RRB NTPC CBT-I Official Paper (Held On: 23 Jan 2021 Shift 2) (Previous Year Paper)

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

Take this paper as a timed mock test

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

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

Q1. At how much distance above Earth's surface is the International Space Station located?

(a) 200 km
(b) 1000 km
(c) 700 km
(d) 400 km

Q2. "SAMYUKTA' is an electronic war programme that was developed in India jointly by _____ and the Indian Army.

(a) DRDO
(b) BEML Limited
(c) Dassault
(d) Bofors AB

Q3. The square root of ((31/4)^4 -(41/3)^4)/((31/4)² - (41/3)²) :

(a) 1 1/7
(b) 5 5/12
(c) 1 1/12
(d) 7 7/12

Q4. As per the UN's 'World Cities Report 2016', India is expected to have _____ megacities by 2030, with each of them having a population of more than 10 million.

(a) 10
(b) 15
(c) 25
(d) 7

Q5. On which of the following rivers was Independent India's first river dam constructed?

(a) Damodar
(b) Krishna
(c) Ganga
(d) Yamuna

Q6. (225^(0.2) × 225^(0.3))/(225^(0.6) × 225^(0.4)) is equal to:

(a) 1/25
(b) 15
(c) 1.5
(d) 1/15

Q7. The value of 2sin30° + 5cos60° + 3sin180° is:

(a) -1/2
(b) 1/2
(c) 9/2
(d) 7/2

Q8. A hard disk is an example of which type of data storage device?

(a) Off-line storage
(b) Secondary storage
(c) Primary storage
(d) Tertiary storage

Q9. What is the simplest form of the ratio of 6 h : 3 days?

(a) 1/12
(b) 1/3
(c) 1/6
(d) 1/9

Q10. Which of the following country's church, hotel and tourist place were attacked by suicide bombers during Easter celebrations in 2019?

(a) Iran
(b) India
(c) Sri Lanka
(d) France

Q11. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.
KL, MO, OR, ?

(a) QU
(b) UQ
(c) SQ
(d) QT

Q12. "As of 1^(st) January 2021, how many times has India been elected to the UN Security Council as a nonpermanent member?"

(a) Five times
(b) Eight times
(c) Six times
(d) Four times

Q13. The nuclear power plant CHASHMA-III is located in?

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

Q14. A student represents his scores in Mathematics, Statistics and Economics examinations in a pie chart. The central angle for Mathematics is 180°. He scored 80 in Statistics and 70 in Economics. His score in Mathematics is:

(a) 210
(b) 130
(c) 150
(d) 180

Q15. If the surface area of a cube is 1014 m^2, then its volume is:

(a) 2028 m^3
(b) 1929 m^3
(c) 2127 m^3
(d) 2197 m^3

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Q16. Bhukti, Bhoga, Visaya, Vithi and Mandal were:

(a) great saints of the Mauryan period
(b) ministers in Chandragupta's durbar
(c) rituals in Aswamedha Yagna
(d) administrative divisions in the Gupta period

Q17. Which of the following devices is used to convert alternating current into direct current?

(a) Calorimeter
(b) Capacitor
(c) Rectifier
(d) Rheostat

Q18. The ratio of the incomes of Barun and Anil is 12 : 13 and that of their expenditures is 10 :13. Find the income of Barun and Anil, if they save Rs. 2,100 and Rs. 1,300, respectively.

(a) Rs. 4,550 and Rs. 3,550
(b) Rs. 5,000 and Rs. 2,000
(c) Rs. 6,600 and Rs. 7,150
(d) Rs. 5,550 and Rs. 4,560

Q19. 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).

Statement:

Most students know English language.

Conclusions:

1. Some students know English language.
2. Some students do not know English language.

(a) Neither conclusion 1 nor 2 follows.
(b) Only conclusion 1 follows.
(c) Only conclusion 2 follows.
(d) Both conclusions 1 and 2 follows.

Q20. Where has India's first floating elementary school been inaugurated?

(a) Loktak Lake, Manipur
(b) Naini Jheel, Nainital
(c) Lake Pichola, Udaipur
(d) Dal Lake, Srinagar

Q21. Solve the following.

$3/\sqrt{0.0009} + 4/\sqrt{0.0016} = ?$

(a) 1/50
(b) 100
(c) 1/200
(d) 200

Q22. A man purchases a washing machine for Rs. 12,000. He pays Rs. 2,000 at first and the rest after 1 year, on which he is charged a simple interest at the rate of 10% per year. The total amount he pays for the washing machine is:

(a) Rs. 15,000
(b) Rs. 13,000
(c) Rs. 16,000
(d) Rs. 12,000

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Q23. A is only 40% as efficient as B. C is 50% as efficient as A and B together. If C alone completes the task in 30 days, then A, B and C together can complete the task in:

(a) 12 days
(b) 10 days
(c) 8 days
(d) 5 days

Q24. A does half as much work as B in three-fourth of the time taken by B. If together they take 12 days to complete the work, how much time shall B take to do it alone?

(a) 16 days
(b) 15 days
(c) 10 days
(d) 20 days

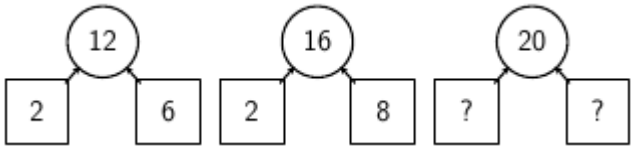
Q25. The speed of sound _____ as it passes from solid to gaseous medium.

(a) decreases
(b) increases
(c) does not change
(d) fluctuates

Q26. After the 1857 Revolt, also known as India's first war of independence, Bahadur Shah Jafar, the last Mughal Emperor of India, was exiled to:

(a) Nepal
(b) England
(c) Burma
(d) Japan

Q27. Study the given pattern carefully and select the numbers from among the given options that would be most appropriate for replacing the question mark (?).



(a) 10, 2
(b) 5, 4
(c) 2, 10
(d) 4, 5

Q28. Which of the following is NOT a part of the hardware of a computer?

(a) Microsoft Office
(b) Monitor
(c) Keyboard
(d) CPU

Q29. The scheme which was launched in March 2016 to free all national highways from Railway level crossings, build bridges and renovate the old bridges on national highways is known as:

(a) Setu-Bharatam Project
(b) Rail-Road Coordination Project
(c) Setu-Samudram Project
(d) Rail-Bridge Connection Project

Q30. The adjacent sides of a parallelogram are 4a and 3a. If the angle between them is 60°, then one of the diagonals of the parallelogram will be:

(a) 2 √3a
(b) 3 √3a

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(c) √13a
(d) 5 √3a

Q31. The purchasing power of a currency relative to another at current exchange rates and prices is _____.
(a) nominal exchange rate
(b) real exchange rate
(c) balance of payments
(d) purchasing power parity

Q32. Blood has a fluid matrix called _____, in which RBCs, WBCs and platelets are suspended.
(a) Cerebrospinal fluid
(b) Saliva
(c) Plasma
(d) Lymph

Q33. Ghoomar is a folk song and dance form that is popular in:
(a) Rajasthan
(b) UP
(c) Gujarat
(d) Bihar

Q34. Simplify the following.
(289 × 289 × 289 + 111 × 111 ×111)/(289 × 289 -289 × 111 + 111 ×111)
(a) 0
(b) 289
(c) 300
(d) 400

Q35. Working 5 h a day, A can complete a task in 8 days and working 6 h a day, B can complete the same task in 10 days. Working 8 h a day, they can jointly complete the task in:
(a) 5 days
(b) 6 days
(c) 4.5 days
(d) 3 days

Q36. Who wrote the medieval-era epic poem “Padmavat"?
(a) Mulla Daud
(b) Malik Muhammad "Jayasi"
(c) Abu'l-Fazl ibn Mubarak
(d) Amir Khusro

Q37. Bharat Heavy Electricals Limited (BHEL) is a _____ company.
(a) Maharatna
(b) Rajratna
(c) Navratna
(d) Miniratna

Q38. Select the term that will come next in the following series.
1O5, 1P6, 1Q7, ____
(a) 81R
(b) R18
(c) 8R1
(d) 1R8

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Q39. Who was appointed as Indian Envoy to Bangladesh in October 2020?

(a) BS Dhanoa
(b) S Lakhotia
(c) VK Singh
(d) Vikram Kumar Doraiswami

Q40. Automobiles are fitted with a device that shows the distance travelled. Identify it.

(a) Autometer
(b) RPM meter
(c) Odometer
(d) Speedometer

Q41. As per the findings of the 2011 census, which is the most thickly populated State (excluding Union territories) in India?

(a) Goa
(b) Bihar
(c) Uttar Pradesh
(d) Tamil Nadu

Q42. The sum of first 'n' natural numbers is:

(a) n/2
(b) n/2 + 1
(c) (n(n-1))/2
(d) (n(n + 1))/2

Q43. The minimum age requirement for becoming a member of a Municipality is _____ (prescribed under Article 243V of the Constitution of India).

(a) 25 years
(b) 21 years
(c) 35 years
(d) 18 years

Q44. While solving a mathematical problem, Atul squared the initial number and then subtracted 15 from it. Pratul first subtracted 15 from the initial number and then squared the difference. If both obtained the same answer, what was the initial number?

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

Q45. Pampas, Steppes, Savanna and Prairies are all names of famous:

(a) grasslands
(b) waterfalls
(c) lakes in America
(d) cyclones

Q46. If $\tan\theta = 5/12$, $0 < \theta < \pi/2$, then the value of $(\cos\theta + 5\cot\theta)/(\operatorname{cosec}\theta - \cos\theta)$ will be :

(a) 860/190
(b) 840/190
(c) 845/109
(d) 840/109

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Q47. The numerator of a fraction is increased by 20% and the denominator is decreased by 50%. If the resultant fraction is 5/6, then what will be the original fraction?

(a) 25/12
(b) 25/72
(c) 72/25
(d) 25/84

Q48. Saubhagya Yojana, launched by the Government of India in 2017, is related to providing:

(a) funds for marriage of Dalit girls
(b) cooking gas to poor households
(c) medical help for safe motherhood
(d) electricity to all households in India

Q49. Two natural numbers are in the ratio of 6 : 8 and their product is 768. The smaller of the numbers is:

(a) 24
(b) 32
(c) 8
(d) 12

Q50. Among the following words, which one will come second last if they are arranged as per their order in an English dictionary?

Discrepancy, Disease, Discuss, Discriminate, Disdain.

(a) Disdain
(b) Discrepancy
(c) Disease
(d) Discuss

Q51. Ravikant cycles at a speed of 12.5 km/h and walks at a speed of 3 km/h. To cover a distance of 40 km by cycle and walk both, Ravikant took 7 hours. How many of these hours were spent cycling?

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

Q52. 250 candidates appeared for an examination, out of which 225 passed. The percentage of the candidates who passed is:

(a) 84%
(b) 93%
(c) 96%
(d) 90%

Q53. Nirbhay missile has a strike range of:

(a) 500 km
(b) 100 km
(c) 200 km
(d) 1000 km

Q54. Select the letter-cluster from among the given options that can replace the question mark (?) in the following series.

DW, HS, LO, PK, ?

(a) GT
(b) TG
(c) CX
(d) ZA

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Q55. How many Indian members were there in the Simon Commission?

(a) One
(b) Three
(c) Two
(d) Zero

Q56. Study the given pattern carefully and select the number from among the given options that can replace the question mark (?).

2	9	5
3	8	?
4	7	6
24	504	30

(a) 1
(b) 3
(c) 2
(d) 0

Q57. In 2019, a Nepalese girl named Bandana Nepal set a Guinness World Record for 'Longest Dancing Marathon by an Individual' by dancing continuously for 126 hours. Whose record did she break?

(a) Vaijantimala Bali
(b) Raja Reddy
(c) Kalamandalam Hemlatha
(d) V Ganeshan

Q58. _____ are known as the powerhouse of the cell.

(a) Nucleus
(b) Cytoplasm
(c) Mitochondria
(d) Endoplasmic Reticulum

Q59. By selling 50 mangoes for Rs. 30, a person loses 10%. How many mangoes should he sell for Rs. 28 to gain 20%?

(a) 35
(b) 25
(c) 30
(d) 20

Q60. Which one of the following multipurpose projects in India is constructed on river Narmada?

(a) Korba Project
(b) Mettur Project
(c) Farakka Project
(d) Sardar Sarovar Project

Q61. A modem is connected to a:

(a) phone line
(b) mouse
(c) mother board
(d) monitor

Q62. What is the value of the following expression?

$(14 \div 7) \times [8 + \{3 + 8 - 2\}] - (5 - 2)$

(a) 25
(b) 31
(c) 30

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(d) 28

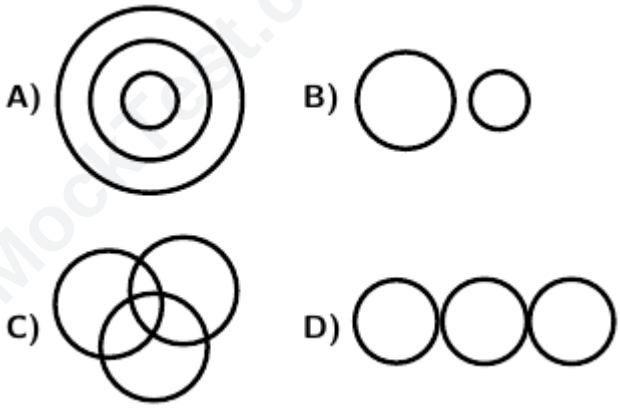
Q63. Which of the following technological companies has launched helicopter services in New York in October 2019?

(a) Apple
(b) Google
(c) Uber
(d) Microsoft

Q64. Select the option that is related to the third term in the same way as the second term is related to the first term.
Goldsmith : Gold :: Blacksmith : ?

(a) Silver
(b) Iron
(c) Diamond
(d) Shoes

Q65. Select the Venn diagram that best represents the relationship between words, letters and sentence.



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

Q66. If a = 9, b = –5 and c = –4, then find the value of $a^3 + b^3 + c^3$.

(a) 550
(b) 570
(c) 540
(d) 560

Q67. When x^4 – px^3 + $2x^2$ – 5x + 8 is divided by x – 1, the remainder is 2p. The value of p is:

(a) 5
(b) 1
(c) 3
(d) 2

Q68. During which period did the Sultanate ruler, Ghiyas-ud-din Balban, take over and rule the throne of Delhi?

(a) 1206-1223
(b) 1290-1322
(c) 1266-1287
(d) 1321-1334

Q69. The present ages of Sheo Kumar and Dileep Kumar are in the ratio of 9 : 10. After 11 years this ratio will become 10 : 11. What are the present ages of Sheo Kumar and Dileep Kumar?

(a) 54 years and 60 years
(b) 99 years and 110 years

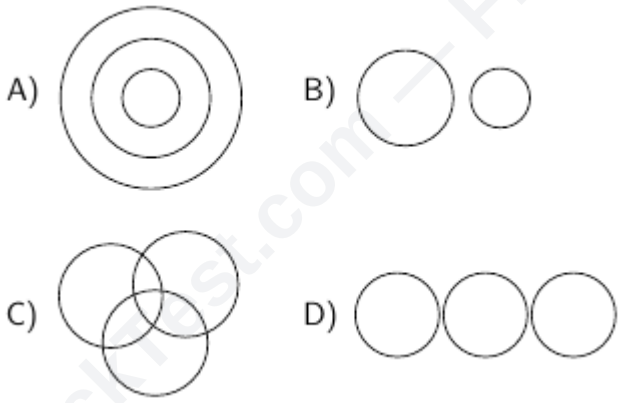
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(c) 81 years and 90 years
(d) 72 years and 80 years

Q70. The constitutional head of the Executive of the Union of India is the:

(a) Chief of Army Staff
(b) Speaker of the Lok Sabha
(c) President
(d) Prime Minister

Q71. Select the Venn diagram that best represents the relationship between man, smokers and cricketers.



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

Q72. If 121/0.121 = 12.1/x, then the value of x will be

(a) 1.210
(b) 0.0121
(c) 0.1121
(d) 0.1210

Q73. The roots of the equation $3x^2 + 5x – a = 0$ are the reciprocals of each other. What is the value of a?

(a) –2
(b) 2
(c) 3
(d) –3

Q74. Which one of the following diseases is NOT caused by a virus?

(a) Tuberculosis
(b) Influenza
(c) Chicken Pox
(d) Measles

Q75. The areas of two similar triangles are respectively 16 m^2 and 36 m^2. Find the ratio of their corresponding sides.

(a) 3 : 4
(b) 16 : 36
(c) 4 : 6
(d) 4 : 8

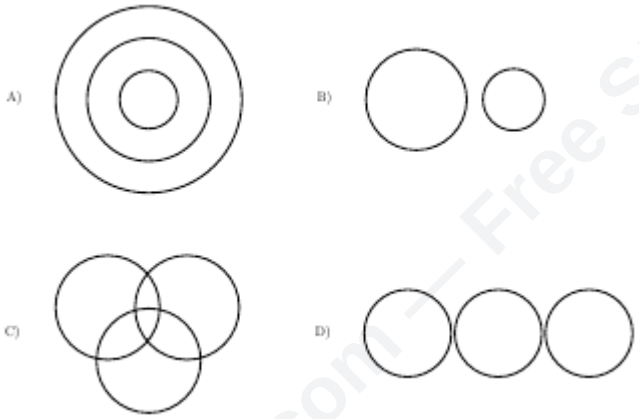
Q76. A thief steals a bag from the car at 3 p.m. and drives away at a speed of 50 km/h. The thief is located at 4 p.m. and the owner sets off in his car at a speed of 70 km/h. When will he catch the thief?

(a) 6:30 p.m.
(b) 8:45 p.m.

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(c) 8:00 p.m.
(d) 6:00 p.m.

Q77. Select the Venn diagram that best represents the relationship between mother, father and women.



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

Q78. Out of the four vegetables listed, three are alike in some manner and one is different. Select the odd one.
(a) Potato
(b) Beetroot
(c) Ladyfinger
(d) Carrot

Q79. The Charminar of Hyderabad was built by:
(a) Asaf Jah
(b) Muhammad Quli Qutab Shah
(c) Allauddin Khilji
(d) Muhammad bin Tuglaq

Q80. The person who was instrumental in bringing Mahatma Gandhi to Champaran in 1917 was:
(a) Aruna Asaf Ali
(b) Maulana Mazharul Haque
(c) Raj Kumar Shukla
(d) Batak Miyan

Q81. To uphold and protect the sovereignty, unity and integrity of India is a the:
(a) army's duty
(b) fundamental duty
(c) fundamental right
(d) legal right

Q82. In a certain code language, MIRROR is written as NRIILI. How will MOBILE be written as in that language?
(a) VORNLY
(b) VORYLN
(c) NLYROV
(d) NLYVOR

Q83. Select the option that is related to the third term in the same way as the second term is related to the first term.
Bihu : Assam :: Kathakali : ?
(a) Karnataka
(b) Kerala

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(c) Rajasthan
(d) Maharashtra

Q84. Select the number from among the given options that will come next in the following series.

-1, 6, 25, 62, ____

(a) 124
(b) 100
(c) 115
(d) 123

Q85. Which of the following production activities is the largest emitter of CO2?

(a) Thermal power production
(b) Meat production
(c) Crop production
(d) Textile production

Q86. The table below gives details of coal production in four different states for the years 2014 to 2018. Observe the table and answer the question below.

State	2014	2015	2016	2017	2018
A	84	86	85	82	85
B	168	164	162	163	145
C	178	180	181	182	185
D	86	79	84	76	74

Coal production (in thousands)

In how many years did the overall production of coal fall when compared to the previous year?

(a) 3 out of 5 years
(b) 5 out of 5 years
(c) 1 out of 5 years
(d) 2 out of 5 years

Q87. The table below gives details of coal production in four different states for the years 2014 to 2018. Observe the table and answer the question below.

State	2014	2015	2016	2017	2018
A	84	86	85	82	85
B	168	164	162	163	145
C	178	180	181	182	185
D	86	79	84	76	74

Coal production (in thousands)

Which State shows the lowest range in the data for production of coal in the given period?

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

Q88. The table below gives details of coal production in four different states for the years 2014 to 2018. Observe the table and answer the question below.

State	2014	2015	2016	2017	2018
A	84	86	85	82	85

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B	168	164	162	163	145
C	178	180	181	182	185
D	86	79	84	76	74

Coal production (in thousands)

In which year has State C registered the highest percentage contribution to the total coal production for the year?

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

Q89. The table below gives details of coal production in four different states for the years 2014 to 2018. Observe the table and answer the question below.

State	2014	2015	2016	2017	2018
A	84	86	85	82	85
B	168	164	162	163	145
C	178	180	181	182	185
D	86	79	84	76	74

Coal production in thousands)

For which State has the percentage contribution to the overall coal production NOT dropped even once during the 5-year period? (Percentage calculation rounded off to the nearest integer).

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

Q90. Read the given instructions carefully and answer the question that follows.

8 people - A, B, C, D, E, F, G, H - are sitting at a round table facing each other. A is between E and G, whereas G is sitting second to the right of F. H is between D and B and is second to the left of F. A and B are sitting opposite each other. Who is sitting between E and H?

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

Q91. Select the number from among the given options that will come next in the following series.

20, 40, 63, 90, 122, __

(a) 160
(b) 150
(c) 110
(d) 120

Q92. Out of the four words listed, three are alike in some manner and one is different. Select the odd one.

(a) MAT
(b) BAT
(c) CAT
(d) HAT

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Q93. Select the option that is related to the third term in the same way as the second term is related to the first term.

Uttar Pradesh : Lucknow :: Chhattisgarh : ?

(a) Bilaspur
(b) Ambikapur
(c) Raipur
(d) Korba

Q94. In the following series, how many times is 5 immediately preceded by 6 but NOT followed by 9?

897659736543288777659654659 8765

(a) 3
(b) 6
(c) 2
(d) 5

Q95. Solve the following.

8000 + 2000/100 – 150 × 60

(a) –8000
(b) 980
(c) –980
(d) 8900

Q96. In a certain code language, RAM is written as TYO. How will CPU be written as in that language?

(a) EWN
(b) NEW
(c) WNE
(d) ENW

Q97. Consider the given statement and decide which of the given assumptions is/are implicit in the statement.

Statement:

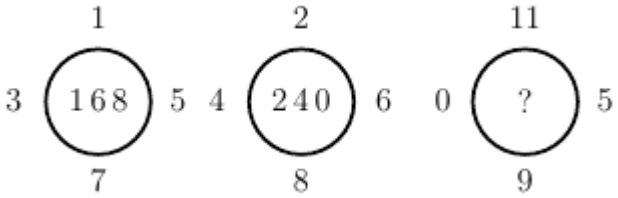
Indians go abroad to get better jobs.

Assumptions:

1. Indians can get better jobs abroad.
2. India lacks better job opportunities.

(a) Only assumption 2 is implicit.
(b) Only assumption 1 is implicit.
(c) Both assumptions 1 and 2 are implicit.
(d) Neither assumption 1 nor 2 is implicit.

Q98. Study the given pattern carefully and select the number from among the given options that can replace the question mark (?).



(a) 216
(b) 156
(c) 454
(d) 227

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Q99. Read the given statement and conclusions carefully. Assuming that the information given in the statement 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.

Statement:

All reds are black.

Conclusions:

1. Some blacks are red.

2. Some reds are black.

(a) Only conclusion 2 follows.

(b) Neither conclusion 1 nor 2 follows.

(c) Both conclusions 1 and 2 follow.

(d) Only conclusion 1 follows.

Q100. Radha told Sita, "My mother's only brother's son is your brother". How is Radha related to Sita?

(a) Father's sister's daughter

(b) Sister

(c) Mother's brother's daughter

(d) Father's sister

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) 400 km

The correct answer is 400 km.

Key Points

• The International Space Station (ISS) orbits Earth at an average altitude of approximately 400 km.

• The ISS travels at a speed of about 28,000 km/h, completing roughly 15.5 orbits per day.

• The ISS serves as a microgravity and space environment research laboratory in which scientific research is conducted in astrobiology, astronomy, meteorology, physics, and other fields.

• The ISS is a joint project of five participating space agencies: NASA (United States), Roscosmos (Russia), JAXA (Japan), ESA (Europe), and CSA (Canada).

Additional Information

Agency	Description
NASA	The National Aeronautics and Space Administration is the United States government agency responsible for the nation's civilian space program and for aeronautics and aerospace research.

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Roscosmos	The Russian Federal Space Agency is responsible for the space science program of the Russian Federation and general aerospace research.
JAXA	The Japan Aerospace Exploration Agency is the Japanese national aerospace agency responsible for space research, technology development, and satellite deployment.
ESA	The European Space Agency is an intergovernmental organization dedicated to the exploration of space, with 22 member states.
CSA	The Canadian Space Agency is the national space agency of Canada, responsible for all elements of the Canadian Space Program.

Q2. Answer: (a) DRDO

The correct answer is DRDO.

Key Points

• SAMYUKTA is an electronic warfare program developed by India.

• This program was developed jointly by the Defence Research and Development Organisation (DRDO) and the Indian Army.

• The system is designed to provide comprehensive electronic support to the Indian Army in various operational scenarios.

• DRDO is a premier research and development organization under the Ministry of Defence, India.

• The program enhances the capability of the Indian Army to carry out electronic warfare operations effectively.

Additional Information

Component	Description
DRDO	A premier research and development organization under the Ministry of Defence, India.
Electronic Warfare	Military action involving the use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum.
SAMYUKTA	An electronic warfare system developed to provide comprehensive electronic support to the Indian Army.
Indian Army	The land-based branch and the largest component of the Indian Armed Forces.
Ministry of Defence	The government department responsible for implementing the defense policy set by the Government of India.

Q3. Answer: (b) 5 5/12

Given:

((31/4)^4 -(41/3)^4)/((31/4)² - (41/3)²)

Formula Used:

a² - b² = (a - b)(a + b)

Calculation:

√((31/4)^4 -(41/3)^4)/((31/4)² - (41/3)²)

=> √([(31/4)² -(41/3)²][(31/4)²+(41/3)²])/((31/4)² - (41/3)²)

=> √([(31/4)²+(41/3)²])

=> √([(13/4)²+(13/3)²])

=> √([(169/16)+(169/9)])

=> √(169[(1/16)+(1/9)])

=> √(169[((9 + 16)/144)])

=> √(169[(25/144)])

=> 13 × 5/12

=> 65/12

=> 5 5/12

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Therefore Square root of ((31/4)^4 -(41/3)^4)/((31/4)² - (41/3)²) is 5 5/12.

Q4. Answer: (d) 7

The correct answer is 7.

Key Points

• UN's 'World Cities Report 2016' provides a comprehensive overview of urbanization trends across the world.

• According to the report, India is expected to have 7 megacities by 2030.

• A megacity is defined as a city with a population of more than 10 million people.

• This trend indicates significant urban growth and development in India.

• Current megacities in India include Mumbai, Delhi, and Kolkata, among others.

Additional Information

The UN's 'World Cities Report 2016' is a detailed examination of the state of urbanization globally, offering insights into demographic, social, economic, and environmental trends. It highlights the challenges and opportunities associated with rapid urban growth, particularly in developing countries.

Q5. Answer: (a) Damodar

The correct answer is Damodar.

Key Points

• Damodar Valley Corporation (DVC) was the first major multipurpose river valley project undertaken by the Government of India after independence.

• The project was initiated in 1948 and aimed at flood control, irrigation, and power generation.

• The Damodar River, often referred to as the "Sorrow of Bengal" due to its frequent floods, was chosen for this significant project.

• The first dam constructed under this project was the Tilaiya Dam, which became operational in 1953.

Additional Information

Option	Details
Option 1: Damodar	First major multipurpose river valley project in Independent India, initiated in 1948.
Option 2: Krishna	Known for dams like Nagarjuna Sagar and Srisailam, but these were constructed later.
Option 3: Ganga	Has many significant dams like the Farakka Barrage, but not the first in Independent India.
Option 4: Yamuna	Famous for the Tajewala Barrage and Hathnikund Barrage, but these were also constructed later.

Q6. Answer: (d) 1/15

Given:

(225^(0.2) × 225^(0.3))/(225^(0.6) × 225^(0.4))

Formula Used:

(a^m × aⁿ = a^(m+n))

Calculation:

=> ((225^(0.2) × 225^(0.3))/(225^(0.6) × 225^(0.4)))

=> ((225^(0.2+0.3))/(225^(0.6+0.4)))

=> ((225^(0.5))/(225¹))

=> (1/(225^(0.5)))

=> 1/15

Therefore, the correct answer is option 4.

Q7. Answer: (d) 7/2

Shortcut Trick

Directly substitute the standard trigonometric values:

sin 30° = 1/2, cos 60° = 1/2, and sin 180° = 0.

Expression: 2(1/2) + 5(1/2) + 3(0)

=> 1 + 2.5 + 0 = 3.5 = 7/2.

Therefore The correct answer is 7/2.

Alternate Method

Given: 2sin30° + 5cos60° + 3sin180°

Using the trigonometric ratios for standard angles:

=> Value of sin 30° = 1/2

=> Value of cos 60° = 1/2

=> Value of sin 180° = 0

Now, substitute these values into the given expression:

=> 2 × (1/2) + 5 × (1/2) + 3 × 0

=> 1 + 5/2 + 0

=> (2 + 5) / 2

=> 7/2

Thus, the final evaluated result is 7/2, which matches Option 4.

Therefore The correct answer is 7/2.

Additional Information

Complementary Angles Property

For any angle θ, sin θ = cos(90° − θ). This is why sin 30° = cos 60° = 1/2.

Values of sin(nπ)

The sine of any integer multiple of 180° (π radians) is always zero. Therefore sin 0° = sin 180° = sin 360° = 0.

Standard Trigonometric Table

Always remember the basic values: sin 45° = 1/√2, cos 30° = √3/2, and tan 45° = 1 for quick calculations.

Q8. Answer: (b) Secondary storage

The correct answer is Secondary storage.

Key Points

• Hard disks are classified as secondary storage devices because they are not directly accessed by the CPU.

• They provide non-volatile storage, meaning data is retained even when the computer is turned off.

• Hard disks are used to store large amounts of data, programs, and files that are not currently in use by the system.

• They offer a higher storage capacity compared to primary storage like RAM.

• Data on a hard disk is accessed via an interface like SATA or SSD.

Additional Information

Secondary storage refers to devices that store data persistently and are not directly accessed by the CPU. Examples include hard disks, SSDs, and external storage devices.

Storage Type	Description
Primary Storage	Includes RAM and cache memory, which are directly accessed by the CPU.
Secondary Storage	Includes hard disks and SSDs, which store data persistently and are not directly accessed by the CPU.
Off-line Storage	Refers to storage devices that are not connected to the computer, such as USB drives and external hard drives.
Tertiary Storage	Used for large-scale data storage and archival, such as tape drives and optical jukeboxes.

Q9. Answer: (a) 1/12

Given:

6 h : 3 days

Formula Used:

1 day = 24 h

Calculation:

=> 6 h : 3 days

=> 6 h : 3 × 24 h

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=> 6 h : 72 h

=> 6 : 72

=> 1 : 12

Therefore Option 1 is the correct answer.

Q10. Answer: (c) Sri Lanka

The correct answer is Sri Lanka.

Key Points

• "Sri Lanka" faced coordinated bombings on Easter Sunday, April 21, 2019. - The attacks targeted three "churches", four "hotels", and a "housing complex". - Over "250 people" were killed and more than "500 injured" in the bombings. - The attacks were carried out by "Islamist extremist" groups, including the local group "National Thowheeth Jama'ath (NTJ)". - The incident raised global concerns about "terrorism" and "security" in "South Asia".

Additional Information

Aspect	Description
"Easter Sunday"	A significant "Christian holiday" celebrating the resurrection of "Jesus Christ" from the dead.
"National Thowheeth Jama'ath (NTJ)"	A "radical Islamist" group in Sri Lanka that was involved in the 2019 Easter bombings.
"Impact"	The attacks led to a "state of emergency" and heightened "security measures" across Sri Lanka.
"Global Response"	The international community condemned the attacks and offered "support" to Sri Lanka.
"Tourism"	The bombings had a significant negative impact on Sri Lanka's "tourism industry", a major part of its economy.

Q11. Answer: (a) QU

The logic followed here is:

The next term in the given series will be:

Hence, 'QU' is the correct answer.

Q12. Answer: (b) Eight times

The correct answer is Eight times.

Key Points

• India has been elected to the UN Security Council as a non-permanent member eight times as of 1st January 2021.

• The most recent term started in 2021 and will end in 2022.

• India's previous terms were in 1950-51, 1967-68, 1972-73, 1977-78, 1984-85, 1991-92, and 2011-12.

• The UN Security Council consists of 15 members, including 5 permanent members and 10 non-permanent members.

Additional Information

Term	Years
First Term	1950-51
Second Term	1967-68
Third Term	1972-73
Fourth Term	1977-78
Fifth Term	1984-85
Sixth Term	1991-92
Seventh Term	2011-12
Eighth Term	2021-22

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Q13. Answer: (d) Pakistan

The correct answer is Pakistan.

Key Points

• Chashma-III is one of the nuclear power plants located in Pakistan.

• It is situated near the town of Chashma, in the Punjab province.

• The plant is operated by the Pakistan Atomic Energy Commission (PAEC).

• Chashma-III started its commercial operation in 2016.

Additional Information

Option	Details
Option 1: Bangladesh	Bangladesh does not have a nuclear power plant named Chashma-III.
Option 2: India	India has several nuclear power plants, but Chashma-III is not one of them.
Option 3: Afghanistan	Afghanistan does not have any operational nuclear power plants.

Q14. Answer: (c) 150

Given:

Central angle for Mathematics = 180°

Score in Statistics = 80

Score in Economics = 70

Formula Used:

Total angle of pie chart = 360°

Percentage of total score = (Central angle of subject / Total angle) × 100

Calculation:

Total score = Score in Mathematics + 80 (Statistics) + 70 (Economics)

Percentage of Mathematics = (180° / 360°) × 100% = 50%

Percentage of remaining subjects = 100% - 50% = 50%

Score in Statistics and Economics together = 80 + 70 = 150

Since the remaining 50% (Statistics + Economics) represents 150 marks

=> 100% represents = 150 × 2 = 300 marks

Score in Mathematics:

Total marks = 300

Marks in Statistics and Economics = 150

=> Marks in Mathematics = 300 - 150 = 150

Therefore, his score in Mathematics is 150.

Q15. Answer: (d) 2197 m^3

Given:

The surface area of a cube = 1014 m^2

Formula Used:

Surface area of a cube = 6 × $(side)^2$

Calculation:

Surface area of a cube = 6 × $(side)^2$

=> 1014 = 6 × $(side)^2$

=> $side^2$ = 1014/6

=> side = √(1014/6)

=> side = 13 m

Volume of a cube = $(side)^3$

=> Volume = $(13\ m)^3$

=> Volume = 2197 m^3

Therefore Option 4 is the correct answer.

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Q16. Answer: (d) administrative divisions in the Gupta period

The correct answer is administrative divisions in the Gupta period.

Key Points

• Bhukti, Bhoga, Visaya, Vithi, and Mandal were administrative divisions in the Gupta period.
• These divisions helped in the efficient administration of the vast Gupta Empire.
• Bhukti was equivalent to a province, while Visaya referred to a district.
• Vithi and Mandal were smaller subdivisions within a district.
• The Gupta rulers implemented a well-structured administrative system to maintain control over their territories.

Additional Information

Division	Description
Bhukti	A province or large administrative division in the Gupta Empire.
Visaya	A district within a Bhukti, responsible for local administration.
Vithi	A smaller administrative unit within a Visaya.
Mandal	Another type of smaller subdivision within a Visaya.

Q17. Answer: (c) Rectifier

The correct answer is Rectifier.

Key Points

• A rectifier is an electrical device that converts alternating current (AC) to direct current (DC).
• It works by allowing current to flow only in one direction.
• Rectifiers are used in power supplies for electronic devices.
• They are essential in converting the AC power from the mains supply to the DC power required by most electronic circuits.

Additional Information

Option	Details
Option 1	A Calorimeter is used to measure the heat of chemical reactions or physical changes.
Option 2	A Capacitor is used to store electrical energy temporarily in an electric field.
Option 3	A Rectifier converts AC to DC.
Option 4	A Rheostat is used to adjust the resistance in an electric circuit.

Q18. Answer: (c) Rs. 6,600 and Rs. 7,150

Given:

Ratio of incomes of Barun and Anil = 12 : 13

Ratio of expenditures of Barun and Anil = 10 : 13

Savings of Barun = Rs. 2,100

Savings of Anil = Rs. 1,300

Formula Used:

Income = Expenditure + Savings

Calculation:

Let Barun's income = 12x and Anil's income = 13x.

Let Barun's expenditure = 10y and Anil's expenditure = 13y.

Since savings = income - expenditure,

Barun's savings = 12x - 10y = 2,100 ... (1)

Anil's savings = 13x - 13y = 1,300 ... (2)

From equation (1), => 12x - 10y = 2,100

From equation (2), => 13x - 13y = 1,300

Multiplying equation (2) by 10 and equation (1) by 13 to make the coefficients of y equal:

=> 130x - 130y = 13,000

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=> 156x - 130y = 27,300

=> 26x = 14,300 => x = 14,300 / 26 => x = 550

Now, substituting the value of x in equation (1) or (2), => 12x = 12 × 550 = 6,600 => 13x = 13 × 550 = 7,150

Therefore, Barun's income is Rs. 6,600 and Anil's income is Rs. 7,150.

Q19. Answer: (d) Both conclusions 1 and 2 follows.

The least possible Venn diagram is as follows:

Conclusions:

1. Some students know English language. → True (as most students know English language)

2. Some students do not know English language. → True (as most students know English language, it means all students do not know English language and there are some students who do not know English language)

Thus, both conclusion follows.

Hence, the correct answer is "Both conclusions 1 and 2 follows.".

Q20. Answer: (a) Loktak Lake, Manipur

The correct answer is Loktak Lake, Manipur.

Key Points

• Loktak Lake is the largest freshwater lake in northeastern India, located in Manipur.

• The lake is known for its unique circular floating swamps, called phumdis.

• The floating elementary school was inaugurated to provide education to children living in the lake's vicinity.

• It aims to address the educational needs of children from the local fishing community.

• The school is part of an initiative to promote sustainable living and education in remote areas.

Additional Information

Aspect	Description
Location	Loktak Lake is situated in the Bishnupur district of Manipur, India.
Phumdis	These are heterogeneous mass of vegetation, soil, and organic matter at various stages of decomposition.
Keibul Lamjao National Park	The only floating national park in the world, located on the southeastern shores of Loktak Lake.
Fishing Community	The lake is home to a large number of fishermen who depend on it for their livelihood.
Environmental Concerns	Issues such as pollution and the construction of dams have affected the lake's ecosystem.

Q21. Answer: (d) 200

Given:

(3/√0.0009 + 4/√0.0016)

Formula Used:

(√(a²) = a)

Calculation:

=> (3/√0.0009 + 4/√0.0016)

=> (3/0.03 + 4/0.04)

=> 100 + 100

=> 200

Hence, the correct answer is 200.

Q22. Answer: (b) Rs. 13,000

Given:

Principal (P) = Rs. 12,000

Down payment = Rs. 2,000

Time (t) = 1 year

Rate (r) = 10% per year

Formula Used:

Simple Interest (SI) = (P × r × t) / 100

Calculation:

Interest will be incurred on the amount = 12000 - 2000 = 10000

=> SI = (10,000 × 10 × 1) / 100

=> SI = 1,000

Total amount paid = Principal + SI

=> Total amount = 12,000 + 1,000

=> Total amount = Rs. 13,000.

Therefore Option 2 is the correct answer.

Q23. Answer: (b) 10 days

Given:

A's efficiency = 0.4 × B's efficiency

C's efficiency = 0.5 × (A's efficiency + B's efficiency)

C alone completes the task in 30 days

Formula Used:

Efficiency = Work / Time

Calculation:

Let B's efficiency be 1 unit/day.

=> A's efficiency = 0.4 × B's efficiency = 0.4 units/day

Since C's efficiency = 0.5 × (A's efficiency + B's efficiency),

=> C's efficiency = 0.5 × (0.4 + 1) = 0.5 × 1.4 = 0.7 units/day

C completes the task in 30 days,

=> Work = C's efficiency × Time = 0.7 units/day × 30 days = 21 units

Combined efficiency of A, B, and C together = 0.4 units/day + 1 unit/day + 0.7 units/day = 2.1 units/day

Time taken by A, B, and C together to complete the task: = 21 units / 2.1 units/day = 10 days.

Therefore Option 2 is the correct answer.

Q24. Answer: (d) 20 days

Given:

A does half of the work done by B in 3/4th of time

Time taken by A and B to complete the work = 12 days

Calculation:

Let the number of days taken by B to complete the work be x.

Then the number of days taken by A to complete half of the work = 3x/4.

Hence, we have the number of days taken by A to complete the work = 2 × (3x/4)= 3x/2.

The number of days taken by both A and B to complete the work =12.

Part of the work done by both in 1 day = 1/12

Part of the work done by A alone in 1 day =1/(3x/2) = 2/3x.

Part of work done by B alone in 1 day = 1/x.

=>1/x + 2/3x = 1/12

=> (3+2)/3x = 1/12

=> 5/3x = 1/12

=> 3x = 5×12

=> x = 20

Therefore B will take 20 days to do the work.

Q25. Answer: (a) decreases

The correct answer is decreases.

Key Points

• Speed of sound is affected by the medium through which it travels.

• In a solid medium, particles are closely packed, allowing sound waves to travel faster.

• In a gaseous medium, particles are spread out, causing sound waves to travel slower.

• Thus, as sound passes from a solid to a gaseous medium, its speed decreases.

Additional Information

Medium	Speed of Sound (m/s)
Solid (e.g., steel)	~5000
Liquid (e.g., water)	~1500
Gas (e.g., air)	~343

Q26. Answer: (c) Burma

The correct answer is Burma.

Key Points

• Bahadur Shah Jafar was the last Mughal Emperor of India.

• He was a symbolic leader during the 1857 Revolt, which is also known as India's first war of independence.

• After the failure of the revolt, he was captured by the British forces.

• In 1858, he was exiled to Burma (present-day Myanmar), where he lived the remainder of his life.

• He died in exile in Rangoon (now Yangon) in 1862.

Additional Information

Year	Event
1857	Start of the First War of Independence
1858	Exile of Bahadur Shah Zafar to Burma
1862	Death of Bahadur Shah Zafar in Rangoon

Additional Information

• 1857 Revolt: Also known as the Sepoy Mutiny, it was a major, but ultimately unsuccessful, uprising in India against the British East India Company's rule.

• Bahadur Shah Zafar: He was more of a symbolic figurehead during the revolt, as the actual fighting was led by Indian soldiers (sepoys) and local leaders.

• British Repression: The British brutally suppressed the revolt, leading to significant changes in their approach to ruling India.

• End of Mughal Rule: The exile of Bahadur Shah Zafar marked the official end of the Mughal Empire in India.

Q27. Answer: (c) 2, 10

The logic followed here is :

In each figure 2 is placed in first square and the product of both the numbers in square is placed in circle.

In figure 1:

2 × 6 = 12;

In figure 2:

2 × 8 = 16

Similarly, in figure 3:

2 × 10 = 20

Hence, both the question marks will be replaced by 2 and 10 respectively from left to right.

Q28. Answer: (a) Microsoft Office

The correct answer is Microsoft Office.

Key Points

• Microsoft Office is a software suite, not hardware.

• Hardware components are physical parts of a computer.

• Examples of hardware include the monitor, keyboard, and CPU.

• Software like Microsoft Office is used to perform tasks on a computer.

Additional Information

Option	Details

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Option 2	A Monitor is an output device that displays information visually.
Option 3	A Keyboard is an input device used to enter data into a computer.
Option 4	The CPU (Central Processing Unit) is the primary component of a computer that performs most of the processing.

Q29. Answer: (a) Setu-Bharatam Project

The correct answer is Setu-Bharatam Project.

Key Points

• Setu-Bharatam Project was launched in March 2016 by the Government of India.

• The aim of the project is to make all national highways free from railway level crossings.

• The project includes the construction of new bridges and the renovation of old ones on national highways.

• The initiative is expected to enhance road safety and reduce travel time across the country.

Additional Information

Component	Description
Objective	To eliminate all railway level crossings on national highways by constructing over bridges and underpasses.
Scope	Construction of around 208 Railway Over Bridges (ROBs) and Railway Under Bridges (RUBs).
Funding	The project is funded by the Government of India and executed by the Ministry of Road Transport and Highways.
Benefits	Improves connectivity and enhances road safety by reducing the risk of accidents at railway crossings.

Q30. Answer: (c) √13a

Given:

Adjacent sides of the parallelogram = 4a and 3a

Angle between two adjacent sides = 60°

Formula used:

Two adjacent sides and the respective diagonal makes a triangle and here, we have the length of two sides and the angle between them

Cosine Law:

$a2 = b2 + c2 – 2bc \cos \alpha$

Calculation:

By using cosine law, we get

$\Rightarrow d^2 = (4a)^2 + (3a)^2 - 2 \times 4a \times 3a \times \cos 60°$

$\Rightarrow d^2 = 16a^2 + 9a^2 - 24a^2 \times 1/2$

$\Rightarrow d^2 = 25a^2 - 12a^2$

$\Rightarrow d^2 = 13a^2$

$\Rightarrow d = \sqrt{(13a^2)}$

$\Rightarrow d = a\sqrt{13}$

Therefore Option 3 is the correct answer.

Q31. Answer: (b) real exchange rate

The correct answer is real exchange rate.

Key Points

• The real exchange rate measures the value of a currency against another, adjusted for price levels.

• It reflects the purchasing power of one currency in terms of another.

• The real exchange rate can indicate whether a currency is overvalued or undervalued compared to another.

• This rate is crucial for evaluating the competitiveness of a country's goods and services.

Additional Information

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Option	Details
Option 1	The nominal exchange rate is the rate at which one currency can be exchanged for another without adjustments for price levels.
Option 2	The real exchange rate considers price level differences between countries.
Option 3	The balance of payments records all economic transactions between residents of a country and the rest of the world.
Option 4	Purchasing power parity (PPP) is a theory that states that in the long term, exchange rates should move towards the rate that would equalize the prices of an identical basket of goods and services in any two countries.

Q32. Answer: (c) Plasma

The correct answer is Plasma.

Key Points

• Plasma is the liquid component of blood that holds the blood cells in suspension.

• It makes up about 55% of the body's total blood volume.

• Plasma is composed mostly of water (about 90%), along with proteins, glucose, electrolytes, hormones, and waste products.

• It serves as a medium for transporting nutrients, hormones, and proteins to the parts of the body that need them.

Additional Information

Option	Details
Option 1	Cerebrospinal fluid is a clear, colorless body fluid found in the brain and spinal cord.
Option 2	Saliva is a watery secretion in the mouth that aids in digestion and keeps the mouth moist.
Option 3	Plasma is the fluid matrix of blood, in which RBCs, WBCs, and platelets are suspended.
Option 4	Lymph is a clear fluid that circulates through the lymphatic system and helps in immune functions.

Q33. Answer: (a) Rajasthan

The correct answer is Rajasthan.

Key Points

• Ghoomar is a traditional folk dance of Rajasthan, known for its graceful movements and colorful attire.

• The dance is typically performed by women who wear flowing dresses called ghagras.

• Ghoomar is often performed during special occasions, such as weddings and festivals like Teej and Holi.

• The dance involves pirouetting and moving in a circular motion, symbolizing happiness and celebration.

Additional Information

Aspect	Description
Origin	Ghoomar originated in the Bhil tribe and was later adopted by the royal communities of Rajasthan.
Attire	Performers wear traditional Rajasthani dresses called ghagras and adorn themselves with jewelry.
Music	The dance is accompanied by traditional Rajasthani folk music, often featuring instruments like the dhol and shehnai.
Significance	Ghoomar is a symbol of cultural heritage and is performed to celebrate joy and prosperity.

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Q34. Answer: (d) 400

Given

(289 × 289 × 289 + 111 × 111 ×111)/(289 × 289 -289 × 111 + 111 ×111)

Formula Used

$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

Calculation

=> (289 × 289 × 289 + 111 × 111 ×111)/(289 × 289 -289 × 111 + 111 ×111)

Using formula,

=> (289 + 111)(289 × 289 -289 × 111 + 111 ×111)/(289 × 289 -289 × 111 + 111 ×111)

=> 400

Therefore Option 4 is the correct answer.

Q35. Answer: (d) 3 days

Given

A can complete a task in 8 days working 5 h a day

B can complete the same task in 10 days working 6 h a day

Formula Used

Work done = Rate of work × Time taken

Calculation:

Total hours A works to complete the task = 5 × 8 = 40 hours Total hours B works to complete the task = 6 × 10 = 60 hours

=> LCM of 40 and 60 = 120 hours

Work done by A in 1 hour = 120 / 40 = 3 units/hour

Work done by B in 1 hour = 120 / 60 = 2 units/hour

Combined work done by A and B in 1 hour = 3 + 2 = 5 units/hour

If they work together 8 hours a day,

=> Total work done in 1 day = 5 units/hour × 8 hours = 40 units

=> Total work / Work done per day = 120 / 40 = 3 days

Therefore, working 8 hours a day, A and B can jointly complete the task in 3 days.

The correct answer is option 4.

Q36. Answer: (b) Malik Muhammad "Jayasi"

The correct answer is Malik Muhammad Jayasi.

Key Points

• Malik Muhammad Jayasi wrote the epic poem "Padmavat" in 1540.

• The poem is a fictionalized account of the siege of Chittor by Alauddin Khilji in 1303.

• "Padmavat" is written in the Awadhi language and is considered a significant work in Indian literature.

• The poem blends elements of history, legend, and folklore, focusing on the beauty and valor of Queen Padmini.

Additional Information

Option	Details
Mulla Daud	He was a 14th-century Indian poet known for his work "Chandayan".
Malik Muhammad Jayasi	He was a 16th-century Indian Sufi poet who wrote "Padmavat".
Abu'l-Fazl ibn Mubarak	He was a court historian of Akbar and author of the "Akbarnama".
Amir Khusro	He was a Sufi musician, poet, and scholar from India, known for his Persian and Hindavi poetry.

Q37. Answer: (a) Maharatna

The correct answer is Maharatna.

Key Points

• Bharat Heavy Electricals Limited (BHEL) is a Maharatna company. - The Maharatna status is granted to select public sector enterprises in India. - BHEL is a leading company in the energy-related and infrastructure sector in India. - The Government of

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India awards the Maharatna status based on certain criteria, including net worth and profitability. - BHEL has a significant presence in the power generation and transmission sectors.

Additional Information

Bharat Heavy Electricals Limited (BHEL) is one of the largest engineering and manufacturing companies in India. Established in 1964, it primarily operates in the power generation and transmission sectors, offering products and services for thermal, hydro, and nuclear power plants. BHEL also caters to industries such as transportation, renewable energy, and defense. The company has a significant presence both in India and globally, with a strong track record of delivering high-quality engineering solutions.

Q38. Answer: (d) 1R8

The logic followed here is:

Hence, '1R8' is the correct answer.

Q39. Answer: (d) Vikram Kumar Doraiswami

The correct answer is Vikram Kumar Doraiswami.

Key Points

• Vikram Kumar Doraiswami was appointed as the Indian Envoy to Bangladesh in October 2020.

• He succeeded Riva Ganguly Das in this position.

• Before this appointment, Doraiswami served as the Additional Secretary in the Ministry of External Affairs.

• He has also served as the Ambassador of India to South Korea.

Additional Information

Term	Description
Indian Envoy	The official diplomatic representative of India to a foreign country, responsible for managing diplomatic relations.
Bangladesh	A neighboring country to India, sharing cultural, historical, and economic ties.
Ministry of External Affairs	The Indian government department responsible for managing India’s foreign relations.
Ambassador	A diplomatic official accredited to a foreign sovereign or government, or to an international organization, to serve as the official representative of their own country.

Q40. Answer: (c) Odometer

The correct answer is Odometer.

Key Points

• The odometer is an instrument used in vehicles to measure the distance travelled by the vehicle.

• It is typically located on the vehicle's dashboard.

• Odometers can be mechanical, digital, or a combination of both.

• This device helps in tracking the vehicle's mileage, which is crucial for maintenance and resale purposes.

Additional Information

Option	Details
Option 1: Autometer	An autometer is a brand name for a company that manufactures various automotive gauges.
Option 2: RPM meter	An RPM meter, or tachometer, measures the engine's revolutions per minute.
Option 3: Odometer	An odometer measures the total distance a vehicle has travelled.
Option 4: Speedometer	A speedometer measures and displays the current speed of the vehicle.

Q41. Answer: (b) Bihar

The correct answer is Bihar.

Key Points

• Bihar is the most thickly populated state in India as per the 2011 census.

• The population density of Bihar is approximately 1102 persons per square kilometer.
• This high density is due to a combination of factors including high birth rates and relatively small land area.
• Other states like Uttar Pradesh have large populations but lower population density compared to Bihar.

Additional Information

Option	Details
Goa	Goa is one of the least populated states and has a much lower population density.
Uttar Pradesh	Uttar Pradesh has the largest population but a lower population density (828 persons per square kilometer) compared to Bihar.
Tamil Nadu	Tamil Nadu has a moderate population density of 555 persons per square kilometer.

Q42. Answer: (d) (n(n + 1))/2

Calculation:

Sum of first 'n' natural numbers = n(n + 1)/2

Therefore Option 4 is the correct answer.

Q43. Answer: (b) 21 years

The correct answer is 21 years.

Key Points

• Article 243V of the Constitution of India prescribes the minimum age requirement for becoming a member of a Municipality.
• The minimum age requirement is 21 years.
• This provision ensures that members have attained a certain level of maturity and responsibility.
• It aligns with the age requirement for other local bodies in India.
• The age criterion is part of broader eligibility criteria that may include residency and non-disqualification clauses.

Additional Information

Article	Description
Article 243V	Eligibility criteria for membership in Municipalities, including age, residency, and other qualifications.
Article 243Q	Defines the constitution of Municipalities in urban areas.
Article 243R	Provides for the composition of Municipalities, including elected and nominated members.
Article 243S	Deals with the constitution and composition of Wards Committees.
Article 243T	Provides for reservation of seats for Scheduled Castes, Scheduled Tribes, and women in Municipalities.
Article 243U	Specifies the duration of Municipalities and conditions for their dissolution.

Q44. Answer: (d) 8

The logic followed here is:

Let the initial number be x

Calculations of Atul:

$x^2 - 15$

Calculations of Pratul:

$(x - 15)^2 = x^2 - 30x + 225$

As per the given problem:

x2 - 15 = x2 - 30x + 225

30x = 225 + 15

30 x = 240

x = 8

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Hence, 8 was the initial answer.

Q45. Answer: (a) grasslands

The correct answer is grasslands.

Key Points

• Pampas are extensive lowlands in South America, primarily in Argentina, known for their fertile soil and grassland vegetation.

• Steppes are large areas of flat, unforested grassland, particularly in southeastern Europe and Siberia.

• Savannas are mixed grasslands and woodlands, commonly found in Africa, characterized by seasonal rainfall.

• Prairies are extensive flat areas of grassland in North America, particularly in the central United States and Canada.

Additional Information

Option	Details
Option 2	Waterfalls are natural formations where water flows over a vertical drop or a series of steep drops.
Option 3	Lakes in America refer to large inland bodies of water, such as the Great Lakes.
Option 4	Cyclones are large-scale air masses that rotate around a strong center of low atmospheric pressure.

Q46. Answer: (d) 840/109

Given:

$\tan \theta = 5/12$

Calculation:

$\tan \theta = 5/12 = p/b$

$p = 5, b = 12$

$h = \sqrt{p^2 + b^2} = \sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13$

So,

$(\cos \theta + 5\cot \theta)/(\text{cosec } \theta - \cos \theta)$

$\Rightarrow (12/13 + 5 \times 12/5) / (13/5 - 12/13)$

$\Rightarrow (12/13 + 60/5) / (13/5 - 12/13)$

$\Rightarrow [(60 + 780)/ 65] / [(169 - 60)/65]$

$\Rightarrow 840 / 109$

Therefore, the correct answer is option (4).

Q47. Answer: (b) 25/72

Given data:

The fraction after increasing the numerator and decreasing of the denominator is 5/6.

The numerator is increased by 20%.

The denominator is increased by 50%.

Concept:

The percentages of increase applied to the numerator and denominator would be applied as follows: original value × 1 + (percentage/100)

Calculation:

Let the numerator be x and the denominator be y.

According to question,

$\Rightarrow (x \times 120/100)/(y \times 50/100) = 5/6$

$\Rightarrow (x \times 120)/(y \times 50) = 5/6$

$\Rightarrow x/y = 5/6 \times 5/12$

$\Rightarrow x/y = 25/72$

Therefore The correct answer is 25/72.

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Q48. Answer: (d) electricity to all households in India

The correct answer is electricity to all households in India.

Key Points

• Saubhagya Yojana was launched by the Government of India in 2017.

• The main objective of the scheme is to provide electricity connections to all households in rural and urban areas.

• The scheme aims to achieve universal household electrification by ensuring last-mile connectivity and electricity connections to all remaining households.

• Under this scheme, free electricity connections are provided to Below Poverty Line (BPL) households.

• The scheme is also known as the Pradhan Mantri Sahaj Bijli Har Ghar Yojana.

Additional Information

Component	Description
Funding	The scheme is funded by the Government of India with a budget of Rs. 16,320 crore.
Implementation	Implemented by the Rural Electrification Corporation (REC) under the Ministry of Power.
Target	To electrify 4 crore households by March 2019.
Features	Includes provision of transformers, meters, and wires.

Q49. Answer: (a) 24

Given:

Two natural numbers are in the ratio of 6 : 8 and their product is 768.

Formula Used:

Let the numbers be 6x and 8x.

Then, (6x) × (8x) = 768

Calculation:

=> $48x^2 = 768$

=> $x^2 = 768/48$

=> $x^2 = 16$

=> $x = \sqrt{16}$

=> $x = 4$

=> $6x = 6 \times 4 = 24$.

Therefore, the smaller of the numbers is 24.

Q50. Answer: (a) Disdain

The logic followed here is:

The arrangement as per dictionary order will be as follows:

The letter D, I, and S are common in the all these words, so we will start from fourth letter.

i) Discrepancy

ii) Discriminate

iii) Discuss

iv) Disdain

v) Disease

Thus, 'Disdain' will come second last if they are arranged as per their order in an English dictionary.

Hence, the correct answer is "Disdain".

Q51. Answer: (a) 2

Shortcut Trick

Apply Alligation on speeds to find the Time Ratio.

Average speed = 40 km ÷ 7 hours = 40/7 km/h.

Alligation: (Cycling: 12.5) − (Avg: 40/7) vs (Avg: 40/7) − (Walking: 3).

Ratio of Time = (40/7 − 3) : (12.5 − 40/7) => (19/7) : (47.5/7) => 19 : 47.5 => 2 : 5.

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Total time parts = 2 + 5 = 7 units. Since total time is 7 hours, 1 unit = 1 hour.
Therefore The correct answer is 2 hours.
Alternate Method
Given: Cycling speed = 12.5 km/h, Walking speed = 3 km/h, Total distance = 40 km, Total time = 7 hours.
Formula Used: Distance = Speed × Time
Let the time spent cycling be t hours.
Then, time spent walking = (7 − t) hours.
=> Distance by Cycle + Distance by Walk = Total Distance
=> (12.5 × t) + [3 × (7 − t)] = 40
=> 12.5t + 21 − 3t = 40
=> 9.5t = 40 − 21
=> 9.5t = 19
=> t = 19 ÷ 9.5
=> t = 2 hours.
Therefore The correct answer is 2 hours.
Additional Information
Alligation on Speed
When alligation is applied to speeds, the resulting ratio is always the ratio of the Time taken for each part of the journey.
Average Speed
Average Speed = Total Distance ÷ Total Time. In this case, 40 ÷ 7 ≈ 5.71 km/h.
Relative Speed
Used when two objects move. In same direction, subtract speeds (S1 − S2); in opposite directions, add speeds (S1 + S2).

Q52. Answer: (d) 90%

Given:
Total candidates = 250
Candidates passed = 225
Formula Used:
Percentage = (Candidates passed × 100) / Total candidates
Calculation:
=> Percentage = (225 × 100) / 250
=> Percentage = 90%
Therefore Option 4 is the correct answer.

Q53. Answer: (d) 1000 km

The correct answer is 1000 km.
Key Points
• The Nirbhay missile is an Indian long-range, all-weather, subsonic cruise missile.
• It has a strike range of approximately 1000 km, making it capable of hitting targets at a considerable distance.
• Developed by the Defence Research and Development Organisation (DRDO) of India, it is designed to carry both conventional and nuclear warheads.
• The missile can be launched from multiple platforms, including land, sea, and air.
• It features a terrain-hugging capability to avoid detection and improve survivability.
Additional Information

Aspect	Description
Development	The Nirbhay missile was developed by the DRDO.
First Test	The first test flight of Nirbhay was conducted on March 12, 2013.
Capabilities	It is designed to carry both conventional and nuclear warheads.
Launch Platforms	It can be launched from land, sea, and air platforms.
Terrain-Hugging	The missile has a terrain-hugging capability to avoid detection.

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Q54. Answer: (b) TG

The logic followed here is:

Hence, TG is the correct answer.

Q55. Answer: (d) Zero

The correct answer is Zero.

Key Points

• The Simon Commission was a group of seven British Members of Parliament.

• It was established in 1927 to report on the political situation in India.

• The commission did not include any Indian members, which led to widespread protests.

• Indian leaders boycotted the commission because it did not represent Indian interests.

Additional Information

Aspect	Details
Formation Year	The Simon Commission was formed in 1927.
Purpose	To study constitutional reforms in British India.
Members	Consisted of seven British MPs.
Indian Response	Boycott and protests due to lack of Indian representation.
Significance	Highlighted the demand for Indian involvement in governance.

Q56. Answer: (a) 1

The logic followed here is:

In a column:

First number × second number × third number = fourth number.

Column 1:

2 × 3 × 4 = 6 × 4 = 24;

Column 2:

9 × 8 × 7 = 72 × 7 = 504;

Similarly,

Column 3:

5 × 1 × 6 = 30

Hence, '1' can replace the question mark.

Q57. Answer: (c) Kalamandalam Hemlatha

The correct answer is Kalamandalam Hemlatha.

Key Points

• Bandana Nepal set a Guinness World Record for the 'Longest Dancing Marathon by an Individual' in 2019.

• She danced continuously for 126 hours.

• She broke the previous record held by Kalamandalam Hemlatha.

• Kalamandalam Hemlatha had set the previous record by dancing for 123 hours and 15 minutes in 2011.

Additional Information

Bandana Nepal is a Nepalese dancer who gained international recognition for her endurance and passion for dance. Her record-breaking performance was a testament to her dedication and physical stamina. The event was widely covered by the media and brought significant attention to Nepalese culture and talent.

Q58. Answer: (c) Mitochondria

The correct answer is Mitochondria.

Key Points

• Mitochondria are known as the powerhouse of the cell because they generate most of the cell's supply of adenosine triphosphate (ATP), which is used as a source of chemical energy.

• They are involved in other tasks such as signaling, cellular differentiation, and cell death, as well as maintaining control of the cell cycle and cell growth.

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• Mitochondria have their own DNA and are thought to have originated from ancient symbiotic bacteria.
• They are double-membrane-bound organelles, with the inner membrane being highly folded into structures known as cristae.

Additional Information

Option	Details
Option 1: Nucleus	The nucleus is the control center of the cell, containing most of the cell's genetic material.
Option 2: Cytoplasm	The cytoplasm is the gel-like substance within the cell membrane, containing all organelles and cell parts.
Option 3: Mitochondria	Mitochondria generate ATP and are involved in various other cellular processes.
Option 4: Endoplasmic Reticulum	The endoplasmic reticulum is involved in protein and lipid synthesis.

Q59. Answer: (a) 35

Given,
A person selling 50 mangoes for Rs. 30, incurs loss by = 10%
Formula:
CP = SP × 100/(100 – Loss%)
Calculation:
Selling price of 50 mangoes = 30
Selling price of 1 mango = 30/50
Cost price of 1 mango = 30/50 × 100/90 = RS. 2/3
Selling price of 1 mango, if he wants 20% profit = Rs. 2/3 × (120/100) = Rs. 4/5
The person sells in Rs. 4/5 = 1 mango
The person sells in Rs. 28 = 1 × 5/4 × 28 = 35 mango
Therefore The person sells 35 mango.

Q60. Answer: (d) Sardar Sarovar Project

The correct answer is Sardar Sarovar Project.

Key Points

• The Sardar Sarovar Project is one of the largest dam projects on the river Narmada.
• It aims to provide water for irrigation, drinking water supply, and hydroelectric power generation.
• The project is located in the state of Gujarat.
• It is a part of the larger Narmada Valley Development Project, which includes multiple dams and canals.

Additional Information

Option	Details
Korba Project	Located in Chhattisgarh, primarily a thermal power project.
Mettur Project	Located in Tamil Nadu, constructed on the river Cauvery.
Farakka Project	Located in West Bengal, constructed on the river Ganges, primarily for irrigation and navigation.

Q61. Answer: (a) phone line

The correct answer is phone line.

Key Points

• Modem stands for Modulator-Demodulator.
• A modem converts digital data from a computer into analog signals that can be sent over a phone line.
• It also converts incoming analog signals back into digital data.20
• This is essential for internet connectivity over traditional phone lines.

Additional Information

Option	Details

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Option 1	A modem is connected to a phone line for internet connectivity.
Option 2	A mouse is a peripheral device used to interact with a computer's user interface.
Option 3	A motherboard is the main circuit board of a computer, connecting all components.
Option 4	A monitor is an output device that displays information from the computer.

Q62. Answer: (b) 31

Given:

(14 ÷ 7) × [8 + {3 + 8 - 2}] - (5 - 2)

Concept Used:

Calculation:

=> (14 ÷ 7) × [8 + {3 + 8 - 2}] - (5 - 2)

=> (2) × [8 + {11 - 2}] - (3)

=> (2) × [8 + 9] - (3)

=> (2) × 17 - (3)

=> 34 - (3)

=> 31

Therefore Option 2 is the correct answer.

Q63. Answer: (c) Uber

The correct answer is Uber.

Key Points

• Uber launched a helicopter service in New York in October 2019.

• The service is known as Uber Copter.

• Uber Copter offers flights between Manhattan and JFK Airport.

• The service aims to reduce travel time significantly compared to traditional road transport.

Additional Information

Aspect	Description
Uber	A global ride-hailing service company.
Uber Copter	An aerial ridesharing service offered by Uber.
Manhattan	A borough of New York City where Uber Copter services are available.
JFK Airport	One of the major airports in New York, connected by Uber Copter.
Travel Time	Uber Copter aims to significantly reduce travel time between Manhattan and JFK Airport.

Q64. Answer: (b) Iron

The logic followed here is:

• Goldsmith is a person who makes items out of gold.

Similarly,

• Blacksmith is a person who makes items out of Iron.

Hence, Iron is the correct answer.

Q65. Answer: (d) A

The relationship between Words, Letters and Sentence is as follows:

• All sentence have words.

• All words have letters.

The least possible Venn Diagram will be as follows:

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Hence, figure 'A' is the correct answer.

Q66. Answer: (c) 540

Given:

a = 9, b = -5 and c = -4

FORMULA USED:

If a + b + c = 0, then

a3 + b3 + c³ = 3abc

CALCULATIONS:

a = 9, b = -5 and c = -4

=> a + b + c = 9 + (-5) + (-4) = 0

=> a3 + b3 + c3 = 3abc

=> 3 × 9 × (-5) × (-4)

=> 540

Therefore Option 3 is the correct answer.

Q67. Answer: (d) 2

Given:

When x4 – px3 + 2x2 – 5x + 8 is divided by (x - 1), the remainder is (2p).

Formula Used:

Remainder Theorem: If a polynomial (f(x)) is divided by ((x-a)), then the remainder is (f(a)).

Calculation:

Using the Remainder Theorem with (x - 1), => (f(1) = 2p)

Substituting (x = 1) into the original polynomial:

=> (f(1) = 14 - p(1)3 + 2(1)2 - 5(1) + 8)

=> (1 - p + 2 - 5 + 8 = 2p)

=> (1 - p + 2 - 5 + 8 = 6 - p = 2p)

=> (6 = 3p)

=> (p = 2)

Therefore Option 4 is the correct answer.

Q68. Answer: (c) 1266-1287

The correct answer is 1266-1287.

Key Points

• Ghiyas-ud-din Balban was one of the most powerful rulers of the Delhi Sultanate.

• He ruled from 1266 to 1287, following the death of Sultan Nasir-ud-din Mahmud.

• Balban is known for his strong centralized administration and military reforms.

• He implemented a policy of iron-fisted governance to consolidate his rule and suppress rebellions.

Additional Information

Aspect	Description
Early Life	Balban was originally a Turkish slave who rose to prominence in the court of Sultan Iltutmish.
Military Reforms	He reorganized the army and established a strong military presence to defend the Sultanate.
Administrative Reforms	He centralized administration and established a system of efficient governance.
Suppression of Nobles	Balban crushed the power of the Turkish nobles to establish his supremacy.
Legacy	He left a legacy of strong centralized rule, which was followed by his successors.

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Q69. Answer: (b) 99 years and 110 years

Given

Present age ratio of Sheo Kumar and Dileep Kumar = 9:10.

After 11 years, their age ratio will be = 10:11.

Formula Used

Present age = Ratio × Common multiple.

Future age = Present age + Years added.

Future age ratio = Future Age of Person 1 / Future Age of Person 2.

Calculation

Let the common multiple be x.

Thus, the present ages of Sheo Kumar and Dileep Kumar would be 9x and 10x respectively.

After 11 years:

Sheo Kumar's age = 9x + 11.

Dileep Kumar's age = 10x + 11.

The future ratio of their ages is 10:11, so:

=> [(9x + 11)/(10x + 11) = 10/11]

=> [11(9x + 11) = 10(10x + 11)]

=> [99x + 121 = 100x + 110]

=> [121 - 110 = 100x - 99x]

=> [11 = x]

Sheo Kumar's age = 9x = 9 × 11 = 99 years.

Dileep Kumar's age = 10x = 10 × 11 = 110 years.

Therefore, the present ages of Sheo Kumar and Dileep Kumar are 99 years and 110 years, respectively.

Q70. Answer: (c) President

The correct answer is President.

Key Points

• The President of India is the constitutional head of the Executive of the Union of India.

• The President exercises his/her executive powers through officers subordinate to him as per the Constitution.

• The President is also the Supreme Commander of the Indian Armed Forces.

• The President is elected by an electoral college consisting of elected members of both houses of Parliament and the legislative assemblies of states and union territories.

Additional Information

Option	Details
Option 1	The Chief of Army Staff is the head of the Indian Army but does not have executive powers over the Union.
Option 2	The Speaker of the Lok Sabha presides over the lower house of Parliament but is not the head of the executive.
Option 3	The President is the constitutional head of the Executive of the Union of India.
Option 4	The Prime Minister is the head of the government but not the constitutional head of the executive.

Q71. Answer: (d) C

The relationship between man, smokers, and cricketers is as follows:

i) Some man are smokers.

ii) Some man are cricketers.

iii) Some smokers are cricketers.

The least possible Venn Diagram is as follows:

Hence, figure 'C' is the correct answer.

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Q72. Answer: (b) 0.0121

Given:

121/0.121 = 12.1/x

Calculation:

=> 121/0.121 = 12.1/x

=> (121 × 1000)/121 = 121/(x × 10)

=> x = (121 × 121)/(121 × 1000× 10)

=> x = 121/10000

=> x = 0.0121

Therefore Option 2 is the correct answer.

Q73. Answer: (d) –3

Given

The roots of the equation (3x^2 + 5x - a = 0) are reciprocals of each other.

Formula Used

For the quadratic equation (ax^2 + bx + c = 0), sum of roots = (-b/a) and product of roots = (c/a).

If roots are reciprocals of each other, the product of roots = 1.

Calculation

Given equation: (3x² + 5x - a = 0)

Product of roots = ((-a)/3 = 1)

=> (-a = 3)

=> (a = -3)

Therefore, the value of (a) is -3.

Q74. Answer: (a) Tuberculosis

The correct answer is Tuberculosis.

Key Points

• Tuberculosis is caused by a bacterium called Mycobacterium tuberculosis.

• Unlike the other diseases listed, it is not caused by a virus.

• Tuberculosis primarily affects the lungs but can also affect other parts of the body.

• The other options (Influenza, Chicken Pox, Measles) are all viral diseases.

Additional Information

Option	Details
Option 2: Influenza	Caused by the Influenza virus, it affects the respiratory system.
Option 3: Chicken Pox	Caused by the Varicella-zoster virus, it leads to an itchy rash with red spots and blisters.
Option 4: Measles	Caused by the Measles virus, it results in a red, blotchy skin rash and flu-like symptoms.

Q75. Answer: (c) 4 : 6

Given

The areas of two similar triangles are respectively 16 m² and 36 m².

Formula Used

The ratio of areas of two similar triangles = (ratio of their corresponding sides)².

Calculation

Let the ratio of their corresponding sides be x:1.

Given, the ratio of their areas = (16:36 = 4:9).

=> (x:1)² = 4:9

=> x² = 4/9

=> x = √(4/9)

=> x = 2/3

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Therefore, the ratio of their corresponding sides is 2:3.

Q76. Answer: (a) 6:30 p.m.

Given

The thief steals a bag and drives away at 50 km/h at 3 p.m.

The owner sets off in pursuit at 70 km/h at 4 p.m.

Calculation

The Distance covered by the thief = 50 km/h × 1 hour = 50 km.

Relative Speed = 70 km/h - 50 km/h = 20 km/h.

Distance to cover to catch the thief = 50 km.

Time taken to catch the thief = Distance / Relative Speed

=> 50 km / 20 km/h = 2.5 hours.

Since the owner starts at 4 p.m., he will catch the thief at (4 + 2.5 = 6:30 PM)

Therefore, the owner will catch the thief at 6:30 p.m.

Q77. Answer: (a) B

The relationship between Mother, father and Women is as follows:

• All mothers are women.

• No mother is father.

• No women is father.

The least possible Venn diagram is as follows:

Hence, figure 'B' is the correct answer.

Q78. Answer: (c) Ladyfinger

The logic followed here is:

Vegetables Potato, Beetroot, and Carrot grow below the ground whereas Ladyfinger grows above the ground.

Hence, Ladyfinger is different from the rest.

Q79. Answer: (b) Muhammad Quli Qutab Shah

The correct answer is Muhammad Quli Qutab Shah.

Key Points

• Muhammad Quli Qutab Shah founded Hyderabad in 1591 and built the Charminar.

• The Charminar was constructed to commemorate the eradication of plague from the city.

• It is an iconic landmark of Hyderabad and a fine example of Indo-Islamic architecture.

• The structure features four grand arches facing each cardinal direction, leading to four streets.

Additional Information

Option	Details
Option 1	Asaf Jah was the founder of the Asaf Jahi dynasty and the first Nizam of Hyderabad, but he did not build the Charminar.
Option 2	Muhammad Quli Qutab Shah was the fifth sultan of the Qutb Shahi dynasty and the founder of Hyderabad, who built the Charminar.
Option 3	Allauddin Khilji was a ruler of the Khilji dynasty in Delhi, known for his military conquests, not for building the Charminar.
Option 4	Muhammad bin Tuglaq was a Sultan of Delhi from the Tughlaq dynasty, known for his ambitious projects and administrative reforms, not for building the Charminar.

Q80. Answer: (c) Raj Kumar Shukla

The correct answer is Raj Kumar Shukla.

Key Points

• Raj Kumar Shukla was a local farmer from Champaran, Bihar.

• He was instrumental in persuading Mahatma Gandhi to visit Champaran to address the grievances of the farmers.

• The farmers were oppressed by the British planters who forced them to grow indigo under exploitative conditions.

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• Gandhi's visit to Champaran in 1917 marked the beginning of the first civil disobedience movement in India.

Additional Information

Option	Details
Option 1	Aruna Asaf Ali was a prominent freedom fighter and is known for hoisting the Indian National Congress flag at the Gowalia Tank Maidan in Bombay during the Quit India Movement in 1942.
Option 2	Maulana Mazharul Haque was an Indian independence activist and a prominent leader in the Indian National Congress, but he was not directly involved in bringing Gandhi to Champaran.
Option 3	Raj Kumar Shukla, a local farmer, played a crucial role in bringing Mahatma Gandhi to Champaran to address the plight of the indigo farmers.
Option 4	Batak Miyan was a cook who saved Mahatma Gandhi's life by warning him about a plot to poison him during his Champaran visit.

Q81. Answer: (b) fundamental duty

The correct answer is fundamental duty.

Key Points

• Fundamental Duties are enshrined in Part IVA of the Indian Constitution under Article 51A.

• These duties were added by the 42nd Amendment Act of 1976, based on the recommendations of the Swaran Singh Committee.

• The purpose of these duties is to remind citizens that they have responsibilities in addition to rights.

• There are currently 11 fundamental duties listed in the Indian Constitution.

• One of these duties is to uphold and protect the sovereignty, unity, and integrity of India.

Additional Information

Duty	Description
To abide by the Constitution and respect its ideals and institutions	This includes respecting the National Flag and the National Anthem.
To cherish and follow the noble ideals	These ideals inspired the national struggle for freedom.
To uphold and protect the sovereignty, unity, and integrity of India	This duty emphasizes the importance of national unity.
To defend the country and render national service	Every citizen is expected to be ready to defend the nation.
To promote harmony and the spirit of common brotherhood	This includes transcending religious, linguistic, and regional diversities.
To value and preserve the rich heritage of our composite culture	Citizens should take pride in India's cultural heritage.
To protect and improve the natural environment	This includes forests, lakes, rivers, and wildlife.
To develop the scientific temper, humanism, and spirit of inquiry and reform	Encourages rational thinking and questioning of superstitions.
To safeguard public property and to abjure violence	Protecting public assets and maintaining peace is crucial.
To strive towards excellence in all spheres of individual and collective activity	This ensures that the nation constantly rises to higher levels of achievement.
To provide opportunities for education to children	Parents or guardians must ensure their children get education.

Q82. Answer: (c) NLYROV

The logic followed here is:

Here, each letter is replaced by the letter which have same positional value in reverse alphabetical order.

So, the code for Mirror will be as follows:

Similarly,

• The code for MOBILE will be:

Hence, NLYROV is the correct answer.

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Q83. Answer: (b) Kerala

The logic followed here is:

• Bihu is a classical dance form which originated in Assam.

Similarly,

• Kathakali is a classical dance form which originated in Kerala.

Hence, Kerala is the correct answer.

Q84. Answer: (d) 123

The logic followed here is:

13 - 2 = -1

23 - 2 = 8 - 2 = 6;

33 - 2 = 27 - 2 = 25;

43 - 2 = 64 - 2 = 62;

53 - 2 = 125 - 2 = 123

Hence, '123' is the next term in the given series.

Q85. Answer: (a) Thermal power production

The correct answer is Thermal power production.

Key Points

• Thermal power production involves burning fossil fuels such as coal, oil, and natural gas, which release large amounts of CO_2 into the atmosphere.

• Coal-fired power plants are the biggest contributors to CO_2 emissions among all types of thermal power plants.

• The process of extracting, transporting, and burning fossil fuels in thermal power plants generates significant quantities of greenhouse gases.

• Reducing emissions from thermal power production is crucial for combating climate change and achieving international climate goals.

Additional Information

Thermal Power Production refers to the process of generating electricity by converting heat energy, typically from burning fossil fuels, into electrical energy. This method is widely used worldwide but is a major source of carbon dioxide (CO_2) emissions, contributing significantly to global warming and air pollution.

Fuel Type	Description
Coal	Most widely used fuel in thermal power plants; highest CO_2 emissions per unit of energy produced.
Natural Gas	Cleaner than coal; emits less CO_2 but still a significant source of greenhouse gases.
Oil	Used in some thermal power plants; higher CO_2 emissions than natural gas but lower than coal.

Q86. Answer: (a) 3 out of 5 years

Formula Used:

Change in total coal production = Total production of current year - Total production of previous year.

Calculation:

Total production 2014 = 84 + 168 + 178 + 86 = 516

Total production 2015 = 86 + 164 + 180 + 79 = 509 => Change 2014 to 2015 = 509 - 516 = -7

Total production 2016 = 85 + 162 + 181 + 84 = 512 => Change 2015 to 2016 = 512 - 509 = +3

Total production 2017 = 82 + 163 + 182 + 76 = 503 => Change 2016 to 2017 = 503 - 512 = -9

Total production 2018 = 85 + 145 + 185 + 74 = 489 => Change 2017 to 2018 = 489 - 503 = -14

In 3 years (2015, 2017, and 2018) the overall production of coal fell when compared to the previous year.

Q87. Answer: (d) State A

Formula Used:

Range = Maximum value - Minimum value in the dataset for each state

Calculation:

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State A: => Maximum value = 86, Minimum value = 82
=> Range = 86 - 82 = 4
State B: => Maximum value = 168, Minimum value = 145
=> Range = 168 - 145 = 23
State C: => Maximum value = 185, Minimum value = 178
=> Range = 185 - 178 = 7
State D: => Maximum value = 86, Minimum value = 74
=> Range = 86 - 74 = 12
State A shows the lowest range in data for coal production in the given period.

Q88. Answer: (d) 2018

Formula Used:
Percentage contribution of State C = (Production of State C / Total production) × 100
Calculation:
=> Total production 2014 = 84 + 168 + 178 + 86 = 516
=> Contribution 2014 = (178 / 516) × 100 = 34.50%
=> Total production 2015 = 86 + 164 + 180 + 79 = 509
=> Contribution 2015 = (180 / 509) × 100 = 35.36%
=> Total production 2016 = 85 + 162 + 181 + 84 = 512
=> Contribution 2016 = (181 / 512) × 100 = 35.35%
=> Total production 2017 = 82 + 163 + 182 + 76 = 503
=> Contribution 2017 = (182 / 503) × 100 = 36.18%
=> Total production 2018 = 85 + 145 + 185 + 74 = 489
=> Contribution 2018 = (185 / 489) × 100 = 37.83%
State C registered the highest percentage contribution in 2018 with 37.83%.

Q89. Answer: (a) State C

Formula Used:
Percentage contribution of a state = (Coal Production of State / Total Coal Production) × 100
Calculation:
Total production 2014 = 84 + 168 + 178 + 86 = 516
Total production 2015 = 86 + 164 + 180 + 79 = 509
Total production 2016 = 85 + 162 + 181 + 84 = 512
Total production 2017 = 82 + 163 + 182 + 76 = 503
Total production 2018 = 85 + 145 + 185 + 74 = 489
State A's percentage contribution:
=> 2014 = (84 / 516) × 100 = 16.28
=> 2015 = (86 / 509) × 100 = 16.89
=> 2016 = (85 / 512) × 100 = 16.60
=> 2017 = (82 / 503) × 100 = 16.30
=> 2018 = (85 / 489) × 100 = 17.38
State B:
=> 2014 = (168 / 516) × 100 = 32.56
=> 2015 = (164 / 509) × 100 = 32.22
=> 2016 = (162 / 512) × 100 = 31.64
=> 2017 = (163 / 503) × 100 = 32.40
=> 2018 = (145 / 489) × 100 = 29.65
State C:
=> 2014 = (178 / 516) × 100 = 34.50
=> 2015 = (180 / 509) × 100 = 35.36
=> 2016 = (181 / 512) × 100 = 35.35
=> 2017 = (182 / 503) × 100 = 36.18

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=> 2018 = (185 / 489) × 100 = 37.83

State D:

=> 2014 = (86 / 516) × 100 = 16.67

=> 2016 = (84 / 512) × 100 = 16.41

=> 2017 = (76 / 503) × 100 = 15.11

=> 2018 = (74 / 489) × 100 = 15.13

State C's percentage contribution to the overall coal production has not dropped even once during the 5-year period.

Q90. Answer: (c) D

8 people - A, B, C, D, E, F, G, H

i) A is between E and G, whereas G is sitting second to the right of F.

ii) H is between D and B and is second to the left of F.

• Here H is second to the left of F.

iii) A and B are sitting opposite each other.

• Thus the final arrangement:

Here, D is sitting between H and E.

Hence, D is the correct answer.

Q91. Answer: (a) 160

The logic followed here is:

Hence, '160' will come next in the following series.

Q92. Answer: (c) CAT

The logic followed here is:

MAT → M(13) + A(1) + T(20) = 13 + 1 + 20 = 34; 3 + 4 = 7;

BAT → B(2) + A(1) + T(20) = 2 + 1 + 20 = 23; 2 + 3 = 5;

CAT → C(3) + A(1) + T(20) = 3 + 1 + 20 = 24; 2 + 4 = 6;

HAT → H(8) + A(1) + T(20) = 8 + 1 + 20 = 29; 2 + 9 = 11;

Hence, 'CAT' is the odd one among the given alternatives.

Q93. Answer: (c) Raipur

The logic followed here is:

Lucknow is the capital of Uttar Pradesh.

Similarly,

Raipur is the capital of Chhattisgarh.

Hence, Raipur is the correct answer.

Q94. Answer: (a) 3

The logic followed here is:

Given:

Left : 897659736543288777696546598765 : Right

Condition to be checked:

i) In the given series, 5 immediately preceded by 6 but NOT followed by 9 are:

6 → 5 → 9 (Not 9)

Left : 897659736543288777696546598765 : Right

Thus, there are three such 5's which are immediately preceded by 6 but NOT followed by 9.

Hence, the correct answer is "3".

Mistake Points

• Immediately preceded by means immediately before or to come just before.

• Immediately followed by means immediately after or to come just after.

Q95. Answer: (c) –980

Calculation:

=> 8000 + 2000/100 – 150 × 60

=> 8000 + 20 - 9000

=> -980

Therefore Option 3 is the correct answer.

Q96. Answer: (d) ENW

The logic followed here is:

• The code for RAM is as follows:

Similarly,

• The code for CPU will be?

Hence, 'CPU' will be coded as 'ENW'.

Q97. Answer: (c) Both assumptions 1 and 2 are implicit.

The logic followed here:

The given statement

1. 'Indians go abroad to get better jobs." implies that Indians can get better jobs abroad.

Assumption 1 is implicit,

2. If they can get better jobs abroad, it means that there is lack of better job opportunities in India.

Assumption II is implicit.

Hence, both the assumptions 1 and 2 are implicit.

Additional Information

1. Read the statement with an approach that the assumptions would be true about the statement.

2. Do not go too logical with the statements. Analyze the given information and the assumption must only be made based on the information in the statement. Do not over-complicate it.

3. Common assumptions can always be followed but other than that do not align the statement with General Knowledge or other facts

4. Use the elimination method if you are unable to apprehend the answer. Read the statement and then the assumptions given in the options, you shall notice that a few of them will most definitely not follow. Eliminate them and then choosing from lesser options may prove to be more convenient

5. One thing to note is that the assumption is something that the author believes to be true, so while choosing the correct option, keep this thought in mind. If any option contradicts the statement, then that assumption will not follow.

Q98. Answer: (c) 454

The logic followed here is:

Addition of square of individual outer numbers × 2 = Middle number

In figure A:

• $7^2 + 5^2 + 1^2 + 3^2 = 49 + 25 + 1 + 9 = 84$; $84 \times 2 = 168$;

In figure B:

• $8^2 + 6^2 + 2^2 + 4^2 = 64 + 36 + 4 + 16 = 120$; $120 \times 2 = 240$;

Similarly,

In figure C:

• $9^2 + 5^2 + 11^2 + 0^2 = 81 + 25 + 121 + 0 = 227$; $227 \times 2 = 454$;

Hence, '454' is the correct answer.

Q99. Answer: (c) Both conclusions 1 and 2 follow.

The least possible Venn Diagram is as follows:

Conclusions:

1. Some blacks are red. → True (as all red are black, so some black will be red)

2. Some reds are black. → True (as all red are black, so some reds are definitely black)

Thus, both the conclusion follows.

Hence, the correct answer is "Both conclusions 1 and 2 follow."

Q100. Answer: (a) Father's sister's daughter

Preparing the family tree using the following symbols:

Radha told Sita, "My mother's only brother's son is your brother".

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Clearly, Radha is Sita's father's sister's daughter.

Hence, the correct answer is "Father's sister's daughter".

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