RRB NTPC CBT-I Official Paper (Held On: 30 Jan 2021 Shift 2) (Previous Year Paper)

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

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Q1. Which of the following solutions do NOT conduct electricity?

(a) Alcohol and acid
(b) Glucose and base
(c) Acid and base
(d) Alcohol and glucose

Q2. A survey of 40 children showed that 25% children liked playing football. How many children did not like playing football?

(a) 38
(b) 26
(c) 30
(d) 35

Q3. If '÷' stands for 'addition', '+' stands for 'subtraction', 'x' stands for 'division and '–' stands for 'multiplication', then which of the following equations will NOT be correct?

(a) 36 ÷ 4 – 3 × 6 + 16 = 22
(b) 36 – 4 × 3 + 6 ÷ 16 = 60
(c) 36 × 4 + 3 – 6 ÷ 16 = 7
(d) 36 + 4 ÷ 3 × 6 – 16 = 40

Q4. What causes Bird Flu?

(a) Tsetse fly
(b) HPV virus
(c) H5N1 virus
(d) Anopheles mosquito

Q5. A man travelled a distance of 28 km in 8 h. He travelled partly by foot at a speed of 2 km/h and partly on bicycle at a speed of 6 km/h. What was the distance (in km) travelled on foot?

(a) 18
(b) 10
(c) 12
(d) 16

Q6. Diamonds can be synthesised by subjecting pure carbon to:

(a) very low pressure and high temperature
(b) very high pressure and low temperature
(c) very high pressure and high temperature
(d) very low pressure and low temperature

Q7. Anita takes a loan of Rs.5,000 at 15% per year as rate of simple interest. Find the interest she has to pay at the end of one year.

(a) Rs.750
(b) Rs.725
(c) Rs.800
(d) Rs.700

Q8. The perimeter of an equilateral triangle is 36 √3 m. Find the height (in metres).

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

Q9. If a^(1/3) = 6, then find the value of $a^2 - 36a$

(a) – 180
(b) 0
(c) 7776
(d) 38880

Q10. If '÷' stands for 'addition', '+' stands for 'subtraction', '×' stands for 'division' and '–' stands for 'multiplication', then which of the following equations will be correct?

(a) 6 ÷ 8 × 6 – 2 + 9 = 8
(b) 5 ÷ 12 × 4 – 3 + 8 = 5
(c) 5 ÷ 12 × 4 – 3 + 8 = 6
(d) 6 ÷ 8 × 6 – 2 + 9 =4

Q11. How many major banks were nationalised by the government in 1969?

(a) 14
(b) 17
(c) 11
(d) 20

Q12. If cot (frac π 2 - θ) = 1/(√3), then find the value of cos θ.

(a) √3
(b) √3/2
(c) 1/2
(d) 1/√3

Q13. Which of the following is NOT used as a moderator in nuclear reactors?

(a) Boron
(b) Graphite
(c) Water
(d) Heavy water

Q14. Which of the following union territories celebrates Tarpa festival?

(a) Ladakh
(b) Dadra and Nagar Haveli
(c) Andaman and Nicobar Islands
(d) Lakshadweep

Q15. Find the LCM and HCF of 6 and 20.

(a) 120, 2
(b) 80, 2
(c) 60, 2
(d) 60, 3

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Q16. How many member countries did the UNO have on its formation in 1945?

(a) 45
(b) 56
(c) 51
(d) 48

Q17. In which year did Mahatma Gandhi organise a satyagraha to support the peasants of the Kheda district?

(a) 1917
(b) 1919
(c) 1915
(d) 1918

Q18. Find the largest 4-digit number which is completely divisible by 66.

(a) 9867
(b) 6754
(c) 9966
(d) 9436

Q19. Which of the following is different from the rest?

Green gram, Pea, Corn, Kidney beans

(a) Kidney beans
(b) Pea
(c) Green gram
(d) Corn

Q20. The sum of the reciprocals of the ages of two colleagues is nine times the difference of the reciprocals of their ages. If the ratio of the products of their ages to the sum of their ages is 100 : 9, Find their ages.

(a) 24 years, 45 years
(b) 15 years, 10 years
(c) 20 years, 25 years
(d) 25 years, 4 years

Q21. The principal value of sin^(-1) 1/√2 is :

(a) π/4
(b) 3π/4
(c) π/6
(d) π/2

Q22. In which year did the United Nations Environment Programme (UNEP) succeed in forging an agreement to freeze CFC production at 1986 levels?

(a) 1987
(b) 1984
(c) 1986
(d) 1985

Q23. Who completed the construction of the Qutub Minar?

(a) Firoz Shah Tuglak
(b) Nasir-ud-Din Muhammad
(c) Muhi-ud-Din Muhammad
(d) Qutub-ud-Din Aibak

Q24. The Integrated Child Protection Scheme was launched in the year:

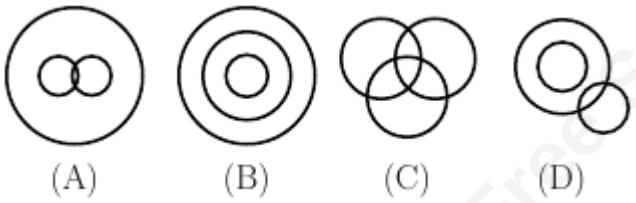
(a) 2011-2012
(b) 2015-2016
(c) 2016-2017

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(d) 2009-2010

Q25. Select the Venn diagram that best represents the relationship between the following classes.

Men, Teachers, Doctors



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

Q26. Approximately, how many bones are there in a child's body at the time of birth?

(a) 250 Bones
(b) 275 Bones
(c) 200 Bones
(d) 300 Bones

Q27. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement:

If it is easy to become a doctor, I don't want to be a doctor.

Assumptions:

I.I aspire to be a professional.

II.I desire to achieve something which is hard earned.

(a) Both assumption I and II are implicit.
(b) Neither I nor II is implicit.
(c) Only assumption I is implicit.
(d) Only assumption II is implicit.

Q28. Which Indian Nationalist leader spearheaded the peasants' agitation known as the Bardoli Satyagraha?

(a) Rajni Patel
(b) Karsanbhai Patel
(c) Govind Ballabh Pant
(d) Vallabhbhai Patel

Q29. Pointing to a photograph, Rajat said, "He is the son of the only daughter of my mother-in-law." How is the person in photograph related to Rajat?

(a) Brother
(b) Son
(c) Sister's Son
(d) Father's brother

Q30. For which Indian spice did the Indian government challenge the US patenting and force them to revoke it?

(a) Cardamom
(b) Turmeric
(c) Mustard
(d) Clove

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Q31. Three of the following four words are alike in a certain way and one is different.
Pick the odd word out.

(a) Schedules
(b) Articles
(c) Preamble
(d) Ordinance

Q32. Write a Pythagorean triplet whose smallest member is 8.

(a) 8, 15, 19
(b) 8, 10, 12
(c) 8, 15, 17
(d) 8, 18, 28

Q33. Find the least number by which 6250 should be multiplied, so that it becomes a perfect cube.

(a) 25
(b) 15
(c) 30
(d) 20

Q34. What is the maximum number of tiles whose length and breadth are 10 cm and 8 cm respectively will be required to fit in a rectangular region whose length and breadth are respectively 352 cm and 100 cm?

(a) 440
(b) 352
(c) 445
(d) 456

Q35. Who won the Women's Singles Australian Open 2020 Tennis title?

(a) Petra Kvitova
(b) Serena Williams
(c) Caroline Wozniacki
(d) Sofia Kenin

Q36. Which of the following canal systems is NOT in Haryana?

(a) Western Yamuna Canal
(b) Nangal canal
(c) Bhakra Canal System
(d) Gandak canal

Q37. In a certain code language, CRICKET is written as ZOFZHBQ. How will FOOTBALL be written as in that language?

(a) CLLPZXII
(b) CLLQYXII
(c) CLLQYYJJ
(d) XMMRZYJJ

Q38. The speeds of three cars are in the ratio of 5 : 6 : 10. The time taken by each of them to travel the same distance is in the ratio of:

(a) 10 : 6 : 5
(b) 6 : 5 : 10
(c) 10 : 5 : 6
(d) 12 : 10 : 6

Q39. In which Olympic games did Milkha Singh finish fourth in the 400 m Running final?

(a) Melbourne Olympic games
(b) Tokyo Olympic games
(c) London Olympic games

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(d) Rome Olympic games

Q40. What is URL ?

(a) Searching engine
(b) A computer software
(c) A web browser
(d) Address of the web page displayed on the internet

Q41. PAHAL Scheme is related with:

(a) Agricultural credit
(b) Direct transfer of LPG subsidy
(c) Child welfare scheme
(d) Women education

Q42. In four consecutive prime numbers, the product of the last three is 7429 and that of the first three is 4199. The largest of these prime number is:

(a) 29
(b) 13
(c) 37
(d) 23

Q43. Which of the following forts is located in Tamil Nadu?

(a) Sikandra Fort
(b) Amer Fort
(c) Manora Fort
(d) Jaisalmer Fort

Q44. Who administers the oath to the President of India?

(a) Chief Justice of India
(b) Prime Minister
(c) Vice President
(d) Attorney General of India

Q45. Which of the following is a drought-tolerant crop?

(a) Millet
(b) Rice
(c) Sugarcane
(d) Jute

Q46. If 2 L of water is evaporated on boiling from 8 L of sugar solution containing 4% sugar, find the percentage of sugar in the remaining solution.

(a) 15%
(b) 16/3 %
(c) 16/5 %
(d) 16%

Q47. What is the percentage of the paid up share capital held by the central government or by any state government or partly by the central governments and partly by one or more state governments in Public Sector Undertakings?

(a) 70% or more
(b) 51% or more
(c) 60% or more
(d) 50% or less

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Q48. The sum of two numbers is 850 and their HCF is 25. A possible pair of such numbers is:

(a) 300, 550
(b) 350, 500
(c) 250, 600
(d) 225, 625

Q49. Select the number from among the given options that can replace the question mark (?) in the given table.

5	8	15
6	11	?
35	96	210

(a) 9
(b) 16
(c) 13
(d) 14

Q50. Who designed India gate of New Delhi?

(a) Herbert Baker
(b) Frederick Gilbert
(c) Elisabeth Lutyens
(d) Edwin Lutyens

Q51. As of October 2020, who is the President of Venezuela?

(a) Juan Vicente Gomez
(b) Romulo Betancourt
(c) Nicolas Maduro
(d) Jose Antonio Paez

Q52. The internal measures of a cuboidal room are 12 m × 8 m × 4 m, with the height being 4 m. Find the total cost of whitewashing all four walls along with ceiling of the room, if the cost of white washing is Rs.5 per sq. m.

(a) Rs.1280
(b) Rs.1180
(c) Rs.1080
(d) Rs.1380

Q53. There are two numbers such that the big number is obtained by adding 5 to the other. If the total of the two numbers is 19, find the product of those numbers.

(a) 65
(b) 95
(c) 84
(d) 24

Q54. Who was the Viceroy of British India at the time India became independent in 1947?

(a) Lord Willingdon
(b) Lord Linlithgow
(c) Lord Mountbatten
(d) Lord Irwin

Q55. Which acid is used in the anodising process?

(a) Dilute acetic acid
(b) Dilute nitric acid
(c) Dilute hydrochloric acid
(d) Dilute sulphuric acid

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Q56. If × = 7 + 4√3. then find the value of √× + 1/(√×)

(a) 1 + √2
(b) 4
(c) 4√2
(d) 6

Q57. Which river did Alexander first cross to invade India in 326 BC?

(a) Indus
(b) Chenab
(c) Sutlej
(d) Jhelum

Q58. IDBI (Industrial Development Bank of India) was established in:

(a) 1955
(b) 1980
(c) 1964
(d) 1982

Q59. What is the Electric Power Generation Capability of Chandrayaan -2's Rover-Pragyan?

(a) 75 W
(b) 50 W
(c) 25 W
(d) 100 W

Q60. In which year did the Government of India institute two civilian awards - Bharat Ratna and Padma Vibhushan?

(a) 1955
(b) 1950
(c) 1954
(d) 1953

Q61. A number is greater than 3 but less than 8. Also, it is greater than 6 but less than 10. The number is:

(a) 8
(b) 6
(c) 5
(d) 7

Q62. Which of the following is NOT a property of ROM (Read Only Memory)?

(a) It is known as volatile memory.
(b) It stores information permanently.
(c) It holds system software such as Boot Loader.
(d) Information is not lost even if the computer is switched off.

Q63. As of October 2020, how many Indian states have bicameral legislatures?

(a) Eight
(b) Five
(c) Six
(d) Nine

Q64. The selling price of a toy car is Rs.540. If the profit made by shopkeeper is 20%, what will be the cost price of this toy car?

(a) Rs.250
(b) Rs.450
(c) Rs.350
(d) Rs.400

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Q65. Which of the United Nation's organization has International Institute of Educational Planning at Paris as its part?

(a) UNESCO
(b) UNO
(c) UNICEF
(d) ILO

Q66. The ages of two persons differ by 15 years. If 5 years ago, the age of the older person was twice that of the younger one, then their present ages (in years) are:

(a) 35, 20
(b) 30, 15
(c) 20, 5
(d) 25, 10

Q67. In which year did India launch an imaging satellite called the Technology Experiment Satellite (TES)?

(a) 2001
(b) 1988
(c) 1998
(d) 2007

Q68. The lengths of two sides of a triangle are 7 cm and 8 cm respectively and the measure of the angle included between these two sides is 60°. The length (in cm) of the third side of the triangle is:

(a) $\sqrt{57}$
(b) 9
(c) $2\sqrt{14}$
(d) 7.5

Q69. In which year did the Constitution of India come into force?

(a) 1949
(b) 1948
(c) 1950
(d) 1947

Q70. When 0.434343..... is converted into a fraction, then the result will be:

(a) 43/9.9
(b) 43/100
(c) 43/99
(d) 43/0.1

Q71. If on a marked price, the difference between selling prices with a discount of 45% and two successive discounts of 30% and 20% is Rs.84, then the marked price is _____.

(a) Rs.2,000
(b) Rs.8,400
(c) Rs.3,000
(d) Rs.4,500

Q72. Select the number from among the given options that can replace the question mark (?) in the following series.

30, 61, 120, 243, ?

(a) 482
(b) 486
(c) 490
(d) 480

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Q73. Which of the following statements about NITI Aayog is INCORRECT?

(a) It works as a premier think tank of the government of India.
(b) It was established on 1 January 2016.
(c) It is a platform for cooperation federalism.
(d) NITI stands for National Institution for Transforming India

Q74. Select the letter-cluster that can replace the question mark(?) in the following series.

CNQ, DOR, EPS, FQT, ?

(a) RGU
(b) GRU
(c) GUR
(d) URG

Q75. Which of the following highways covers most of Rajasthan?

(a) NH 8
(b) NH 7
(c) NH 15
(d) NH 47

Q76. Select the option that is related to the third term in the same way as the second term is related to the first term.

Dogs : Lungs :: Fish : ?

(a) Oxygen
(b) Gills
(c) Water
(d) Fins

Q77. Which of the following is an allotropic form of carbon?

(a) Chalk
(b) Diamond
(c) Gypsum
(d) Marble

Q78. A sum of Rs. 10,000 is borrowed at a rate of simple interest 15% per annum for 2 years. Find the amount to be paid at the end of two years.

(a) Rs. 15,000
(b) Rs. 13,000
(c) Rs. 11,000
(d) Rs. 12,000

Q79. Two trains start from stations A and B and travel towards each other at the speeds of 60 km/h and 70 km/h respectively. At the time of their meeting, the second train has travelled 100 km more than the first. The distance between A and B is:

(a) 780 km
(b) 1000 km
(c) 1300 km
(d) 980 km

Q80. The lengths of three medians of a triangle are 3 cm, 6 cm, and 5 cm. The area of the triangle is:

(a) $\sqrt{345}/3$ cm²
(b) $\sqrt{255}/3$ cm²
(c) $4/3\sqrt{56}$cm²
(d) $\sqrt{405}/3$cm²

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Q81. Which period has been described as the Golden Age of Indian history?

(a) Maurya period
(b) Gupta period
(c) Magadha period
(d) Mughal period

Q82. An apple tree is taller than a lemon tree. A papaya tree is shorter than a palm tree. A mango tree is shorter than the papaya tree but taller than apple tree. Which is the tallest tree?

(a) Mango tree
(b) Apple tree
(c) Papaya tree
(d) Palm tree

Q83. A bag contains Rs.3,000, the notes of which are in the denominations of Rs.50, Rs.100 and Rs.10. If the notes of Rs.100, Rs.50 and Rs.10 are in the ratio of 5 : 8 : 10, then the number of the notes of Rs.50 in the bag will be:

(a) 24
(b) 16
(c) 32
(d) 8

Q84. Salim bought an article for Rs.784 which included GST of 12%. What was the price of the article before GST was added?

(a) Rs.650
(b) Rs.550
(c) Rs.600
(d) Rs.700

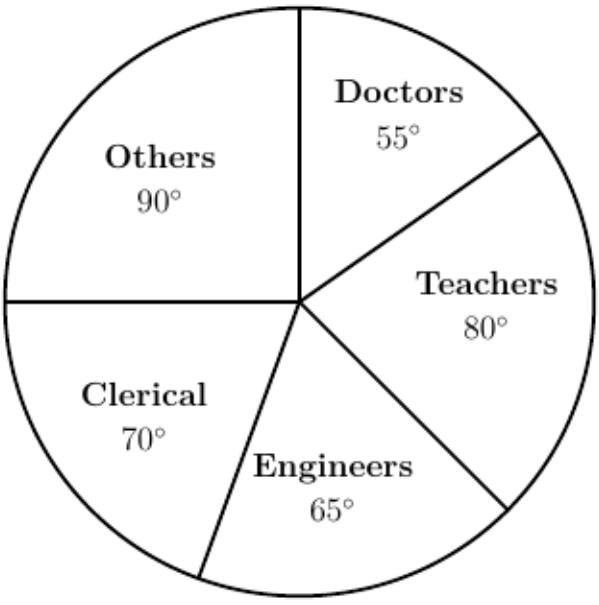
Q85. Select the number from among the given options that can replace the question mark(?) in the following series.

126, 65, ?, 9, 2

(a) 26
(b) 24
(c) 28
(d) 17

Q86. The below pie diagram shows population distribution of different professionals in a city.

Study the pie diagram and answer the question that follows.

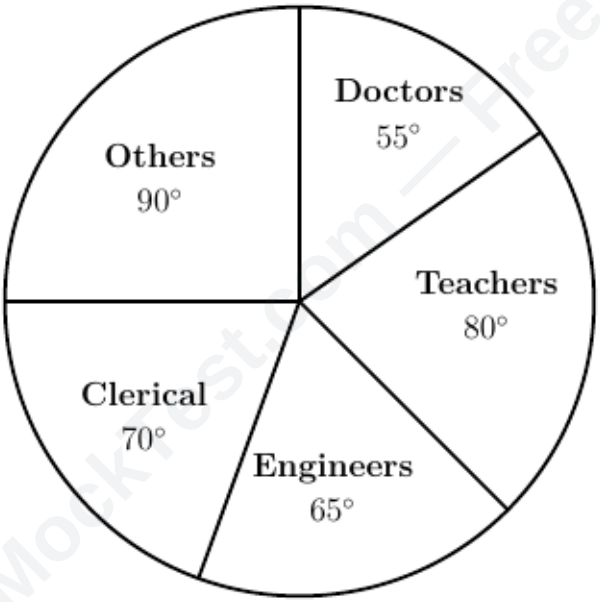


If the total population of a city is 250000, then what will be the approximate number of engineers in the city?

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(a) 47500
(b) 24250
(c) 45000
(d) 55500

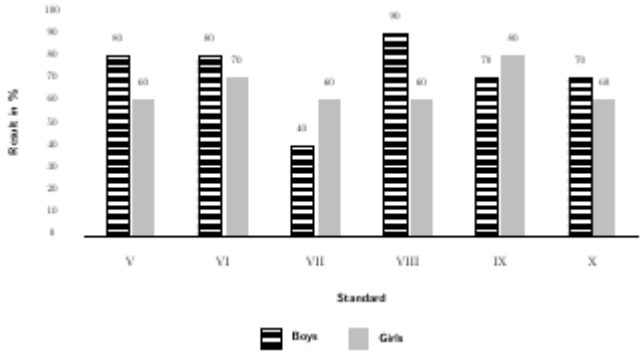
Q87. The below pie diagram shows population distributions of different professionals in a city.
Study the pie diagram and answer the question that follows.



The strength of the Clerks (Clerical Staff) is how many times that of the teachers?

(a) 1.14 times
(b) 1.4 times
(c) 2.4 times
(d) 0.875 times

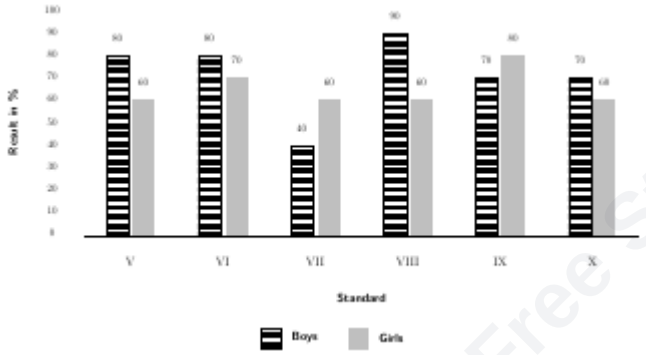
Q88. The below graph shows the results of boys and girls in different standards.
Study the graph and answer the question that follows.



In which standard is the ratio of boys' performance to girls' performance 3 : 2?

(a) IX
(b) VIII
(c) VII
(d) VI

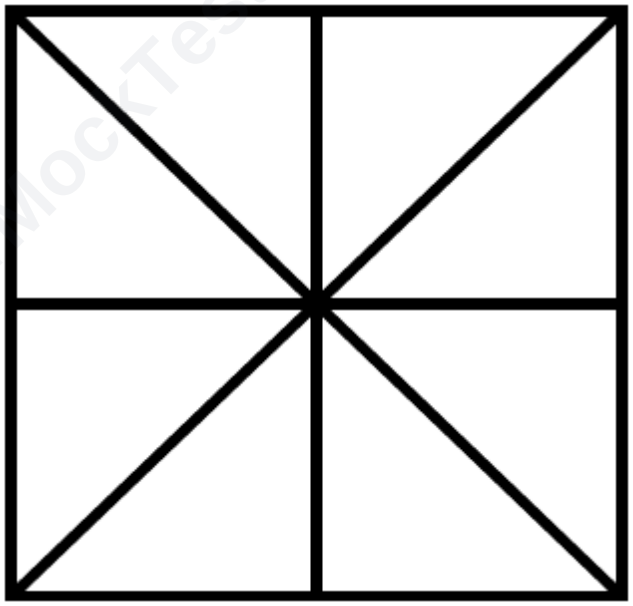
Q89. The below graph shows the results of boys and girls in different standards.
Study the graph and answer the question that follows.



Across all the given standards, what is the difference in overall average percentage in marks between boys and girls?

(a) 5
(b) 5.67
(c) 2
(d) 6.67

Q90. How many triangles are there in the following figure?



(a) 8
(b) 20
(c) 16
(d) 12

Q91. If the letters of the word ACCELERATIONS are arranged in the alphabetical order, then which of the following letters will be in the centre of the arrangement?

(a) I
(b) N
(c) E
(d) L

Q92. 'Painting' is related to 'Brush' in the same way as 'Letter' is related to '_____'.

(a) Pen
(b) Writer
(c) Ink
(d) Post-Office

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Q93. Read the given statement and conclusions carefully and decide which of the conclusion logically follow(s) from the statement.

Statement:

If you are an efficient typist, then we definitely have a job for you.

Conclusions:

I. You are an efficient typist.

II. We are in need of an efficient typist.

(a) Both conclusions I and II follow.
(b) Only conclusion I follows.
(c) Only conclusion II follows.
(d) None of the conclusions follows.

Q94. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some students are bright.

All bright people are successful.

Conclusions:

I. Some students are successful.

II. Some successful people are students.

III. All successful people are students.

(a) None of the conclusions follows.
(b) Both conclusions I and II follow.
(c) Only conclusions I follows.
(d) All the three conclusions follow.

Q95. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

No dog is a cat.

All cats are rats.

Conclusions:

I. Some rats are dogs.

II. Some dogs are not rats.

III. No rat is a dog.

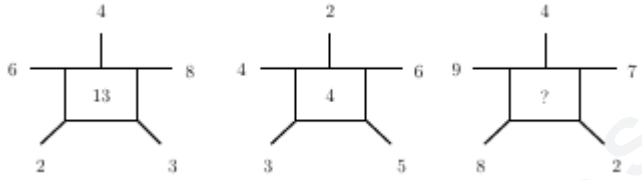
(a) Only conclusion II follows.
(b) Only conclusion I follows.
(c) Only conclusion III follows.
(d) None of the conclusions follows.

Q96. In a certain code language, UNIVERSITY is written as EVINUYTISR. How will TEMPRATURE be written as in that language?

(a) ETPMARUTER
(b) RPMETERUTA
(c) ERUTARPMET
(d) ATURETEMPR

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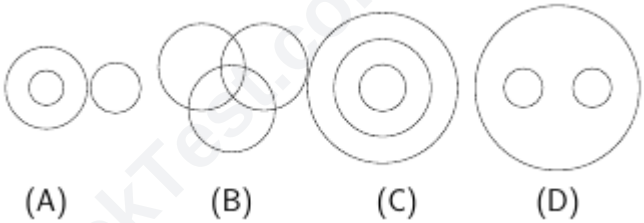
Q97. Based on the pattern given below, select the number from among the given options that can replace the question mark (?) in the given figure.



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

Q98. Select the Venn diagram that best represents the relationship between the following classes.

Food, Vegetable, Dosa



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

Q99. Three of the following four words are alike in a certain way and one is different.

Pick the odd word out.

Capsicum, Brinjal, Potato, Ladies' fingers

(a) Capsicum
(b) Brinjal
(c) Potato
(d) Ladies' fingers

Q100. Select the combination of letters that when sequentially placed in the blanks will create a repetitive pattern.

mmnn_,_pmmnnnp_,_mnnn_,_

(a) n, p, m, p, p, m
(b) n, p, p, m, m, p
(c) n, p, p, m, p, p
(d) m, p, p, n, p, p

ANSWER KEY

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

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

SOLUTIONS

Q1. Answer: (d) Alcohol and glucose

Key Points

• Alcohol and glucose are both covalent compounds that do not dissociate into ions in a solution, which is necessary for electrical conductivity.

• Alcohol has molecules that are bound by covalent bonds and does not have free ions available to conduct electricity.

• Glucose also does not produce free ions in solution and therefore does not conduct electricity.

• Since solutions that conduct electricity typically contain free ions or are metallic with free electrons, a mixture of alcohol and glucose lacks these characteristics and thus does not conduct electricity.

Additional Information

Concept	Description
Electricity	Electricity is a form of energy resulting from the flow of electric charge, primarily through conductors such as metals or through ionic solutions.
Conductivity	Conductivity refers to a material's ability to allow the flow of electric current, influenced by the presence of free ions or electrons.
Insulators	Insulators are materials that resist the flow of electric current. Examples include rubber, glass, and dry wood.
Electrolytes	Electrolytes are substances that become ionic solutions when dissolved in water, thus conducting electricity. Common electrolytes include sodium chloride.

Q2. Answer: (c) 30

Given:

Total children = 40

Percentage of children who like playing football = 25

Calculation:

Percent of children don't like playing football = 100-25 = 75%

Now, 100% = 40 Students

So, 75% = How many students?

Students did not like paying football = (75 x 40)/100 = 30

Hence, 30 children did not like playing football.

Q3. Answer: (b) 36 – 4 × 3 + 6 ÷ 16 = 60

Given that,

• '÷' stands for 'addition' that is '+'

• '+' stands for 'subtraction' that is '-'

• '× ' stands for 'division' that is '÷'

• '–' stands for 'multiplication' that is '×'

Option 1:

Given that, 36 ÷ 4 – 3 × 6 + 16 = 22.

Interchanging the mathematical operations according to the problem, we get,

LHS = 36 + 4 × 3 ÷ 6 - 16

= 36 + 4 × 3 ÷ 6 - 16

=36 + 4 × 0.5 - 16

=36 + 2 - 16

=38 - 16

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=22 = RHS

Option 2:

Given that, 36 – 4 × 3 + 6 ÷ 16 = 60.

Interchanging the mathematical operations according to the problem, we get,

LHS = 36 × 4 ÷ 3 - 6 + 16

= 36 × 4 ÷ 3 - 6 + 16

= 36 × 1.3 - 6 + 16

= 46.8 - 6 + 16

= 46.8 + 16 - 6

= 62.8 - 6

= 56.8 which is not equal to 60.

Thus, this option is correct.

Option 3:

Given that, 36 × 4 + 3 – 6 ÷ 16 = 7.

Interchanging the mathematical operations according to the problem, we get,

LHS = 36 ÷ 4 - 3 × 6 + 16

= 36 ÷ 4 - 3 × 6 + 16

= 9 - 3 × 6 + 16

= 9 - 18 + 16

= 9 + 16 - 18

= 25 - 18

= 7 = RHS.

Option 4:

Given that, 36 + 4 ÷ 3 × 6 – 16 = 40.

Interchanging the mathematical operations according to the problem, we get,

LHS = 36 - 4 + 3 ÷ 6 × 16

= 36 - 4 + 3 ÷ 6 × 16

= 36 - 4 + 0.5 × 16

= 36 - 4 + 8

= 36 + 8 - 4

=44 - 4

= 40 = RHS

Hence, the correct answer is "option (2)".

Q4. Answer: (c) H5N1 virus

The correct answer is H5N1 virus.

Key Points

• Bird Flu is caused by the H5N1 virus, which is a highly pathogenic avian influenza virus.

• Transmission to humans typically occurs through direct contact with infected birds or surfaces contaminated with the virus.

• Humans affected by the H5N1 virus often exhibit severe respiratory symptoms, and the infection can be fatal.

• Preventative measures include avoiding direct contact with birds in endemic areas and observing strict biosecurity measures.

Additional Information

Option	Details
Tsetse fly	Transmits trypanosomiasis (sleeping sickness), not related to influenza.
HPV virus	Causes human papillomavirus infections, leading to warts and certain types of cancer.
Anopheles mosquito	Known for spreading malaria through the Plasmodium parasite, not influenza viruses.

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Q5. Answer: (b) 10

Given:

Total Distance = 28km

Total Time taken = 8h

Formula used:

Distance = Speed x Time

Calculation:

Let, m be the distance travelled by foot.

Hence, the distance traveled by bicycle = (28 - m)

Now,

(Total Distance)/(Total Speed) = m/2 + (28-m)/6;

Time = m/2 + (28-m)/ 6

8 = m/2 + (28-m)/ 6

8 = (3m + 28-m) /6

48 = 2m + 28

2m = 20

m = 10

Hence, the distance travelled by foot is 10km.

Q6. Answer: (c) very high pressure and high temperature

The correct answer is very high pressure and high temperature.

Key Points

• Diamond synthesis requires the combination of high temperatures and high pressures to convert carbon into its crystalline form.

• High pressure mimics the natural conditions found deep within the Earth where natural diamonds are formed.

• High temperature is necessary to facilitate the rearrangement of carbon atoms into the diamond crystal structure.

• Techniques such as the High Pressure High Temperature (HPHT) method are commonly used in industrial diamond manufacturing.

Additional Information

Concept	Description
Carbon	Carbon is a nonmetallic element, basis of all organic compounds, as well as many inorganic compounds and materials, including diamonds.
Allotropes of Carbon	Carbon exists in various forms including graphite, diamond, fullerenes, and graphene, each with unique properties.
Natural vs. Synthetic Diamonds	While natural diamonds are formed over billions of years under the Earth's surface, synthetic diamonds are created in laboratories within a few weeks using technological processes.
Applications of Diamonds	Beyond jewelry, diamonds are used in cutting, grinding, drilling, and in high-performance electronics due to their extraordinary hardness and thermal conductivity.

Q7. Answer: (a) Rs.750

Given:

Principle = Rs. 5000

Rate = 15%

Time = 1 year

Formula used:

Simple Interest = (P × R × T)/100

P = Principle

R = Rate

T= time in years

Calculation:

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Let's put the given values in the above formula to find the interest.
SI = (P × R × T)/100= (5000 × 15 × 1)/100
Interest = 50 x 15 = 750
Hence, she needs to pay Rs.750 as interest.

Q8. Answer: (d) 18

Given:
Perimeter = 36 √3 m
Formula used:
Perimeter = sum of all sides = 3 x side
Area = 1/2 x base x height = √3/4 side²
Solution:
Let, m be the length of one side,
=> 3m = 36 √3
=> m = 12 √3
1/2 x base x height = √3/4 side²
1/2 × 12√3 × height = √3/4 × (12 √3)²
=> Height = 18 m
Hence, the height of the triangle is 18m.

Q9. Answer: (d) 38880

Given:
$a^1/3 = 6$
Solution:
$a^1/3 = 6$
a^(1/3³) = 216
$a^2 = 216 \times 216 = 46656$
36a = 7776
$a^2 - 36a = 46656 - 7776 = 38880$
Hence, the value of a2 - 36a is 38880.

Q10. Answer: (c) 5 ÷ 12 × 4 – 3 + 8 = 6

From the given information:
'÷' stands for 'addition'
'+' stands for 'subtraction'
'×' stands for 'division'
'–' stands for 'multiplication
We substitute the values in the given options and solve the equation using BODMAS rule:
1) 6 ÷ 8 × 6 – 2 + 9 = 8
6 + 8 ÷ 6 × 2 - 9 = 8
6 + 1.3 × 2 - 9 = 8
6 + 2.6 - 9 = 8
8.6 - 9 = 8
-0.4 ≠ 8
2) 5 ÷ 12 × 4 – 3 + 8 = 5
5 + 12 ÷ 4 × 3 - 8 = 5
5 + 3 × 3 - 8 = 5
5 + 9 - 8 = 5
14 - 8 = 5
6 ≠ 5
3) 5 ÷ 12 × 4 – 3 + 8 = 6
5 + 12 ÷ 4 × 3 - 8 = 6
5 + 3 × 3 - 8 = 6

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5 + 9 - 8 = 6

14 - 8 = 6

6 = 6

4) 6 ÷ 8 × 6 – 2 + 9 =4

6 + 8 ÷ 6 × 2 - 9 = 4

6 + 1.3 × 2 - 9 = 4

6 + 2.6 - 9 = 4

8.6 - 9 = 4

-0.4 ≠ 4

Hence the correct answer is option 3)

Q11. Answer: (a) 14

The correct answer is 14.

Key Points

• It was on July 19, 1969, when then prime minister Indira Gandhi declared the nationalisation of 14 commercial Indian banks with deposits of over Rs 50 crores.

• In 1969, Allahabad Bank, Canara Bank, United Bank of India, UCO Bank, Syndicate Bank, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, Bank of India, Bank of Maharashtra, Central Bank of India, Indian Bank, Dena Bank, Union Bank and were nationalised.

• The government of India issued the Banking Companies Ordinance, 1969, and nationalized the 14 largest commercial banks with effect from midnight of 19 July 1969.

Additional Information

• The Reserve Bank of India (RBI) is India's central banking and monetary authority.

• Canara Bank is the third largest nationalised bank in India.

• Dena Bank was a government-owned bank that in 2019 integrated with the Bank of Baroda.

• Union Bank of India, generally mention as Union Bank or UBI is an Indian government-owned bank with 120+ million customers.

Q12. Answer: (b) √3/2

Given:

cot (π/2 - θ) = 1/√3

Formula Used:

cot (π/2 - θ) = tan (θ)

tan (θ) = 1/√3

cos (θ) = 1/(√(1 + tan²(θ)))

Calculation:

=> tan (θ) = 1/√3

=> tan²(θ) = (1/√3)²

=> tan²(θ) = 1/3

=> cos (θ) = 1/(√(1 + 1/3))

=> cos (θ) = 1/(√(4/3))

=> cos (θ) = 1/(2/√3)

=> cos (θ) = √3/2

Therefore The value of cos θ is √3/2.

Q13. Answer: (a) Boron

The correct answer is Boron.

Key Points

• Boron is not used as a moderator in nuclear reactors but as a neutron absorber due to its high neutron capture cross-section.

• Graphite and Water (including Heavy Water) are common moderators used to slow down neutrons in reactors, promoting the nuclear fission process.

• Moderators are crucial for maintaining a sustained nuclear chain reaction by reducing the speed of neutrons, making them more likely to cause fission.

• Boron is often added to control rods to regulate the fission process within the reactor, preventing the reactor from going critical.

Additional Information

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Nuclear Reactors	Description
Pressurized Water Reactor (PWR)	Uses water as a moderator and coolant, maintaining the water under high pressure to prevent boiling within the reactor core.
Boiling Water Reactor (BWR)	Boils water to generate steam directly inside the reactor core, which is then used to drive the turbine generators.
Heavy Water Reactor (CANDU)	Employs heavy water as a moderator, allowing it to use natural uranium as a fuel.
Graphite-Moderated Reactor	Uses graphite as a moderator, notable examples include the RBMK reactors used in the former Soviet Union.

Q14. Answer: (b) Dadra and Nagar Haveli

The correct answer is Dadra and Nagar Haveli.

Key Points

• Tarpa Festival in Dadra, the winter festival of India.

• Tarpa Festival gets its name from the famous and extremely popular folk dance of Dadra & Nagar Haveli- the Tarpa Dance.

• The many kinds of folk and tribal dances of Dadra and Nagar Haveli include the Tarpa Dance, Bhawada Dance, Dhol Dance, and Tur and Thali Dance.

• Tarpa is the most popular and colourful folk dance among the Varli, Kokna, and Koli tribes, and is best seen in Silvassa.

• Additional Information

• Shondol dance, which is called the royal dance of Ladakh, has generated history by entering into the Guinness Book of World Records as the largest Ladakhi dance.

• Nicobari dance is the traditional dance of Andaman and Nicobar.

• Kolkali and Parichakali are the two popular folk art forms in the Territory Lakshadweep.

Q15. Answer: (c) 60, 2

Given:

Number 1 = 6

Number 2 = 20

Definition used:

LCM = Product of greatest power of each prime factor, involved in numbers.

HCF = Product of smallest power of each common prime factor, involved in numbers.

Calculation:

6 = 2 x 3

20 = 2 x 2 x 5

LCM(6, 20) = 2 x 2 x 3 x 5 = 60

HCF(6, 20) = 2

Hence, LCM = 60 & HCF = 2.

Q16. Answer: (c) 51

The correct answer is 51.

Key Points

• When the UN was established in 1945, just 51 countries were 'member states'.

• This count grew steadily as more countries gained independence - with help from the UN and today the UN has 193 member states.

• The member states finance the UN's activities and rule its programme of work.

• According to the UN Yearbook, 1946-1947, China was the first to sign the UN Charter.

Additional Information

• The United Nations (U.N.), headquartered in New York, is an international organization of 193 member-states and was founded in 1945 to prevent another world war.

• The U.N. is not a government, nor can it pass binding laws, but between persuasion, negotiates multilateral agreements to assist form international law.

• In inclusion to keep international peace and security, the United Nations protects human rights, delivers humanitarian aid, promotes sustainable development and upholds international law.

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Q17. Answer: (d) 1918

The correct answer is 1918.

Key Points

• The Kheda Satyagraha of 1918 was a satyagraha movement in the Kheda district of Gujarat in India arranged by Mahatma Gandhi through the period of the British Raj.

• It was a great revolt in the Indian independence movement.

• It is one of the revolutionary methods of freedom fighters.

• It was the third Satyagraha movement.

• Additional Information

• The Khilafat movement was an agitation by Indian Muslims allied with Indian nationalism in the years following World War I.

• Dandi March was a 24-day non-violent march led by Mahatma Gandhi.

• The quit India movement was assumed to be a peaceful non-violent movement aimed at urging the British to grant India independence.

Q18. Answer: (c) 9966

Given:

Divisor = 66

Calculation:

The largest 4-digit number is 9999

Now, if we divide 9999 by 66 we get 33 as a remainder.

Hence, the largest 4-digit number divisible by 66 will be 9999 - 33 = 9966

Q19. Answer: (d) Corn

From the given words:

1) Kidney beans : It falls under the category of pulses.

2) Pea : It falls under the category of pulses.

3) Green gram : It falls under the category of pulses.

4) Corn : It falls under the category of cereal.

So, corn is the odd one.

Hence the correct answer is option 4)

Q20. Answer: (c) 20 years, 25 years

Given:

1/m + 1/n = 9 × [1/m - 1/n]; (m × n)/(m +n) = 100/9

m & n are the ages of two colleagues.

Calculation:

Now, let's solve the above two equations in two variables.

1/m + 1/n = 9 × [1/m - 1/n]; (m+n)/(m × n) = 9 [(n - m)/(m × n)]

m+n = 9[n-m]

m+n = 9n -9m

m = 0.8n

Now, let's put the value of m in equation 2,

0.8n × n over0.8n +n = 100/9; $(0.8n^2)/1.8n = 100/9$

$7.2n^2 = 180n$

7.2n = 180

Hence, n = 25

Now, m = 0.8n = 0.8 x 25 = 20

Hence, the age of the two colleagues is 20 and 25 years.

Q21. Answer: (a) π/4

Given:

sin^(-1) 1/(√2)

Calculation:

Now, sin θ = 1/(√2)

We know, that sinπ/4 = 1/(√2)

Hence, the principle value is π/4

Q22. Answer: (a) 1987

The correct answer is 1987.

Key Points

• In 1987, the United Nations Environment Programme (UNEP) succeeded in forging an agreement to freeze CFC production at 1986 levels.

• In 1987, in an attempt to save the ozone layer, the UNEP forged an agreement between its member countries to freeze the production of chlorofluorocarbons at 1986 levels.

• United Nations act to control the production of chlorofluorocarbons (CFCs) used in refrigerators as the CFCs depletes the ozone layer that protect from UV radiation from the Sun and directly reaches the earth.

• UNEP's mission is to provide leadership and encourage partnership in caring for the environment.

Additional Information

• UNESCO: United Nations Educational, Scientific and Cultural Organization.

• The United Nations Educational, Scientific and Cultural Organization (UNESCO) was born on 16 November 1945.

• The United Nations Children's Fund (UNICEF), originally called as the United Nations International Children's Emergency Fund.

Q23. Answer: (a) Firoz Shah Tuglak

The correct answer is Firoz Shah Tuglak.

Key Points

• Qutab-ud-din Aibak, the first Muslim ruler of Delhi, begin the construction of the Qutab Minar in 1200 AD.

• But could only finish the basement.

• His successor, Iltutmush, added three more storeys, and in 1368.

• Firoz Shah Tughlak constructed the fifth and the last storey and completed the construction of the Qutub Minar.

Additional Information

• The tomb of Khan Jahan at Bagerhat and the tomb of an Allama at Hazrat Pandua were erected during Nasir-ud-Din Muhammad's time.

• Muhi al-Din Muhammad commonly known as Aurangzeb, who built the Badshahi Mosque, Bibi Ka Maqbara, Moti Masjid etc.

• The most important monuments of Qutub-ud-Din Aibak were. Alai Darwaza, Qutub Minar.

Q24. Answer: (d) 2009-2010

The correct answer is 2009-2010.

Key Points

• Integrated Child Protection Scheme (ICPS) was launched in the year 2009-10 and is committed to children.

• The Scheme is established by the Central government.

• This scheme is relevant for children in need of care and protection and children in conflict.

• The Integrated Child Protection Scheme (ICPS) is a centrally sponsored scheme aimed at building a protective environment for children in difficult circumstances.

Additional Information

• Sukanya Samriddhi Yojana is a Small Savings Scheme of the Government of India meant exclusively for a girl child.

• A Child Education Plan is an insurance policy that offers protection as well as an opportunity for saving money to ensure a secure future for your child.

• The child Welfare scheme's aim was to provide provisions for nutrition, shelter, sanitation, health care, and hygiene.

Q25. Answer: (b) C

From the given words:

Men, Teachers, Doctors

We know that men can be teachers and doctors, doctors can be teachers and men & teachers can be doctors and men. Since all them are inter related,

The Venn diagram will be:

From the given figures, we can see that figure C is same as the Venn diagram obtained.

Hence the correct answer is option 2)

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Q26. Answer: (d) 300 Bones

Correct answer is 300 Bones.

Key Points

• A baby's body has about 300 bones at birth.

• These in the end fuse (grow together) to form the 206 bones that adults have.

• Some of a baby's bones are made entirely of a special material known as cartilage.

• Newborns come in a range of healthy sizes.

• Most babies born between 37 and 40 weeks weigh somewhere between 5 pounds, 8 ounces (2,500 grams), and 8 pounds, 13 ounces (4,000 grams).

• Newborns who are lighter or heavier than the average baby are normally fine.

• As well 9 out of 10 babies born at term (37 to 40 weeks) weigh between 2.5kg and 4.5kg.

Q27. Answer: (d) Only assumption II is implicit.

From the given statement:

If it is easy to become a doctor, I don't want to be a doctor.

We consider the given assumptions:

I.I aspire to be a professional: There is no explanation or information presented in the given statement which leads to aspiration to become a professional therefore it will be wrong to assume anything out of context and thus the assumption is not implicit.

II.I desire to achieve something which is hard earned: From the given statement it can be rephrased as 'if the task is easy then, I don't want to do that task' which can be implied in the given assumption. So the assumption is implicit.

Since only assumption II is implicit.

Hence the correct answer is option 4)

Q28. Answer: (d) Vallabhbhai Patel

The correct answer is Vallabhbhai Patel.

Key Points

• Sardar Vallabh Bhia Patel led the Bardoli Satyagraha.

• After its success, he became one of the greatest leaders of the Indian independence movement.

• The Bardoli Satyagraha was a peasants' movement against the British government's decision to raise land revenue.

• It took place in Gujarat in February 1928.

Additional Information

• Rajni Patel (1915–1982) was an Indian politician and barrister.

• Karsanbhai Patel is an Indian billionaire businessman, industrialist and founder of the Nirma group a company.

• Govind Ballabh Pant was an Indian freedom fighter and the first chief minister of Uttar Pradesh.

Q29. Answer: (b) Son

Preparing the family tree using the following symbols:

• Rajat said,"He is the son of the only daughter of my mother-in-law".

So, the person in photograph is the Rajat's son.

Hence, 'Option 2)' is the correct answer.

Q30. Answer: (b) Turmeric

The correct answer is Turmeric.

Key Points

• Indian government challenges the US for patenting turmeric and forces them to repeal it.

• US patent 5401504 was granted in March 1995, for use of turmeric powder as a wound-healing agent.

• The Turmeric case was a landmark case.

• As it was the first time that a patent based on the traditional knowledge of a developing country had been successfully challenged.

Additional Information

• India, formerly the foremost producer, consumer, and exporter of small cardamom, is second to Guatemala which fortuitously is currently the largest producer of cardamom.

• France became a recognized center for mustard-making by the 13th century.

• Cloves come from the flower buds of an evergreen tree that is native to the North Moluccas Islands in Indonesia.

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Q31. Answer: (d) Ordinance

From the given options:

1) Schedules: It consists general statements which does not require any permission from anyone.

2) Articles: It consists general statements which does not require any permission from anyone.

3) Preambles: It consists general statements which does not require any permission from anyone.

4) Ordinance: It consists authoritative orders which requires permission from a superior.

So, Ordinance is the odd one.

Hence the correct answer is option 4)

Q32. Answer: (c) 8, 15, 17

Given:

Smallest number = 8

Formula used:

The triplets are 2m, (m^2 - 1) & (m^2 + 1)

Calculation:

Now, the smallest number is 8 = 2m

Means, m = 4

Hence, the other two numbers are

m^2 - 1 = 4^2 -1 = 16 - 1 = 15

m^2 + 1 = 4^2 + 1 = 16 + 1 = 17

Hence, the triplet is 8, 15, and 17.

Q33. Answer: (d) 20

Given:

Number = 6250

Formula used:

LCM = Lowest common factor to find cube

Calculation:

LCM(6250) = 2 x 5 x 5 x 5 x 5 x 5 = 2 x 5^5

now, to form a perfect cuber it must be multiplied by 2 x 2 x 5= 20

Hence, it must be multiplied by 20 to be a perfect cube.

Q34. Answer: (a) 440

Given:

Area of Region = 352 x 100 = 35200cm^2

Are of Tile = 10 x 8 = 80cm^2

Formula used:

Area of Rectangle = Length x Breadth

Calculation:

Now, the tiles required to fit the region = 35200/80

= 440

Hence, a total of 440 tiles will be required to fit the region.

Q35. Answer: (d) Sofia Kenin

The correct answer is Sofia Kenin.

Key Points

• Sofia Kenin defeated Garbiñe Muguruza in the final, 4–6, 6–2, 6–2 to win the women's singles tennis title at the 2020 Australian Open.

• It was her first major title.

• Sofia Anna is an American professional tennis player.

• Kenin picked up a foot injury, pulled out of the Olympics, and later the US Open due to testing positive for COVID-19, prior to finally stop work her season having not played since Wimbledon.

Additional Information

• Petra Kvitová is a Czech professional tennis player.
• Serena Jameka Williams is an American professional tennis player.
• Caroline Wozniacki R is a Danish former professional tennis player.

Q36. Answer: (d) Gandak canal

The correct answer is Gandak canal.

Key Points

• The Eastern Gandak Canal Project was a start-up in 1960 and the Main Canal system was completed in 1975.
• A hydroelectric generating station with an installed capacity of 15 MW(3x5 MW) has already been constructed and commissioned on the fall of 5.3 m at RD 6.0 on by pass to Eastern Gandak Canal.
• The Gandak Project at Valmikinagar (Bhainsaloton) intercepts water from a catchment area of 37,410 km (23,250 mi), which is mostly in Nepal and partly in India.
• An agreement was signed on 4 December 1959 between the governments of Nepal and of India.

Additional Information

• Western Yamuna Canal is a canal in the river Yamuna that was dug out and renovated in 1335 CE by Firoz Shah Tughlaq.
• The Bhakra-Nangal dam is one of the earliest river valley development schemes undertaken after the independence of India.
• The Bhakra Canal System provides an irrigation facility to 27.41 hectares of land in Haryana, Punjab, and Rajasthan.

Q37. Answer: (b) CLLQYXII

The pattern followed here is:

Letters are decreasing by -3.

• In CRICKET → ZOFZHBQ
• .
• Similarly, In FOOTBALL → ?
• We get 'CLLQYXII'.

Hence, Option 2) is the correct answer.

Q38. Answer: (d) 12 : 10 : 6

Given:

Speed ratio = 5 : 6 : 10

Formula used:

Distance = Speed x Time

Solution:

Let, Distance = D

Time = D/5S : D/6S : D/10S

LCM(5, 6, 10) = 30

Time = 6D/30 : 5D/30 : 3D/30

D can vary from 1 to n

Time will be in a ratio 6 : 5 : 3

Option 4 matches for D = 2

Hence, the ratio will be 12 : 10 : 6

Q39. Answer: (d) Rome Olympic games

The correct answer is Rome Olympic games.

Key Points

• The men's 400 meters was an event at the 1960 Summer Olympics in Rome.
• Milkha Singh represented India in three Olympics from 1956-1964.
• He was awarded the Padma Shri, India's fourth-highest civilian honour, in recognition of his sporting winnings.
• Milkha Singh was a great athlete.

Additional Information

• The Olympic Games are a global sports festival, organized every four years.
• The main motives are to cultivate human beings, through sport, and provide global peace.
• Summer Games and Winter Games are arranged Seperetaly.

Q40. Answer: (d) Address of the web page displayed on the internet

The correct answer is Address of the web page displayed on the internet.

Key Points

• A URL (Uniform Resource Locator) serves as the address for a resource on the internet.

• It provides the means to retrieve any resource on the web, such as websites, images, videos, and other files.

• A URL consists of several parts including a protocol (e.g., HTTP, HTTPS), domain name, and possibly a path and query parameters.

• URLs ensure that users can easily navigate the web and that resources are accessible via clear, addressable locations.

• It is essential for the functioning of the web, allowing browsers to locate web resources globally.

Additional Information

Component	Description
Protocol	Indicates the method used to access the resource, such as HTTP or HTTPS.
Domain Name	The unique name that identifies a website which is translated into an IP address by DNS.
Path	The specific address within a website where a resource is located.
Query Parameters	Additional options added to a URL that define and refine requests for resources.
Anchor	A reference to a specific part within a webpage, accessed by adding '#section_name' at the end of a URL.

Q41. Answer: (b) Direct transfer of LPG subsidy

The correct answer is Direct transfer of LPG subsidy.

Key Points

• The PAHAL (DBTL) motive is to reduce diversion and eliminate duplicate or bogus LPG connections.

• The scheme was earlier started in 2013 and was modified in 2015.

• Under the PaHaL scheme, LPG cylinders are sold at market rates and allow consumers get the subsidy directly into their bank accounts.

• The government launched PAHAL (Pratyaksh Hanstantrit Labh) or Direct Benefits Transfer for LPG (DBTL) scheme for LPG consumers across India on 1 June 2013.

• Under this scheme, the customers require to have an Aadhaar number for availing of LPG subsidy compulsory.

Additional Information

• Agricultural credit mention to one of several credit vehicles used to finance agricultural transactions such as a loan, note, bill of exchange, or a banker's acceptance.

• The Indian Child Welfare Act (ICWA) of 1978 is a Federal law that governs the removal and out-of-home placement of American Indian children.

• The Indian government has shown a strong commitment to education for all, but, India still has one of the lowest female literacy rates in Asia.

Q42. Answer: (d) 23

Given:

(n x s) x p = 7429

m x (n x s) = 4199

here, m, n, s, and p are consecutive prime numbers.

Solution:

Let, p = Larget prime number

[(n x s) x p] / [m x (n x s)] = 7429/4199

p/m = 23/13

p = 23

Hence, the largest prime number of these is 23.

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Q43. Answer: (c) Manora Fort

The correct answer is Manora Fort.

Key Points

• The Manora fort is located 20 km (12 mi) away from Pattukkottai, Tamil Nadu, India, and 60 km (37 mi) away from Thanjavur.

• It was built to commemorate the British victory over Napoleon.

• Manora Fort was built by the Talpur dynasty in 1797 in order to protect the port, which holds trade with Oman and Bahrain.

• The fort was built at the top of cliffs that were 90–100 feet (27–30 m) in height, with a small mosque and round tower.

Additional Information

• Sikandra Fort is the place where the Tomb of the great Mughal Emperor stands.

• Amer Fort is known for its artistic style elements.

• Jaisalmer Fort is located in the city of Jaisalmer, in the Indian state of Rajasthan.

Q44. Answer: (a) Chief Justice of India

The correct answer is Chief Justice of India.

Key Points

• The Chief Justice of India administers the oath of office to the President.

• The affidavit to the President is administered by the Chief Justice of India and in his absence, the seniormost judge of the Supreme Court is available.

• The Chief Justice of India (CJI) is the head of the judiciary of India and the Supreme Court of India.

• As head of the supreme court, the chief justice is responsible for the allocation of cases and appointment of constitutional benches.

• As of December 2022, Justice Dhananjaya Yashwant Chandrachud is the 50th Chief Justice of India.

Additional Information

• The prime minister can be a member of the Lok Sabha or of the Rajya Sabha, the upper house of the parliament.

• The Vice President is elected indirectly by members of an electoral college consisting of the members of both houses of the Parliament of India.

• Article 76 of the constitution mentions that the Attorney General of India is the highest law officer in India.

Q45. Answer: (a) Millet

The correct answer is Millet.

Key Points

• Millets are a group of highly variable small-seeded grasses.

• Drought is the major restriction to pearl millet as it is grown in the drier semiarid and arid regions.

• But, adaptive evolution and natural selection made pearl millet relatively the most drought and heat tolerant among other cereals.

• Millet is a good source of protein, fiber, key vitamins, and minerals.

Additional Information

• Rice is one of the most important food crops in India.

• Sugarcane is one of the most efficient crops in terms of photosynthetic efficiency and biomass production.

• Jute is a bast fibre crop and can be harvested at any stage after a certain period of vegetative growth, usually between 100 to 150 days.

Q46. Answer: (b) 16/3 %

Given:

Water evaporated = 2L

Solution = 8L

Percent of sugar in solution = 4%

Calculation:

Sugar present in solution= 8 x 4over 100 = 0.32L

Now, the water remained in the solution after evaporating = 8 - 2 - 0.32 = 5.68L

Hence, the percent of sugar in the remaining solution = 0.32/(0.32+5.68) x 100

= 0.32/6 x 100

= (16/3)%

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Hence, the sugar left in the remaining solution is 16/3%.

Q47. Answer: (b) 51% or more

The correct answer is 51% or more.

Key Points

• Section 2(45) of the Indian companies act, 2013, defines a government company as, "Any company in which not less than 51% of the paid-up share capital is held by the central government, or by any state government."

• The Central Government and partly one or more State Governments, from time to time these Companies are known as Mixed Ownership Companies.

• At least 51% of the shares must be owned by the government in order to be a government company.

• Shares in a Government company can be clasped in the name of the President of India or the Governor of a State.

Additional Information

• The subsidiary company is the one in which another company grip more than 51% of the nominal value of its equity share capital or more than 51 % of its voting power.

• Government stock means any stock issued by the Government or any funds of or annuity granted by the Government.

• The Paid-up share capital of a company is the amount of money for which shares were issued to the shareholder for which payment was made by the shareholder.

Q48. Answer: (d) 225, 625

Given:

25(m+n) =850

m & n are two numbers

Calculation:

25(m+n) =850

Now,

m+n = 34

Now, since the HCF is 25, means m & n are co-prime.

Prime numbers less than 34 = 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31

Now, from the above list, the pairs whose sum will give 18 are = (3,31), (5, 29), (11, 23)

If the pair is (3, 31) we will get the pair of two numbers = (75, 775)

75 + 775 = 850, but this pair is not in our given option.

so, now let's check out the second pair,

If the pair is (5, 29) we will get the pair of two numbers = (125, 725)

125+725=850, but this pair is not in our given option.

so, now let's check out the last pair,

If the pair is (11, 23) we will get the pair of two numbers = (265, 575)

265+575 != 850, & this pair is not in our given option.

Hence, either no correct options are available or the HCF is not equal to 25.

Q49. Answer: (c) 13

The logic followed here is:

Second number = (Third number ÷ First number) - 1

5
6
35

Second number = (35 ÷ 5) - 1 = 7 - 1 = 6

8
11
96

Second number = (96 ÷ 8) - 1 = 12 - 1 = 11

Similarly,

15
?
210

Second number = (210 ÷ 15) - 1 = 14 - 1 = 13

Hence, option 3) is the correct answer.

Q50. Answer: (d) Edwin Lutyens

The correct answer is Edwin Lutyens.

Key Points

• The designer was Sir Edwin Lutyens, an Englishman who designed many other war memorials and was also the chief planner of New Delhi.

• It is located in the middle of a hexagonal complex with a diameter of 625m and a total area of 360,000 m2, the India Gate is 42m in height and 9.1m in width.

• The historic India Gate, an arch gate made using sandstone, is a war memorial situated in the Rajpath area, Delhi.

• It was built to commemorate the Undivided British Army soldiers who laid down their lives during the First World War and the Third Anglo-Afghan War of 1919.

Additional Information

• Sir Herbert Baker was an English architect remembered as the dominant force in South African architecture for two decades.

• Frederick Gilbert worked on many designs in Minnesota including the Minnesota State Capital Building.

• Elisabeth Lutyens is famous especially for his planning of New Delhi and his design of the Viceroy's House there.

Q51. Answer: (c) Nicolas Maduro

The correct answer is Nicolas Maduro.

Key Points

• Nicolás Maduro is a Venezuelan politician and president of Venezuela since 2013, with his presidency under debate since 2019.

• Venezuela has the world's largest known oil reserves and has been one of the world's leading exporters of oil.

• On 14 April 2013 Nicolás Maduro was elected President of Venezuela, only just defeating opposition candidate Henrique Capriles with just 1.5% of the vote separating the two candidates.

• Venezuela is home to the world's largest rodent.

Additional Information

• Juan Vicente Gómez Chacón was a Venezuelan military general and ruler of Venezuela from 1908 till his death in 1935.

• Rómulo Ernesto Betancourt Bello famous as "The Father of Venezuelan Democracy", was the president of Venezuela.

• Jose Antonio Paez was a mestizo llanero, one of the horsemen of the plains.

Q52. Answer: (a) Rs.1280

Given:

l = 12m

b = 8m

h = 4m

l = length

b = breadth

h = height

Solution:

The area of the four wall and ceiling = 2 x (l + b)h + lb

= 2 x (12 + 8) × 4 + 12 × 8

= 2 x 20 × 4 + 96

= 160 + 96 = 256 m²

Hence, the Price for whitewashing = 5 x 256 = Rs.1280

Q53. Answer: (c) 84

Shortcut Trick

Difference between numbers = 5

Sum of numbers = 19

Larger number = (Sum + Difference) ÷ 2 = (19 + 5) ÷ 2 = 12

Smaller number = (Sum − Difference) ÷ 2 = (19 − 5) ÷ 2 = 7

Product = 12 × 7 = 84

Therefore The correct answer is 84.

Alternate Method

Given:

Let the smaller number be x.

Then the larger number is x + 5.

Calculation:

=> x + (x + 5) = 19

=> 2x + 5 = 19

=> 2x = 19 − 5

=> 2x = 14

=> x = 7

=> Smaller number = 7

=> Larger number = 7 + 5 = 12

=> Product = 12 × 7 = 84

Therefore The correct answer is 84.

Additional Information

Sum and Difference Rule

If the sum (S) and difference (D) of two numbers are known, the numbers are (S+D)/2 and (S−D)/2.

Product of Numbers

The product of two numbers can also be expressed as $[(Sum)^2 - (Difference)^2] \div 4$.

Q54. Answer: (c) Lord Mountbatten

The correct answer is Lord Mountbatten.

Key Points

• Lord Mountbatten continued as the first Governor General of independent India.

• For his service through the war, Mountbatten was generate viscount in 1946 and earl the following year.

• In March 1947, Mountbatten was assigned Viceroy of India and supervise the Partition of British India into India and Pakistan.

• He then served as the first Governor-General of India up to June 1948.

Additional Information

• Lord Willingdon was Governor-General of Canada from 1926 to 1931 and Viceroy of India from 1931 to 1936.

• Lord Linlithgow successfully carried out the India Act of 1935 by holding general elections in all provinces of British India in 1937.

• Lord Irwin, was a senior British Conservative politician of the 1930s and the Viceroy of British India from 3 April 1926 – 18 April 1931.

Q55. Answer: (d) Dilute sulphuric acid

The correct answer is Dilute sulphuric acid.

Key Points

• Dilute sulphuric acid is used in the anodising process to create a protective oxide layer on metals, particularly aluminum.

• This acid helps increase the thickness of the natural oxide layer on the metal surface, enhancing durability and corrosion resistance.

• Anodising using sulphuric acid is preferred for providing a base for dyeing and painting metals, due to the porous nature of the oxide layer it forms.

• The process involves submerging the metal in an electrolytic solution where it serves as the anode, hence the term 'anodising'.

• The use of dilute sulphuric acid is critical as it achieves the desired oxide thickness and quality effectively.

Additional Information

Process	Description
Anodising	An electrochemical process that converts the metal surface into a decorative, durable, corrosion-resistant, anodic oxide finish.

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Electrolyte	The conductive solution used in the anodising tank, often a dilute sulphuric acid solution to facilitate the flow of electrical current.
Oxide Layer	The hard, non-conductive layer formed on the surface of the anodised metal, which can be dyed or left transparent.
Applications	Used in various industries including aerospace, automotive, architecture, and consumer goods for enhanced aesthetics and lifespan.

Q56. Answer: (b) 4

Given:

$x = 7 + 4\sqrt{3}$

Formula Used:

$\sqrt{x} + 1/\sqrt{x}$

Calculation:

=> Let $\sqrt{x} = a$, then $x = a^2$

=> $a^2 = 7 + 4\sqrt{3}$

=> Assume $a = \sqrt{(7 + 4\sqrt{3})}$

=> $\sqrt{x} + 1/\sqrt{x} = \sqrt{(7 + 4\sqrt{3})} + 1/(\sqrt{(7 + 4\sqrt{3})})$

=> $u = \sqrt{(7 + 4\sqrt{3})}$ and $v = 1/(\sqrt{(7 + 4\sqrt{3})})$

=> $u \cdot v = 1$ (because $u \cdot v = \sqrt{x} \cdot 1/\sqrt{x}$)

=> Use rationalization for u and v

=> $u = \sqrt{(7 + 4\sqrt{3})} = 2 + \sqrt{3}$ (by rationalizing the surd)

=> $v = 1/(2 + \sqrt{3}) = 2 - \sqrt{3}$ (by rationalizing the denominator)

=> $u + v = (2 + \sqrt{3}) + (2 - \sqrt{3}) = 4$

Therefore The value of correct answer is 4.

Q57. Answer: (a) Indus

The correct answer is Indus.

Key Points

• Alexander occupied India in 326 B.C., crossing the Indus River on his way to Taxila.

• The Indus is the most important supplier of water resources to the Punjab and Sindh plains.

• It forms the backbone of agriculture and food production in Pakistan.

• The river is mainly critical since rainfall is meager in the lower Indus valley.

Additional Information

• Chenab River, is the river of the Indian subcontinent in northwestern India and northeastern and eastern Pakistan.

• The Sutlej River is the longest of the five rivers that flow through the historic crossroads region of Punjab in northern India and Pakistan.

• Jhelum River at Srinagar, Jammu and Kashmir, India.

Q58. Answer: (c) 1964

The correct answer is 1964.

Key Points

• IDBI Bank Limited is a secondary Life Insurance Corporation providing financial and banking services.

• It was established in 1964 as the Industrial Development Bank of India.

• IDBI Bank is now categorized as a private sector lender, with the government holding a 45.48 percent stake in the bank, and the Life Insurance Corporation of India (LIC) owning 49.24 percent.

• IDBI Bank is such a wonderful great bank.

Additional Information

• The Reserve Bank of India (RBI) is India's chief banking and monetary power.

• State Bank of India (SBI) is the country's largest commercial bank, with regards to assets, deposits, and employees.

• Bank of Baroda is an Indian nationalized banking and financial services company main office in Vadodara.

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Q59. Answer: (b) 50 W

The Correct answer is 50W.

Key Points

• It weighs a total of 27 kg and has an electric power generation capacity of 50 W.

• According to ISRO, The Pragyan Rover is capable of conducting in-situ payload experiments.

• Chandrayaan-2's Rover was a 6-wheeled robotic vehicle named as Pragyan, which translates to 'wisdom' in Sanskrit.

• The failure of Chandrayaan-2, India's second mission to the Moon, to make a soft landing on the lunar surface had led to much disappointment.

Additional Information

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

• The spacecraft operated for less than two years: 312 days as against two years.

• But, the Chandrayaan-1 was successful in achieving at least 95 percent of its objectives.

Q60. Answer: (c) 1954

The correct answer is 1954.

Key Points

• The Government of India instituted two civilian awards-Bharat Ratna & Padma Vibhushan in 1954.

• The latter had three classes that are Pahela Varg, Dusra Varg, and Tisra Varg.

• These were later renamed Padma Vibhushan, Padma Bhushan and Padma Shri vide Presidential Notification issued on January 8, 1955.

• The first receiver of the Padma Vibhushan was Satyendra Nath Bose, Nandalal Bose, Zakir Husain, Balasaheb Gangadhar Kher, V. K. Krishna Menon, and Jigme Dorji Wangchuck, who was honored in 1954.

Additional Information

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

• The Padma Vibhushan ("Lotus Decoration") is the second-highest civilian award of the self government of India, following the Bharat Ratna.

• Padma Shri is the fourth-highest civilian award of the self government of India.

Q61. Answer: (d) 7

Given:

$3 < n < 8$

$6 < n < 10$

n = number

Calculation:

If the number is greater than 3 &less than 8, it can be any of these (4, 5, 6, 7)

Now, the number is also greater than 6 & less than 8,

Here, only one number can come, and that is 7.

Hence, the number is 7.

Q62. Answer: (a) It is known as volatile memory.

The correct answer is It is known as volatile memory.

Key Points

• ROM (Read Only Memory) is a type of non-volatile memory, meaning it retains information even when the power is turned off.

• ROM is primarily used to store firmware, a type of software that is closely tied to specific hardware and unlikely to need frequent updates.

• This memory type is essential for storing system-critical data, such as the boot firmware which is used when a computer system is starting up.

• Unlike RAM (Random Access Memory), which is volatile and loses its data when power is lost, ROM maintains its data permanently.

• The misconception that ROM is volatile stems from confusion with RAM; ROM by its nature is specifically designed to be permanent storage.

Additional Information

Memory Type	Description

EPROM (Erasable Programmable ROM)	A type of ROM that can be erased by exposing it to strong ultraviolet light and then reprogrammed.
EEPROM (Electrically Erasable Programmable ROM)	Can be erased and reprogrammed through electrical charges, allowing data to be updated without removing the chip from the device.
Flash Memory	A modern form of EEPROM widely used in USB flash drives and SSDs, allowing multiple data erase and write cycles.
MROM (Masked ROM)	The oldest type of ROM, programmed during the manufacturing process and cannot be modified afterwards.

Q63. Answer: (c) Six

The correct answer is Six.

Key Points

• The 6 states of India are those that have bicameral legislature they are Andhra Pradesh, Maharashtra, Karnataka, Telangana, Bihar, and Uttar Pradesh.

• It is a legislative body with two houses.

• India is one such example where there are two houses both at union and also at 6 of its 28 states.

• In a bicameral legislature, the function to administer and implement the laws is shared between the two houses.

Additional Information

• The legislature of the Union, which is known as Parliament, is made up of the President and two Houses, known as the Council of States (Rajya Sabha) and the House of the People (Lok Sabha).

• All House has to meet within six months of their previous sitting.

• A joint sitting of two Houses can be held in certain cases.

Q64. Answer: (b) Rs.450

Given:

SP= Rs. 540

P% = 20%

Formula used:

CP = SP[100 overP %+100]

Here,

CP = Cost Price

SP = Selling Price

P% = Profit %

Calculation:

Now, let's put the values given, in the formula.

=> CP = SP[100 overP %+100] ; => CP = 540[100 over20+100]; => CP = 540[100 over120]; => CP = 540[10 over12]; => CP = 5400 over12\

CP = 450

Hence, the cost price is Rs. 450.

Q65. Answer: (a) UNESCO

The correct answer is UNESCO.

Key Points

• UNESCO has the International Institute of Educational Planning in Paris as its Part.

• UNESCO's International Institute for Educational Planning was founded in Paris, France, in 1963.

• UNESCO: United Nations Educational, Scientific and Cultural Organization.

• The United Nations Educational, Scientific, and Cultural Organization (UNESCO) was established on 16 November 1945.

Additional Information

• UNICEF is committed to make sure special defence for the most underprivileged children.

• The International Labor Organization (ILO) is committed to encouraging social justice and internationally recognized human and labour rights.

• The United Nations (UNO) defends human rights, delivers humanitarian support, encourage sustainable development and

upholds international law.

Q66. Answer: (a) 35, 20

Given:

m - n = 15

(m-5) = 2 x (n - 5)

m = age of the older person

n = age of the younger person

Calculation:

Now, let's solve the above two equations given, by putting the value of m from 1st equation to the second equation.

m = 15 + n

Now,

((15 + n) - 5) = 2 x (n - 5)

10 + n = 2n - 10

n = 20

m = 15+n = 15+20 = 35

Hence, the ages are 35 & 20 years.

Q67. Answer: (a) 2001

The correct answer is 2001.

Key Points

• The Technology Experiment Satellite (TES), weighing 1108 kg, was launched on October 22, 2001.

• Technology Experiment Satellite is an Indian remote sensing and photo-reconnaissance satellite.

• The Aryabhata spacecraft, named after the famous Indian astronomer, was India's first satellite.

• TES is an experimental satellite to demonstrate and validate the technologies like attitude and orbit control systems and high-torque reaction wheels.

Additional Information

• Aryabhata was the first unmanned Earth satellite built by India.

• ISRO's Polar Satellite Launch Vehicle, PSLV-C24, fortunately, started IRNSS-1B, the second satellite in the Indian Regional Navigation Satellite System (IRNSS).

• India has established 346 satellites for 36 different countries as of 30 June 2022.

Q68. Answer: (a) √57

Given:

a = 7

b = 8

angle = 60

Formula used:

cos θ = $a^2 + b^2 - c^2$over2 × a × b

here, a, b, & c are the sides of the triangle and theta is the angle between a & b.

Calculation:

Here, we need to find c = third side, so let's put the values in the above formula, to get the answer,

cos 60= $7^2 + 8^2 - c^2$over2 × 7 × 8 ; 1/2 = 49 + 64 - c^2over2 × 56 ; 1 = 49 + 64 - c^2over 56 ; 56 = 49 + 64 - c^2; c^2 = 49+64-56 = 57; c= √57

Hence, the third side is √57 cm.

Q69. Answer: (c) 1950

The correct answer is 1950.

Key Points

• The Republic is governed in terms of the Constitution of India which was adopted by the Constituent Assembly on 26th November 1949 and effective on 26th January 1950.

• A Constitution is a set of rules and regulations guiding the administration of a country.

• The constitution of India is the structure for political principles, procedures and powers of the government.

• It is as well the longest constitution in the world with 395 articles and 12 schedules.

Additional Information

Qualities of the Indian Constitution are given below:

• Lengthiest Written Constitution.

• Blend of Rigidity and Flexibility.

• Drawn from Various Sources.

• Rule Of Law.

• Integrated and Independent Judiciary.

Q70. Answer: (c) 43/99

Given:

Number = 0.43434343...

Calculation:

Let, m = 0.434343...

Now, multiply both sides by 100,

100m = 43.434343...

100m = 43 + m

99m = 43

m = 43 over 99

Hence, the number 0.434343... will be equal to 43 over 99

Q71. Answer: (b) Rs.8,400

Shortcut Trick

Single discount = 45%.

Equivalent successive discount = 30 + 20 − (30 × 20) ÷ 100 = 50 − 6 = 44%.

Difference in discount rates = 45% − 44% = 1%.

Given, 1% of Marked Price (MP) = Rs. 84.

Therefore, 100% (MP) = 84 × 100 = Rs. 8,400.

Therefore The correct answer is Rs. 8,400.

Alternate Method

Given: First discount = 45%; Successive discounts = 30% and 20%; Difference in SP = Rs. 84.

Formulas: SP = MP × (100 − D%)/100 | Net discount for a and b = a + b − ab/100.

=> Let Marked Price be M.

=> SP1 = M × (100 − 45)/100 = 0.55M.

=> Equivalent Discount of 30% and 20% = 30 + 20 − (30 × 20)/100 = 44%.

=> SP2 = M × (100 − 44)/100 = 0.56M.

=> Difference = SP2 − SP1 = 0.56M − 0.55M = 0.01M.

=> 0.01M = 84 => M = 84 ÷ 0.01 = 8,400.

Therefore The correct answer is Rs. 8,400.

Additional Information

Successive Discounts

When two or more discounts are applied one after another, they are called successive discounts. The net discount is always less than the sum of individual rates.

Marked Price & Selling Price

Marked Price (MP) is the price printed on the label. Selling Price (SP) is the actual price after deducting the discount from the MP.

Q72. Answer: (a) 482

Given:

30, 61, 120, 243, ?

Solution:

30 × 2 + 1 = 61

61 × 2 - 2 = 120

120 × 2 + 3 = 243

243 × 2 - 4 = 482

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Hence, 482 is the next term of the given series.

Therefore The correct answer is option (1).

Q73. Answer: (b) It was established on 1 January 2016.

The correct answer is It was established on 1 January 2016.

Key Points

• NITI Aayog was formed via a resolution of the Union Cabinet on 1 January 2015.

• NITI Aayog replaced the Planning Commission of India.

• It is generally a think-tank or an advisory body.

• The Planning Commission designed Five Years Plans in India.

• NITI Aayog gives to-the-point advice to the center and state governments as well as to the Union territories.

Additional Information

• NITI Aayog was established with the motive to achieve Sustainable Development Goals and to increase cooperative federalism.

• NITI AAYOG stands for NATIONAL INSTITUTION FOR TRANSFORMING INDIA.

• Mr. Parameswaran Iyer is the Chief Executive Officer of NITI Aayog.

Q74. Answer: (b) GRU

The pattern followed here is:

Letters are increasing by +1.

On continuing the pattern, we get,

Hence, 'GRU' is the correct answer.

Q75. Answer: (c) NH 15

The correct answer is NH 15.

Key Points

• National Highway-15 covers most of Rajasthan.

• The longest national highway in Rajasthan that joins the state to the Kandla port of Gujarat is NH-15.

• Aside from NH-15, the other highway that joins Rajasthan state to the Kandla port of Gujarat is NH-14.

• National Highway 15 begins from Baihata in Assam and terminates at Wakro in Arunachal Pradesh, while traversing between Mangaldai, Dhekiajuli, Tezpur, Banderdeva, North Lakhimpur, Kulajan, Dibrugarh, Tinsukia, Rupai and Mahadevpur.

Additional Information

• National Highway 8 (NH 8) is a National Highway in India running from Karimganj in Assam to Sabroom in Tripura.

• National Highway 7 (NH 7) is a highway connecting Fazilka (Punjab) to Mana (Uttarakhand) in India.

• National Highway 47 (NH 47) is the main National Highway in India, It starts from Bamanbore in Gujarat and terminates at Nagpur in Maharashtra.

Q76. Answer: (b) Gills

The logic followed here is:

• Dogs : Lungs

• Dogs use their lungs for breathing.

• Similarly, Fish :?

• Fish use gills for breathing in water.

Hence, option 2) is the correct answer.

Q77. Answer: (b) Diamond

The correct answer is Diamond

Key Points

• Diamond is an allotropic form of carbon, where carbon atoms are arranged in a crystal structure known as a diamond lattice. This structure gives diamonds their remarkable hardness and high optical dispersion.

• Chalk, primarily composed of calcium carbonate ($CaCO_3$), is not an allotropic form of carbon. It is commonly used in classrooms and various industrial applications but does not contain carbon in the allotropic form.

• Gypsum, a soft sulfate mineral composed of calcium sulfate dihydrate ($CaSO_4 \cdot 2H_2O$), is also unrelated to carbon allotropes. It's widely used in plaster and as a fertilizer ingredient.

• Marble, metamorphosed limestone, mainly consists of recrystallized carbonate minerals. Like chalk and gypsum, it does not represent an allotropic form of carbon.

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Additional Information

Carbon Allotropes	Description
Graphite	Soft and conductive, graphite is another allotropic form of carbon used in pencils and as a lubricant.
Fullerenes	Composed of carbon atoms connected in spherical, tubular, or ellipsoidal formations, these are used in pharmaceutical delivery systems and electronic applications.
Carbon Nanotubes	Known for their strength and electrical conductivity, carbon nanotubes are used in nanotechnology, electronics, and materials science.
Amorphous Carbon	A less organized form of carbon found in coal and soot, amorphous carbon is used for filtration and in printing inks.

Q78. Answer: (b) Rs. 13,000

Given:

Principal = Rs. 10,000

Rate = 15%

Time = 2 years

Formula used:

SI = (P × R × T)/100

A = P + SI

here,

A = Amount

SI = Simple Interest

P = Principle

R = Rate

T = Time

Calculation:

Let's put the values given, in the formula to find the value of SI;

SI = (P × R × T)/100 ; => SI = (10000 × 15 × 2)/100; => SI = 100 × 15 × 2

SI = 3000

Hence,

A = P + SI

A = 10000 + 3000

A = 13000

Hence, the amount to be paid at the end of two years is Rs.13,000.

Q79. Answer: (c) 1300 km

Shortcut Trick

The difference in speeds is 70 − 60 = 10 km/h.

This difference causes a lead of 100 km for the faster train.

Time taken to meet = Distance difference ÷ Speed difference = 100 ÷ 10 = 10 hours.

Total distance = (Sum of speeds) × Time = (60 + 70) × 10 = 1300 km.

Therefore The correct answer is 1300 km.

Alternate Method

Given:

Speed of Train 1 (S1) = 60 km/h

Speed of Train 2 (S2) = 70 km/h

Difference in distance = 100 km

Formula: Distance = Speed × Time

=> Let the time taken to meet be t hours.

=> Distance covered by the first train (d1) = 60 × t

=> Distance covered by the second train (d2) = 70 × t

=> According to the problem: d2 − d1 = 100

=> 70t − 60t = 100

=> 10t = 100 => t = 10 hours

=> Total distance between A and B = d1 + d2 = 60t + 70t

=> Total Distance = 130t = 130 × 10 = 1300 km

Therefore The correct answer is 1300 km.

Additional Information

Relative Speed in Opposite Directions

When two objects move towards each other, their relative speed is the sum of their individual speeds (S1 + S2).

Relative Speed in Same Direction

When two objects move in the same direction, their relative speed is the difference between their individual speeds (|S1 − S2|).

Meeting Time Formula

Time of Meeting = Initial Distance between objects ÷ Relative Speed.

Distance Proportion

Since Time is constant until the meeting point, the Ratio of Distance covered is equal to the Ratio of Speeds (D1/D2 = S1/S2).

Therefore The correct answer is 1300 km.

Q80. Answer: (c) 4/3√56cm²

Given:

a = 3cm

b = 6cm

c = 5cm

Formula used:

Area of a triangle having sides a,b, and c = √(s(s-a)(s-b)(s-c))

s = a + b + cover 2

Area of triangle = 4over3 x (Area of a triangle having a,b,c sides)

Calculation:

First of let's find the value of semi-perimeter = s,

s = (a + b + c)/2 = (3+ 6+ 5)/2 = 7

Now, Let's find the area of the triangle formed by medians a, b, and c as its sides.

A = √(s(s-a)(s-b)(s-c)) = √(7(7-3)(7-6)(7-5)) = √56

Now, let's put the values in the formula,

Area of triangle = 4over3 x (Area of a triangle having a,b,c sides)

= 4/3 √56

Hence, the area of the triangle is 4/3 √56.

Q81. Answer: (b) Gupta period

The correct answer is Gupta period.

Key Points

• The period between the 4th and 6th centuries CE is called as the Golden Age of India.

• Because of the goodly achievements of Indians in the fields of mathematics, astronomy, science, religion and philosophy during the Gupta Empire.

• In Ancient India, the Gupta Dynasty governed the mid-to-late 3rd century (approximately) to 543 AD.

• Established by Sri Gupta, the dynasty rose to fame with rulers like Chandragupta-I, Samudragupta, etc.

Additional Information

• The Mauryan Empire was formed around 321 B.C.E. and ended in 185 B.C.E.

• Magadha was ruled by the Brihadratha dynasty, the Pradyota dynasty (682–544 BCE), the Haryana dynasty (544–413 BCE), and the Shaishunaga dynasty (413–345 BCE).

• The Mughal Empire was an early-modern empire that controlled much of South Asia between the 16th and 19th centuries.

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Q82. Answer: (d) Palm tree

The logic followed here is:

1) An apple tree is taller than a lemon tree.

=> Apple tree > Lemon tree

2) A papaya tree is shorter than a palm tree

=> Papaya tree < Palm tree

3) A mango tree is shorter than the papaya tree but taller than apple tree

=> Papaya tree > Mango tree > Apple tree

So, the correct order is: Palm tree > Papaya tree > Mango tree > Apple tree

Hence, Palm tree is the tallest tree.

Q83. Answer: (a) 24

Given:

Total = Rs. 3,000

Solution:

100(5m) + 50(8m) + 10(10m) = 3000

500m + 400m + 100m = 3000

1000m = 3000

m =3

Now, 8m = 8 x 3 = 24

Hence, 24 notes of 50Rs.

Q84. Answer: (d) Rs.700

Given:

Price after GST = Rs.784

GST = 12%

Formula used:

Original Price = (Original Price + GST) - [GST x original price) /100]

Calculation:

Let, m = Original Price

m = 784 - 0.12m

Solution:

1.12m = 784

m= 700

Hence, The original price was Rs. 700.

Q85. Answer: (c) 28

Given:

126, 65, ?, 9, 2

Formula :

$n^3 + 1$

Solution:

$n[1] = 1^3 + 1 = 2$

$n[2] = 23 + 1 = 9$

$n[3] = 33 + 1 = 28$

$n[4] = 43 + 1 = 65$

$n[5] = 53 + 1 = 126$

Reversing this series, we get,

126, 65, 28, 9, 2

Q86. Answer: (c) 45000

Given:

Total Population = 2,50,000

Engineers = 65°
Formula used:
Population(m) = (Degrees of m / 360°) x Total Population
Solution:
Population(Engineers) = (65/360) x 250000
= (13/72) x 250000
= 3250000/72
= 45139
Hence, the approximate number will be 45000.

Q87. Answer: (d) 0.875 times

Given:
Let total Population =10,000
Clerical = 70°
Teachers = 80°
Formula used:
Population(m) = (Degrees of m / 360°) x Total Population
Solution:
Population(Clerical) = C = (70/360) x 10000
= 70000/36
Population(Teachers) = T = (80/360) x 10000
= 80000/36
Now,
C/T = 7/8
= 0.875
Hence, the Clerks (Clerical Staff) strength is 0.875 times that of the teachers.

Q88. Answer: (b) VIII

Given:
B : G = 3 : 2
Solution:
V(B : G) = 80 : 60 = 4 : 3
VI(B : G) = 80 : 70 = 8 : 7
VII(B : G) = 40: 60 = 2 : 3
VIII(B : G) = 90 : 60 = 3 : 2
IX(B : G) = 70 : 80 = 7 : 8
X(B : G) = 70 : 60 = 7 : 6
From the above calculations, we can say that the Boys to girls ratio 3: 2 is in VIII standard.

Q89. Answer: (d) 6.67

Given:
Total percent of Boys = 80 + 80 + 40 + 90 + 70 + 70 = 430
total Percent of Girls = 60 + 70 + 60 + 60 + 80 + 60 = 390
Total Percent = 600
Formula used:
Average = Sum of percent / Total Percent
Solution:
Average of Boys = 430/600 = 43/60
Average of Girls = 390/600 = 39/60
Difference = (43-39)/60 x 100 = 4/60 x 100= 20/3 = 6.67
Hence, the difference is 6.67.

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Q90. Answer: (c) 16

The number of triangles in given figure is as shown below :

Therefore There are 16 triangles in the given figure.

Hence, the correct answer is "16".

Q91. Answer: (a) I

If the letters of the word ACCELERATIONS are arranged in the alphabetical order

A < A < C < C < E < E < I < L < N < O < R < S < T

Here, we can see that 'I' is in the centre of the arrangement.

Hence, option 1) is the correct answer.

Q92. Answer: (a) Pen

The logic followed here is:

• Painting → Brush

• We use brushes for painting.

• Similarly, Letter → ?

• We use a pen to write the letter.

Hence, option 1) is the correct answer.

Q93. Answer: (c) Only conclusion II follows.

From the given statement:

If you are an efficient typist, then we definitely have a job for you.

Now we consider the given statements:

I. You are an efficient typist: There is no base for this conclusion as the statement suggests the asks and tells a thing that is completely different from assuming such conclusion. Thus the conclusion does not follow.

II. We are in need of an efficient typist: The statement offers a job to an efficient typist which clearly means there is a need for an efficient typist and therefore the conclusion follows.

Since only conclusion II follows.

Hence the correct answer is option 3)

Q94. Answer: (b) Both conclusions I and II follow.

Statements:

Some students are bright.

All bright people are successful.

Venn Diagram:

Conclusions:

I. Some students are successful → Follow → We are given that some students are bright and all bright are successful so there is a direct relation which can be seen that some students are successful. Thus the conclusion follows.

II. Some successful people are students → Follow → We are given that some successful people are bright and some bright are students so it can be said that some successful people are students and therefore the conclusion follows.

III. All successful people are students → Does not follow → According to the statements and the diagram it is clear that not all successful people are bright also not all bright people are students so it will be wrong to say that all successful people are students so the conclusion does not follow.

Since both conclusions I and II follow.

Hence the correct answer is option 2.

Q95. Answer: (d) None of the conclusions follows.

Statements:

No dog is a cat.

All cats are rats.

Venn Diagram:

Conclusions:

I. Some rats are dogs → Does not follow → From the diagram we can see that rats are only related to cats and some rats can be cats but it will be wrong to say that some rats are dogs and thus the conclusion does not follow.

II. Some dogs are not rats → Does not follow → All the dogs are not related to either cats or dogs and we have no evidence that

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suggests the relation of some dogs being not rats so this conclusion cannot be correct and hence it does not follow.

III. No rat is a dog → Does not follow → There is no information given on the relation between dogs and rats so due to lack of information we cannot conclude this point so the conclusion does not follow.

Since, none of the conclusions follow.

Hence the correct answer is option 4.

Q96. Answer: (b) RPMETERUTA

The logic is:

UNIVERSITY is written as EVINUYTISR

Similarly,

TEMPRATURE be written as ?

Hence the correct answer is RPMETERUTA.

Q97. Answer: (a) 10

The pattern followed in the given series is:

Sum of the number on the upper half - Sum of the numbers on the lower half = Middle term

Let's apply the pattern on the given figures:

1) (6 + 4 + 8) - (2 + 3) = 13

18 - 5 = 13

13 = 13

2) (2 + 4 + 6) - (3 + 5) = 4

12 - 8 = 4

4 = 4

3) (9 + 4 + 7) - (8 + 2) = ?

20 - 10 = ?

10 = Answer

Hence the correct answer is option 1)

Q98. Answer: (b) D

From the given words:

Food, Vegetable, Dosa

We know that both vegetables and dosa are types of food. But they are not related to each other.

So the Venn diagram will be:

From the given figures, the Venn diagram in figure D matches.

Hence the correct answer is option 2)

Q99. Answer: (c) Potato

From the given words:

Capsicum	Have a pointy head
Brinjal	Have a pointy head
Potato	Doesn't have a pointy head
Lady Finger	Have a pointy head

So, Potato is the odd one.

Hence the correct answer is option 3)

Q100. Answer: (c) n, p, p, m, p, p

The given series is: mmnn_,_pmmnnnp_,_mnnn_,_

We consider the given options:

1) n, p, m, p, p, m : mmnnnpp/mmnnnpm/pmnnnpm

2) n, p, p, m, m, p : mmnnnpp/mmnnnpp/mmnnnmp

3) n, p, p, m, p, p : mmnnnpp/mmnnnpp/mmnnnpp

• mmnnnpp repeated.

4) m, p, p, n, p, p : mmnnmpp/mmnnnpp/nmnnnpp
We can see a pattern in the 'n, p, p, m, p, p'
Hence the correct answer is option 3)

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