RRB NTPC CBT-I Official Paper (Held On: 20 Jan 2021 Shift 2) (Previous Year Paper)

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

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Q1. The HCF of 24 and 144 is '10p + 4', then the value of 'p' is:

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

Q2. Five friends, G, H, I, J and K, are standing in a row (not necessarily in the same order).

1. The person in the middle is between J and I.
2. G is at the left end.
3. K is the neighbour of both J and I.

Who is standing at the right end?

(a) H
(b) I
(c) K
(d) J

Q3. x% of y is y% of:

(a) 100x
(b) x
(c) x/10
(d) y/10

Q4. The ratio of the area of a circle and that of an equilateral triangle, where the diameter of the circle is equal to the sides of the equilateral tringle, is:

(a) √3 : π
(b) π : 1
(c) π : √3
(d) π : √2

Q5. Which Mughal monument was designed by Ustad Ahmad Lahori and declared a UNESCO World Heritage site in 1983?

(a) Taj Mahal
(b) Red Fort
(c) Humayun's Tomb
(d) Agra Fort

Q6. A can finish a piece of work in 20 days and B can finish it in 24 days. They work together for 10 days then A leaves. In how many days will B finish the remaining work?

(a) 2 days
(b) Half day
(c) 1 day
(d) 3 days

Q7. If J is coded as N, R is coded as V and X is coded as B, then how will you code JOY?

(a) NOB
(b) NSA
(c) NSC
(d) NRA

Q8. Which Indian state has declared Malkhamb as it state sport?

(a) Haryana
(b) Uttar Pradesh
(c) Uttarakhand
(d) Madhya Pradesh

Q9. A tank has two inlets A and B that can fill it in 5 h and 6 h respectively. An outlet C can empty the full tank in 30 h. If all the three pipes are opened together in the empty tank, how much time will the pipes take to fill the tank?

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

Q10. Name the creation of Devaki Nandan Khatri which is considered to be the first authentic work of prose in Hindi.

(a) Gita Govinda
(b) Chandrakanta
(c) Gitanjali
(d) Ratnavali

Q11. Which among the following is NOT an extension for a video file?

(a) .jpeg
(b) .mp4
(c) .mov
(d) .avi

Q12. Radha is the sister of the son of Abhinav's son. How is Radha related to Abhinav?

(a) Grandmother
(b) Sister
(c) Aunt
(d) Granddaughter

Q13. Median of 14, 14, 15, 17, 16, 17, 17, 22, 13 is:

(a) 14
(b) 15
(c) 17
(d) 16

Q14. $\sqrt{2} - \sqrt{3}$ is :

(a) a natural number
(b) a whole number
(c) an irrational number
(d) a rational number

Q15. If $\sin 3\theta = \cos(\theta - 6°)$, then θ is:

(a) 26°
(b) 12°
(c) 3°
(d) 24°

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Q16. What is the scale for measuring a hydrogen ion concentration in a solution?

(a) OH scale
(b) dB scale
(c) Hydrogen scale
(d) pH scale

Q17. A number exceeds 25% of itself by 60. the number is:

(a) 65
(b) 80
(c) 45
(d) 75

Q18. "The Nice Guy Who Finished First" is the biography of which famous sportsperson?

(a) Rahul Dravid
(b) David Beckham
(c) Michael Phelps
(d) Tiger Woods

Q19. In a row of girls, Rajeshwari is fifth from one extreme and sixth from the other. Find the total number of girls in the row.

(a) 11
(b) 12
(c) 10
(d) 9

Q20. If 23 A 64 A 13 = 136423 and 9 A 57 A 12 = 12579, then 29 A 4 A 6 = ?

(a) 6429
(b) 6249
(c) 6492
(d) 6924

Q21. A 600 m long train is running at the speed of 72 km/h. How much time will it take to cross a 200 m long bridge?

(a) 30 s
(b) 10 s
(c) 40 s
(d) 20 s

Q22. Which of the following river's section was declared as National Waterway-2 in 1988?

(a) Ganga
(b) Narmada
(c) Brahmaputra
(d) Krishna

Q23. In April, the profit of a book store is increased by 25%, and in May, it is decreased by 20%. How did the profit of the store at the end of May compare to that in the beginning of April?

(a) It was same.
(b) It was 5% greater.
(c) It was 25% greater.
(d) It was less.

Q24. What is another name for calcium oxide?

(a) Lime soda
(b) Quick lime
(c) Cement
(d) Baking soda

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Q25. If an article is sold at a gain of 5% instead of being sold at a loss of 5%, a man gets Rs. 5 more. What is the cost price of the article?

(a) Rs. 60
(b) Rs. 80
(c) Rs. 50
(d) Rs. 40

Q26. Name the German chemist who grouped elements into triads in 1817.

(a) Dmitri Ivanovich Mendeleev
(b) John Newlands
(c) Henry Moseley
(d) Johann Wolfgang Dobereiner

Q27. Which place in India was known as “kala pani'?

(a) Gulf of Kutch
(b) Lakshadweep
(c) Kerala's backwaters
(d) Andaman Islands

Q28. In a certain code, METHOD is written as DOHTEM. How will CHOCOLATE be written as in that code?

(a) TELAOCOCH
(b) ETALOCOHC
(c) ETALCOHOC
(d) ETLAOCOCH

Q29. Name the drainage pattern where the river originates from a hill and flows in all directions.

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

Q30. Who along with Motilal Nehru formed the Swaraj Party within the Congress to argue for a return to council politics?

(a) Subhas Chandra Bose
(b) CR Das
(c) Jawaharlal Nehru
(d) BR Ambedkar

Q31. 20 years ago, the average age of a husband and his wife was 23 years. Now, the average age of the family consisting of the husband, wife and their son is 34 years. The present age of the son is:

(a) 24 years
(b) 42 years
(c) 16 years
(d) 34 years

Q32. Which of the following is NOT a part of the National Social Assistance Programme?

(a) Indira Gandhi National Widow Pension Scheme
(b) Indira Gandhi National Disability Pension Scheme
(c) Annapurna
(d) AYUSH

Q33. When was the first Indian Cricket Club-the Calcutta Cricket Club established?

(a) 1791
(b) 1790
(c) 1793
(d) 1792

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Q34. At which university did Mahatma Gandhi make his first public appearance in 1916 after returning from South Africa to India?

(a) Aligarh Muslim University
(b) Allahabad University
(c) Banaras Hindu University
(d) University of Mumbai

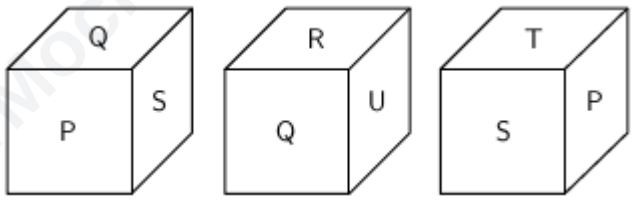
Q35. Which of the following is a property of an ionic compound?

(a) It conducts electricity in the solid state
(b) It is hard and does not break easily.
(c) It has a high melting point and boiling point.
(d) It is soluble in solvents such as kerosene and petrol.

Q36. The radius of a semicircular compound is 35 m. What will be its circumference?

(a) 180 m
(b) 90 m
(c) 45 m
(d) 135 m

Q37. Three different positions of the same dice are shown. Select the letter that will be on the face opposite to the one having U?



(a) R
(b) S
(c) T
(d) P

Q38. From where did India's Polar Satellite Launch Vehicle (PSLV-C45) successfully launch EMISAT and 28 international customer satellites on 1^(st)April 2019?

(a) UR Rao Satellite Centre
(b) Spaceport in French Guiana
(c) Centre Spatial Guyanais, Kourou
(d) Satish Dhawan Space Centre

Q39. Who among the following Nobel Prize winners is the founder of a grassroots movement to combat deforestation?

(a) May-Britt Moser
(b) Wangari Mathai
(c) Linda Buck
(d) Francoise Barre

Q40. What will be the compound interest on Rs. 25,000 at the rate of 6% per annum in 2 years?

(a) Rs. 3,090
(b) Rs. 1,560
(c) Rs. 1,950
(d) Rs. 2,560

Q41. In which of the following states in India the 'rat hole mining' is still practised?

(a) Meghalaya
(b) Gujarat
(c) Maharashtra

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(d) Jharkhand

Q42. A ratio of the cost price and the selling price of an article is 4 : 5. What is the percentage gain or loss?

(a) 20% loss
(b) 25% gain
(c) 25% loss
(d) 20% gain

Q43. Where is the office of the United Nations Environment Programme (UNEP) located in India?

(a) Bangalore
(b) New Delhi
(c) Mumbai
(d) Chennai

Q44. Four fractions have been given, out of which three are alike in some manner and one is different. Select the one that is different from the rest.

(a) 65/16
(b) 62/15
(c) 37/9
(d) 49/12

Q45. A photograph of a bacteria enlarged 60000 times attains a length of 6 cm. The actual length of bacteria is:

(a) 1000 cm
(b) 1/100 cm
(c) 1/1000 cm
(d) 1/10000 cm

Q46. Find the value of:

$(0.63 \div 1.26) \times 4 + 5 \times 3$

(a) 17
(b) 16
(c) 18
(d) 15

Q47. Name the British chemist who presented his atomic theory in 1808, on conservation of mass and law of definite proportions, which was a turning point in the study of matter.

(a) Ernest Rutherford
(b) Lavoisier
(c) Proust
(d) John Dalton

Q48. From which Constitution has the Fundamental Rights in the Indian Constitution drawn?

(a) Switzerland
(b) United States
(c) Britain
(d) Soviet Union

Q49. Who among the following is NOT a Cabinet Minister?

(a) Minister of Home Affairs
(b) Minister of External Affairs
(c) Minister of State in the Ministry of Defence
(d) Minister of Law and Justice

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Q50. Two boxes, A and B, have the capacity of holding 85 and 68 units of an article respectively. However, these articles have to be first packed into uniformly sized smaller packets that fit into the boxes. What is the maximum number of units that should be put into each of these packets such that both boxes A and B are filled to their full capacity?

(a) 85 units per packet
(b) 17 units per packet
(c) 68 units per packet
(d) 1445 units per packet

Q51. In 1930, who organised the Dalits into the Depressed Classes Association and demanded separate electorates for them?

(a) Abdul Gaffar Khan
(b) Jawahar Lal Nehru
(c) BR Ambedkar
(d) Mahatma Gandhi

Q52. Select the number that can replace the question mark (?) in the following series.

12, 49, 197, 789, ?

(a) 1845
(b) 2341
(c) 3157
(d) 4029

Q53. Name the Shiva temple near Taliparamba in Kerala, where women are allowed to enter only after 8 p.m. A unique feature of this temple is the absence of a flagstaff.

(a) Gokarnanatheshwara Temple
(b) Rameswaram Mahadeva Temple
(c) Rajarajeshwara temple
(d) Mallikarjun Temple

Q54. Pointing to a photograph of a man, a woman said, “That man is the son of the only brother of my husband." How is the woman related to the man in the photograph?

(a) Sister
(b) Paternal Aunt
(c) Maternal Aunt
(d) Mother

Q55. Solve the following.

$(\sqrt{3} - \sqrt{2}) \times (\sqrt{3} + \sqrt{2}) = ?$

(a) 1
(b) 2
(c) $(\sqrt{3}+ \sqrt{2})$
(d) 3

Q56. The decimal expansion of 27/25 will terminate after:

(a) two decimal places
(b) three decimal places
(c) more than three decimal places
(d) one decimal place

Q57. A dealer lists his goods at 40% above cost price and allows a discount of 20%. His profit is:

(a) 40%
(b) 20%
(c) 12%
(d) 10%

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Q58. Name the writ under which the court orders that the arrested person should be presented before it or can order to set free an arrested person if the manner or grounds of arrest are NOT lawful or satisfactory.

(a) Certiorari
(b) Quo Warranto
(c) Habeas corpus
(d) Mandamus

Q59. If 2 + 2 = 12, 3 + 3 = 24, 4 + 4 = 34 and 5 + 5 = 42, then what will be the value of 8 + 8?

(a) 56
(b) 52
(c) 54
(d) 50

Q60. What is the language spoken by a majority of the people in Lakshadweep?

(a) Malayalam
(b) Konkani
(c) Marathi
(d) Kannada

Q61. The first Pressurised Heavy Water Reactor (PHWR) of India in 1964 was a Collaborative venture between Atomic Energy of _____ Ltd and NPCIL of India.

(a) Israel
(b) France
(c) USSR
(d) Canada

Q62. In February 2019, which communication satellite was launched by ISRO to help in bulk data transfer for telecommunication applications?

(a) GSAT-31
(b) GSAT-32
(c) GSAT-30
(d) GSAT-13

Q63. Rationalising factor of cbrt40 is:

(a) 2^(2/3)
(b) 10^(1/3)
(c) 40^(1/3)
(d) 5^(1/3)

Q64. The value of

tan 5° tan 25° tan 45° tan 65° tan 85° is equal to:

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

Q65. Rahul is shorter than Raman. Ramesh is shorter than Ravi but taller than Raman. Who among them is the tallest?

(a) Raman
(b) Ravi
(c) Ramesh
(d) Rahul

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Q66. In the expansion of $(x + 3)^3$, the coefficient of x is:

(a) 9
(b) 27
(c) 1
(d) 18

Q67. In which type of forests Tendu, Amaltas, Bael (Bengal Quince) are found in India?

(a) Tropical thorny forests
(b) Mountain forests
(c) Dry deciduous forests
(d) Wet Deciduous Forests

Q68. The quadratic equation whose one root is $3 + \sqrt{5}$, is:

(a) $x^2 – 6x + 4 = 0$
(b) $x^2 + 6x – 4 = 0$
(c) $x^2 + 6x + 4 = 0$
(d) $x^2 – 6x – 4 = 0$

Q69. The mean of the first ten even natural numbers is:

(a) 9
(b) 10
(c) 11
(d) 8

Q70. On heating gypsum at 373 K, it loses water molecules and becomes calcium sulphate hemihydrate. This substance is used to make toys, materials for decoration and smooth surfaces. What is this substance commonly known as?

(a) Plaster of Paris
(b) Clay
(c) Alabaster
(d) Cement

Q71. If Quantity A is the number of ways to assign a number from 1 to 5 without repetition to each of four people, and Quantity B is the number of ways to assign a number from 1 to 5 without repetition to each of 5 people, then which of the following statements is correct with respect to Quantities A and B?

(a) Impossible to determine.
(b) Quantity B is greater.
(c) Quantity A is greater.
(d) Both Quantities A and B are equal.

Q72. Who was one of the founders of American computer company Sun microsystems later acquired by oracle?

(a) Vinod Khosla
(b) Satya Nadella
(c) Sabeer Bhatia
(d) Sunder Pichai

Q73. The National TB programme (NTP) was launched by the Government of India in year _____ in the form of District TB Centre Model involved with BCG Vaccination and TB treatment.

(a) 1962
(b) 1961
(c) 1960
(d) 1963

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Q74. Which flagship programme under the Ministry of Rural Development aims to organise the rural poor women into their own institutions like self-help groups and their federations, producers' collectives etc. and also ensure their financial inclusion and livelihood support?

(a) Mahatma Gandhi National Rural Employment Guarantee Programme (MGNREGA)
(b) Rashtriya Krishi Vikas Yojana
(c) Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM)
(d) The National Social Assistance Programme (NSAP)

Q75. Government of India has set ambitious target of building _____ kms of highways in FY21.

(a) 5000
(b) 1000
(c) 15000
(d) 10000

Q76. Name the book written by Mahatma Gandhi in 1909 that suggested the British rule would come to an end if Indians didn't cooperate with them.

(a) Constructive Programme - Its Meaning and Place
(b) Hind Swaraj
(c) India of my dreams
(d) Village Swaraj

Q77. If $x + 1/x = 6$, then value of $x^2 + 1/(x^2)$ is :

(a) 38
(b) 12
(c) 34
(d) 36

Q78. The HCF of the least prime number and the least composite natural number is:

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

Q79. Yakshagana is a folk performance of which Indian state?

(a) Maharashtra
(b) Assam
(c) Gujarat
(d) Karnataka

Q80. Which of the following pairs of numbers is co-prime?

(a) 14 and 21
(b) 6 and 35
(c) 9 and 12
(d) 39 and 65

Q81. Consider the given statements and decide which of the given assumptions is/are implicit in the statement.

Statement:

To expand their business, a budding company now requires more staff.

Assumptions:

I: The current staff is incompetent.

II: Business can only be expanded by always hiring new staff.

(a) Neither assumption I nor II is implicit.
(b) Only assumption II is implicit.
(c) Only assumption I is implicit.

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(d) Both the assumptions are implicit.

Q82. The Ministry of Human Resource Development has designed a one stop education portal which caters to the needs of students, starting from elementary students to research, scholars, teachers and life-long learners. What is the name of this portal?

(a) PADHAI
(b) DIKSHA
(c) SAKSHAT
(d) PRASHIKSHAK

Q83. Which of the following special trains can be taken to travel to Lumbini, Bodhgaya, Sarnath and Kushinagar?

(a) Buddhist Circuit Tourist Train
(b) Buddhist Tourist Train
(c) Buddhist Train
(d) Buddha Express Special Tourist Train

Q84. The International Criminal Police Commission (ICPC), predecessor to INTERPOL was founded at _____ in 1923.

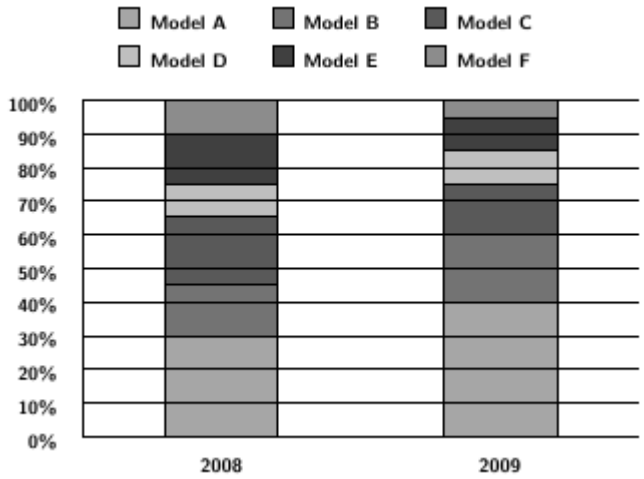
(a) Washington
(b) Vienna
(c) Geneva
(d) New York

Q85. The mean of the first twelve prime numbers is:

(a) 10.50
(b) 12.00
(c) 16.42
(d) 20.45

Q86. The given graph shows the percentage-wise distribution of different mobile phone models (A to F) produced by a mobile company in 2008 and 2009. The total number of mobile phones produced in 2008 was 4,50,000 and that in 2009 was 6,40,000.

(If a value for any model in between a range, consider it to be at midpoint, e.g any point between 10 and 20 should be considered 15.)

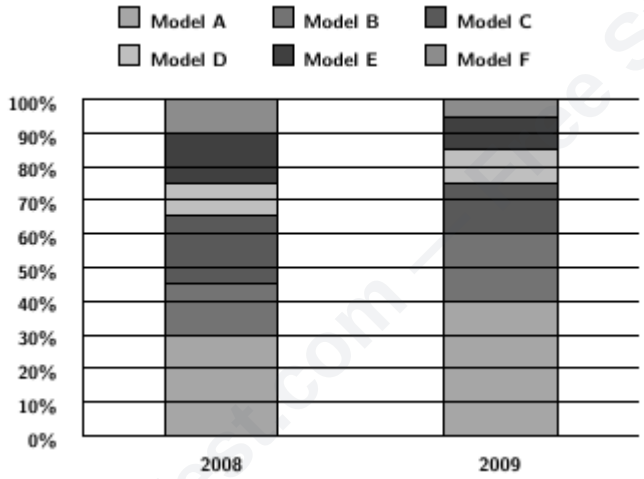


What is the total number of mobile phones produced of models C, D and F in 2008?

(a) 1,80,000
(b) 2,25,000
(c) 1,35,000
(d) 2,02,500

Q87. The given graph shows the percentage-wise distribution of different mobile phone models (A to F) produced by a mobile company in 2008 and 2009. The total number of mobile phones produced in 2008 was 4,50,000 and that in 2009 was 6,40,000.

(If a value for any model in between a range, consider it to be at midpoint, e.g any point between 10 and 20 should be considered 15.)

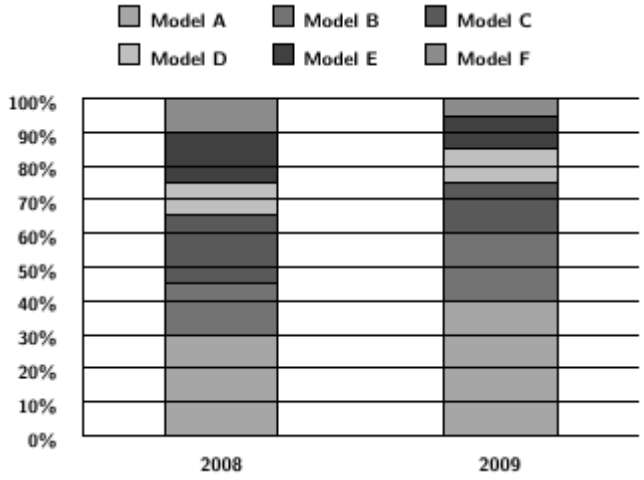


For which model was the increase/decrease in production volume between 2008 and 2009 the minimum?

(a) Model E
(b) Model B
(c) Model C
(d) Model A

Q88. The given graph shows the percentage-wise distribution of different mobile phone models (A to F) produced by a mobile company in 2008 and 2009. The total number of mobile phones produced in 2008 was 4,50,000 and that in 2009 was 6,40,000.

(If a value for any model in between a range, consider it to be at midpoint, e.g any point between 10 and 20 should be considered 15.)

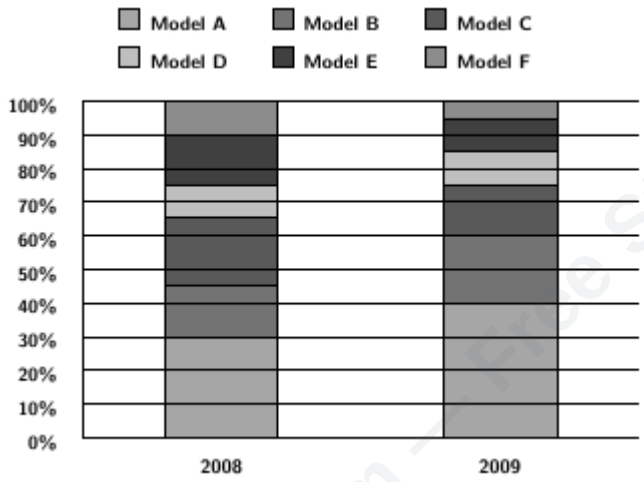


What is the difference between the numbers of Model B sets produced in 2008 and 2009?

(a) 1,21,000
(b) 22,000
(c) 65,000
(d) 60,500

Q89. The given graph shows the percentage-wise distribution of different mobile phone models (A to F) produced by a mobile company in 2008 and 2009. The total number of mobile phones produced in 2008 was 4,50,000 and that in 2009 was 6,40,000.

(If a value for any model in between a range, consider it to be at midpoint, e.g any point between 10 and 20 should be considered 15.)



If 90% of Model C sets produced by the company were sold each year, then how many of them were remaining at the end of 2009?

(a) 96,000
(b) 1,67,400
(c) 6,000
(d) 18,600

Q90. If x = –2, y = 3, Quantity A = $-x^2y^3$ and Quantity B = 0, then which of the following statements is correct with respect to Quantities A and B?

(a) Quantity A is greater.
(b) Quantity B is greater.
(c) Impossible to determine
(d) Both Quantities A and B are equal.

Q91. Four letter-clusters have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) BDG
(b) JLO
(c) MOQ
(d) RTW

Q92. Select the number from among the given options that can replace the question mark (?) in the following series.
D4R22H8Y15P?

(a) 18
(b) 24
(c) 20
(d) 7

Q93. H has three times as many cards as R has. If H gives 50 cards to R, R will have three times as many cards as H has. How many cards does H have?

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

Q94. In a certain code language, 'VLGH' is written as '52', 'QBNZ' is written as '62'. What is the code for "XPRF' in that code language?

(a) 69
(b) 71
(c) 67
(d) 73

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Q95. Select the word from the following options that CANNOT be formed using the letters of the given word.

CATASTROPHE

(a) TRAP
(b) STAR
(c) TROPHY
(d) CASTOR

Q96. If GOES is coded as 715519, then what will be the code for FAST?

(a) 611519
(b) 511620
(c) 512620
(d) 611920

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

Statement:

The British introduced the postal system in India in 1764.

Conclusions:

I. Postal letters often are late, or they are lost.

II. Postmen get less salary, so they tend to do mistakes.

(a) Neither of the conclusions I or II follow
(b) Both of the conclusions I and II follow
(c) Only conclusion I follows
(d) Only conclusion II follows

Q98. Anuj, Ankit, Anu and Alka are teachers who teach Biology, History and Mathematics. Biology is the only subject taught by two teachers, one of whom is male. Two of the four are married to each other and they teach History and Biology respectively. Ankit teaches Biology and is unmarried.

Anu and Alka are females.

Which subject does Anuj teach?

(a) History
(b) Mathematics
(c) Cannot be determined
(d) Biology

Q99. Select the option in which the words are related to each other in the same way the given words are related.

Whisper : Singing : Sound

(a) Babies : Soft : Cute
(b) Sea : Underneath : Large
(c) Magazine : Book : Read
(d) Road : Vehicle : Destination

Q100. 'Minute' is related to 'Hour' in the same way as 'Inch' is related to '_____'.

(a) Measure
(b) Foot
(c) Metre
(d) Centigrade

ANSWER KEY

1	a	2	a	3	b	4	c	5	a	6	a	7	c	8	d	9	a	10	b
11	a	12	d	13	d	14	c	15	d	16	d	17	b	18	a	19	c	20	a
21	c	22	c	23	a	24	b	25	c	26	d	27	d	28	b	29	a	30	b

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31	c	32	d	33	d	34	c	35	c	36	a	37	d	38	d	39	b	40	a
41	a	42	b	43	b	44	b	45	d	46	a	47	d	48	b	49	c	50	b
51	c	52	c	53	c	54	b	55	a	56	a	57	c	58	c	59	c	60	a
61	d	62	a	63	d	64	b	65	b	66	b	67	c	68	a	69	c	70	a
71	d	72	a	73	a	74	c	75	c	76	b	77	c	78	d	79	d	80	b
81	a	82	c	83	a	84	b	85	c	86	a	87	a	88	d	89	d	90	b
91	c	92	b	93	d	94	c	95	c	96	d	97	a	98	a	99	c	100	b

SOLUTIONS

Q1. Answer: (a) 2

Given:

Given numbers are 24, 144.

Concept used:

If P is the HCF of A and B then

A = P × m

B = P × n

(Where m, and n are arbitrary positive integers and they are co-prime to each other)

Calculation:

24 = 24 × 1

144 = 24 × 6

HCF (24, 144) = 24

According to the question,

10p + 4 = 24

=> p = 2

Therefore The value of p is 2.

Q2. Answer: (a) H

Five friend: G, H, I, J and K, are standing in a row

1) G is at the left end.

2) The person in the middle is between J and I.

Case (i) :

Case (ii) :

3) K is the neighbour of both J and I.

Case (i) :

Case (ii) :

Therefore Here, from both the cases 'H' is standing at right end.

Hence, the correct answer is "H".

Q3. Answer: (b) x

Concept used:

A% of B is equal to B% of A.

Calculation:

Hence, x% of y must be equal to y% of x.

Therefore x% ofy is y% of x.

Q4. Answer: (c) π : √3

Given:

The diameter of the circle is equal to the sides of the equilateral tringle

Concept used:

Area of an equilateral triangle = √3/4 × (Side)2

Area of a circle = π × Radius2

Diameter = Radius × 2

Calculation:

Let the diameter of the circle be 2R unit.

Hence, the measure of the side of the equilateral triangle = 2R units

Thus,

The ratio of the area of a circle and that of an equilateral triangle

=> π × (2R ÷ 2)² : √3/4 × (2R)²

=> π : √3

Therefore The ratio of the area of a circle and that of an equilateral triangle is π : √3.

Q5. Answer: (a) Taj Mahal

The correct answer is Taj Mahal.

• Taj Mahal is considered a fine example of Mughal architecture (a mixture of Indian, Persian and Islamic styles).

• The Taj Mahal is also one of the most iconic monuments in the world, which is visited by millions of tourists every year.

• The complex was designated a UNESCO World Heritage Site in 1983.

Key Points

• The Taj Mahal is situated on the right bank of the Yamuna River in the sprawling Mughal Gardens spread over 17 hectares in the Agra district of Uttar Pradesh.

• Its construction was started by the Mughal Emperor Shah Jahan in memory of his wife Mumtaz Mahal in 1632 AD and was completed in 1648 AD, adding the mosque, guest house and the main entrance to the south, the outer courtyard and its monasteries.

• Later and completed in 1653 AD.

Additional Information

Some of the UNESCO World Heritage Sites in India:

Name of Sites	Year	Location
Agra Fort	1983	Agra
Taj Mahal	1983	Agra
Humayun's Tomb	1993	Delhi
Red Fort	2007	Delhi
Kakatiya Rudreshwara (Ramappa) Temple	2021	Telangana
Dholavira	2021	Gujarat

Q6. Answer: (a) 2 days

Given:

A can finish a piece of work in 20 days and B can finish it in 24 days.

They work together for 10 days then A leaves.

Concept used:

Total work = Efficiency (Work done per hour) × Total time taken

Calculation:

LCM (20, 24) = 120

Let the total work be the LCM of the time taken by A and B.

Hence,

A does each day = 120 ÷ 20 = 6 units

B does each day = 120 ÷ 24 = 5 units

Remaining work after 10 days = 120 - (5 + 6) × 10 = 10 units

B will complete the rest of the work in = 10 ÷ 5 = 2 days

Therefore B will finish the remaining work in 2 days.

Q7. Answer: (c) NSC

The logic followed here is :-

• J is coded as N.

• R is coded as V.

• X is coded as B.

Similarly, JOY is coded as :

Hence. the correct answer is "NSC".

Q8. Answer: (d) Madhya Pradesh

The correct answer is Madhya Pradesh.

• In 2013 Madhya Pradesh Government declared 'Malkhamb' as the state sport and also launched 'Mission Olympics 2020' for imparting coaching to the budding talents.

• The name Mallakhamb is derived from the words Malla, meaning wrestler, and Khamb, meaning pole.

• Literally meaning wrestling pole, the term refers to the traditional training implement used by wrestlers.

• In this sport, a gymnast performs aerial yoga or gymnastic poses and wrestling grips in concert with a vertical stable or hanging wooden pole, cane or rope.

Additional Information

• The Sports Authority of India (SAI) is the apex national sports body of India, established by the Ministry of Youth Affairs and Sports, Government of India for the development of sports in India.

• Sports Authority of India (SAI) was set up in 1984 to carry forward the legacy of the IXth Asian Games held in New Delhi in 1982 under the Department of Sports.

• The Major Dhyan Chand Khel Ratna is India's highest award for achievement in sports, while the Dronacharya Award is given for excellence in coaching.

Q9. Answer: (a) 3 h

Given:

A tank has two inlets A and B that can fill it in 5 h and 6 h respectively.

An outlet C can empty the full tank in 30 h.

Concept used:

Total work = Efficiency (Work done per hour) × Total time taken

Calculation:

LCM (5, 6, 30) = 30

Let the capacity of the tank be the LCM of the time taken by all pipes.

Hence, the capacity of the tank = 30 units

Thus,

Inlet A fills the tank each hour by = 30 ÷ 5 = 6 units

Inlet B fills the tank each hour by = 30 ÷ 6 = 5 units

Outlet C empties the tank each hour by = 30 ÷ 30 = 1 unit

Hence, time taken to fill the tank when all pipes are opened = 30/(6 + 5 - 1) = 3 hours

Therefore All the three pipes are opened together in the empty tank, 3 hours will the pipes take to fill the tank.

Q10. Answer: (b) Chandrakanta

The correct answer is Chandrakanta.

• Chandrakanta Santati Babu is a Hindi novel written by Devaki Nandan Khatri.

• It is considered to be the first work of prose in the Hindi language.

• The book has a love story of two lovers who belong to rival kingdoms. Chandrakanta - A princess of Vijaygarh and Prince Virendra of Naugarh.

Additional Information

Book	Details
Gita Govinda	• The Gita Govinda is a work composed by the 12th-century Hindu poet, Jayadeva.
Gitanjali	• Gitanjali is a collection of poems by the Bengali poet Rabindranath Tagore.

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Ratnavali	• Ratnavali is a Sanskrit drama about a beautiful princess named Ratnavali and a great king named Udayana. - The credit for this goes to the Indian emperor Harsha.

Q11. Answer: (a) .jpeg

The correct answer is .jpeg.

Key Points

• JPEG stands for Joint Photographic Experts Group (JPEG)

• It is a standardized image compression mechanism designed for compressing either full-colour three-band (RGB) or grey-scale one-band images.JPEG stands for Joint Photographic Experts Group (JPEG)

• It is a standardized image compression mechanism designed for compressing either full-colour three-band (RGB) or grey-scale one-band images.

• Hence it is the correct answer.

Additional Information

• There are 8 common video formats data MP4, MOV, WMV, FLV, AVI, AVCHD, WebM, and MKV.

• The video format is the container that stores audio-video subtitles and any other metadata.

• A codec encodes and decodes the multimedia data such as audio or video.

• A QT file is a movie file saved in the QuickTime File Format (QTFF), which is a multimedia container format developed by Apple.

Q12. Answer: (d) Granddaughter

Family chart :

Radha is the sister of the son of Abhinav's son.

Family Tree :

Therefore Here, Radha is 'Grand daughter' of Abhinav.

Hence, the correct answer is "Grand daughter".

Q13. Answer: (d) 16

Given:

14, 14, 15, 17, 16, 17, 17, 22, 13

Concept used:

The median is the middle value in a list ordered from smallest to largest.

Calculation:

Given series in the ascending order,

13, 14, 14, 15, 16, 17, 17, 17, 22

Hence, the median = 16

Therefore The median of the given series is 16.

Q14. Answer: (c) an irrational number

Shortcut Trick

The difference between two distinct irrational numbers (√2 and √3) where neither is a multiple of the other by a rational factor always results in an irrational number.

√2 ≈ 1.4142... and √3 ≈ 1.7320...

√2 − √3 ≈ −0.3178... which is non-terminating and non-repeating.

Such decimals represent irrational numbers.

Therefore The correct answer is an irrational number.

Alternate Method

Given: The expression is √2 − √3.

Method: Proof by Contradiction.

=> Let us assume that √2 − √3 = r, where r is a rational number.

=> Squaring both sides: $(\sqrt{2} - \sqrt{3})^2 = r^2$

=> $(\sqrt{2})^2 + (\sqrt{3})^2 - 2(\sqrt{2} \times \sqrt{3}) = r^2$

=> $2 + 3 - 2\sqrt{6} = r^2$

=> $5 - 2\sqrt{6} = r^2$

=> $5 - r^2 = 2\sqrt{6}$

=> $\sqrt{6} = (5 - r^2) / 2$

=> Since r is rational, r^2 is rational, and $(5 - r^2) / 2$ is also rational.

=> However, $\sqrt{6}$ is an irrational number (as 6 is not a perfect square).

=> An irrational number cannot be equal to a rational number.

=> This is a contradiction, so our assumption was wrong.

Therefore The correct answer is an irrational number.

Additional Information

Irrational Numbers

These are numbers that cannot be expressed as a ratio of two integers (p/q). Their decimal expansion is non-terminating and non-repeating.

Properties of Irrationals

The sum or difference of a rational and an irrational number is always irrational. The sum or difference of two irrationals may be rational or irrational.

Square Roots of Primes

The square root of any prime number (like 2, 3, 5, 7, etc.) is always an irrational number.

Real Numbers

Real numbers are the union of rational numbers and irrational numbers. Every point on the number line represents a unique real number.

Q15. Answer: (d) 24°

Given:

$\sin 3\theta = \cos (\theta - 6°)$

Concept used:

$\text{Cos}\ (90° - \alpha) = \text{Sin}\alpha$

Calculation:

$\sin 3\theta = \cos (\theta - 6°)$

=> $\text{Cos}\ (90° - 3\theta) = \cos (\theta - 6°)$

=> $4\theta = 96°$

=> $\theta = 24°$

Therefore The value of θ is 24°.

Q16. Answer: (d) pH scale

The correct answer is pH scale.

Key Points

• pH means the potential of Hydrogen.

• The strength of acids and bases depends on the number of H+ ions and OH- ions produced, respectively.

• The pH scale is the scale used to express the acidity or alkalinity of a substance based on the concentration of hydrogen ions in its solution.

• pH scale was discovered by Soren Sorensen.

• The range of pH scales is 0 to 14.

• If pH < 7 then solution is acidic.

• If pH > 7 then solution is basic.

• If pH = 7 then solution is neutral.

Additional Information

• The human body works within the pH range of 7.0 to 7.8.

• When the pH of rainwater is less than 5.6, it is called acid rain.

• Tooth decay starts when the pH of the mouth is lower than 5.5.

Q17. Answer: (b) 80

Given:

The number exceeds 25% of itself by 60.

Concept used:

Application of Percentage

Calculation:

Let the number be Q

According to the question,

Q = 60 + Q × 25%

=> 3Q over 4 = 60

=> Q = 80

Therefore The number is 80.

Q18. Answer: (a) Rahul Dravid

The correct answer is Rahul Dravid.

Key Points

• "The Nice Guy Who Finished First" is a biography of Rahul Dravid.

• The book was authored by Devendra Prabhudesai.

• Rahul Dravid is an Indian former International cricketer and a batsman.

• His nickname is 'The Great Wall', 'Mr. Dependable'.

• He got Padma Bhsuhan (2013), Padma Sri (2004), Arjuna Award (1998).

Additional Information

• David Beckham is an English former professional footballer, the current president & co-owner of Inter Miami CF and the co-owner of Salford City.

• Michael Phelps belongs to the United States of America.

• He is also known as the "Flying Fish" or "The Baltimore Bullet".

• He is one of the most celebrated Sportsperson in the Olympic games ever with rewards of approximately two dozen Gold medals.

• Tiger Woods is an American golfer.

• He holds the record for being World Number One for the most consecutive weeks as well as for the greatest total number of weeks.

Q19. Answer: (c) 10

The followed here is :-

• Case (i) :

Position of Rajeshwari from left side of the row = 5^(th)

Position of Rajeshwari from ight side of the row = 6^(th)

Total number of girls in the row = Left side position + Right side position - 1

• Total number of girls in the row = 5 + 6 - 1

• Total number of girls in the row = 11 - 1

• Total number of girls in the row = 10.

• Case (ii) :

Position of Rajeshwari from left side of the row = 6th

Position of Rajeshwari from ight side of the row = 5th

Total number of girls in the row = Left side position + Right side position - 1

• Total number of girls in the row = 6 + 5 - 1

• Total number of girls in the row = 11 - 1

• Total number of girls in the row = 10.

Hence, the correct answer is "10".

Q20. Answer: (a) 6429

The logic followed here is :-

• 23 A 64 A 13 = 136423

and,

• 9 A 57 A 12 = 12579

Similarly,

• 29 A 4 A 6 = ?

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Hence, the correct answer is "6429".

Q21. Answer: (c) 40 s

Given:

Length of the train = 200m

Length of the platform = 600m

Speed = 72kmph

Concept used:

Meter per second (mps) = (5 / 18) × Kilometer per hour (kmph)

While a train crosses a bridge, it crosses the sum of its length and the length of the bridge.

Calculation:

72 kmph = 72 × (5 / 18) = 20 m/s

Hence, time taken to cross the bridge = (600 + 200) over 20 = 40 seconds

Therefore It will taken 40s to cross a 200m long bridge.

Q22. Answer: (c) Brahmaputra

The correct answer is Brahmaputra.

• The Brahmaputra river with a length of 891 km between the Bangladesh border and Sadiya was declared as National Waterway No. 2 (NW-2) on 1 September 1988.

Key Points

• The National Waterways Act came into force in 2016.

• In 1986, the Government of India created the Inland Waterways Authority of India (IWAI) to regulate and develop inland waterways for navigation and shipping.

Additional Information

NW	River System	Route	Locations	Established
NW – 1	Ganga-Bhagirathi-Hooghly	Prayagraj – Haldia	Uttar Pradesh, Bihar, Jharkhand, West Bengal	1986
NW – 2	Brahmaputra	Sadiya-Dhubri	Assam	1988
NW – 3	West Coast Canal, Champakara Canal, and Udyogamandal Canal	Kottapuram – Kollam	Kerala	1993
NW – 4	Krishna and Godavari	Kakinada–Puducherry stretch of canals, Kaluvelly Tank, Bhadrachalam – Rajahmundry, Waziraba–Vijayawada	Andhra Pradesh, Tamil Nadu, and Puducherry	2008

Q23. Answer: (a) It was same.

Given:

In April, the profit of a book store is increased by 25%, and in May, it is decreased by 20%

Concept used:

Incremented/Reduced value = Initial value (1 ± change%)

Calculation:

Let the initial profit at beginning of April be 100Q

In April, the profit = 100Q × 1.25 = 125Q

In May, the profit = 125Q × 0.8 = 100Q

Hence, the profit remains the same at the end of May compared to that at the beginning of April.

Therefore The profit remains the same at the end of May compared to that at the beginning of April.

Q24. Answer: (b) Quick lime

The correct answer is Quick lime.

Key Points

• Quick lime is another name for calcium oxide.

• Calcium oxide, commonly known as lime, is a chemical compound with the formula CaO.

• It is believed that quicklime is one of the oldest chemicals known to the human race.

• It can also be referred to as burnt lime or lime.

• Calcium oxide can be produced by the thermal decomposition of materials like limestone or seashells that contain calcium carbonate (CaCO3 mineral calcite) in a lime kiln.

• Cement is a mixture formed by the heating together of CaCO3 and clay.

• Sodium Bicarbonate is the chemical name is ‘baking soda’.

Q25. Answer: (c) Rs. 50

Given:

If an article is sold at a gain of 5% instead of being sold at a loss of 5%, a man gets Rs. 5 more.

Concept used:

Selling Price = Cost Price × (1 + Gain%)

Selling Price = Cost Price × (1 - Loss%)

Calculation:

Let the cost price of the article be Rs. Q.

According to the question,

Q × (1 + 5%) - Q × (1 - 5%) = 5

=> Q × 0.1 = 5

=> Q = 50

Therefore The cost price of the article is Rs. 50.

Q26. Answer: (d) Johann Wolfgang Dobereiner

The correct answer is Johann Wolfgang Dobereiner.

• In 1817, German chemist Johann Wolfgang Dobereiner arranged elements with similar properties into a group.

• The Dobereiner triad is based on a group of three elements.

• He was the first to start grouping the elements on the basis of atomic mass.

• The three elements of the triad were arranged in such a way that the atomic mass of the middle element was approximately the average of the atomic masses of the other two elements.

Additional Information

• Dmitri Mendeleev was a Russian chemist.

• He is considered to be the most important contributor to the development of the periodic table.

• His version of the periodic table organized elements into rows according to their atomic mass and into columns based on chemical and physical properties.

• The British chemist John Newlands was the first to arrange the elements in the periodic table with increasing order of atomic mass.

• He found that each of the eight elements has similar properties and called this the law of octaves.

• He arranged the elements into eight groups but did not leave any gaps for the unseen elements.

• Henry Moseley: In 1913, while working at the University of Manchester, he observed and measured the X-ray spectra of various chemical elements using diffraction in crystals. Through this, he discovered a systematic relationship between wavelength and atomic number. This discovery is now known as Moseley's law.

Q27. Answer: (d) Andaman Islands

The correct answer is Andaman Islands.

Important Points

• The cellular jail built by Britishers in the Andaman and Nicobar Island is known as Kala Pani.

• The construction of the Cellular Jail started in 1893 and was completed in 1905-06.

• Prisoners were used as labour.

• It is built in a way that no communication of any kind was possible between prisoners in the same or different wings.

• The remoteness and terror of the facility gave it a name, ‘Kala Pani’ (Blackwaters).

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Q28. Answer: (b) ETALOCOHC

The logic followed here is :-

• METHOD is written as DOHTEM.

Similarly,

• CHOCOLATE will be written as :

Hence, the correct answer is "ETALOCOHC".

Q29. Answer: (a) Radial

The correct answer is Radial.

Key Points

• When the rivers originate from a hill and flow in all directions, the drainage pattern is known as ‘radial’.

• Volcanoes usually display excellent radial drainage.

• The rivers originating from the Amarkantak range present a good example of it.

Additional Information

• Centripetal Patterns

• When the rivers discharge their waters from all directions in a lake or depression, the pattern is known as ‘centripetal’.

• Dendritic patterns

• These are by far the most common, develop in areas where the rock (or unconsolidated material) beneath the stream has no particular fabric or structure and can be eroded equally easily in all directions.

• The drainage pattern resembling the branches of a tree is known as “dendritic” the examples of which are the rivers of the northern plain.

• Trellis drainage

• When the primary tributaries of rivers flow parallel to each other and secondary tributaries join them at right angles, the pattern is known as ‘trellis’.

• These patterns typically develop where sedimentary rocks have been folded or tilted and then eroded to varying degrees depending on their strength.

• The Rocky Mountains of B.C. and Alberta are good examples of this, and many of the drainage systems within the Rockies have trellis patterns.

Q30. Answer: (b) CR Das

The correct answer is CR Das.

Important Points

• Swaraj Party was formed on 1 January 1923.

• Chittaranjan Das, Narasimha Chintaman Kelkar and Motilal Nehru formed the Congress-Khilafat Swarajaya Party with Das as the president and Nehru as one of the secretaries.

• The Swaraj Party was established as the Congress-Khilafat Swaraj Party.

• It was a political party formed in India on 1 January 1923 after the Gaya annual conference in December 1922 of the National Congress, that sought greater self-government and political freedom for the Indian people from the British Raj.

• Within the Congress, some leaders were by now tired of mass struggles and wanted to participate in elections to the provincial councils that had been set up by the Government of India Act of 1919.

• They felt that it was important to oppose British policies within the councils, argue for reform and also demonstrate that these councils were not truly democratic.

• C. R. Das and Motilal Nehru formed the Swaraj Party within Congress to argue for a return to council politics.

Q31. Answer: (c) 16 years

Let us consider,

Present age of husband = x.

Present age of wife = y.

Present age of son = z.

Given :

20 years ago, the average age of a husband and his wife was 23 years.

Age of husband 20 years ago = x - 20.

Age of wife 20 years ago = y - 20.

average age of a husband and his wife was 23 years.

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=> (x - 20 + y - 20) / 2 = 23

=> (x - 20 + y - 20) = 46

=> x + y - 40 = 46

=> x + y = 86 ..... (i)

average age of the family consisting of the husband, wife and their son is 34 years.

=> (x + y + z) / 3 = 34

=> x + y + z = 102 ..... (ii)

Substitute equation (i) in equation (ii) we get,

=> 86 + z = 102

=> z = 102 - 86

=> z = 16

Therefore Here, the present age of son is 16 years.

Hence, the correct answer is "16 years".

Q32. Answer: (d) AYUSH

The correct answer is AYUSH.

• The Ministry of AYUSH, a ministry of the Government of India, is responsible for the development of education, research and dissemination of indigenous and alternative systems of medicine in India.

• AYUSH is an acronym for Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy and are the six Indian systems of medicine prevalent and practised in India and some of the neighbouring Asian countries with very few exceptions in some of the developed countries.

Key Points

• Presently (National Social Assistance Programme) NSAP comprises five schemes, namely –

• Indira Gandhi National Old Age Pension Scheme (IGNOAPS): The eligible age for IGNOAPS is 60 years.

• The pension is Rs.200 p.m. for persons between 60 years and 79 years. For persons who are 80 years and above the pension is Rs.500/ - per month.

• Indira Gandhi National Widow Pension Scheme (IGNWPS): The eligible age is 40 years and the pension is Rs.300 per month. After attaining the age of 80 years, the beneficiary will get Rs.500/ - per month.

• Indira Gandhi National Disability Pension Scheme (IGNDPS): The eligible age for the pensioner is 18 years and above and the disability level has to be 80%.

• The amount is Rs.300 per month and after attaining the age of 80 years, the beneficiary will get Rs 500/ - per month.

• Dwarfs will also be an eligible category for this pension.

• Annapurna Scheme: 10 kgs of food grains (wheat or rice) is given per month per beneficiary.

• The scheme aims at providing food security to meet the requirements of those eligible old aged persons who have remained uncovered under the IGNOAPS

Q33. Answer: (d) 1792

The correct answer is 1792.

• The establishment of the Calcutta Cricket Club (what we know today as CC & FC) in 1792, was another watershed for the sport in the land.

• It is the second-oldest cricket club in the world, after the MCC (1787).

Key Points

• Calcutta Cricket and Football Club is a sports club founded in 1792 AD, which currently has the resources to practice cricket, field hockey, football, rugby, cycle polo and tennis.

• The club was originally founded as the 'Calcutta Cricket Club Clippers' by the British, who came with the British East India Company.

• The Calcutta Cricket Club and the Calcutta Football Club were respectively the oldest cricket and football clubs outside the United Kingdom, which later merged to form the Calcutta Cricket and Football Club in 1965.

Additional Information

• The Board of Control for Cricket in India is the governing body for cricket in India and is under the jurisdiction of the Ministry of Youth Affairs and Sports, Government of India.

• It is an autonomous organization and does not come under the National Sports Federation of India.

• Headquarters: Mumbai

• Founded: December 1928

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Q34. Answer: (c) Banaras Hindu University

The correct answer is Banaras Hindu University.

Key Points

• Gandhiji, the first major public appearance was at the opening of the Banaras Hindu University in February 1916.

• Banaras Hindu University is an internationally reputed temple of learning, situated in the holy city of Varanasi.

• This creative and innovative university was established in 1916 by the great nationalist leader Pandit Madan Mohan Malaviya in collaboration with great personalities like Dr Annie Besant, who saw it as the University of India.

• Banaras Hindu University was created under the Parliamentary Act - B.H.U. Act 1915.

Important Points

• Mahatma Gandhi was born October 2, 1869, in Porbandar, India & died January 30, 1948, in Delhi.

• Champaran Satyagraha

• In the Champaran district of Bihar, farmers were forced by Europeans to grow indigo.

• They could not grow the food they needed, nor did they get paid enough for the indigo.

• Gandhi accompanied the prince to Champaran in early 1917 to start the Satyagraha.

• Ahmedabad Mill Strike

• In 1918, it was one of the early movements led by Gandhi.

• In March 1918, under the leadership of Gandhiji, there was a strike in the cotton mills.

• In this strike, Gandhi used the weapon of hunger strike.

Q35. Answer: (c) It has a high melting point and boiling point.

The correct answer is It has a high melting point and boiling point.

Important Points

• Properties of ionic compounds:

• Due to the strong attractive force between the positive and negative ions, ionic compounds are solids that are rather rigid.

• These compounds are often brittle and break into fragments when pressure is applied.

• The melting and boiling points of ionic compounds are extremely high.

• This is due to the significant amount of energy necessary to break the strong inter-ionic affinity.

• In general, ionic compounds are soluble in water but insoluble in solvents such as kerosene, petrol, ether, alcohol, carbon tetrachloride, etc.

• In solution, the movement of charged particles is involved in the conduction of electricity.

• In the solid-state ionic compounds do not conduct electricity because ion mobility in a solid is impossible due to its rigid or hard structure, on the other hand, in molten or in aqueous solution it conducts electricity. As heat overcomes the electrostatic forces of attraction between oppositely charged ions.

• Hence Option 3 is the correct answer.

Q36. Answer: (a) 180 m

Given:

The radius of a semicircular compound is 35 m.

Concept used:

The circumference of the semicircle = π × Radius + 2 × Radius

Calculation:

The circumference of the semicircular compound

=> π × 35 + 35 × 2

=> 180m

Therefore Its circumference is 180m

Q37. Answer: (d) P

Opposite surface of the open dice can be found by the below method:-

• Alternate surfaces are opposite to each other.

• No two opposite surface are touched by side or by corners

From the positions 1, 2, 3 of Dice the opposite faces identified as :

Alphabets	Opposite side
P	U

S	R
Q	Not shown (T)

Therefore Here, the opposite letter of U is 'P'.

Hence, the correct answer is "P".

Q38. Answer: (d) Satish Dhawan Space Centre

The correct answer is Satish Dhawan Space Centre.

• The PSLV-C45 was launched from the second launch pad of the Satish Dhawan Space Centre in Sriharikota, Andhra Pradesh, India.

Key Points

• ISRO has many facilities each dedicated to a specialized field of study in space:

• Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram

• Liquid Propulsion Systems Centre (LPSC), Thiruvananthapuram

• Satish Dhawan Space Centre (SDSC-SHAR), Sriharikota

• Space Applications Centre (SAC), Ahmedabad

• National Remote Sensing Centre (NRSC), Hyderabad

Additional Information

• The Indian National Committee for Space Research (INCOSPAR) was established by Jawaharlal Nehru in 1962 under the Department of Atomic Energy (DAE).

• Eminent scientist Dr Vikram Sarabhai had a big role in this development.

• INCOSPAR established the Thumba Equatorial Rocket Launching Station (TERLS) at Thumba near Thiruvananthapuram on the southern tip of India.

• INCOSPAR became ISRO in 1969.

• Gaganyaan Mission: India's maiden space mission, Gaganyaan, will be launched in 2023.

• Chandrayaan-3 Mission: Chandrayaan-3 is likely to be launched during the third quarter of 2022.

• Three Earth Observation Satellites (EOSs):

• EOS-4 (Risat-1A) and EOS-6 (Oceansat-3) — will be launched using Isro’s workhorse PSLV, the third one, EOS-2 (Microsat), will be launched in the first developmental flight of the Small Satellite Launch Vehicle (SSLV).

Q39. Answer: (b) Wangari Mathai

The correct answer is Wangari Mathai.

• Wangari Maathai was the founder of the Green Belt Movement and the 2004 Nobel Peace Prize, Laureate.

• She authored four books: The Green Belt Movement; Unbowed: A Memoir; The Challenge for Africa; and Replenishing the Earth.

• Peace on earth depends on our ability to secure our living environment.

• Maathai stands at the front of the fight to promote ecologically viable social, economic and cultural development in Kenya and in Africa.

• She has taken a holistic approach to sustainable development that embraces democracy, human rights and women’s rights in particular.

Additional Information

Nobel Prizes 2021

Field	Recipient	Contributions
Chemistry	Benjamin List and David W.C. MacMillan	Finding an easier and environmentally cleaner way to build molecules that can be used to make compounds, including medicines and pesticides (organocatalysis).
Physics	Syukuro Manabe, Klaus Hasselmann and Giorgio Parisi	Understanding of complex physical systems.
Medicine	David Julius and Ardem Patapoutian	For their work in the field of somatosensation, that is the ability of specialised organs such as eyes, ears and skin to see, hear and feel.

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Peace Prize	Maria Ressa and Dmitry Muratov	For their efforts to safeguard freedom of expression, which is a precondition for democracy and lasting peace.
Literature	Abdulrazak Gurnah	For his uncompromising and compassionate penetration of the effects of colonialism and the fate of the refugee in the gulf between cultures and continents.
Economics	David Card, Joshua Angrist and Guido Imbens	Research on wages, jobs

Q40. Answer: (a) Rs. 3,090

Given:

Principal amount = Rs. 25000

Rate of interest = 6%

Time = 2 years

Concept used:

Compound interest, CI = $P(1 + R/100)^n - P$

where

P = Principal amount

R = Rate of interest per year

N = Time in years

Calculation:

The compound interest incurred

=> $25000 (1 + 6/100)^2 - 25000$

=> 28090 - 25000

=> 3090

Therefore The compound interest on Rs. 25,000 at the rate of 6% per annum in 2 years will be 3090.

Q41. Answer: (a) Meghalaya

The correct answer is Meghalaya.

• Rat Hole mining is majorly only practised in Meghalaya.

• Rathole mining involves digging very small tunnels, usually only 3-4 feet high, which workers (often children) enter and extract coal.

Key Points

• Meghalaya is a state in Northeast India.

• Meghalaya was formed by merging two districts from the state of Assam: the United Khasi Hills and Jaintia Hills, and the Garo Hills on 21 January 1972.

Additional Information

Some of the mineral mines are:

Mineral	Mines	Top Producer (State)
Iron ore	Barabil – Koira Valley (Odisha) Bailadila Mine (Chhattisgarh) Dalli-Rajhara (CH)	1. Odisha 2. Chhattisgarh 3. Karnataka
Copper	Malanjkhand Belt (Madhya Pradesh) Khetri Belt (Rajasthan) Kho-Dariba (Rajasthan)	1. Madhya Pradesh 2. Rajasthan 3. Jharkhand

Q42. Answer: (b) 25% gain

Given:

The ratio of the cost price and the selling price of an article is 4 : 5.

Concept used:

Gain percentage = (Selling Price - Cost Price)/(Cost Price) × 100%

Calculation:

Let the common ratio be Q.

Hence,

the selling price of the article = 5Q

the cost price of the article = 4Q

Thus, Gain% = (5Q - 4Q)/4Q × 100% = 25%

Therefore The percentage gain is 25%.

Q43. Answer: (b) New Delhi

The correct answer is New Delhi.

Key Points

• United Nations Environment Programme office in India is located in New Delhi.

• United Nations Environment Programme is an agency of United Nations that sets the global environmental agenda and promotes the implementation of the environmental dimension of sustainable development within the United Nations system.

• It is headquartered in Nairobi, Kenya.

• It was founded by Maurice Strong, the first director of UNEP, as a result of the United Nations Conference on the Human Environment in June 1972.

Additional Information

Headquarters	Organizations
Paris	United Nations Educational, Scientific and Cultural Organization (UNESCO) Organization for Economic Cooperation and Development (OECD)
New York	United Nations Organisation United Nations Childrens' Fund (UNICEF)
Geneva	World Health Organisation (WHO) International Labour Organisation (ILO) World Trade Organisation (WTO) United Nations Conference on Trade and Development (UNCTAD) World Intellectual Property Organization (WIPO) World Economic Forum

Q44. Answer: (b) 62/15

The logic followed here is :-

1) 65/16 → Here Quotient = 4 and Remainder = 1

2) 62/15 → Here Quotient = 4 and Remainder = 2

3) 37/9 → Here Quotient = 4 and Remainder = 1

4) 49/12 → Here Quotient = 4 and Remainder = 1

Therefore Here, 62/15 is different from other three alternatives.

Hence, the correct answer is " 62/15 ".

Q45. Answer: (d) 1/10000 cm

Given:

The photograph of a bacteria enlarged 60000 times attains a length of 6 cm.

Calculation:

Let the actual length of the bacteria be Q cm.

According to the question,

Q × 60000 = 6

=> Q = 1/10000

Therefore The actual length of bacteria 1/10000.

Q46. Answer: (a) 17

Given:

(0.63 ÷ 1.26) × 4 + 5 × 3

Concept used:

Calculation:

(0.63 ÷ 1.26) × 4 + 5 × 3

=> 0.5 × 4 + 5 × 3

=> 2 + 15

=> 17

Therefore The simplified value is 17.

Q47. Answer: (d) John Dalton

The correct answer is John Dalton.

• John Dalton's atomic theory:

• His theory was based on the laws of chemical combination.

• Dalton's atomic theory provided an explanation of the law of conservation of mass and the law of definite proportions.

• In 1808 he presented his atomic theory which was a turning point in the study of matter.

Key Points

• According to Dalton’s atomic theory, all matter, whether an element, a compound or a mixture is composed of small particles called atoms. The postulates of this theory may be stated as follows:

• (i) All matter is made of very tiny particles called atoms.

• (ii) Atoms are indivisible particles, which cannot be created or destroyed in a chemical reaction.

• (iii) Atoms of a given element are identical in mass and chemical properties.

• (iv) Atoms of different elements have different masses and chemical properties.

• (v) Atoms combine in the ratio of small whole numbers to form compounds.

• (vi) The relative number and kinds of atoms are constant in a given compound.

Additional Information

• Ernest Rutherford is best known for his pioneering studies of radioactivity and the atom.

• He found that there are two types of radiation coming from uranium, alpha and beta particles.

• He found that the atom consists mostly of empty space, with its mass concentrated in a centrally positively charged nucleus.

• Antoine Lavoisier determined that oxygen was a major substance in combustion, and he gave the element its name.

• He developed a modern system of naming chemical substances and has been called "the father of modern chemistry" for his emphasis on careful experimentation.

• In chemistry, the law of definite proportions, sometimes called Proust's law or law of constant structure, states that a given chemical compound always has its constituent elements in a fixed proportion (by mass) and that it does not depend on its source and method of preparation.

Q48. Answer: (b) United States

The correct answer is United States.

Key Points

• The model for “Fundamental Rights” in India is taken from the US constitution.

• As Indian citizens, We have 6 Fundamental Rights by our constitution.

• They are-

• Right to Equality.

• Right to Freedom.

• Right against Exploitation.

• Right to Freedom of Religion.

• Cultural and Educational Rights.

• Right to Constitutional Remedies.

Additional Information

• Sources of Indian Constitution

Source	Provisions
Indian Govt. Act 1935	• Federal system - Power of the judiciary - Public service commission, - Emergency provisions, - Governor's office, - Administrative details.
USA	• Fundamental Rights - Independence of Judiciary - Judicial Review - Impeachment of the President - Removal of Supreme Court and High Court Judges - Post of Vice President

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Britain	• Parliamentary government - Rule of Law - Legislative Procedure - Single citizenship - Cabinet system - Parliamentary privileges - Bicameral system - Prerogative writs
Irish	• DPSPs - Nomination of members to Rajya Sabha - Method of election of President
Russia (Soviet Union)	• Fundamental Duties - The ideal of Justice in the Preamble
France	• Republic - Ideals of liberty, equality, and fraternity
South Africa	• The procedure for amendment of the Constitution. - Election of members of the Rajya Sabha.
Japan	• The procedure established by law

Q49. Answer: (c) Minister of State in the Ministry of Defence

Minister of State in the Ministry of Defence is NOT correct.

• The Minister of State in the Ministry of Defence is NOT a Cabinet Minister.

Key Points

• A minister of state is a junior minister in the council of ministers in the central government who may assist a cabinet minister or hold an independent charge of the ministry.

• The Constitution of India restricts the number of Ministers of State in the federal government.

• A minister of state with an independent charge is a minister without a supervising cabinet minister in the state or central government of India.

• He is himself in charge of his ministry, unlike a minister of state who is also a minister but assists a cabinet minister.

• In addition, such ministers can participate in cabinet meetings on important issues unlike ministers of state who do not participate in any cabinet meeting.

• The Ministry of Defense is directly charged with coordinating and supervising all agencies and functions of the government directly related to national security and the Indian Armed Forces.

• The President of India is the formal Commander-in-Chief of the country's armed forces.

Q50. Answer: (b) 17 units per packet

Given:

Two boxes, A and B, have the capacity of holding 85 and 68 units of an article respectively.

Concept used:

HCF is the largest number or quantity that is a factor of each member of a group of numbers.

Calculation:

The maximum number of units that should be put into each of these packets such that both boxes A and B are filled to their full capacity should be the HCF the capacity of A and B.

HCF (85, 68) = 17

Therefore The maximum number of units that should be put into each of these packets such that both boxes A and B are filled to their full capacity is 17 units per packet.

Q51. Answer: (c) BR Ambedkar

The correct answer is BR Ambedkar.

Important Points

• Dr B. R. Ambedkar established the Depressed Classes Federation (DCF) in 1930.

• He established the Independent Labour Party (ILP) in 1935.

• The first convention of Depressed Classes changed into convened on November 11, 1917, via way of means of Justice Chandravarkar.

• The convention pleaded the needs of untouchables earlier than the government.

• The first All India Depressed Classes convention was changed into held in Bombay on March 23, 1918, below the Chairmanship of Maharaja Shivajirao of Baroda.

• It changed into attended via way of means of many distinguished leaders.

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Q52. Answer: (c) 3157

The logic followed here is :-

Hence, the correct answer is "3157".

Q53. Answer: (c) Rajarajeshwara temple

The correct answer is Rajarajeshwara temple.

Important Points

• Rajarajeshwara temple is near Taliparamba in Kerala, where women are allowed to enter only after 8 p.m.

• A unique feature of this temple is the absence of a flagstaff.

• Raja Rajeshwara Temple is dedicated to Lord Shiva.

• It is also known as Brihadeshwara Temple.

• It is located in Thanjavur(Tanjore), Tamil Nadu on the bank of the Cauvery River.

• It is one of the best examples of the Dravidian style of temple architecture.

• It was built by Chola emperor Raja Raja Chola I between 1003 AD and 1010 AD.

• The temple comes under the list of UNESCO World Heritage Sites in 1987 and it is also a part of the "Great Living Chola temple".

• It is the largest and tallest of all Indian temples.

Q54. Answer: (b) Paternal Aunt

Family chart :

Pointing to a photograph of a man, a woman said, “That man is the son of the only brother of my husband."

Family Tree :

Therefore Here, Woman is paternal aunt to the man in photo.

Hence, the correct answer is "Paternal Aunt".

Q55. Answer: (a) 1

Concept used:

$A^2 - B^2 = (A + B) (A - B)$

Calculation:

$(\sqrt{3} - \sqrt{2}) \times (\sqrt{3} + \sqrt{2})$

$\Rightarrow (\sqrt{3})^2 - (\sqrt{2})^2$

$\Rightarrow 3 - 2$

$\Rightarrow 1$

Therefore The simplified value is 1.

Q56. Answer: (a) two decimal places

Calculation:

27/25 = 1.08

Therefore The decimal expansion of 27/25 will terminate after two decimal places.

Q57. Answer: (c) 12%

Given:

A dealer lists his goods at 40% above the cost price and allows a discount of 20%.

Concept used:

Successive percentage change of A% and B%, results into = (A + B + (A × B)/100)%

Calculation:

Profit percentage = 40 - 20 - (40 × 20)/100 = 12%

(Here discount is considered as a negative percentage change)

Therefore His profit is 12%.

Q58. Answer: (c) Habeas corpus

The correct answer is Habeas corpus.

Key Points

• Habeas corpus means " to produce the body" or " to have the body".

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• This writ is issued for the enforcement of the fundamental right.

• It can be issued by both the supreme court and the high court.

• It is issued against both public and private authorities.

• It is not issued on certain grounds such as detention being outside the jurisdiction of the court or detention being by a competent court.

Additional Information

• Writs are a written order from the Supreme Court or High Court that commands constitutional remedies for Indian Citizens against the violation of their fundamental rights.

• Article 32 in the Indian Constitution deals with constitutional remedies that an Indian citizen can seek from the Supreme Court and High Court against the violation of his/her fundamental rights.

• Five kinds of writs are issued for enforcing the fundamental rights of the citizens.

• Habeas Corpus

• Mandamus - We command.

• Prohibition - To forbid.

• Certiorari - To be certified' or 'To be informed.

• Quo-Warranto- By what authority or warrant.

Q59. Answer: (c) 54

The logic followed here is :-

2 + 2 = 12, 3 + 3 = 24, 4 + 4 = 34 and 5 + 5 = 42 :

Therefore Here, the value of 8 + 8 = 54.

Hence, the correct answer is "54".

Q60. Answer: (a) Malayalam

The correct answer is Malayalam.

Important Points

• Malayalam is the language spoken by a majority of the people in Lakshadweep.

• According to Census 2011, Hindi has retained its position as a predominant language spoken by about 43.63% of the population.

• Bengali was the second most spoken language which is spoken by 8.03% of the population.

• Marathi was at 3rd with 6.86% of speakers.

• Out of 22 scheduled languages,13 were reported as the mother tongue by at least 1% of the population.

• Sanskrit is spoken by nearly 25000 people.

• The Eighth Schedule of the Indian Constitution provides a list of all the officially recognized languages in India.

• It is found in Articles 344(1) and 351 of the Constitution

Q61. Answer: (d) Canada

The correct answer is Canada.

• The first Pressurised Heavy Water Reactor (PHWR) of India in 1964 was a Collaborative venture between Atomic Energy of Canada Ltd and NPCIL of India.

• Plans for building the first Pressurised Heavy Water Reactor (PHWR) were finalized in 1964, and this prototype Rajasthan 1, which had Canada's Douglas Point reactor as a reference unit, was built as a collaborative venture between Atomic Energy of Canada Ltd (AECL) and NPCIL.

Key Points

• IPHWR-700 (Indian Pressurized Heavy Water Reactor-700) is an Indian pressurized heavy water reactor designed by Bhabha Atomic Research Center.

• It is a Generation III reactor developed from earlier CANDU based 220 MW and 540 MW designs.

• PHWR technology was introduced to India in the late 1960s with the construction of RAPS-1, a CANDU reactor in Rajasthan.

• All the main components for the first unit were supplied by Canada. India did the construction, installation, and commissioning.

• In 1974, after India conducted its first nuclear weapons test by Smiling Buddha, Canada ended its support for the project.

Important Points

• Apsara is the first nuclear reactor in India.

• It was built in the year 1956.

• It is the first nuclear reactor in Asia.

• Kamini (Kalpakkam Mini reactor) is the first fast breeder neutron reactor in India.

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• Uranium-233 is used as the fuel in this reactor.

• Kudankulam nuclear power plant is the largest nuclear power station in India.

• It was established with the collaboration of India and Russia.

Q62. Answer: (a) GSAT-31

The correct answer is GSAT-31.

• In February 2019, GSAT-31 was launched by ISRO to help in bulk data transfer for telecommunication applications.

Key Points

• The Indian Space and Research Organization (ISRO) has launched GSAT-31 on an Ariane 5 rocket from French Guiana in South America.

• GSAT-31 is India's 40th communication satellite

• GSAT will replace 31 satellites INSAT-4CR and INSAT-4A which are going to be phased out soon and will help in maintaining the continuity of the services currently provided by these satellites.

• The satellite will provide connectivity to Very Small Aperture Terminals (VSATs) for ATMs, stock exchanges, e-governance applications and direct-to-home (DTH) services.

• It will also provide telecom applications for bulk data transfer for applications, emergency communication, and disaster management support.

Additional Information

• The Indian National Committee for Space Research (INCOSPAR) was established by Jawaharlal Nehru in 1962 under the Department of Atomic Energy (DAE).

• Eminent scientist Dr Vikram Sarabhai had a big role in this development. He understood the need for space research and was convinced of the role it can play in helping a nation develop.

• INCOSPAR set up the Thumba Equatorial Rocket Launching Station (TERLS) at Thumba, near Thiruvananthapuram at India’s southern tip. TERLS is a spaceport used to launch rockets.

• The INCOSPAR became ISRO in 1969.

Q63. Answer: (d) 5^(1/3)

Given:

cbrt40

Calculation:

cbrt40

=> cbrt(2× 2 × 2 × 5)

=> 2 cbrt5

=> 2 × $5^{1}/3$

Therefore Rationalising factor of cbrt40 is $5^{1}/3$.

Q64. Answer: (b) 1

Given:

tan 5° tan 25° tan 45° tan 65° tan 85°

Concept used:

tan (90° - θ) = cot θ

tanθ cotθ = 1

Calculation:

tan 5° tan 25° tan 45° tan 65° tan 85°

=> tan (90° - 85°) tan (90° - 65°) tan 45° tan 65° tan 85°

=> cot 85° cot 65° tan 45° tan 65° tan 85°

=> tan 45°

=> 1

Therefore The simplified value is 1.

Q65. Answer: (b) Ravi

The logic followed here is :-

1) Rahul is shorter than Raman.

• Raman > Rahul

2) Ramesh is shorter than Ravi but taller than Raman.

• Ravi > Ramesh > Raman

Thus final arrangement;

• Ravi > Ramesh > Raman > Rahul.

Therefore Here, 'Ravi' is tallest among them.

Hence, the correct answer is "Ravi".

Q66. Answer: (b) 27

Shortcut Trick

In the binomial expansion of $(x + a)^n$, the term containing x^1 is given by ${}^nC_{(n-1)} \times x^1 \times a^{(n-1)}$.

Here, n = 3 and a = 3.

Coefficient of $x = {}^3C2 \times 3^{(3-1)} = 3 \times 3^2$

Coefficient = 3 × 9 = 27.

Therefore The correct answer is 27.

Alternate Method

Given: The algebraic expression $(x + 3)^3$.

Formula Used: $(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

Calculations:

=> Let a = x and b = 3.

=> $(x + 3)^3 = x^3 + 3(x^2)(3) + 3(x)(3^2) + 3^3$

=> $(x + 3)^3 = x^3 + 9x^2 + 3(x)(9) + 27$

=> $(x + 3)^3 = x^3 + 9x^2 + 27x + 27$

=> The coefficient is the numerical factor of the variable term.

=> In the term 27x, the coefficient of x is 27.

Therefore The correct answer is 27.

Additional Information

Binomial Theorem

The general expansion of $(x + y)^n$ is $\Sigma\ {}^nC_k \times x^{(n-k)} \times y^k$ for k = 0 to n.

Algebraic Identity $(a - b)^3$

The expansion of $(a - b)^3$ is $a^3 - 3a^2b + 3ab^2 - b^3$.

Coefficient Definition

A coefficient is a multiplicative factor in some term of a polynomial, a series, or any expression; it is usually a number.

Q67. Answer: (c) Dry deciduous forests

The correct answer is Dry deciduous forests.

• Dry deciduous forests are more pronounced in areas that record annual rainfall between 70–100 cm.

• The main species found in moist deciduous forests are teak, shisham, sal, hurra, amla, safflower and sandalwood.

• The main species found in dry deciduous forests are tendu, amaltas, bael, Khair, excelword, palas etc.

Additional Information

• There are five categories of forests in India.

• Tropical Deciduous Forest

• Trees have broadleafs. India also has temperate deciduous forests but they're very less in number.

• These broad leaves are shed within the autumn season but it's within the case of temperate deciduous mode.

• The tropical deciduous forests have trees that shed their leaves within the winter season.

• Tropical Rain Forests

• It is also referred to as equatorial rainforests.

• Rainforests are those forests that are characterized by heavy rainfall between 1750 mm and 2000 mm.

• These forests incur heavy showers of 100-600 cm a year.

• Coffee, bananas, and chocolates come from tropical rainforests.

• Mountain Forests

• It is found in mountain or hilly areas.

• These areas include the hilly area of the Himalayas and Vindhyas or Nilgiri Hills.

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• The forests within the northern region are denser than in the South.
• At higher altitudes, fir, juniper, deodar, and chilgoza are often found.
• Tropical Thorn forests
• It is found in a neighbourhood with little or no rainfall (as little as 50cm).
• Arid regions of Rajasthan, Madhya Pradesh, Gujarat, and Uttar Pradesh have these forests.
• Swamp Forests
• It is also referred to as Wetland forests and Littoral forests in Gujarat, Rajasthan, and Rann of Kutch.
• Another name is alpine forests another category of forests.

Q68. Answer: (a) $x^2 – 6x + 4 = 0$

Given:
One root is $3 + \sqrt{5}$
Concept used:
$(A + B)^2 = A^2 + B^2 + 2AB$
Calculation:
Hence,
$x = 3 + \sqrt{5}$
$\Rightarrow (x - 3)^2 = 5$ (Sqauring both side)
$\Rightarrow x^2 - 6x + 9 = 5$
$\Rightarrow x^2 - 6x + 4 = 0$
Therefore The quadratic equation is x2 - 6x + 4 = 0.

Q69. Answer: (c) 11

Concept used:
Total = Mean (Average) × number of entities
Calculation:
First ten even natural numbers in the ascending order -
=> 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
Hence, the mean = Sum (2, 4, 6, 8, 10, 12, 14, 16, 18, 20) ÷ 10 = 11
Therefore The mean of the first ten even natural numbers is 11.

Q70. Answer: (a) Plaster of Paris

The correct answer is Plaster of Paris.
• On heating gypsum at 373 K, it loses water molecules and becomes calcium sulphate hemihydrate.
• This substance is used to make toys, materials for decoration, and smooth surfaces.
• This substance is commonly known as the Plaster of Paris.
Key Points
• Gypsum is the name given to a mineral classified as a calcium sulfate mineral, and its chemical formula is calcium sulfate dihydrate, CaSO4? 2H2O.
• Plaster of Paris is prepared by heating calcium sulfate dihydrate or gypsum to 120–180 °C.
• Plaster of Paris has the chemical formula (CaSO4) 1/2H2O and is known as calcium sulfate hemihydrate.
• Plaster of Paris generally does not shrink or crack when dry, making it an excellent medium for mould casting.
• It is commonly used to precast and hold parts of decorative plasterwork installed on ceilings and cornices.
• It is also used in medicine to make plaster casts to repair broken bones, although many modern orthopaedic casts are made of fibreglass or thermoplastics.

Q71. Answer: (d) Both Quantities A and B are equal.

Given:
Quantity A is the number of ways to assign a number from 1 to 5 without repetition to each of four people
Quantity B is the number of ways to assign a number from 1 to 5 without repetition to each of 5 people
Concept used:
Permutation and Combination
Calculation:

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The number of ways to assign a number from 1 to 5 without repetition to each of four people = 5 × 4 × 3 × 2 = 120

The number of ways to assign a number from 1 to 5 without repetition to each of 5 people = 5! = 5 × 4 × 3 × 2 × 1 = 120

Hence, Quantity A = Quantity B

Therefore Both Quantities A and B are equal.

Q72. Answer: (a) Vinod Khosla

The correct answer is Vinod Khosla.

Important Points

• Vinod Khosla was one of the founders of the American computer company Sun microsystems later acquired by oracle.

• Vinod Khosla is an Indian-American billionaire businessman and venture capitalist.

• Java was originally developed at Sun Microsystems and released in 1995 as a core component of Sun Microsystems' Java platform.

• Oracle database is a relational database management system.

• It is also called OracleDB, or simply Oracle.

• It is produced and marketed by Oracle Corporation.

• It was created in 1977 by Lawrence Ellison.

Q73. Answer: (a) 1962

The correct answer is 1962.

Important Points

• The National TB Programme (NTP) was launched by the Government of India in 1962 in the form of the District TB Centre model involved with BCG vaccination and TB treatment.

• In 1978, BCG vaccination was shifted under the Expanded Programme on Immunisation.

• ‘National strategic plan for tuberculosis elimination 2017-2025’

• RNTCP has released a ‘National strategic plan for tuberculosis 2017-2025’ (NSP) for the control and elimination of TB in India by 2025.

• According to the NSP TB elimination has been integrated into the four strategic pillars of “Detect – Treat – Prevent – Build” (DTPB).

Additional Information

• Tuberculosis is caused by Mycobacterium Tuberculosis.

• It is a gram-positive aerobic bacteria.

• It belongs to the family Mycobacteriaceae.

• Tuberculosis is an upper respiratory tract infection.

Q74. Answer: (c) Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM)

The correct answer is Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM).

• Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM) under the Ministry of Rural Development aims to organize rural poor women into their own institutions like Self Help Groups and their associations, producers, collectives etc. and ensure their financial inclusion.

• Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM) is a new name given to Livelihoods - NRLM in November 2015.

• An initiative to move towards a demand-driven strategy to enable states to formulate their own livelihood-based poverty reduction action plans is at the core of the mission.

Additional Information

• The National Rural Employment Guarantee Act 2005 or NREGA, later renamed as Mahatma Gandhi National Rural Employment Guarantee Act or MGNREGA in 2009, is Indian labour law and social security measure that aims to guarantee the 'right to work'.

• Beneficial Approach for Transformation of Agriculture and Allied Sector, earlier Rashtriya Krishi Vikas Yojana is a state plan scheme of additional central assistance, which was launched by the Government of India in August 2007 as a part of the 11th Five Year Plan.

• NSAP stands for National Social Assistance Program.

• NSAP was launched on August 15, 1995.

• The National Social Assistance Program (NSAP) represents an important step toward the fulfilment of the Directive Principles in Articles 41 and 42 of the Constitution, recognizing the concurrent responsibility of the Central and State Governments in this matter.

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Q75. Answer: (c) 15000

The correct answer is 15000.

• The government has set an ambitious target of awarding contracts for 20,000 km and building 15,000 km of highways in FY21.

Key Points

• PM GatiShakti

• PM GatiShakti National Master Plan will encompass the seven engines for economic transformation, seamless multimodal connectivity and logistics efficiency.

• The seven engines include roads, railways, airports, ports, mass transport, waterways, and logistics infrastructure.

• To facilitate better movement of people and goods, The National Highways Network will be expanded by 25,000 km in FY23.

• 400 new gen Vande Bharat trains to be manufactured in the next 3 years.

• Railways will develop new products and logistic services for small farmers and MSMEs.

• 'One Station- One Product' concept will be promoted to help local businesses and supply chains built on a hub and spoke model.

• 2,000 km of the network to be brought under a new scheme, Kavach – for safety and capacity augmentation.

Additional Information

• Union Budget 2022-23:

• Growth estimates

• 9.2 per cent expansion in GDP in FY22.

• 8−8.5 per cent projected GDP growth for FY23.

• Deficit

• The Revised Fiscal Deficit in the current year is estimated at 6.9 per cent of GDP.

• The Fiscal Deficit in 2022-23 is estimated at 6.4 per cent of GDP.

• Infrastructure

• PM Gati Shakti National Master Plan at a cost of Rs. 20,000 crores.

• 5G spectrum auctions are to be conducted in 2022.

• The scheme for design-led manufacturing for 5G will be part of the production-linked scheme.

• To award contracts to lay optical fibre in rural areas, completion in 2025.

• To allocate additional 195 billion rupees for production-linked incentives towards solar equipment manufacturing.

Q76. Answer: (b) Hind Swaraj

The correct answer is Hind Swaraj.

• Hind Swaraj or Indian Home Rule is a book written by Gandhiji in 1909.

• After the Jallianwala Bagh massacre and the death of Bal Gangadhar Tikal, Mahatma Gandhi announced the non-cooperation movement in August 1920.

Additional Information

• Gandhi was an Indian lawyer, anti-colonial nationalist, and political ethicist who employed nonviolent resistance to lead the successful campaign for India's independence from British rule.

• His birthday (2nd October) is commemorated worldwide as International Day of Nonviolence.

• Books are written by Mahatma Gandhi:

• The Story of My Experiments with Truth (1927).

• Hind Swaraj (1909).

• India of my dreams (1947).

• Satyagraha in South Africa (1928).

Q77. Answer: (c) 34

Given:

$x + 1/x = 6$

Concept used:

$(A + 1/A)^2 = A^2 + 1/A^2 + 2$

Calculation:

$x + 1/x = 6$

$\Rightarrow (x + 1/x)^2 = 36$ (Squaring both side)

$\Rightarrow x^2 + 1$ over $x^2 + 2 = 36$

$\Rightarrow x2 + 1$ over $x^2 = 34$

Therefore The value of x2 + 1/(x^2) is 34.

Q78. Answer: (d) 2

Concept used:

HCF is the largest number or quantity that is a factor of each member of a group of numbers.

Calculation:

Least Prime Natural number = 2

Least Composite Natural number = 4

HCF (2, 4) = 2

Therefore The HCF of the least prime number and the least composite natural number is 2.

Q79. Answer: (d) Karnataka

The correct answer is Karnataka.

Key Points

• Yakshagana is a traditional theatre form of Karnataka.

• It literally means the song of the yaksha.

• It developed in the Udupi district of Karnataka.

• It is believed to have originated between the 10th and 16th centuries.

• It is a temple art form that depicts mythological stories, Ramayana, Mahabharata, Bhagavata, and other Hindu epics.

Q80. Answer: (b) 6 and 35

Concept used:

Co-prime numbers are a set of numbers or integers which have only 1 as their common factor i.e. their highest common factor (HCF) will be 1.

Calculation:

Option 1:

14 = 2 × 7

21 = 3 × 7

Hence, 14 and 21 aren't co-prime.

Option 2:

6 = 2 × 3

35 = 5 × 7

Hence, 6 and 35 are co-prime.

Since Option 2 suffices as the required answer, there is no need to check any further.

Therefore 6 and 35 of the following pairs of numbers are co-prime.

Q81. Answer: (a) Neither assumption I nor II is implicit.

According to the given statement :-

Assumption I: This is not implicit, because nothing about staff incompetent is mentioned in the statement.

Assumption II: This is not implicit, because nothing about hiring new staff to expand business is not mentioned in statement.

Therefore Here, both the statements are not implicit so, Neither assumption I nor II is implicit.

Hence, the correct answer is "Neither assumption I nor II is implicit".

Q82. Answer: (c) SAKSHAT

The correct answer is SAKSHAT.

Important Points

• The Ministry of Human Resource Development has designed an education portal which caters to the needs of students, starting from elementary students to research, scholars, teachers and lifelong learners.

• SAKSHAT is the name of the portal which was launched in the year 2006.

• It was launched by former President of India Dr APJ Abdul Kalam.

• It was developed by eGyanKosh of IGNOU.

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Q83. Answer: (a) Buddhist Circuit Tourist Train

The correct answer is Buddhist Circuit Tourist Train.

Key Points

• Buddhist circuit tourist train is the train recently started by the Indian Railways.

• It travels to Lumbini, Bodhgaya, Sarnath and Kushinagar.

• It links all the places associated with Budhha and Buddhism.

• The new chairman of the Railway board is Vinay Kumar Tripathi (1 Jan 2022–30 Jun 2022).

Additional Information

• Important Tourist trains:

• Vaishnodevi with Amritsar, Ex Silchar

• Destination: AMRITSAR / VAISHNO DEVI

• 07 Jyotirlinga Yatra

• Destination: BHIMSHANKAR / DWARKADHISH / GRISHNESHWAR / MAHAKALESHWAR / NAGESHWAR / OMKARESHWAR / PARLI VAIJANATH / SABARMATI JN / SOMNATH / STATUE OF UNITY / TRIAMBAKESHWAR

• Banglore Mysore with Dakshin Darshan Yatra

• Destination: BANGALORE / KANYAKUMARI / MADURAI / MYSORE / RAMESHWARAM / TIRUCHIRAPALLI / TIRUPATI / TRIVANDRUM

• Uttar Bharat Darshan With Mata Vaishno Devi

• Destination: AGRA / AMRITSAR / HARIDWAR / Mathura / VAISHNO DEVI

• Dakshin Bharat Tourist Trai

• Destination: Ayodhya / Haridwar / Mathura / Prayagraj / Rishikesh / Varanasi / Vrindavan

• Vaishnodevi with Uttar Bharat Darshan

• Destination: Ayodhya / Haridwar / Shivkhori / Vaishno Devi / Varanasi

Q84. Answer: (b) Vienna

The correct answer is Vienna.

Key Points

• The International Criminal Police Commission (ICPC), the predecessor to INTERPOL was founded in Vienna in 1923.

• The International Criminal Police Organisation (INTERPOL) is an international organization that facilitates worldwide police cooperation and crime control.

• Interpol uses communication and databases to track criminals across international borders.

• Headquarters of INTERPOL - Lyon, France.

• It was founded in 1923 as the International Criminal Police Commission (ICPC).

• India joined the organization in 1949 and is one of its oldest members.

Q85. Answer: (c) 16.42

Concept used:

Total = Mean (Average) × number of entities

Calculation:

The first twelve prime numbers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37.

Hence, the mean = Sum (2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37) ÷ 12

=> 197/12

=> 16.4166 ≈ 16.42

Therefore The mean of the first twelve prime numbers is 16.42.

Q86. Answer: (a) 1,80,000

Calculation:

Share of Model C and D = 75% - 45% = 30%

Share of Model F = 100% - 90% = 10%

Total share of Mode C, D and F = 30 + 10 = 40%

Hence, total number of mobile phones produced of models C, D and F in 2008 = 450000 × 40% = 1,80,000

Therefore The total number of mobile phones produced of models C, D and F in 2008 is 1,80,000.

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Q87. Answer: (a) Model E

Calculation:

In Model A, Difference of two years production volume = 40% × 640000 - 30% × 450000 = 121000

In Model B, Difference of two years production volume = 20% × 640000 - 15% × 450000 = 60500

In Model C, Difference of two years production volume = 15% × 640000 - 20% × 450000 = 6000

In Model D, Difference of two years production volume = 10% × 640000 - 10% × 450000 = 19000

In Model E, Difference of two years production volume = 10% × 640000 - 15% × 450000 = (-3500)

In Model F, Difference of two years production volume = 5% × 640000 - 10% × 450000 = (-13000)

Therefore For Model E the increase/decrease was in production volume between 2008 and 2009 the minimum.

Q88. Answer: (d) 60,500

Calculation:

Model B, Difference of two years production volume = 20% × 640000 - 15% × 450000 = 60500

Therefore 60500 is the difference between the numbers of Model B sets produced in 2008 and 2009.

Q89. Answer: (d) 18,600

Calculation:

Number of Model C sets remaining at the end of 2009 = (15% × 640000 + 20% × 450000) × (100 - 90)% = 18600

Therefore If 90% of Model C sets produced by the company were sold each year, then 18600 of them were remaining at the end of 2009.

Q90. Answer: (b) Quantity B is greater.

Shortcut Trick

Check the signs: Quantity A = −(negative)^(even) × (positive)^(odd).

$-x^2y^3 = -(-2)^2(3)^3$ => −(4)(27) => Negative Value.

Since Quantity A is negative and Quantity B is zero, 0 > negative.

Therefore The correct answer is Quantity B is greater.

Alternate Method

Given: x = −2, y = 3, Quantity A = $-x^2y^3$, Quantity B = 0.

=> Substitute the values in Quantity A:

=> Quantity A = $-(-2)^2 \times (3)^3$

=> Quantity A = −(4) × (27)

=> Quantity A = −108

=> Compare with Quantity B: −108 < 0.

Therefore The correct answer is Quantity B is greater.

Additional Information

Power of Negative Numbers

$(-a)^n$ is positive if n is an even integer and negative if n is an odd integer.

Comparison with Zero

Any positive number is always greater than 0, and any negative number is always less than 0.

BODMAS in Algebra

Always solve exponents before applying the leading negative sign in expressions like $-x^n$.

Q91. Answer: (c) MOQ

The logic followed here is :-

1) BDG

2) JLO

3) MOQ

4) RTW

Therefore Here, 'MOQ' is different from other three alternatives.

Hence, the correct answer is "MOQ".

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Q92. Answer: (b) 24

The logic followed here is :-

Hence, the correct answer is "24".

Q93. Answer: (d) 75

Given :

H has three times as many cards as R has.

Let us consider number of cards R have = x

Number of cards H have = 3 × as many cards as R has.

Number of cards H has = 3x

If H gives 50 cards to R :

=> 3x - 50 = x + 50

R will have three times as many cards as H has :

=> 3 × (3x - 50) = x + 50

=> 9x - 150 = x + 50

=> 9x - x = 50 + 150

=> 8x = 200

=> x = 25.

Number of cards H have = 3x

Number of cards H have = 3 × 25

Number of cards H have = 75

Therefore Here, the number of cards 'H' have is 75.

Hence, the correct answer is "75".

Q94. Answer: (c) 67

The logic followed here is :-

Sum of alphabet positional value + 3

'VLGH' is written as '52'.

=> 22 + 12 + 7 + 8 = 49

=> 49 + 3 = 52

and,

'QBNZ' is written as '62'.

=> 17 + 2 + 14 + 26 = 59

=> 59 + 3 = 62

Similarly,

"XPRF' will be coded as :

=> 24 + 16 + 18 + 6 = 64

=> 64 + 3 = 67

Hence, the correct answer is "67".

Q95. Answer: (c) TROPHY

Option 1) The word 'TRAP' can be made with the word "CATASTROPHE" because all the letters of the word are present in the given word.

Option 2) The word 'STAR' can be made with the word "CATASTROPHE" because all the letters of the word are present in the given word.

Option 3) The word 'TROPHY' cannot be made from the word "CATASTROPHE" because letter 'Y' is used in given word 'TROPHY'.

Option 4) The word 'CASTOR' can be made with the word "CATASTROPHE" because all the letters of the word are present in the given word.

Therefore Here, the word 'TROPHY' cannot be made from given word 'CATASTROPHE'.

Hence, the correct answer is "TROPHY".

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Q96. Answer: (d) 611920

The logic followed here is :-

Representation of alphabets positional values.

GOES is coded as 715519.

Similarly,

FAST will be coded as :

Therefore Here, FAST is coded as 611920.

Hence, the correct answer is "611920".

Q97. Answer: (a) Neither of the conclusions I or II follow

According to the given information,

Conclusions 1 → This is not implicit, because there is no relationship between when the postal system was established and Postal letters often being late, or they are lost.

Conclusions 2 → This is not implicit, because there is no statement given regarding postman salary and why they do mistakes.

Hence, “Neither of the conclusions I or II follow".

Additional Information

• If there are two or more sentences that are used to frame a statement, then, the sentences must be interrelated, and mutual contradiction should be there.

• Do not look for truthful notions. The information provided in the statement is the only requirement for a student to answer the question. No assumptions must be made.

• Read the statement carefully and look for keywords that are common between the statement and the conclusions

• If there is more than one conclusion that is applicable to the statement, students must ensure that the conclusions they opt for have some relation with each other.

Q98. Answer: (a) History

Given:

1) Anuj, Ankit, Anu and Alka are teachers who teach Biology, History and Mathematics.

2) Ankit teaches Biology and is unmarried.

Teachers	Subject
Anuj	
Ankit	Biology (Unmarried)
Anu	
Alka	

3) Biology is the only subject taught by two teachers, one of whom is male.

4) Two of the four are married to each other and they teach History and Biology respectively.

But only one male can teach biology so a second male teaches history and a married female teach biology.

• We can't say which female is married so Anu and Alka teach maybe biology and maybe mathematics.

Teachers	Subject
Anuj	History (Married)
Ankit	Biology (Unmarried)
Anu	Biology / Mathematics
Alka	Biology / Mathematics

Hence, Anuj teaches “History” subject.

Q99. Answer: (c) Magazine : Book : Read

The logic followed here is :-

• The sound is produced when we whisper and when we are singing.

Similarly,

• The Magazines and Books are printed or produced to Read.

Hence, the correct answer is "Magazine : Book : Read".

Q100. Answer: (b) Foot

The logic followed here is :-

• The time period of 60 minutes is a hour.

Similarly,

• The unit length of 12 inches is Foot.

Hence, the correct answer is "Foot".

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