + 1 + 1 = 8

=> a = 8 - 2

=> a = 6

Q4. Answer: (d) 2104

Given:

Numbers = 3 to 18

Concept used:

Sum of squares of n natural numbers = (n (n+1)(2n+1))/6

Calculation:

=> Sum of squares of numbers from 1 to 18 = (18 (18+1)(2(18)+1))/6

=> (18× 19× 37)/6=12654/6=2109

=> Sum of squares of numbers from 1 to 18 = 2109

=> Now, Sum of squares of numbers from 3 to 18 = Sum of squares of numbers from 1 to 18 – (1^2 + 2^2)

=> 2109 – 5 = 2104

Therefore, the sum of squares of numbers from 3 to 18 is 2104

Q5. Answer: (c) 10

Given:

√2 sin (5x – 5)° = tan 45°

Calculation:

=> As, tan 45º = 1

=> √2 sin (5x – 5)° = 1

=> sin (5x – 5)° = 1/√2

=> As, sin 45º = 1/√2,

=> sin (5x – 5)° = sin 45º

=> Equating both, we get

=> 5x – 5 = 45

=> 5x = 50

=> x = 10º

Therefore, the value of x is 10º

Q6. Answer: (b) 1920

Correct answer is 1920.

Key Points

• Noncooperation was accepted to by the Indian National Congress at Calcutta in September 1920 and started that December.

• The movement was actually a peaceful and non-violent protest against the British government in India.

• Indians were asked to give up their titles and leave from nominated seats in the local bodies as a mark of protest.

• Middle class people mainly take part in non cooperation movement in towns.

• Additional Information

• Civil disobedience, also known as passive resistance, the refusal to obey the demands or commands of a government or occupying power, without resorting to violence or active measures of opposition.

• Gandhi organised Kheda movement to support farmers of the Kheda district.

• The Champaran Satyagraha is considered to be a important event in the history of India's freedom struggle.

Q7. Answer: (a) Hardeep

From the given information, we can draw a table:

Hardeep, Jagjeet and Rohan are honest. Kamal, Jagjeet, and Gaurav are ambitious. Rohan, Jagjeet and Kamal hard-working. Gaurav, Hardeep, and Kamal are intelligent.

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| Name | Qualities | | --- | --- | | Hardeep | Honest, Intelligent | | Jagjeet | Honest, Ambitious, Hard working | | Rohan | Honest, Hardworking | | Kamal | Ambitious, Hard working, Intelligent | | Gaurav | Ambitious, Intelligent |	**Name**	**Qualities**	**Hardeep**	**Honest, Intelligent**	**Jagjeet**	**Honest, Ambitious, Hard working**	**Rohan**	**Honest, Hard working**	**Kamal**	**Ambitious, Hard working, Intelligent**	**Gaurav**	**Ambitious, Intelligent**	
Name	Qualities												
Hardeep	Honest, Intelligent												
Jagjeet	Honest, Ambitious, Hard working												
Rohan	Honest, Hard working												
Kamal	Ambitious, Hard working, Intelligent												
Gaurav	Ambitious, Intelligent												

From the table, we can see that Hardeep is neither ambitious nor hard-working.

Hence the correct answer is option 1)

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Q8. Answer: (c) 4 and 9

Given:

Product of LCM and HCF of two positive numbers = 36

Difference between two numbers = 5

Concept Used:

LCM (a, b) × HCF (a, b) = a × b

Calculation:

=> Let the two positive numbers be a and b.

=> LCM × HCF = 36 and b – a = 5

=> According to the formula,

=> 36 = a × b → (1)

=> Also b – a = 5, can be written as b = 5 + a.

=> Substituting b = 5 + a in (1), we get

=> 36 = a × (5 + a)

=> 36 = 5a + a^2

=> a^2 + 5a – 36 = 0

=> a^2 + 9a – 4a – 36 = 0

=> a(a + 9) – 4(a + 9) = 0

=> (a + 9)(a – 4) = 0

=> a + 9 = 0 and a – 4 = 0

=> a = –9 (Not possible because a is positive number)

=> So, a = 4

=> Substitute, a = 4 in (1) we get

=> 36 = 4 × b

=> b = 36/4=9

Therefore, the two positive numbers are 4 and 9

Q9. Answer: (d) 234

Given:

LCM of two numbers = 26 times the HCF of two numbers

HCF + LCM = 729

One number = 81

Concept Used:

LCM (a, b) × HCF (a, b) = a × b

Calculation:

=> Let the two numbers be a and b

=> LCM (a, b) = 26 HCF (a, b)

=> HCF (a, b) + LCM (a, b) = 729 → (1)

=> Now substitute LCM (a, b) with 26 HCF (a, b) in (1), we get

=> HCF (a, b) + 26 HCF (a, b) = 729 → (2)

=> 27 × HCF (a, b) = 729

=> HCF (a, b) = 729/27

=> HCF (a, b) = 27

=> Now substitute this value in (2), we get

=> 27 + LCM (a, b) = 729

=> LCM (a, b) = 729 – 27

=> LCM (a, b) = 702

=> Substitute LCM(a, b), HCF(a, b) and one number in LCM (a, b) × HCF (a, b) = a × b, we get

=> 702 × 27 = 81 × b

=> 18954 = 81 × b

=> b = 18954/81=234

Therefore, the other number is 234

Q10. Answer: (b) 35 : 27

Given:

Total number of students in a school = 500

Boys : Girls = 7 : 3

New girls enrolled in the school = 120

Concept Used:

Total number of students in a school = Total number of boys + Total number of Girls

Calculation:

=> Let the total number of boys = 7x

=> So, the total number of girls = 3x

=> Total number of students in a school = 500

=> Boys + Girls = 500

=> 7x+3x=500

=> 10x = 500

=> x = 500/10

=> x=50

=> Substitute x=50 to get total number of boys and girls,

=> Total number of Boys = 7 × 50 = 350

=> Total number of Girls = 3 × 50=150

=> If 120 new girls enrolled then the total number of girls becomes, 150+120 = 270

=> The ratio of boys to that of girls is, 350 : 270

=> 350:270= 350/270

=> 350/270=35/27

=>) (35/27=35:27

Therefore, the ratio of boys to that of girls is 35 : 27

Q11. Answer: (a) The Preamble of the Constitution

Correct answer is The Preamble of the Constitution.

Key Points

• The Preamble of the constitution establishes India as a Secular State.

• The meaning of a secular state is that it does not prioritize any one religion for the country and its people.

• The word 'Secular' was attached by the Constitution Act, 1976.

• India is known as a secular state because it does not have any state religion and people are free to practice any religion of their choice.

Additional Information

• Directive Principles of State Policy motive to create social and economic conditions under which the citizens can guide a good life.

• Article 44 of the constitution looks for the Indian state to apply directive principles and common law for all Indian citizens while formulating national policies.

• Article 475, delivery to commanding officers of persons liable to be tried by Court-martial.

Q12. Answer: (a) Kilogram : Quintal

The logic followed here is,

Paisa : Rupee

=> 1 Rupee = 100 Paise

Similarly,

Kilogram : Quintal

=> 1 Quintal = 100 Kilogram

Hence, 'option 1' is the correct answer.

Q13. Answer: (c) Electronic Voting Machine

Correct answer is Electronic Voting Machine.

Key Points

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• Electronic voting machines (EVM) help to record votes.

• The Indian electronic voting machine (EVM) was developed in 1989 by the Election Commission of India.

• EVM supports provide the basis to assess work progress against a baseline plan, relate technical, time and cost performance.

• The chief cause is EVM requires a bottom-up approach to defining the full scope of work by using a "deliverable-oriented" WBS focused on end products.

• Additional Information

• The election commission has the right to permit marks to the political parties.

• It gives identification to the national parties, state parties, and regional parties.

• It sets limitations on poll expenses.

• The commission produces electoral rolls and updates the voter's list from time to time.

Q14. Answer: (d) WTO

Correct answer is WTO.

Key Points

• The World Trade Organization (WTO) is an international organization of 164 members that manage the rules of trade between nations.

• The WTO has over 160 members representing 98 per cent of world trade.

• WTO cheif work is to ensure that trade flows as smoothly, predictably and freely as possible.

• The World Trade Organisation was started on January 1, 1995, with the Marrakesh Agreement, which put back the General Agreement on Tariffs and Trade.

• Additional Information

• The International Monetary Fund (IMF) works to achieve sustainable growth and prosperity for all of its 190 member countries.

• The World Health Organization is an international organization that is a member of the United Nations and helps developing countries by giving them information and medicine.

• India is a originater member of the International Labour Organization, which came alive in 1919.

Q15. Answer: (c) UYGGV

The positional values of the English alphabet are as follows:

The pattern followed here is:

LOVE is written as NQXG

Similarly, SWEET will be written as:

Hence, 'option 3' is the correct answer.

Q16. Answer: (c) Airports Authority of India

Correct answer is Airports Authority of India.

Key Points

• The Directorate General of Civil Aviation (DGCA) is the regulatory body in the field of Civil Aviation, primarily dealing with safety issues.

• It is in charge of regulation of air transport services of India.

• The first Indian airline, Tata Sons Ltd., began a regular airmail service between Karachi and Madras without any patronage from the government in 1915.

• 'Air India' came into being when Tata Airlines changed its name to Air India in 1946.

Additional Information

• The Airports Authority of India, or AAI, is a statutory body, under the ownership of the Ministry of Civil Aviation, Government of India.

• It is responsible for creating, upgrading, maintaining, and managing civil aviation infrastructure in India.

• AAI manages a total of 137 airports which include 24 International airports (3 Civil Enclaves), 10 Customs Airports (4 Civil Enclaves), and 103 Domestic airports (23 Civil Enclaves).

Q17. Answer: (b) Kapil Dev

Correct answer is Kapil Dev.

Key Points

• As reffered ahead, India played under the captaincy of Kapil Dev in the 1983 Cricket World Cup.

• Dev was be one of best all-rounders of that era, and he played 225 ODI matches in his career.

• He picked up 253 wickets and scored 3,783 runs.

• Kapil Dev-led India win maiden World Cup trophy in 1983.

• Additional Information

• Mohinder Amarnath Bhardwaj is an Indian former cricketer,current cricket analyst and actor.

• Sunil Manohar Gavaskar is an Indian cricket commentator and former cricketer who represented India and Bombay from 1971 to 1987.

• Ravishankar Jayadritha Shastri is the former cheif coach of the India national cricket team, a cricket commentator and former captain of Indian Cricket Team.

Q18. Answer: (b) 84 km

Given:

Time taken to cover certain distance = 13 hours

For the first half the speed = 7 km/hr

For the second half the speed = 6 km/hr

Concept Used:

Time = Distance/Speed

Calculation:

=> Let the total distance be 2x km.

=> For the first half, time taken = x/7 hr

=> For the second half, time taken = x/6 hr

=> Total time taken = 13 hr

=> x/7+x/6=13

=> (6x+7x)/42=13

=> 13x/42=13

=> x=(13 × 42)/13

=> x=42 km

=> The total distance = 2x=2×42 km

=> Total distance = 84 km

Therefore, the total distance is 84 km.

Q19. Answer: (a) Indefinite detention without trial and censorship of the press

Correct answer is Indefinite detention without trial and censorship of the press.

Key Points

• Rowlatt Acts, (February 1919), legislation proceeded by the Imperial Legislative Council, the legislature of British India.

• The acts allowed definite political cases to be tried without juries and permitted internment of suspects without trial.

• The Rowlatt Act was proceeded by the British government to grow their grasp on power over the common folk.

• This act allow the British government to arrest anybody suspected of terrorist activities.

• Additional Information

• Employing 'lathi charge' to crush protests and demonstrations has been inherited from the legal structure used by the colonial police.

• All kinds of goods which are prohibited from import under the Foreign Trade (Development and Regulation) Act, 1992 are banned for imported into India.

Q20. Answer: (a) 5% p.a.

Given:

A woman borrowed some money on simple interest for 4 years.

Returned amount = 6/5 × Money borrowed

Concept Used:

Amount = Principal + Interest

Simple Interest = (P× R× T)/100

Calculation:

=> Let the principal be Rs.100

=> Interest = Amount – Principal

=> Interest = 6/5×100-100

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=> Interest = 120-100=20

=> Now substituting the values in SI formula, we get

=> 20=(100×4× r)/100

=> 20=4× r

=> r=20/4=5

Therefore, rate of interest for the money borrowed by a women is 5% p.a.

Q21. Answer: (c) MOM

Correct answer is MOM.

Key Points

• The Mars Orbiter Mission (MOM) or Mangalyaan, is a space investigation started by the Indian Space Research Organization on November 5, 2013.

• Mangalyaan was India's first interplanetary mission.

• The primitively-built space investigation has been in the Martian orbit since September 24, 2014.

• It was profitably started by the Polar Satellite Launch Vehicle (PSLV) C-25 from the Satish Dhawan Space Center in Sriharikota, Andhra Pradesh.

• Additional Information

• Chandrayaan-1, India's first mission to Moon, was started profitably on October 22, 2008, from SDSC SHAR, Sriharikota.

• GSAT-31 is a high-production telecommunication satellite started by the Indian Space Research Organisation (ISRO).

• ASTROSAT is India's first devoted multi-wavelength space observatory.

Q22. Answer: (a) Father-in -law

Family chart:

According to the statement, the family tree is drawn below,

Vishal is father-in-law of Radhika.

Hence, 'option 1' is the correct answer.

Q23. Answer: (d) 30 km

Given:

Speed of Ravi = 80 km/h

Speed of Mohan = 40 km/h

Time = 15 min

Formula Used:

Speed = Distance/Time

Calculation:

=> Firstly, convert the time from 15 min to hours by dividing by 60,

=> 15 min = 15/60=0.25 hour

=> Distance covered by Ravi = 80 × 0.25 = 20 km

=> Distance covered by Mohan = 40 × 0.25 = 10 km

=> Distance between Ravi and Mohan after 15 min = 20 + 10 = 30 km

Therefore, the distance between Ravi and Mohan after 15 min is 30 km.

Q24. Answer: (a) Kinetic energy

Correct answer is Kinetic energy.

Key Points

• Wind turbines change the kinetic energy in the wind into mechanical power.

• Kinetic energy is a form of energy that an object or a particle has by reason of its motion.

• Any object in motion is using kinetic energy.

• The units of kinetic energy are mass times the square of the speed, or kg · m 2 /s 2 kg · m 2 /s 2.

• Additional Information

• Thermal energy mentions to the movement of molecules inside an object or substance.

• Heat is the form of energy that is transferred between systems or objects with unlike temperatures.

• Hydroelectric energy is a form of sustainable energy that uses the power of moving water to generate electricity.

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Q25. Answer: (a) Odisha

Correct answer is Odisha.

Key Points

• The 5,569-square kilometre Similipal Biosphere Reserve is Odisha's first such reserve and was notified on May 20, 1996.

• Simlipal bio-reserve is located in the district of Mayurbhanj in Odisha state.

• Similipal Biosphere Reserve deliberates to encourage the conservation of biodiversity and as well to promote alternate livelihood for man and preserve cultural values.

• Additional Information

• The total count of Conservation reserves in Rajasthan is 14.

• The Ranthambore National Park is one of the largest and principal national parks in the country.

• Hastinapur Wildlife Sanctuary is a secured area in the Gangetic plains of Uttar Pradesh, India.

• Noradehi is the largest of all the wildlife sanctuaries in Madhya Pradesh.

Q26. Answer: (c) Dogs : Coop

Let's check each option and identify which one is different from the rest:

1) Snakes : Hiss

=> Hiss is a sound made by snake.

2) Birds : Chirp

=> Chirp is a sound made by birds.

3) Dogs : Coop

=> Coop is a shelter name of hens. It is not the sound made by dog.

4) Lion : Roar

=> Roar is the sound made by lion.

Hence, 'option 3' is the correct answer.

Q27. Answer: (b) Uttar Pradesh

Correct answer is Uttar Pradesh.

Key Points

• Uttar Pradesh is the state which reports a maximum or more than one-third of sugarcane production.

• Uttar Pradesh is India's largest sugarcane-producing state, producing above 177 million tonnes in 2021.

• Some other states as well produce sugarcane in large quantities.

• Uttar Pradesh, the chief producer of sugarcane in India, is known as the 'Sugar Bowl' of India.

Additional Information

• Haryana is mainly an agricultural economy with the prevalence of wheat, rice, bajra, mustard, sugarcane, and cotton.

• Punjab state continues to be one of the largest producers of food grains and cash crops in the country.

• Bihar is the largest producer of Litchi, Makhana, Guava, and Lady's finger in India.

Q28. Answer: (a) 16 km

Given:

Speed of first woman = 6 km/h

Speed of second woman = 8 km/h)

Time taken by first woman = 40 min + Time taken by the second woman

Concept Used:

Time = (Distance/Speed

Calculation:

=> Let the distance be x km/hr.

=> Time taken for the first woman = x/6 hr

=> Time taken for the second woman = x/8 hr

=> Time taken by first woman = 40 min + Time taken by second woman

=> So, firstly change minutes into hours,

=> 40 min=40/60 hr

=> x/6=40/60+x/8

=> x/6 - x/8=40/60

=> (8x-6x)/48=2/3

=> 2x/48=2/3

=> x= 2×48/(3 ×2)

=> x=96/6

=> x = 16 km

Therefore, the distance covered by the two women is 16 km.

Q29. Answer: (d) 20 ÷ 12 + 6 × 5 - 2 = 12

BODMAS Rule:

Let us decode the symbols:

Symbol	Meaning
÷	Addition
×	Subtraction
•	Division
•	Multiplication

1) 20 × 12 + 4 ÷ 3 - 2 = 12

After replacing the mathematical symbols, we get:

=> 20 - 12 ÷ 4 + 3 × 2

=> 20 - 3 + 3 × 2

=> 20 - 3 + 6

=> 26 - 3 = 23 ≠ 12

2) 20 × 12 + 6 ÷ 5 - 2 = 12

After replacing the mathematical symbols, we get:

=> 20 - 12 ÷ 6 + 5 × 2

=> 20 - 2 + 5 × 2

=> 20 - 2 + 10

=> 30 - 2 = 28 ≠ 12

3) 18 × 12 + 6 ÷ 3 - 2 = 12

After replacing the mathematical symbols, we get:

=> 18 - 12 ÷ 6 + 3 × 2

=> 18 - 2 + 3 × 2

=> 18 - 2 + 6

=> 24 - 2 = 22 ≠ 12

4) 20 ÷ 12 + 6 × 5 - 2 = 12

After replacing the mathematical symbols, we get:

=> 20 + 12 ÷ 6 - 5 × 2

=> 20 + 2 - 5 × 2

=> 20 + 2 - 10

=> 22 - 10 = 12 = 12

L.H.S = R.H.S

Hence, 'option 4' is the correct answer.

Q30. Answer: (b) Xylem tissue

Correct answer is Xylem tissue.

Key Points

• Water and solutes are moved by the xylem from the roots to the leaves.

• The xylem distributes water and dissolved minerals upward through the plant, from the roots to the leaves.

• Xylem cells form the crucial part of a mature woody stem or root.

• The xylem is located towards the adaxial surface of the leaf.

• Additional Information

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• The phloem is in charge of the transport and distribution of sugars produced by photosynthesis.
• Collenchyma helps to provide strength to the plant's stems, branches, leaves, and other structures.
• The chief work of parenchyma is to store and assimilate food.

Q31. Answer: (d) 48 km\h

Given:
Running speed of horse = 40 km/hr
Time taken to cover its distance = 3 hr
And time taken to cover obtained distance = 21/2hr
Concept Used:
Distance = Speed × Time
Calculation:
=> First to find the distance,
=> Distance = 40 × 3 = 120 km
=> Now to find the speed the horse should run to cover a distance of 120 km in 21/2hrs,
=> Speed = Distance/Time
=> Speed = 120/(5/2)=(120× 2)/5
=> Speed = 24 × 2 = 48 km/h
Therefore, the horse should run at 48 km/hr speed to cover a distance of 120 km in 21/2 hrs.

Q32. Answer: (a) 130°

Given:
Four angles of a pentagon = 70°, 110°, 135°, and 95°
Concept Used:
Sum of the Measure of Interior Angles of a Polygon = (n - 2) × 180°
Where, n = number of sides of the polygon
Therefore Sum of all five angles of the pentagon = 540º
Calculation:
=> Sum of four angles of a pentagon = 70 + 110 + 135 + 95 = 410º
=> According to the formula,
=> Fifth angle of a pentagon = 540 – 410 = 130º
Therefore, the measure of the fifth angle of the pentagon is 130º.

Q33. Answer: (d) 6.25 % increase

Given:
Reduction in the price of an article = 15%
Increase in the sale = 25%
Calculation:
=> Let the price of an article be Rs x and sales be y.
=> Total Revenue = xy
=> Price of an article after reduction = x-15/100× x
=> Price of an article after reduction = (20x-3x)/20=17x/20
=> Sales after increase = y+25/100× y=y+y/4
=> Sales after increase = (4y+y)/4=5y/4
=> Total Revenue after changes = 17x/20× 5y/4=17xy/16
=> Increase in revenue = 17xy/16-xy=(17xy-16xy)/16=xy/16
=> Net increase in sales = (xy/16)/xy× 100=100/16=6.25%
Therefore, the net percentage effect on the daily sale is increase of 6.25%.

Q34. Answer: (a) Protein

Correct answer is Protein.
Key Points
• The main reason for kwashiorkor is not eating sufficient protein or other crucial vitamins and minerals.

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• Kwashiorkor is a form of acute malnutrition that happens due to protein deficiency.
• Severe protein deficiency can lead to fluid retention, which can make the stomach look bloated.
• The best treatment to stop malnutrition is to eat a healthy, balanced diet.
• Additional Information
• Marasmus is caused by the deficiency of all the nutrients or minerals.
• If a person doesn't get sufficient dietary fat, it could affect the health of his skin and lead to dermatitis.
• Marasmus happens due to a deficiency of carbohydrates, fats, and proteins in the diet, and mainly affects infants below the age of one year.

Q35. Answer: (a) Morley-Minto Reforms

Correct answer is Morley-Minto Reforms.

Key Points

• Indian Council Act of 1909 is also called as Morley- Minto Reform.
• It was instituted to pacify the Moderates (Congress) and introduce separate electorates on the basis of religion.
• So, Lord Minto came to be famous as the Father of Communal Electorate in India.
• Additional Information
• The Wavell Plan was first presented at the Shimla Conference in 1945.
• Rowlatt's acts authorized definite political cases to be tried without juries and permitted the internment of suspects without trial.
• The Cripps Mission was a failed attempt in late March 1942 by the British government to save full Indian cooperation and support for their efforts in World War II.

Q36. Answer: (a) 0

Given:

$91 \times 92 \times 93 \times ..... \times 99$

Concept Used:

Logic of 5 and 2 is applied in this problem.

Calculation:

=> In this problem logic has been used,

=> Since, the number 95 has 5 or 10 as multiples.

=> And also here is the number 92

=> So, the number 2×5 gives 10

Therefore, the unit digit in the product $91 \times 92 \times 93 \times ..... \times 99$ is 0

Q37. Answer: (a) 10

Correct answer is 10.

Key Points

• According to 2011 census, there were 46 million-plus cities in India, with Delhi, Mumbai, and Kolkata having populations above 10 million.
• There are 53 urban agglomerations in India with a population of 1 million or more according to the 2011 census.
• As per the Census of India 2011, the number of Urban Agglomerations in India is 475.
• According to the 2011 census, Mumbai is the biggest urban agglomeration in India with a population of 1.84 Crore.

Additional Information

• The population of India according to the 2011 census was 1,210,854,977.
• The population of the nation according to the provisional figures of Census 2011 is 1210.19 million of which 623.7 million (51.54%) are males and 586.46 million (48.46%) are females.
• So, Henry Walter is famous as the father of the Indian Census.
-

Q38. Answer: (a) Abu Dhabi, UAE

Correct answer is Abu Dhabi, UAE.

Key Points

• Special Olympics World Games 2019 was held in Abu Dhabi, Uthe nited Arab Emirates from March 14–21, 2019. ESPN offered international coverage of the games.
• The 2019 Special Olympics World Summer Games was the first Special Olympics games to take place in the Middle East.

• India comes back with a huge tally of 368 medals as the Special Olympics World Games 2019 in Abu Dhabi.
• India produce history in UAE by scooping 85 gold, 154 silver, and 129 bronze.

Additional Information

• The Olympic Games are an international sports festival, held every four years.
• Canada has dispatched athletes to every Winter Olympic Games and nearly every Summer Olympic Games.
• Athens 1896 Olympic Games, athletic festival clasped in Athens that took place April 6–15, 1896.
• When the Olympics came to Tahoe: A look at the 1960 Winter Games.

Q39. Answer: (b) Rio Summit, 1992

Correct answer is Rio Summit, 1992.

Key Points

• It is a result of the Earth Summit (UN Conference on Environment and Development) held in Rio de Janeiro, Brazil, in 1992.
• Agenda 21 is an action plan regarding sustainable development, but it is non-binding.
• The slogan for Agenda 21 was “think globally and act locally”.
• Agenda 21 sets out a plan of action to guarantee that life in the next millennium will change substantially for the better.
• Additional Information
• The United Nations Conference on the Human Environment in Stockholm 1982 Earth Summit in Nairobi (Kenya).
• The World Summit on Sustainable Development 2002, occurred in South Africa, from 26 August to 4 September 2002.
• The UNCHS, Stockholm,1972 United Nations Conference on the Environment in Stockholm was the first world conference to make the environment an important issue.

Q40. Answer: (c) They contained sacred relics

Correct answer is They contained sacred relics.

Key Points

• Buddhist stupas were initially built to house the earthly remains of the historical Buddha and his associates and are almost always established at sites sacred to Buddhism.
• The idea of a relic was later increased to include sacred texts.
• The stupa is an main form of Buddhist architecture, though it predates Buddhism.
• It is usually examine to be a sepulchral monument—a place of burial or a receptacle for religious objects.
• Additional Information
• Great Stupa, the most notable of the structures at the historic site of Sanchi in Madhya Pradesh state, India.
• The Great Stupa was initially built in the 3rd-century bce by the Mauryan emperor Ashoka.
• The simple structure was damaged at some point through the 2nd-century bce.

Q41. Answer: (c) Bengal

Correct answer is Bengal.

Key Points

• The Brahmo Samaj was a monotheistic sect of Hinduism.
• The movement began between meetings of Bengalis in Calcutta in 1828.
• The imortant motive of the Brahmo Samaj was the worship of the eternal God.
• It was opposed to priesthood, rituals and sacrifices.
• Additional Information
• Arya Samaj, robust improve movement of modern Hinduism, started in 1875 by Dayananda Sarasvati.
• Arya Samaj's motive was to renew the Vedas, the earliest Hindu scriptures, as revealed truth.
• The Arya Samaj had a very notable results on the emergence of the community as a cohesive one with a self-confident identity.

Q42. Answer: (d) Kailash Satyarthi

Correct answer is Kailash Satyarthi.

Key Points

• Children's rights activist Kailash Satyarthi was granted the Nobel Peace Prize for “focusing attention on the grave exploitation of children for financial gain”.
• One more main cause was that he followed the non-violent tradition of Indian independence leader Mahatma Gandhi.
• In 1998, Satyarthi think up and led the Global March against Child Labour traveling over 103 countries covering 80,000 km to request an International Law on Worst Forms of Child Labour.

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• Additional Information
• Rajendra Kumar Pachauri was the chairman of the Intergovernmental Panel on Climate Change (IPCC) from 2002 to 2015.
• Har Gobind Khorana was the first scientist to chemically synthesize oligonucleotides.
• Amartya Sen is an economist presently working as a Professor of Economics and Philosophy at Harvard University.

Q43. Answer: (a) V is to the immediate right of S

Friends : P, Q, R, S, T, U, V, and W
1) They are sitting around a circular table facing opposite the center.
2) Q is third to the right of T and second to the left of P.
3) V is not the neighbour of P or T and only two friends are sitting between U and V.
4) W is second to the right of R.
Possible sitting arrangement:
Let's check each option and identify which statement is correct:
1) V is to the immediate right of S → Correct
2) P is to the immediate left of R → Incorrect (Since Q is to the immediate left of R)
3) W is to the immediate right of Q → Incorrect (Since R is to the immediate right of Q)
4) S is to the immediate left of T → Incorrect (Since U is to the immediate left of T)
Hence, 'option 1' is the correct answer.

Q44. Answer: (a) 45 cm²

Given:
Side of triangle = 15 cm
Height of triangle = 6 cm
Concept Used:
Area of triangle = 1/2 × Base × Height
Calculation:
=> Putting the values in the formula, we get
=> Area of triangle = 1/2 × 15 × 6
=> Area of triangle = 15 × 3 = 45 cm²
Therefore, the area of a triangle is 45 cm².

Q45. Answer: (c) (49 π)/72

Given:
Sum of angles = 155°
Difference of angles = π over 2 = 90º
Concept used:
Elimination method in a system of 2 variables
Calculation:
=> Let x and y be the two angles.
=> According to the question,
=> x + y = 155 → (1)
=> x – y = 90 → (2)
=> By subtracting (2) from (1), we get
=> 2y = 65
=> y = 65/2=32.5 º
=> Putting the value of y in equation (2), we get
=> x = 122.5º
=> To change this angle into radians, we will multiply with π/180.
=> Greater angle = 122.5π/180=1225π/1800=49π/72
Therefore, the value of greater angle (in radians) is 49π/72.

Q46. Answer: (b) Venus

Correct answer is Venus.

Key Points

• After the successful Mars Orbiter Mission, ISRO is eyeing inter-planetary missions to Jupiter and Venus and is studying them practically.

• The project announce for 'Shukrayaan-I' – the name given to ISRO's Venus mission, is ready and the budget has also been recognized for it.

• Here are 10 fascinating things to know about the Venus Orbiter Mission of ISRO, likely to be started by December 2024.

• It takes Venus longer to rotate once on its axis than to complete one orbit of the Sun.

• Additional Information

• Saturn was first overtaken by Pioneer 11 in September 1979.

• NASA's Parker Solar Probe is the foremost mission to "touch" the Sun.

• The first spacecraft to visit Mercury was NASA's Mariner 10, which imaged about 45% of the surface.

Q47. Answer: (b) World Commission on Environment and Development

Correct answer is World Commission on Environment and Development.

Key Points

• The goal of the Brundtland Commission was to support and direct the nations of the world toward the goal of sustainable development.

• The commission is also called the World Commission on Environment and Development (WCED).

• It worked from 1984 to 1987.

• The commission issued its outcomes in the Brundtland report in 1987.

Additional Information

• The UN's World Commission for Environment and Development, chaired by previous Norwegian Prime Minister Gro Harlem Brundtland and so mentioned to as the Brundtland Commission, published the report “Our Common Future,” also called the “Brundtland Report,” in 1987.

• The Brundtland Commission was chaired by previous Norwegian prime minister Gro Harlem Brundtland. Politicians, civil servants, and environmental experts made up the majority of the members.

Q48. Answer: (c) 278

Given:

Amount of petrol = 475 L

Amount of diesel = 420 L

Amount of oil = 495 L

Concept Used:

HCF(Highest common factor)

For least possible number of bottles the capacity of the bottle should be maximum. The amount should be such that it completely divides the three numbers in order to fill the bottle completely.

Calculation:

=> Factors of 420 = 1, 2, 3, 4, 5, 6, 7, 10, 12, 14, 15, 20, 21, 28, 30, 35, 42, 60, 70, 84, 105, 140, 210, 420

=> Factors of 475 = 1, 5, 19, 25, 95, 475

=> Factors of 495 = 1, 3, 5, 9, 11, 15, 33, 45, 55, 99, 165, 495

=> HCF (420, 475, 495) = 5

=> Hence the capacity of each bottle is going to be 5 L.

=> Number of bottles filled with diesel = 420/5=84

=> Number of bottles filled with petrol = 475/5=95

=> Number of bottles filled with oil = 495/5=99

=> Total no of bottles = 84 + 95 + 99 = 278

Therefore, the least possible number of bottles required is 278.

Q49. Answer: (b) Bokaro Steel Plant and Bhilai Steel Plant

Correct answer is Bokaro Steel Plant and Bhilai Steel Plant.

Key Points

• Steel plants that were set up with Russian collaboration are Bokaro Steel Plant in Jharkhand and Bhilai Steel Plant in

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Chhattisgarh.

• Bokaro Steel Plant is situated in the Bokaro district of Jharkhand.

• It is the fourth integrated public sector steel plant in India built with Soviet help.

• Bhilai Steel Plant, be one of the largest in India, this industrial city is situated about 25 km far from Raipur.

Additional Information

• Rourkela Steel Plant is located on the northwestern tip of Odisha.

• Durgapur steel plant (DSP) is situated in the Durgapur district of West Bengal.

• Bhilai Steel Plant has been the head integrated steel plant unit of the Public Sector steel company, the Steel Authority of India Limited, and is its largest and most profitable production facility.

Q50. Answer: (c) 59.5 L

Given:

Consumption of milk per day = 1700 mL

Total time = 5 weeks

Concept Used:

Conversion from mL to L

Conversion from weeks to days

Unitary method

Calculation:

=> Milk consumption per day = 1700 ml = 1700/1000=1.7 L

=> Milk consumed in 1 week = 1.7 × 7 = 11.9 L → (1 week = 7 days)

=> Milk consumed in 5 weeks = 11.9 × 5 = 59.5 L

Therefore, 59.5 L of milk will be consumed by Terry in 5 weeks.

Q51. Answer: (b) 4 : 3

Given:

Ratio of areas of two squares = 16 : 9

Concept used:

Operation of ratios

Area of a square = $(Side)^2$

Perimeter of a square = 4 × Side

Calculation:

=> Let the sides of the two squares be 'a' and 'b' respectively.

=> Their areas are a^2 and b^2 respectively.

=> According to the question, $a^2 : b^2 = 16 : 9$

=> a^2over b^2 = 16 over9 → (1)

=> Perimeter of the squares will be 4a and 4b respectively.

=> Ratio of perimeters = 4aover 4b = aover b → (2)

=> Taking square root on both sides of the equation (1),

=> a/b=√(16/9)=4/3 → (3)

=> Using (3) in (2): Ratio of perimeters = 4over 3

=> Ratio of parameter = 4 : 3

Therefore, the ratio of their respective perimeter is 4 : 3

Q52. Answer: (b) Horticulture

Correct answer is Horticulture.

Key Points

• Horticulture is the branch of plant agriculture using with garden crops, usually fruits, vegetables, and ornamental plants.

• Horticultural crops involve fruits, vegetables, medicinal, aromatic, and ornamental plants.

• Examples of horticulture involve the following: landscaping. gardening.

• Marigowda is also famous as Father of Horticulture in India.

• Additional Information

• The artificial reproduction, rearing, and transplantation of fish is known as pisciculture.

• Apiculture is the operation of keeping bees and also the manufacturing of honey and beeswax.

• Sericulture is the growing of silkworms to produce silk.

Q53. Answer: (a) 8

The pattern followed here is as follows:

So the value of '?' is 8.

Hence, 'option 1' is the correct answer.

Q54. Answer: (d) Brother's wife

Preparing the family tree using the following symbols:

From the information given:

Step 1: She is the daughter-in-law

Step 2: my grandfather's daughter-in-law = my mother

So the final diagram will be: She is the daughter-in-law of my grandfather's daughter-in-law

According to the given statement, there is a possibility that the lady could be the wife of Raman also but as per the given options, the lady is Raman's brother's wife.

Hence the correct answer is option 4)

Q55. Answer: (a) Four

From the given information:

Step 1: D sits third to the right of A and second to the left of C. Only three soldiers sit between D and E.

We place D and then A & C according to the conditions, now we place E with three spots from the left of D.

Step 2: Only two soldiers sit between E and F. F sits second to the left of B.

Now we place F two spots from E and then place B second to the right of F.

Step 3: A is the neighbor of G. H sits to the right of D.

Here we place G next to A and place H at the only spot left i.e. right end.

From the arrangement, we can see that there are 4 soldiers sitting between H and G.

Hence the correct answer is option 1)

Q56. Answer: (b) Only conclusion II follows.

From the given statements:

1. Some kites are birds.

2. All birds are black.

Now we consider the conclusions:

I. All black birds are kites: From the diagram and the statements given we can clearly say that not all kites are birds and therefore it will be wrong to say that all black birds are kites. Thus the conclusion does not follow.

II. Some black things are kites: All birds are black and some birds are kites so it can be said that some black birds are kites and which can be rephrased as some black things are kites. So the conclusion follows.

Since only conclusion II follows.

Hence the correct answer is option 2).

Q57. Answer: (a) 1066646

GIVEN:

Number of digits = 6

Digits to be used = 0,4,6 and each of these digits has to be used at least once.

Concept Used:

Basic number system

Calculation:

=> For the smallest 6-digit number consisting of 0,4,6,

=> First digit can not be 0 or it will not be a 6-digit number; So the next smallest number is 4.

=> Note that, we also have to use the digit 6 in the number, so we use it at the unit place to have the least total value of the number.

=> Other digits in between can be 0 which makes the number = 400006 → (1)

=> For the largest positive 6 digit number we start the number with the largest that is 6.

=> We have to make it the largest possible value and hence we will have to use 6 multiple times.

=> We also have to use 4 and 0 at least once, so we use it at the last.

=> Two possible combinations arise which are: 666640 or 666604

=> In order the have largest possible value we will choose 666640 → (2)

=> Now to find the sum, we add the numbers obtained in (1) & (2),

=> Sum = 400006 + 666640

=> Sum = 1066646

The sum of the smallest and the largest positive numbers of 6 digits which contain only 0, 4, 6 and each of them appear at least once is 1066646

Q58. Answer: (c) Bihar

Correct answer is Bihar.

Key Points

• The folk art of Bihar, usually called as Madhubani, mentions to the market town of the same name.

• Madhubani paintings use two-dimensional imagery, and the colors used are derived from plants.

• Ochre, Lampblack, and Red are used for reddish-brown and black, appropriately.

• Madhubani paintings mainly depict people and their association with nature and scenes and deities from the old epics.

• Additional Information

• Dokra Metal Craft is one of the most famous forms of art practiced in Bengal.

• Phulkari is the most famous handiwork in India (Punjab).

• The Warli Painting tradition in Maharashtra is among the finest examples of the folk style of paintings.

Q59. Answer: (a) Columbia

Correct answer is Columbia.

Key Points

• Kalpana Chawla died when the space shuttle Columbia broke up on re-entry into Earth's atmosphere, killing all seven astronauts on board.

• Her first expedition to space was on board the Space Shuttle Columbia, as a mission specialist and prime robotic arm operator, in 1997.

• Kalpana Chawla was an Indian-born American astronaut and engineer who went to space twice in her life.

• The tragedy happened over Texas, and only minutes before Columbia was scheduled to land at the Kennedy Space Center.

• Additional Information

• Discovery shuttle established satellites and served as an orbiting science laboratory.

• Challenger space shuttle is a reusable spacecraft designed to transport people and cargo between earth and space.

• Atlantis space shuttle is presently displayed at the Kennedy Space Center Visitor Complex.

Q60. Answer: (d) 35

Given:

Length of rectangle = 49 m

Breadth of rectangle = 35 m

Side of square = 7 m

Concept used:

Area of square = Side × Side

Area of rectangle = Length × Breadth

Calculation:

=> Area of rectangle = 49 × 35 = 1715 → (1)

=> Area of square = 7 × 7 = 49 → (2)

=> Number of square beds that can fit inside the rectangle = (Area of rectangle)/(Area of square bed)

=> Number of square beds from (1) & (2) = 1715over 49 = 35

Therefore, 35 square beds can be accommodated in this rectangle.

Q61. Answer: (d) Fifth

Correct answer is Fifth.

Key Points

• The Integrated Tribal Development Programme was previously started in 1974 with the Fifth Five Year Plan.
• The Integrated Tribal Development Projects (ITDP) under Tribal Sub-Plan (TSP) is being execute since the Fifth Five Year Plan.
• The Integrated Tribal Development Project (I.T.D.P), Rayagada take in of Rayagada Block came into existence on the 29th of August 1974.
• The Tribal Development Blocks were launched for the development of tribal areas.
• Additional Information
• The Second Plan concentrated on the development of the public sector and "rapid Industrialisation".
• The five-year plan is a method of planning economic extensions over limited periods by the use of quotas.
• The Sixth Five-Year Plan decided the start of economic liberalisation.

Q62. Answer: (a) Rs. 35 per kg

Given:
Increase in rate of rice = 20%
For Rs 630, the amount of less rice a man gets = 3 kg
Calculation:
=> Let the old rate of the variety of rice be Rs x.
=> Amount of rice a man gets in Rs 630 at old rate = 630/x
=> New price after increase = x + 20% of x
=> New price after increase = x+20/100× x = x+x/5=6x/5
=> Amount of rice a man gets in Rs 630 in new rate = 630/(6x/5)
=> According to the question,
=> 630/x-630/(6x/5)=3
=> (630× 6-630× 5)/6x=3
=> 3780-3150=18x
=> x=630/18=35
Therefore, the old rate for that variety of rice was Rs 35 per kg.

Q63. Answer: (b) 3

Given:
Ratio = 17 : 21
Required ratio = 7 : 9
Calculation:
=> Let the subtracted number from the ratio be x.
=> According to the question,
=> (17-x)/(21-x)=7/9
=> Cross-multiplying the terms, we get
=> 9(17-x)=7(21-x)
=> 153-9x=147-7x
=> 9x-7x=153-147
=> 2x=6
=> x=6/2=3
Therefore, the term which should be reduced from the ratio 17 : 21 to make it 7 : 9 is 3

Q64. Answer: (b) Demography

Correct answer is Demography.
Key Points
• Demography is the study of demographics, the social characteristics, and statistics of a human population.
• This study of the size, age forms and economics of dissimilar populations can be used for a diversity of purposes.
• The field of demography can be split into two general areas, basic or academic demography and applied demography.
• A demographic mentions to distinct characteristics of a population.
• Additional Information
• Resource geography by its very name is the study of the spatial variation in the physical stuff with regard to their appraisal by humans.

• Geography of Marketing works on the concept that people in that place have alike needs, wants, and cultural considerations.
• Geography is important to the study of tourism because tourism is geographical in nature.

Q65. Answer: (c) 377

Given:
HCF of two numbers = 29
Two factors of their LCM = 13 and 17
Concept Used:
The HCF of a group of numbers will always be a factor of their LCM.
Because HCF is the product of all common prime factors using the least power of each common prime factor, and LCM is the product of the highest powers of all prime factors.
Calculation :
=> Since HCF is a factor in their LCM
=> So, the factors of LCM are 29, 13, 17
=> Two numbers are (29 × 13) and (29×17)
=> Numbers are 377 and 493
Therefore, the smallest of the two numbers is 377

Q66. Answer: (a) Rs. 22,500

Given:
Selling Price of Gold Ring = Rs. 19,125
Loss Percentage = 15%
Concept Used:
Cost Price = (Selling Price)/(100-Loss %)× 100
Calculation:
=> Cost Price = 19125/(100 - 15)× 100
=> Cost Price = 1912500/85 = Rs. 22,500
Therefore, the cost price of the gold ring is Rs. 22,500

Q67. Answer: (b) 9

According to the English alphabet and its positional values:
The logic followed here is:
• Alphabets are increased to 2 positional values.
• Numbers are decreased to -1 of the previous difference.
The pattern followed by the given series is:
Hence the correct answer is option 2).

Q68. Answer: (b) Bombay, Thane

Correct answer is Bombay, Thane.
Key Points
• The first passenger train in India ran between Bombay (Bori Bunder) and Thane on 16 April 1853.
• The first train began from Bori Bunder in Bombay at 3:35 pm on April 16, 1853 w,ith a 21-gun salute.
• It was worked by three engines, named Sahib, Sultan, and Sindh, and had thirteen carriages.
• The first railway line in India was built during the rule of Lord Dalhousie.
• Additional Information
• The Indian railways are the largest public sector undertaking in India.
• Railways are the main mode of shipment for goods and passengers in India.
• A railway is a route between two places along which trains travel on steel rails.
• Indian Railways (IR) is a statutory body under the ownership of The Ministry of Railways, Government of India that operates India's national railway system.

Q69. Answer: (a) Annelida

Correct answer is Annelida.
Key Points

• Annelids are recognized members of the Lophotrochozoa, a "super-phylum" of protostomes.
• It also involves mollusks, brachiopods, and nemerteans.
• The basic annelid form consists of multiple segments.
• The phylum includes earthworms, polychaete worms, and leeches.
• Annelids show protostome development in embryonic stages and are frequently known as “segmented worms”
• Additional Information
• The Cyclostomata are the modified and degenerate offshoot of the primitive vertebrate stalk.
• Pisces people are called for being emotionally sensitive, gracious, and emotionally aware.
• Reptiles are air-breathing vertebrates covered in special skin made up of scales, bony plates, or a combination of both.

Q70. Answer: (a) King George V

The correct answer is "King George V".

Key Points

• George V was King of the United Kingdom and the British Dominions, and Emperor of India, from 6 May 1910 until his death in 1936.
• After his father passed away in 1910, George V was crowned as king-emperor.
• During George's reign, the political climate of the British Empire was drastically altered by the rise of socialism, communism, fascism, Irish republicanism, and the Indian independence movement.

Additional Information

• Sir William Jones was a British philologist, a puisne judge on the Supreme Court of Judicature at Fort William in Bengal, and a scholar of ancient India.
• Dalhousie was responsible for introducing a variety of modern reforms such as the railways, telegraph and postal networks, and public works in India.
• The Ganga Canal was completed during his tenure but, he is most remembered for the Doctrine of Lapse policy which many hold directly responsible for the Indian Revolt of 1857.
• Portugal was the major European commercial power in the Far East in the sixteenth century, and its Estado da India trading company operated throughout the Indian Ocean basin.

Q71. Answer: (c) 1/(√2)

Given:

$\cos 2\theta = 1/2$

Concept Used:

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

$\sin^2\theta + \cos^2\theta = 1$

$\sin(A + B) = \sin A \times \cos B + \cos A \times \sin B$

$\cos(A + B) = \cos A \times \cos B - \sin A \times \sin B$

Calculation:

=> Using the formula,

=> $1 - 2\sin^2\theta = 1/2$

=> $-2\sin^2\theta = 1/2 - 1 = -1/2$

=> $\sin^2\theta = 1/4$

=> $\sin\theta = \sqrt{(1/4)} = 1/2$

=> $\sin^2\theta + \cos^2\theta = 1$

=> $\cos^2\theta = 1 - 1/4$

=> $\cos^2\theta = 3/4$

=> $\cos\theta = \sqrt{3}/2$

=> $\sin(75^\circ - \theta) = \sin 75^\circ \times \cos\theta - \cos 75^\circ \times \sin\theta$

=> To find $\sin 75^\circ$ and $\cos 75^\circ$

=> $\sin 75^\circ = \sin(45+30)^\circ = \sin 45^\circ \cos 30^\circ + \cos 45^\circ \sin 30^\circ$

=> $\sin 75^\circ = 1/\sqrt{2} \times \sqrt{3}/2 + 1/\sqrt{2} \times 1/2$

=> $\sin 75^\circ = (\sqrt{3} + 1)/(2\sqrt{2})$

=> $\cos 75^\circ = \cos(45+30)^\circ = \cos 45^\circ \cos 30^\circ - \sin 45^\circ \sin 30^\circ$

=> $\cos 75^\circ = 1/\sqrt{2} \times (\sqrt{3})/2 - 1/(\sqrt{2}) \times 1/2$

=> cos 75 ^? = (√3-1)/2√2

=> sin(75^? - θ)= sin75^? cosθ - cos 75^? sinθ

=> sin(75^? - θ)= (√3+1)/2√2× (√3)/2-(√3-1)/2√2× 1/2

=> sin(75^? - θ) = (3+√3)/4√2-(√3-1)/4√2

=> sin(75° - θ)= (3+√3-√3+1)/4√2

=> sin(75° - θ)= 4/4√2= 1/√2

Therefore, the value of sin(75° - θ)= 1/√2.

Q72. Answer: (c) A substance gaining oxygen during a chemical reaction

The correct answer is" A substance gaining oxygen during a chemical reaction".

Key Points

• A chemical reaction that occurs when a substance comes into contact with oxygen or another oxidizing agent. Examples - Oxidation is rust and brown color on a cut apple.

• Water is oxidized to form oxygen gas.

• Bleach oxidizes the electrons of compounds that cause stains on clothes.

• These redox reactions help clean clothes.

• The process of oxidation is chemically described as the loss of electrons.

• Usually the electrons will be taken by another atomic species which reduces it. Many situations in everyday life involve these redox reactions.

Additional Information

• Iron metal is oxidized to form iron oxide known as rust.

• Electrochemical reactions are great examples of oxidation reactions.

• When a copper wire is placed in a solution that contains silver ions, electrons are transferred from the copper metal to the silver ions

• Metallic copper is oxidized.

Q73. Answer: (a) Once every 12 hours

The correct answer is "Once every 12 hours".

Key Points

• GPS satellite blocks are various output generations of the Global Positioning System "GPS". accustomed for satellite navigation.

• The system's first satellite, his Navstar 1, was launched on February 22, 1978.

• The GPS satellite constellation is operated by Space Delta 8's 2nd Space Operations Squadron (2 SOPS), United States Space Force.

• GPS satellites orbit the Earth at an altitude of about 20,000 km (12,427 miles), making two complete orbits each day.

Additional Information

• Navstar is the US satellite network that provides the Global Positioning System "GPS". service.

• They are used for navigation by both military and civilians.

• These 24 major GPS satellites orbit the earth every 12 hours, broadcasting synchronization signals from each satellite.

Q74. Answer: (d) 81°

Given:

Time taken by the earth to rotate about its own axis = 24 h

Calculation:

=> Time taken by earth to rotate about its own axis = 24 h = 24 × 60 min

=> Angle rotated in 1 min = 360/(24× 60)=1/4 º

=> Angle rotated in 5 hr and 24 min = 1/4× (5× 60+24)=1/4× 324=81 º

Therefore, the angle earth will turn in 5 h and 24 min is 81º.

Q75. Answer: (b) Tetra-Atomic

The correct answer is "Tetra-Atomic".

Key Points

• Tetra atomic molecules are those molecules which are formed by combination of four atoms like NH3.

• Tetra atomic ions are charged species that contain four covalently linked atoms.

• Tetra atomic ions are a type of polyatomic ions.

• Examples of tetra atomic ions are,H_3O^+(3 atoms of H + 1 atom of O), SO_3^{2-}, NO_3^-.

Additional Information

• The prefix poly- means many, so a polyatomic ion is an ion that contains more than one atom.

• This differentiates polyatomic ions from monatomic ions, which contain only one atom.

• "Monatomic" is a combination of the words "mono" and "atomic", and means "single atom".

• It is usually applied to gases: a monatomic gas is one gas in which atoms are not bound to each other.

• Diatomic molecules are molecules composed of only two atoms, of the same or different chemical elements.

• If a diatomic molecule consists of two atoms of the same element, such as hydrogen or oxygen, then it is said to be homonuclear.

Q76. Answer: (a) 1858

The correct answer is "1858".

Key Points

• Rani Laxmibai, the Rani of Jhansi, passed away on June 18, 1858, while battling the British at Gwalior.

• She played a key role in the 1857 Indian Revolt.

• She became a role model for the Indian freedom movement after her sacrifice.

• She symbolizes both women's empowerment and national pride.

Additional Information

• On November 19,1835, Manikarnika Tambe, a Marathi woman, was born in Varanasi who is known as Rani Laxmibai.

• Her parents were Bhagirathi Bai and Moropant Tambe. Morapant was working in Bithoor in the Peshwa’s court.

• She was a relative of Nana Sahib, the adopted son of the exiled Peshwa Baji Rao II.

• Rani Laxmibai had Nana Sahib and Tatya Tope as her childhood friends.

• Her education was taken care of by the Peshwa who ensured that she was also trained in shooting, fencing and horse riding.

• When she turned 7, Manikarnika Tambe was married to Gangadhar Rao, who was the King of Jhansi.

• She was renamed Laxmibai after marriage.

Q77. Answer: (d) 14 cm

Given:

Area of equilateral triangle = $49\sqrt{3}$ cm²

Concept Used:

Area of equilateral triangle = $\sqrt{3}/4a^2$

Where, a = side of an equilateral triangle

Calculation:

=> Equating the given area with the formula, we get

=> $\sqrt{3}/4a^2=49\sqrt{3}$

=> $a^2=(49\sqrt{3}\times 4)/\sqrt{3}=49\times 4$

=> $a=\sqrt{49}\times \sqrt{4}=7\times 2=14$ cm

Therefore, the side of the triangle is 14 cm.

Q78. Answer: (b) Cyclic

The correct answer is "Cyclic".

Key Points

• Recyclable resources are resources that can be formed any number of times. Similarly, water is a cyclical resource.

• Water in oceans, rivers, and seas evaporates and condenses to form clouds.

• When it rains, water falls from these clouds onto the ground and flows into water sources.

• Coal, minerals, fossil fuels, etc. It is also an example of a recyclable resource that produces energy.

Additional Information

• Abiotic factors are the non-living parts of an ecosystem that make up its environment. in terrestrial ecosystems.

• Some examples are temperature, light and water. In marine ecosystems, abiotic factors include salinity and ocean currents.

• A periodic resources are either not associated with a periodicity or occur with a periodicity.

• These often include coal, fuel and gas. A non-renewable resource is a natural resource that cannot be replaced by natural means fast enough to keep up with consumption.

• There are four main types of non-renewable resources: oil, natural gas, coal and nuclear power. Oil, natural gas and coal are

collectively called fossil fuels.

Q79. Answer: (a) Mainframe computer

The correct answer is "Mainframe computer".

Key Points

• Mainframe computer commonly known as the mainframe or big iron.

• Computers used primarily by large organizations for critical applications such as bulk data processing for tasks such as census, industry and consumer statistics, enterprise resource planning, and large-scale transaction processing.

• Examples of mainframe computers include the UNIVAC series of general-purpose automation computers and the IBM Z series of mainframe computers.

Additional Information

• Computers small enough to be handheld, with small screens and compact keyboards, are often used as personal organizers and are called palmtops.

• A desktop computer is a personal computer that, due to its size and power requirements, is designed for regular use on or near your desk in one location.

• A laptop is a small portable personal computer with a screen and an alphanumeric keyboard.

• The perfect form of laptop is a lightweight analytics platform with fully optimized performance.

Q80. Answer: (c) The relationship between the state and the center should be based on cooperation.

The correct answer is "The relationship between the state and the center should be based on cooperation."

Key Points

• India is a federal system,but leans towards a unitary system of government.

• It is sometimes considered a quasi-federal system because it has features of both federal and unitary systems.

• Article 1 of the Indian Constitution states that "India, meaning Bharat, is a federation of states."

• The word union does not appear in the constitution.

• The federal element was introduced into modern India by the Government of India Act 1919.

• This law separated powers between central and local councils.

Additional Information

• Two levels of government,-center and state.

• Division of Powers Between Central and State - The 7th Schedule of the Constitution has three lists indicating the issues for which each level has jurisdiction: the union list, the state list and the concurrent list.

• The Constitution is the supreme law of India.

• The constitution provides for an independent and unified judiciary.

• The lower courts and district courts are at the lowest level and the Supreme Court is at the state level.

• The highest court is the Supreme Court of India. All courts are subordinate to the Supreme Court.

Q81. Answer: (b) 4 : 9

Given:

X : Y = 4 : 5

Y : Z = 5 : 7

Z : W = 7 : 9

Calculation:

=> X/Y=4/5 → (1)

=> Z/Y=7/5 → (2)

=> Dividing (1) by (2), we get

=> (X/Y)/(Z/Y)=(4/5)/(7/5)

=> X/Z=4/7 → (3)

=> W/Z=9/7 → (4)

=> Dividing (3) by (4), we get

=> (X/Z)/(W/Z)=(4/7)/(9/7)

=> X/W=4/9

Therefore, the ratio X : W is equal to 4 : 9

Q82. Answer: (c) LGY

According to the English alphabet and its positional values:

The pattern followed by the given series is:

• The First alphabet is increased to 2 positional values.

• The Second alphabet is decreased to 1 positional value.

• The third alphabet is increased to 3 positional values.

Hence the correct answer is option 3).

Q83. Answer: (c) Automated Teller Machine

The correct answer is "Automated Teller Machine".

Key Points

• Automated teller machines (ATMs) are electronic banking transactions that allow you to complete transactions without entering a bank branch.

• Some ATMs are basic cash dispensers, while others allow a variety of transactions such as depositing checks, transferring balances, and paying bills.

• The first ATMs appeared in his mid-to-late 1960s and worldwide he has grown to over 2 million units.

Additional Information

• Today's ATMs are a technological marvel, many of which can accept deposits and a variety of other banking services.

• To keep ATM fees low, use your own bank's ATM whenever possible.

• In 2021, there were over 2,38,000 automated teller machines (ATMs) across India.

• In 2019, this is up from about 200,000 ATMs.

Q84. Answer: (d) 21

Given:

Numbers = 1 to 30

Divisor = 3

Calculation:

=> Numbers from 1 to 30 which are divisible by 3 = 3, 6, 9, 12, 15, 18, 21, 24, 27, 30

=> Arranging the numbers in the descending order, we get

=> 30, 27, 24, 21, 18, 15, 12, 9, 6, 3

Therefore, the number at 7th place from the bottom is 21

Q85. Answer: (c) 1963

The correct answer is "1963".

Key Points

• The launch of Tumba's first sounding rocket near Thiruvananthapuram,

• Kerala on November 21, 1963 marked the beginning of India's space program.

• Coordinated campaigns can be conducted by launching sounding rockets from different locations at the same time.

• It is also possible to launch multiple sounding rockets per day.

Additional Information

• Sounding rockets are single- or double-stage solid-fuel rockets used for observation of the upper atmospheric region and space exploration.

• It also serves as an affordable platform for testing and prototyping new components and subsystems for use in rockets and satellites.

• In 1963, with the Thumba Equatorial Rocket Launching Station (TERLS) at Thumba, a location close to the magnetic equator, a breakthrough was made in the field of Indian aeronautics and atmospheric sciences.

Q86. Answer: (b) 2018

Given:

Concept Used:

Value per unit = Sales/Production×100

Calculation:

For the year 2015,

Value per unit = Sales/Production × 100

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=> 150/100× 100 =150
For the year 2016,
=> Value per unit = Sales/Production × 100
=> 350/250× 100 =140
For the year 2017,
Value per unit = Sales/Production × 100
=> 400/150× 100 = 266.67
For the year 2018,
Value per unit = Sales/Production × 100
=> 500/200× 100 =250
Therefore, for the year 2018, the value per unit is Rs. 250.

Q87. Answer: (a) Rs. 210 crore

Given:
In 2017, the items were sold at the same rate as in 2016.
Concept Used:
Value per unit = Sales/Production× 100
Calculation:
Per quantity value in 2016 = 350/250× 100=Rs. 140
According to the question,
Number of items in 2017 = 15000000
Total value of the sale in 2017
=> 15000000 × 140 = Rs. 21,00,000,000 = Rs. 210 Crore
Therefore, the value of the sale in 2017 according to the rate of the year 2016 is Rs. 210 crore.

Q88. Answer: (b) 35°

Concept used:
Sum of the central angles of a circle = 360°
Solution:
=> Let the percentage ratio be 'x'.
=> 7.00x + 19.00x + 9.44x + 9.72x + 54.84x = 360°
=> 100x = 360°
=> x = 360/100=3.6
=> Required central angle = 9.72 × 3.6 = 35º
Therefore, the approximate central angle formed by the sector corresponding to road expenditure is 35°.

Q89. Answer: (b) Rs. 60 million

Given:
Calculation:
=> Let the total budget be 'x'
=> Expenditure on dairy= 7.00% of x = 0.07x
=> Expenditure on others= 19.00% of x = 0.19x
=> Expenditure on dairy - expenditure on others = 7.2 million
=> 0.19x – 0.07x = 7.2 million
=> 0.12x = 7.2 million
=> x = 7.2/0.12=60 million
Therefore, the total budget is Rs. 60 million.

Q90. Answer: (d) 89

The logic used in the given figures is:
(Term in left × Term in the bottom) + (Term in right × Term in top) = Middle term
Let's apply the pattern in the figures:
1) (4 × 8) + (1 × 18) = 50

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32 + 18 = 50

50 = 50

2) (6 × 3) + (15 × 5) = 93

18 + 75 = 93

93 = 93

3) (9 × 6) + (7 × 5) = ?

54 + 35 = ?

89 = Answer

Hence the correct answer is option 4).

Q91. Answer: (a) A

From the given words:

Cabbage, Food, Vegetables

We know that cabbage is a type of vegetable and both cabbage & vegetables fall into the category of food.

So the Venn diagram will be:

So, figure A matches the Venn diagram.

Hence the correct answer is option 1).

Q92. Answer: (b) Only decision II follows.

From the given statement:

The sale of a particular product has gone down markedly due to a change in the trend causing great concern to the company.

Now we consider the given decisions:

I. The price of the product should be reduced and the quality should be improved: Reducing the prices and improving the quality might not be the right decision here because if any product is out of trend then it is not likely to catch up in the market again due to better products and enhanced services and there is no information about the cause of the fewer sales so we cannot assume and choose. Thus this decision does not follow.

II. The company should make a study of customer choices and market competition in the market: Making a study of customer choices will definitely help in improving the services and sales as well as the products also catching up on market competition will give an idea of the latest trends and technologies used so that the product and services are up to date which will eventually result in better sales. So the decision follows.

Since only decision II follows.

Hence the correct answer is option 2).

Q93. Answer: (d) Neither conclusions I nor II follow.

From the given statements:

1. Some brushes are bats.

2. Some bats are balls.

Now we consider the conclusions:

I. Some brushes are balls: From the diagram, we can see that there is no relation between brushes and balls and therefore it will be wrong to say that some brushes are balls. Thus this conclusion does not follow.

II. Some brushes are not balls: From the given statements we have no information about the brushes that are not balls and we cannot assume the possibility in such cases as we have to be sure about the conclusions being true. So the conclusion does not follow.

So, neither conclusions I nor II follow.

Hence the correct answer is option 4).

Q94. Answer: (b) D

From the given information:

A circle represents ‘educated persons', the triangle represents 'urban persons', the square represents ‘laborious persons’, and the rectangle represents ‘honest persons’.

Now we have to find the region which includes squares and rectangles and excludes circles and triangles:

So, region D represents uneducated, honest, laborious persons who are NOT urban.

Hence the correct answer is option 2).

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Q95. Answer: (d) Keyboard

From the given options:

1) Motherboard - It is the backbone of the computer and contains a storage unit for storing information.

2) Hard disk - It is used for storing information.

3) CD-ROM - It is used for storing information.

4) Keyboard - it is not used for storing information.

So, Keyboard is an odd one.

Hence the correct answer is option 4).

Q96. Answer: (d) Hot

The relation in the given pair is:

Day : Night -- Day and Night are opposite of each other.

Similarly,

Cold : ? -- We have to find the opposite of cold.

From the given options:

1) Wet - It is not the opposite of cold.

2) Fire - It is not the opposite of cold.

3) Winter - It is not the opposite of cold.

4) Hot - It is the opposite of cold.

Hence the correct answer is option 4).

Q97. Answer: (b) B

From the given words:

Pencil, Stationery, Notebook.

We know that pencil and notebook fall into the category of stationary also pencil and notebook do not have any direct relation:

So the Venn diagram will be:

So, figure B matches the Venn diagram.

Hence the correct answer is option 2).

Q98. Answer: (c) 9

From the given information, we can draw the table:

Alphabet	Denotation
T	Subtract
K	Divide
J	Multiply
Q	Add

Now we substitute the values in the given equation and solve it by using the BODMAS rule:

18 K 3 Q 4 J 2 T 5 = ?

Now, interchanging the alphabet with the arithmetic operators as assigned in the question,

18 ÷ 3 + 4 × 2 - 5 = ?

6 + 4 × 2 - 5 = ?

6 + 8 - 5 = ?

14 - 5 = ?

9 = Answer

Hence the correct answer is option 3).

Q99. Answer: (b) RICELC

According to the English alphabets and their positional values:

The pattern followed in the given code is:

• The first and third letters are interchanged.

• The fourth and sixth letters are interchanged.

Similarly,

Hence the correct answer is option 2).

Q100. Answer: (a) Both arguments I and II are strong.

From the given statement:

Should the government encourage young entrepreneurs?

Now we consider the given arguments:

I. Yes, they will reduce the burden of unemployment: Many entrepreneurs have innovative and great ideas but those ideas are not sufficiently implemented and if the government encourages young entrepreneurs, it will definitely reduce unemployment on large scale. Thus the argument is strong.

II. Yes, they will contribute to the development of the country: With more and more interest in entrepreneurship from the young generation, it will be huge diversification of different fields and it will ultimately lead to the development of the country and this initiative from the government will inspire many young minds from an early age to think out of the box and come up with something different and new ideas. Therefore the argument is strong.

So, both arguments I and II are strong.

Hence the correct answer is option 1).

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