RRB NTPC CBT-I Official Paper (Held On: 12 Jan 2021 Shift 1) (Previous Year Paper)

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

Take this paper as a timed mock test

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

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Q1. A can complete 25% of a task in 10 days. B can complete 40% of the task in 40 days and C can complete 1/3 of the task in 13 days. Who among them has the fastest speed to complete the same task?

(a) B
(b) A
(c) All have the same speed
(d) C

Q2. If (2, 7), (5, 1), (x, 3) are the vertices of a triangle whose area is 18 (sq. units), then find the possible value of x.

(a) –7
(b) 7
(c) 10
(d) -10

Q3. The cost price of a car was Rs. 150000. Raju sold it to Montoo at a profit of 5%, and later Montoo sold it back to Raju at 2% loss. Find The total profit or loss in the entire transaction.

(a) Raju's gain Rs. 4,500
(b) Raju's loss Rs. 4,350
(c) Raju's gain Rs. 3,150
(d) Raju's gain Rs. 4,350

Q4. Given that ΔABC ~ ΔDEF, if BC = 12.5 cm and EF = 10 cm, then the areas of ΔABC and ΔDEF are in the ratio of:

(a) 3 : 4
(b) 25 : 16
(c) 16 : 25
(d) 1 : 2

Q5. Sariska National Park is located in :

(a) Karnataka
(b) Uttarakhand
(c) Rajasthan
(d) Sikkim

Q6. Read the given statements carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, select the conclusion from the given options which logically does NOT follow from the statements.

Statements:

(i) All balls are flowers.

(ii) All bats are balls.

(a) No ball is a flower.
(b) Some flowers are bats.
(c) Some ball are bats.
(d) All bats are flowers.

Q7. Who was the Speaker of 16^(th) Lok Sabha?

(a) Manohar Joshi
(b) Sumitra Mahajan
(c) Somnath Chatterjee
(d) Meira Kumar

Q8. The Challenger Deep in the _____ is considered to be the deepest point known on Earth.

(a) Mariana Trench
(b) Lake Eyre
(c) Puerto Rico Trench
(d) Java Trench

Q9. In India, all the bills introduced and passed by both the houses (Lok Sabha & Rajya Sabha) can come into force only after they receive the assent of:

(a) President
(b) Parliament
(c) Supreme Court
(d) Prime Minister

Q10. In a certain code language, 'BUREAK' is written as 'PZVIFY'. What is the code for 'CASPTL' in that code language?

(a) OHKGZX
(b) PHKGYX
(c) PGKHYX
(d) OGKHZX

Q11. The present age of Myra and Meera are in the ratio of 6 : 5 and after fifteen years the ratio will be 9 : 8. Meera's age is:

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

Q12. The Ajanta caves are located in _____.

(a) Chhattisgarh
(b) Delhi
(c) Tamilnadu
(d) Maharashtra

Q13. Which of the following is the oldest Nuclear research reactor of India?

(a) Kamini
(b) Cirus
(c) Dhruva
(d) Apsara

Q14. Identify the number that DOES NOT belong to the following series.

10, 17, 26, 39, 50

(a) 26
(b) 39
(c) 17
(d) 50

Q15. ISRO has established the _____, at Bharati station, Antarctica, for receiving IRS data.

(a) NCAOR
(b) NRSC
(c) AGEOS

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(d) IMGEOS

Q16. What is the value of the following expression?

$(243)^2 \div (27)^2 \times 6 \div 18$

(a) 81
(b) 162
(c) 27
(d) 1

Q17. 'Glove' is related to 'Hand' in the same way as 'Cap' is related to '_____'.

(a) Foot
(b) Neck
(c) Head
(d) Back

Q18. Which of the following is the correct full form of 'MRTP' in MRTP Act 1969?

(a) Money Reservation Trade Policy Act
(b) Money Reservation Trade Practices Act
(c) Monopolies and Restrictive Trade Practices Act
(d) Monopolies Reservation Trade Practices Act

Q19. Which one country of the following was not a part of former USSR?

(a) Moldova
(b) Georgia
(c) Finland
(d) Russia

Q20. If $\sin(A + B) = (\sqrt{3})/2$ and $\cos(A-B) = (\sqrt{3})/2$ then which of the following will be possible values of A and B?

(a) A = 45°, B = 15°
(b) A = 45°, B = 30°
(c) A = 10°, B = 45°
(d) A = 50°, B = 10°

Q21. In a certain code language, 'Car have wheels' is written as '@ mu #', 'Wheels are red' is written as 'Su bc mu', 'I have red car' is written as '7 @ Su #'. Which among the following is the code for 'Wheels car' in that language?

(a) @
(b) mu Su
(c) mu #
(d) Su #

Q22. If 192/3-71/4 = x + 21/2, then what will be the value of x?

(a) 11 9/12
(b) 11/12
(c) 91/12
(d) 911/12

Q23. If the radii of two circles are 4.5 cm and 3.5 cm and the length of the transverse common tangent is 6 cm, then the distance between the two centers will be:

(a) 8 cm
(b) 12 cm
(c) 10 cm
(d) 9 cm

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Q24. In Excel, what shortcut key is used to fill the selected cell with active cells to the right?

(a) Ctrl + S
(b) Ctrl + R
(c) Ctrl + D
(d) Ctrl + V

Q25. If (3x + 2y) : (3x – 2y) = 5 : 3 then find x : y.

(a) 16/3
(b) 8/3
(c) 32/3
(d) 4/3

Q26. According to the Constitution of India, the minimum age requirement for being a member of Panchayat is _____.

(a) 24 years
(b) 18 years
(c) 21 years
(d) 28 years

Q27. Which of the following terms best describes the biological study of animal behaviour?

(a) Ethology
(b) Ethnology
(c) Entomology
(d) Etiology

Q28. 10.53 divided by 0.09 gives:

(a) 117
(b) 100.9
(c) 1.019
(d) 109

Q29. Shree Guru Nanak Dev Ji was born in Rai Bhoi Ki Talwandi (present day Nankana Sahib) in:

(a) 1539
(b) 1465
(c) 1456
(d) 1469

Q30. Who invented the modern mercury thermometer with a standardised scale?

(a) Anders Celsius
(b) Galileo Galilei
(c) Grand Duke
(d) Daniel Gabriel Fahrenheit

Q31. Hampi was declared a World Heritage site by _____.

(a) IMF
(b) UNO
(c) WHO
(d) UNESCO

Q32. Seven students A, B, C, D, E, F and G take a series of test. No two students get the same marks. A always scores more than B. G always scores more than A. Each time either C scores the highest and E scores the least or D scores the highest and F or B scores the least.

If D is ranked sixth and B is ranked fifth according to their marks, then which of the following can be true?

(a) G is ranked first or fourth
(b) E is ranked fourth or third
(c) F is ranked third or fourth

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(d) A is ranked second or seventh

Q33. According to India's Election Commission, political parties cannot release their manifesto in pre poll silence period of:

(a) 60 hours
(b) 36 hours
(c) 24 hours
(d) 48 hours

Q34. In a certain code language FMOPRA is written as 834207 and KQMATL is written as 953761. How will QTMPRL be written as in that language?

(a) 652301
(b) 563201
(c) 562301
(d) 635210

Q35. Which of the following monument is built with some influence of Gujarati style to welcome King George V and Queen Mary to India?

(a) Jallianwala Bagh
(b) Sun Temple
(c) India Gate
(d) Gateway of India

Q36. Study the given information and answer the question that follows.

i) Six students P, Q, R, S, T, and U are in a class.
ii) Q and R are lighter than U but taller than P.
iii) S is taller than Q and heavier than R.
iv) T is lighter than S but heavier than U.
v) U is taller than S.
vi) P is lighter than T but heavier than U.
vii) P is taller than T.
Who among the students is the shortest?

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

Q37. When did Sir William Jones found Asiatic Society?

(a) 1793
(b) 1784
(c) 1854
(d) 1782

Q38. When did Nadir Shah invade India and sack Delhi?

(a) 1739
(b) 1765
(c) 1750
(d) 1754

Q39. If the average age of A, B and C is 22 years and the average age of B and C is 25 years, then find A's age after 9 years.

(a) 35 years
(b) 50 years
(c) 45 years
(d) 25 years

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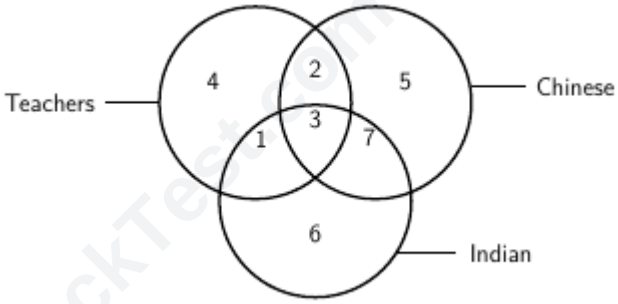
Q40. Which organisation has launched Samwad with students (SwS) as a part of its programme on New Year Day, 2019?

(a) NCERT
(b) BARC
(c) DRDO
(d) ISRO

Q41. Who has written Bahuroopi Gandhi?

(a) Jawaharlal Nehru
(b) Chakravarti Rajagopalachari
(c) Amrita Pritam
(d) Anu Bandyopadhyaya

Q42. Study the diagram and identify the region representing teachers who are not Indian and not Chinese.



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

Q43. Privatisation of the public sector enterprises by selling off part of the equity of PSEs to the public is known as:

(a) outsourcing
(b) commercialisation
(c) modernisation
(d) disinvestment

Q44. In an examination, 35% students failed in one subject and 42% failed in the other subject, 30% failed in both the subjects. If total number of students is 2500 then how many students passed only in one subject?

(a) 1050
(b) 1750
(c) 750
(d) 425

Q45. Which of the following is the major hazard of nuclear power generation?

(a) Limited availability
(b) Storage and Dispersal
(c) Installation
(d) Energy requirement

Q46. Who among the following freedom fighters was NOT involved in the Kakori Train Robbery?

(a) Chandrashekhar Azad
(b) Ram Prasad Bismil
(c) Bhagat Singh
(d) Ashfaqullah Khan

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Q47. The digit of hundred's place value of 19! is:

(a) 1
(b) 0
(c) 4
(d) 9

Q48. LCM and HCF of two numbers are 1920 and 16 respectively. If one of the numbers is 240, then find the other number.

(a) 128
(b) 182
(c) 150
(d) 112

Q49. When was WTO (World Trade Organization) established?

(a) 1995
(b) 1948
(c) 1999
(d) 1983

Q50. Which of the following neighbouring countries is separated from India by a narrow channel of sea formed by the Palk Strait and the Gulf of Mannar?

(a) Nepal
(b) Sri Lanka
(c) Maldives
(d) Pakistan

Q51. Who among the following received Mexico's highest civilian honour for foreigners in 2019?

(a) Pratibha Singh Patil
(b) Narendra Modi
(c) Amitabh Bacchan
(d) Pranab Mukherji

Q52. What is the value of the following expression?

$(-20)^3 + (13)^3 + (7)^3$

(a) 4560
(b) –5460
(c) –4650
(d) 4566

Q53. Which of the following plants has 'hidden reproductive organs'?

(a) Ipomoea
(b) Marsilea
(c) Pinus
(d) Deodar

Q54. The perimeter of a rhombus is 120 m and the distance between any two parallel sides is 15 m. The area of the rhombus is:

(a) 450 cm^2
(b) 450 m^2
(c) 4.5 m^2
(d) 45 m^2

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Q55. Which of the following is the process of converting sugar into alcohol?

(a) Oxidation
(b) Pasteurisation
(c) Bleaching
(d) Fermentation

Q56. During which financial year was Jal Kranti Abhiyan launched by the Government of India?

(a) 2015-16
(b) 2003-2004
(c) 2018-19
(d) 2017-18

Q57. If $16 \sec^2 \theta - 40 \sec \theta + 25 = 0$ and θ is an acute angle, then what will be the value of $\tan \theta$?

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

Q58. A shopkeeper gives 20% discount on MRP. Joginder buys a suitcase from the shop, at an additional discount of 20% on the reduced price. If the MRP of the suitcase is Rs. 1,200, then find the purchasing price paid by Joginder.

(a) Rs. 864
(b) Rs. 800
(c) Rs. 768
(d) Rs. 600

Q59. Which of the following includes genetic engineering?

(a) Gene revolution
(b) Bloodless revolution
(c) Globalisation
(d) Green revolution

Q60. Who among the following was the first Indian woman to win the Booker Prize?

(a) Anita Desai
(b) Amrita Pritam
(c) Arundhati Roy
(d) Sarojini Naidu

Q61. Which of the following options defines Operating System?

(a) It is a set of programs used to convert high level language to low level language.
(b) It is a set of programs that controls the way a computer works and runs other programs.
(c) It is a software that is used to convert source program instructions to set programs.
(d) It is the actual way of working on computers.

Q62. A company sold six different cars Swift, Santro, Creta, Audi, I10 and Magna during a period of Monday to Saturday. Only one car was sold on a particular day. No car was sold twice. Atleast four cars were sold after the car Santro. The car Magna was sold on Tuesday.

The car Audi was sold immediately after the car Creta and car Creta was sold atleast before three cars. Both the cars Santro and I10 were sold atleast before one car. On which day was Swift car sold?

(a) Thursday
(b) Friday
(c) Monday
(d) Saturday

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Q63. For which of the following diseases has U.S. FDA approved the first vaccine Dengvaxia in 2019?

(a) Dengue
(b) Cholera
(c) Swine flu
(d) Chikungunya

Q64. What is the value of the following expression?

394 × 394 + 2 × 394 × 106 + 106 × 106

(a) 25000
(b) 500
(c) 250000
(d) 2500

Q65. PQ is the diameter of a circle whose centre is O. If a point R lies on the circle and and angle RPO is 39°, then what will be the measure of angle RQP?

(a) 51°
(b) 129°
(c) 125°
(d) 151°

Q66. In a certain code language, VUFOTJM is written as XWHQVLO. How will ENTGYH be written as in that code language?

(a) GPVIJA
(b) GPVJAI
(c) GPVJIA
(d) GPVIAJ

Q67. Find the smallest positive number which must be subtracted from the number 5970 for the difference to be a perfect square

(a) 9
(b) 25
(c) 41
(d) 16

Q68. In a reunion of class XII, out of 45 students, 30 students participated in the function. If all present in the function shake hands with one other, find the total number of handshakes.

(a) 870
(b) 435
(c) 841
(d) 900

Q69. When did Moplah revolt (Malabar Rebellion) in Kerala take place?

(a) 1928
(b) 1921
(c) 1945
(d) 1934

Q70. In ΔABC, angle BAC = 60°, and O is a point inside ΔABC. If angle OBC is two times angle OBA and angle OCB is two times angle OCA, then what will be the measure of angle BOC?

(a) 60°
(b) 120°
(c) 80°
(d) 100°

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Q71. In which of the following states is the famous Sun Temple situated?

(a) Punjab
(b) Tamil Nadu
(c) Andhra Pradesh
(d) Odisha

Q72. In the field of computers and Internet, what does W3C stand for?

(a) World Wide Web Content
(b) World Wide Web Centre
(c) World Wide Web Consortium
(d) World Wide Web Commission

Q73. A sum of money doubles itself at a compound interest in 8 years. In how many years will it become four times itself?

(a) 12
(b) 20
(c) 14
(d) 16

Q74. If we increase 50% of the numerator and 80% of the denominator of a fraction, then what fraction of the original will be the new fraction?

(a) 6/5
(b) 5/6
(c) 7/9
(d) 5/8

Q75. The number between 6000 and 7000 that is divisible by each of 12, 21, 32 and 18 is:

(a) 6040
(b) 6480
(c) 6048
(d) 6064

Q76. Among the four letter-clusters listed, three are alike in some manner and one is different. Select the odd one.

(a) NARD
(b) CPGL
(c) AUEQ
(d) PWTS

Q77. Rohan can travel from Delhi to Kanyakumari in 30 h. If he reduces his speed by 1/15th, he will go 10 km less in the same time. His speed is:

(a) 8 km/h
(b) 5 km/h
(c) 3 km/h
(d) 2.5 km/h

Q78. Select the option that is related to the third term in the same way as the second term is related to the first term.

Patient : Doctor :: Student : ?

(a) Monitor
(b) School
(c) Teacher
(d) Lecture

Q79. Among the four words listed, three are alike in some manner and one is different. Select the odd one.

(a) Bitter
(b) Salty
(c) Sour

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(d) Delicious

Q80. The inner lining of the small intestine has numerous finger like projections that are called:

(a) enzymes
(b) tissues
(c) villi
(d) cells

Q81. Select the letter-cluster that can replace the question mark (?) in the following series.

AYD, BVF, CSH, ?

(a) DWS
(b) DQI
(c) EQK
(d) DPJ

Q82. The National Informatics Centre (NIC) was established in:

(a) 1979
(b) 1977
(c) 1978
(d) 1976

Q83. If α and β are the zeroes of the polynomial $x^2 – 5x + m$ such that $\alpha – \beta = 1$, then what will be the value of m.

(a) 6
(b) 10
(c) 3
(d) 2

Q84. According to National Waterways 1 (NW1) in India, what is the length (stretch) of Allahabad (Prayagraj)-Haldia in km?

(a) 891 km
(b) 205 km
(c) 1078 km
(d) 1,620 km

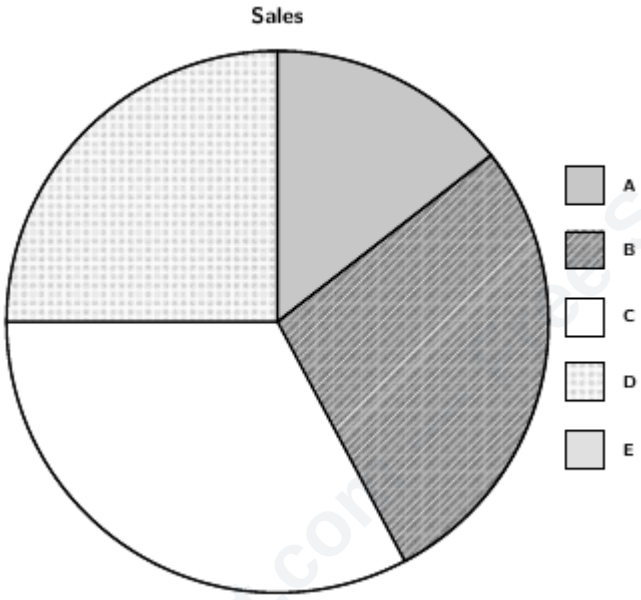
Q85. The least positive number, which must be added to the greatest number of 4 digits in order that the sum may be exactly divisible by 307, is:

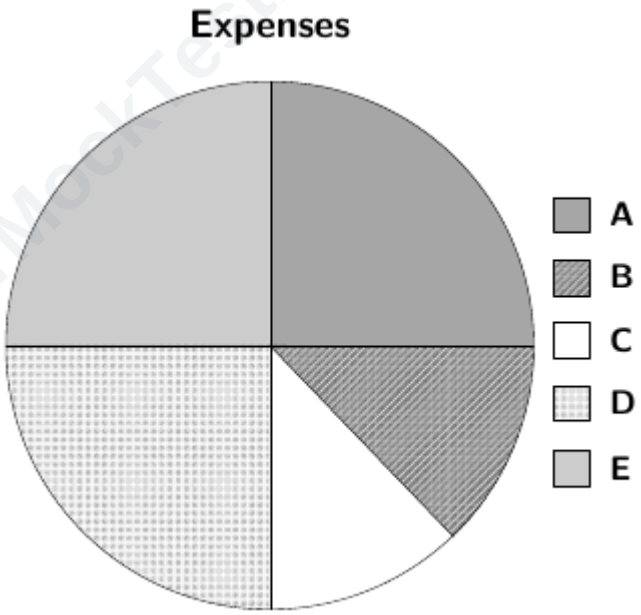
(a) 132
(b) 131
(c) 176
(d) 175

Q86. Study the given pie charts and answers the question that follows.

The pie charts represent the values of sales and expenses of five companies A, B, C, D, E in terms of percentages.

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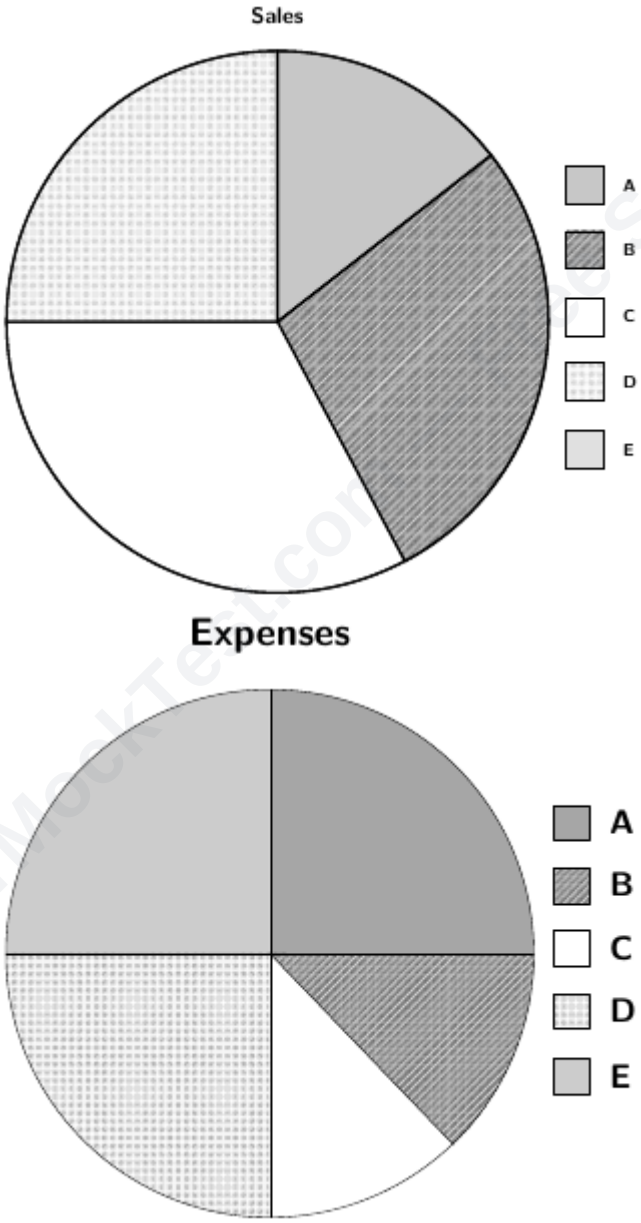


Based on the visual reading of the pie-chart, which company is the most profitable in percentage terms.

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

Q87. Study the given pie charts and answers the question that follows.

The pie charts represent the values of sales and expenses of five companies A, B, C, D, E in terms of percentages.

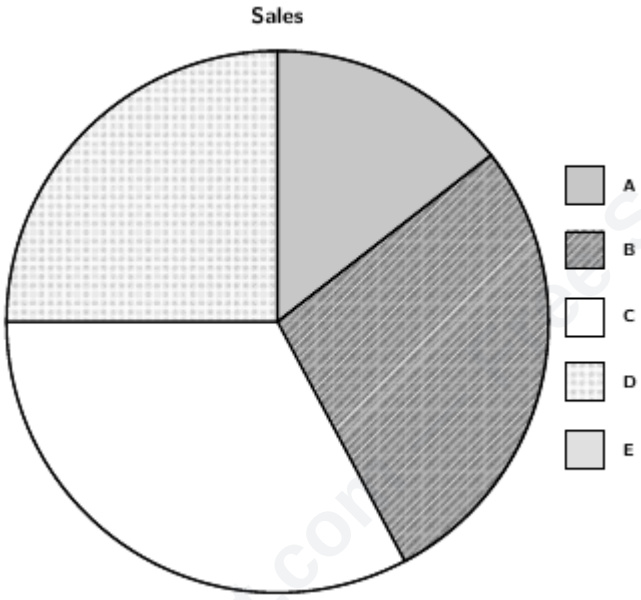


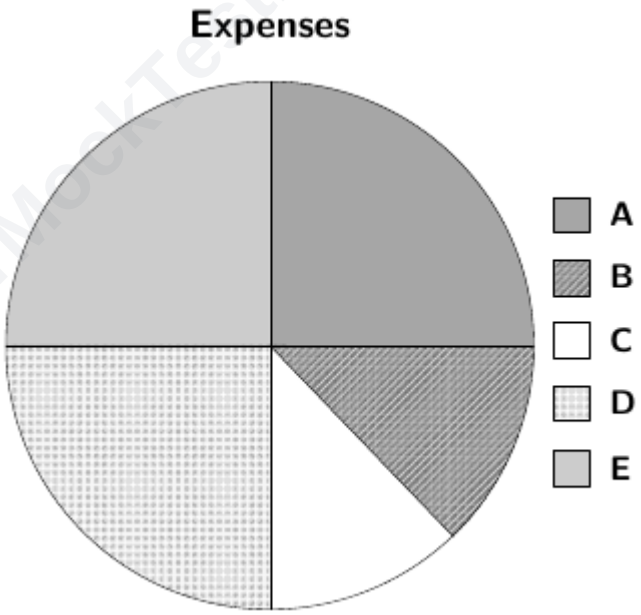
Based on the visual reading of the pie-chart, which of the companies has the highest percentage loss?

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

Q88. Study the given pie charts and answers the question that follows.

The pie charts represent the values of sales and expenses of five companies A, B, C, D, E in terms of percentages.



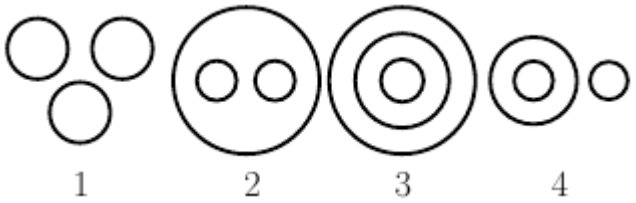


Based on the visual reading of the pie-chart, which of the companies reported no percentage profit/loss?

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

Q89. Select the Venn diagram that best represents the relationship between the following classes.

Mammals, Horse, Elephant



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

Q90. Among the four places listed, three are alike in some manner and one is different. Select the odd one.

(a) Ranchi
(b) Patna
(c) Bhopal
(d) Punjab

Q91. Read the given statements carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, select the conclusion from the given options which logically does NOT follow from the statements.

Statements:

(i) All children are cats.

(ii) All pots are children.

(a) Some children are pots.
(b) No pot is a cat.
(c) Some cats are pots.
(d) All pots are cats.

Q92. In a certain code language, HSBTQ is written as CNWOL. How will DSBOF be written as in that code language?

(a) IOXKB
(b) YWNJA
(c) YNWJA
(d) IXOWA

Q93. If '÷' means '+', '–' means '×', '×' means '–' and '+' means '÷', then find the value of

40 ÷ 20 × 10 + 10 – 5.

(a) 25
(b) 1
(c) 52
(d) 55

Q94. Study the following carefully and answer the question that follows.

9 B Q = 5 R $ J @ 4 * P & 9 M X # G

Which of the given options is exactly midway between B and X?

(a) @
(b) *
(c) &
(d) $

Q95. 7 members A, B, C, D, E, F and G are going to office in a particular order (not necessarily in the same order). C reached the office in the end. None of them reached the office at the same time. Atleast 3 members reached the office after G. E reached the office just after A and G reached the office just after E. F reached the office just before A but didn't reached the office after D.

Who among them reached the office first?

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

Q96. 'Cow' is related to 'Animal' in the same way as 'Sparrow' is related to '_____'.

(a) Flower
(b) Bird
(c) Food
(d) Insect

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Q97. There are five girls in a group. K is second tallest. P is taller than M. R is taller than M. N is taller than P. Which of the following sequence about their height is not possible?

(a) R > K > N > P > M
(b) N > K > R > P > M
(c) R > K > P > N > M
(d) N > K > P > R > M

Q98. If '×' means '+', '+' means ÷', '–' means '×', and '÷' means '–', then find the value of 16 × 15 + 5 – 2 ÷ 4.

(a) 26
(b) 18
(c) 16
(d) 22

Q99. Select the word that will come in the middle if the given words are arranged in the order in which they would appear in an English dictionary.

Sports → Spoil → Spouse → Spit → Sparrow

(a) Spit
(b) Spouse
(c) Sports
(d) Spoil

Q100. Select the option that is related to the third expression in the same way as the second expression is related to the first expression.

L × V : 12 × 22 :: Q × Z : ?

(a) 17 × 26
(b) 18 × 10
(c) 11 × 15
(d) 12 × 14

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) C

Shortcut Trick

Calculate total days for 100% work for each person.

A → 10 × 4 = 40 days.

B → 40 ÷ 0.4 = 100 days.

C → 13 × 3 = 39 days.

Least days = Fastest speed.

Therefore The correct answer is C.

Alternate Method

Person	Days	Total Work	Efficiency
A	40	1560	39
B	100	15.6	
C	39	40	

Given:

=> A: 25% (1/4) work in 10 days → Total time = 10 × 4 = 40 days.

=> B: 40% (2/5) work in 40 days → Total time = 40 × (5/2) = 100 days.

=> C: 1/3 work in 13 days → Total time = 13 × 3 = 39 days.

Calculations:

=> Speed is inversely proportional to time taken.

=> Time taken: B (100 days) > A (40 days) > C (39 days).

=> Since C takes the minimum time, C has the fastest speed.

Therefore The correct answer is C.

Additional Information

Work and Efficiency Relationship

Efficiency is inversely proportional to the time taken to complete a task. Efficiency = Work ÷ Time.

Pipes and Cisterns

Similar to time and work, where filling a tank is positive work and emptying it is negative work.

Man-Days Formula

M1D1H1/W1 = M2D2H2/W2, used for comparing work done by different groups.

Q2. Answer: (c) 10

Given:

Vertices of triangle = (2, 7), (5, 1), (x, 3)

Formula:

Area of triangle = 1/2 × [x1(y2 - y3) + x2(y3 - y1) + x3(y1 - y2)]

Calculation:

=> 18 = 1/2 × [2(1 - 3) + 5(3 - 7) + x(7 - 1)]

=> 36 = -4 - 20 + 6x

=> 6x = 60

=> x = 10

Therefore Value of x = 10.

NOTE: Options are changed as given options are not correct.

Q3. Answer: (c) Raju's gain Rs. 3,150

Shortcut Trick

When an original owner repurchases an item, their net financial gain is exactly equal to the second person's cash loss.

Montoo's Cost Price = 150000 × (100 + 5) ÷ 100 = Rs. 157500.

Montoo's Loss = 2% of 157500 = Rs. 3150.

This loss amount represents Raju's exact net profit.

Therefore The correct answer is Rs. 3150.

Alternate Method

Given:

Original CP of the car for Raju = Rs. 150000

Raju's profit percentage = 5%

Montoo's loss percentage = 2%

Calculations:

=> Selling Price (SP) of Raju = CP × (100 + Profit%) ÷ 100

=> SP of Raju = 150000 × (100 + 5) ÷ 100 = 150000 × 105 ÷ 100 = Rs. 157500

=> This SP becomes the Cost Price for Montoo.

=> SP of Montoo = 157500 × (100 − 2) ÷ 100 = 157500 × 98 ÷ 100 = Rs. 154350

=> Raju initially made a profit of: 157500 − 150000 = Rs. 7500

=> To repurchase the car, Raju paid an extra amount over the original CP: 154350 − 150000 = Rs. 4350

=> Raju's net financial gain = Initial Profit − Extra amount paid

=> Net gain = 7500 − 4350 = Rs. 3150

Therefore The correct answer is Rs. 3150.

Additional Information

Closed Loop Repurchase

If person A sells an item to person B and later buys it back, A's net physical assets are restored. Their net financial gain exactly equals B's net cash loss.

Successive Transactions

When an item changes hands sequentially, the final price is determined by chaining the percentage changes: Final Price = Initial Price × (1 ± P1/100) × (1 ± P2/100).

Profit and Loss Basics

Profit occurs when Selling Price > Cost Price (Profit = SP − CP). Loss occurs when Cost Price > Selling Price (Loss = CP − SP). Both are fundamentally calculated based on the Cost Price.

Q4. Answer: (b) 25 : 16

Given:

ΔABC ~ ΔDEF,

If BC = 12.5 cm and EF = 10 cm

Calculation:

According to the question ΔABC ~ ΔDEF,

Applying similarity rule

AB/DE = BC/EF = AC/DF

Then, Using formulae

Area of (ΔABC) : Area of (ΔDEF) = $BC^2/EF^2 = (12.5/10)^2 = 25/16$

Therefore Area of (ΔABC) : Area of(ΔDEF) = 25 : 16

Q5. Answer: (c) Rajasthan

The correct answer is Rajasthan.

• Sariska National park is located in Rajasthan.

• Sariska Tiger Reserve is well nestled in the Aravali Hills covering an 800 sq km area divided into grasslands, dry deciduous forests, sheer cliffs, and rocky landscape.

• The Sariska Wildlife Sanctuary houses the ruins of medieval temples of Garh-Rajor that date back to the 10th and 11th centuries. Also, a 17th-century castle on a hilltop at Kankwari provides a panoramic view of flying vultures and eagles.

• The Sariska was declared a sanctuary in 1955 and attained the status of a National Park in 1979.

Key Points

• Rajasthan is a state in northern India. It covers 342,239 square kilometers or 10.4 percent of India's total geographical area.

• It is the largest Indian state by area and the seventh-largest by population.

• Rajasthan's capital is Jaipur and its current Governor is Kalraj Mishra.

• The chief minister of Rajasthan is Bhajan Lal Sharma.

Additional Information

State	Governor	Chief Minister	Capital
Karnataka	Thawar Chand Gehlot	Siddaramaiah	Bengaluru
Uttarakhand	Gurmit Singh	Pushkar Singh Dhami	Dehradun (Winter), Gairsain (Summer)
Sikkim	Ganga Prasad	Prem Singh Tamang	Gangtok

Q6. Answer: (a) No ball is a flower.

Given:

Statements:

(i) All balls are flowers.

(ii) All bats are balls.

The least possible diagram for the given statements is as follows

Conclusions:

Option (1) No ball is a flower → False (Because All balls are flowers so some flowers will be also balls).

Option (2) Some flowers are bats → True (Because All bats are balls and All balls are flowers so definitely some flowers will be bats).

Option (3) Some balls are bats → True (Because All bats are balls so some balls will be also bats).

Option (4) All bats are flowers → True (Because All bats are balls and All balls are flowers so definitely all bats will be also flowers).

Hence, “Option (1)” does NOT follow from the statements.

Additional Information

Q7. Answer: (b) Sumitra Mahajan

The correct answer is Sumitra Mahajan.

Key Points

• Sumitra Mahajan was the Speaker of the 16th Lok Sabha.

• Sumitra Mahajan was born on 12 April 1943, is an Indian politician who was the Speaker of Lok Sabha from 2014 to 2019. She belongs to Bharatiya Janata Party.

• On 6 June 2014, Mahajan was unanimously elected as the Speaker of the 16th Lok Sabha. She had earlier worked as a member of the 'Panel of Chairmen' in the Lok Sabha.

• She was the eldest and seniormost among woman Members of Parliament in the 16th Lok Sabha. She is the second woman after Meira Kumar to be elected as the Speaker of the Lok Sabha. She was awarded India's third highest civilian award the Padma Bhushan in 2021.

• She represented the Indore constituency of Madhya Pradesh from 1989 to 2019 as the longest-serving Woman Member of Parliament, and then retired from electoral politics.

Additional Information

Name	Description
Manohar Joshi	• Manohar Joshi (born 2 December 1937) is a prominent politician from the state of Maharashtra. - He was the Chief Minister of Maharashtra from 1995 to 1999. - He was the 13th Speaker of the Lok Sabha from 2002 to 2004 during the National Democratic Alliance (NDA) administration.
Somnath Chatterjee	• Somnath Chatterjee was the 14th Speaker of the Lok Sabha (House of the People) from 2004 to 2009.
Meira Kumar	• Meira Kumar was the 15th Speaker of the Lok Sabha from 2009 to 2014.

Important Points

• Om Birla MP is the 17th and current Speaker of the Lok Sabha.

Q8. Answer: (a) Mariana Trench

The correct answer is Mariana Trench.

• The Challenger Deep in the Mariana Trench is considered to be the deepest point known on Earth.

• The Mariana Trench is a crescent-shaped trench in the Western Pacific, just east of the Mariana Islands near Guam.

• The Mariana Trench contains the deepest known points on Earth, vents bubbling up liquid sulfur and carbon dioxide, active mud volcanoes, and marine life adapted to pressures 1,000 times that at sea level.

• In 2010, the Challenger Deep was pegged at 36,070 feet (10,994 m), as measured with sound pulses sent through the ocean during a 2010 survey by the National Oceanic and Atmospheric Administration (NOAA).

• The ocean's second-deepest place is also in the Mariana Trench. The Sirena Deep, which lies 124 miles (200 kilometres) to the east of Challenger Deep, is a bruising 35,462 feet deep (10,809 m).

Key Points

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Name of the Place	Details
Lake Eyre	• Lake Eyre, officially known as Kati Thanda–Lake Eyre, is an endorheic lake in east-central Far North South Australia. - The lake was named in honour of Edward John Eyre, the first European to see it in 1840. The lake's official name was changed in December 2012 to combine the name Lake Eyre with the Aboriginal name, Kati Thanda.
Puerto Rico Trench	• The Puerto Rico Trench is located on the boundary between the Caribbean Sea and the Atlantic Ocean. - The trench is 800 kilometres (497 mi) long and has a maximum depth of 8,376 meters (27,480 ft) or 5.20 miles. This constitutes the single deepest point in the Atlantic Ocean.
Java Trench	• The Sunda Trench, earlier known as and sometimes still indicated as the Java Trench, is an oceanic trench located in the Indian Ocean near Sumatra, formed where the Australian-Capricorn plates subduct under a part of the Eurasian Plate. - It is 3,200 kilometres long with a maximum depth of 7,290 meters.

Q9. Answer: (a) President

The correct answer is President.

Key Points

• In India, all the bills introduced and passed by both the houses (Lok Sabha & Rajya Sabha) can come into force only after they receive the assent of the President of India.

• A Bill is a proposed legislative proposal that, when enacted, becomes a Law. Bills are roughly grouped into four types:

• Ordinary Bill (Article 107, Article 108) - It is concerned with any matter other than financial subjects.

• Money Bill (Article 110) - It is concerned with financial matters like taxation, public expenditure, etc.

• Financial Bill (Article 117 [1], Article 117[3]) - It is concerned with financial matters (but are different from money bills).

• Constitutional Amendment Bill (Article 368) - It is concerned with the amendment of the provisions of the Constitution.

Additional Information

• The Indian President is the head of the state and he is also called the first citizen of India. He is a part of the Union Executive.

• He is a part of the Union Executive along with the Vice-President, Prime Minister, Council of Ministers, and Attorney-General of India.

• Article 54 mentions that there shall be an election for the President of India.

• Article 55 states the manner of the election of the President.

Q10. Answer: (d) OGKHZX

Table show alphabet serial number –

The pattern for the code is as follows,

So, 'BUREAK' is written as 'PZVIFY'

Similarly,

Hence, CASPTL is coded as OGKHZX.

Q11. Answer: (c) 25 years

The ratio of the present ages of Myra and Meera is 6 : 5.

Calculation:

Let the present ages of Myra and Meera be 6x & 5x respectively.

According to question,

After fifteen years the ratio of Myra and Meera age will be 9 : 8

=> (6x + 15) : (5x + 15) = 9 : 8

Cross multiplication both side;

=> (6x + 15) × 8 = (5x + 15) × 9

=> 48x + 120 = 45x + 135

=> 48x – 45x = 135 – 120

=> 3x = 15

=> x = 5

Meera present date is 5x = 5 × 5 = 25.

Therefore The present age of Meera is 25 years.

Q12. Answer: (d) Maharashtra

The correct answer is Maharashtra.

• The Ajanta caves are located in the Aurangabad district of Maharashtra.

• The first Buddhist cave monuments at Ajanta date from the 2nd and 1st centuries B.C. during the Gupta period (5th and 6th centuries A.D.).

• The Ajanta caves were first found by a few British soldiers in the 19th century when they were out hunting and one of them happened to lay his eyes on a cave covered with bushes, leaves, and stones.

• The walls and ceilings of the famous Ajanta caves are chiselled, carved, and painted with the life and teachings of Lord Buddha.

• There is a total of 30 caves that bring to your notice the talent of the people and their dedication to preserving the past in the form of a never-fading art.

Key Points

• The Ajanta caves are a set of 3 rock-cutout Buddhist caves that date back to the period between 2nd century BC and 650 CE.

• The Ajanta caves are considered one of the most prestigious monuments of India as they house many beautiful paintings and sculptures depicting the rich cultural heritage of India.

• The site is a protected monument in the care of the Archaeological Survey of India, and since 1983, the Ajanta Caves have been a UNESCO World Heritage Site.

Additional Information

State	Details
Chhattisgarh	• Chhattisgarh is a heavily forested state in central India known for its temples and waterfalls. - It was founded on 1st November 2000.
Delhi	• Delhi, India’s capital territory, is a massive metropolitan area in the country’s north.
Tamilnadu	• Tamil Nadu, a South Indian state, is famed for its Dravidian-style Hindu temples. - In Madurai, Meenakshi Amman Temple has high ‘gopuram’ towers ornamented with colourful figures. - On Pamban Island, Ramanathaswamy Temple is a pilgrimage site. - The town of Kanyakumari, at India’s southernmost tip, is the site of ritual sunrises.

Q13. Answer: (d) Apsara

The correct answer is Apsara.

• Apsara is the oldest Nuclear research reactor in India.

• Apsara is a highly versatile swimming pool-type of reactor that was built in August 1956. It was shut down in 2009 for a revamp.

• The research reactor's earlier French-made enriched fuel has been replaced with an Indian-made enriched fuel.

• Nearly 62 years after Apsara came into existence, a swimming pool-type research reactor Apsara-upgraded of higher capacity was commissioned. The reactor made indigenously uses plate-type dispersion fuel elements made of low enriched uranium.

• The Apsara reactor was utilized for various experiments including neutron activation analysis, radiation damage studies, forensic research, neutron radiography, and shielding experiments.

Key Points

Nuclear Reactor	Details
Kamini	• KAMINI (Kalpakkam Mini reactor) is a research reactor at Indira Gandhi Center for Atomic Research in Kalpakkam, India, it is the world's only thorium-based experimental reactor. - KAMINI was the first and is currently the only reactor in the world designed specifically to use Uranium-233 fuel.
Cirus	• CIRUS was a research reactor at the Bhabha Atomic Research Center in Trombay near Mumbai, India. - CIRUS was supplied by Canada in 1954 but used heavy water supplied by the United States. It was the second nuclear reactor to be built in India.

Dhruva	• The Dhruva reactor is India's largest nuclear research reactor. - It was the first nuclear reactor in Asia proper. Located in the Mumbai suburb of Trombay at the Bhabha Atomic Research Centre, it is India's primary generator of weapons-grade plutonium-bearing spent fuel for its nuclear weapons program.

Q14. Answer: (b) 39

The pattern followed is given below

As it is seen that addition is done in a particular sequence.

And '39' is wrong, the correct sequence should be

Hence, the correct answer is "39"

Alternate Method

The pattern followed here is -

10 + 7 = 17

17 + 9 = 26

26 + 11 = 37

37 + 13 = 50

Hence, the correct answer is "39"

Q15. Answer: (c) AGEOS

The correct answer is AGEOS.

Key Points

• ISRO has established the AGEOS, at Bharati Station, Antarctica, for receiving IRS data.

• ISRO has established the Antarctica Ground Station for Earth Observation Satellites (AGEOS), at Bharati Station, Larsemann Hills, Antarctica, for receiving Indian Remote sensing Satellites (IRS) data.

• This state-of-the-art advanced Ground station was commissioned during August 2013 and is receiving data from IRS satellites (like CARTOSAT-2 Series, SCATSAT-1, RESOURCESAT-2/2A, CARTOSAT-1) and transferring the same to NRSC, Shadnagar near Hyderabad.

• This Satcom station is providing vital communication support to the Indian scientific community for pursuing their research work at Maitri throughout the year. With the commissioning of the Earth station at NCAOR, Goa, the Indian station, Maitri has been brought into the ambit of the World Wide Web.

• The AGEOS is continuously operated and maintained by the Engineers of ISRO who are under deputation to Bharati Station, Antarctica on a regular basis.

Additional Information

Organization	Description
NCAOR	• The National Centre for Antarctic & Ocean Research (NCAOR), an Autonomous Society under the Ministry of Earth Sciences, Govt. of India, New Delhi, is the nodal agency responsible for planning, coordinating and executing the Indian Polar Programme. - In addition, the Centre has a well-focused scientific mandate of basic and applied research in various disciplines and themes of polar and ocean sciences.
NRSC	• National Remote Sensing Centre (NRSC) is one of the primary centres of the Indian Space Research Organisation (ISRO), Department of Space (DOS). - NRSC operates through multiple campuses to meet the national and regional remote sensing data and applications needs of the country.
IMGEOS	• Integrated Multi-Mission Ground Segment for Earth Observation Satellites (IMGEOS) facility is established in Shadnagar campus. - This facility is equipped with state of the art data acquisition systems which receive data from various satellites.

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Q16. Answer: (c) 27

Given:

? = $(243)^2 \div (27)^2 \times 6 \div 18$

Concept:

Calculation:

=> ? = $(243)^2 \div (27)^2 \times 6 \div 18$

=> ? = $81 \times 6 \div 18$

=> ? = 27

Therefore $(243)^2 \div (27)^2 \times 6 \div 18 = 27$

Q17. Answer: (c) Head

The logic followed here is:

'Glove' is related to 'Hand' → Gloves are worn on the hands.

Similarly,

'Cap' is related to ‘Head' → Cap is worn on the head.

Hence, ‘Head’ is the correct answer.

Q18. Answer: (c) Monopolies and Restrictive Trade Practices Act

The correct answer is the Monopolies and Restrictive Trade Practices Act.

Key Points

• the correct full form of 'MRTP' in the MRTP Act 1969 is the Monopolies and Restrictive Trade Practices Act.

• The Monopolies and Restrictive Trade Practices Act (MRTP Act) was passed by the Parliament of India on 18 December 1969 and got the president's assent on December 27, 1969, But it came into force on June 1, 1970.

• Monopolies and Restrictive Trade Practices Commission (MRTPC) was set up under section 5 of the Monopolies and Restrictive Trade Practices Act, 1969. The MRTPC is an organ of the Department of Company Affairs, Ministry of Company Affairs, Government of India.

• On the basis of the recommendation of the Dutt Committee, MRTP Act was enacted in 1969 to ensure the concentration of economic power in hands of a few rich. The act was there to prohibit monopolistic and restrictive trade practices. It extended to all of India except Jammu & Kashmir.

• The act defines the Monopolistic Trade Practice as Such practice indicates misuse of one’s power to abuse the market in terms of production and sales of goods and services.

Additional Information

• The aims and objectives of this act were:

1. To ensure that the operation of the economic system does not result in the concentration of economic power in hands of a few rich.

2. To provide for the control of monopolies, and

3. To prohibit monopolistic and restrictive trade practices.

• This act is not in force in India currently as it was repealed and was replaced by Competition Act 2002 with effect from September 1, 2009. The MRTP Commission was replaced by the Competition Commission of India.

Q19. Answer: (c) Finland

The correct answer is Finland.

Key Points

• Finland was not a part of the former USSR.

• In 1991, the Soviet Union included present-day Russia, Ukraine, Belarus, Moldova, Latvia, Lithuania, Estonia, Armenia, Georgia, Azerbaijan, Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, and Kazakhstan.

• It also included the disputed territories of Transnistria, Artkash (Nagorno-Karabakh), South Ossetia, Abkhazia, Donetsk, and Luhansk. It also included some disputed border regions (such as Tabarov Island and Bolshoy Ussuriyski Island) which have been transferred to China after the fall of the USSR.

• The territories which were part of the Russian Empire but were not part of the Soviet Union are Poland, Finland, Alaska (a state of the USA), Kars and Ardahan (parts of Turkey), and some additional slices of territories in China and Iran.

• The capital of the USSR was Moscow, which is also modern Russia's capital city.

Additional Information

• The USSR was founded in 1922, five years after the Russian Revolution overthrew the monarchy of Czar Nicholas II.

• During its existence, the USSR was the largest country by area in the world. It included more than 8.6 million square miles (22.4

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million square kilometers) and stretched 6,800 miles (10,900 kilometres) from the Baltic Sea in the west to the Pacific Ocean in the east.

• USSR decades after it was established, the Russian-dominated Soviet Union grew into one of the world's most powerful and influential states and eventually encompassed 15 republics–Russia, Ukraine, Georgia, Belorussia, Uzbekistan, Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova, Turkmenistan, Tajikistan, Latvia, Lithuania, and Estonia.

Q20. Answer: (a) A = 45°, B = 15°

Given:

sin (A + B) = (√ 3)/2 and cos (A-B) = (√ 3)/2

Calculation:

(A + B) = sin^(-1)(√3/2)

A + B = 60°

Then,

(A - B) = cos^(-1)(√3/2)

A - B = 30°

Solving,

Therefore A = 45° and B = 15°

Q21. Answer: (c) mu #

According to the given information,

Car is coed as # or @.

Wheels are coed as mu.

'Wheels car' is coded as ‘mu #’.

Or,

'Wheels car' is coded as ‘mu @’.

But "mu @" is not given in options.

Hence, ‘mu #’ is the correct answer.

Q22. Answer: (d) 911/12

Given:

192/3-71/4 = x + 21/2,

Concept:

Calculation:

192/3-71/4 = x + 21/2,

=> 59/3 - 29/4 = x + 5/2

=> 236 - 87 = 12x + 30

=> x = 119/12

Therefore x = 911/12

Q23. Answer: (c) 10 cm

Given:

Radii of two circles = 4.5 cm and 3.5 cm

Calculation:

In ΔOPQ and ΔMBQ

=> angle OPQ = angle MBQ = 90

=> angle PQO = angle MQB ----(Vertically opposite angles)

ΔOPQ ~ ΔMBQ.

=> OQ/QM = OP/MB = PQ/QB = 4.5/3.5 = 9/7

Then,

=> PQ + QB = 6

=> PQ = 9QB/7

PQ = 3.375cm and QB = 2.625 cm

Let OQ and QM be 9a and 7a respectively.

=> OM = OQ + QM = 16a

In ΔOPQ,

Using pythagoras theorem,

=> $OP^2 + PQ^2 = OQ^2$

In ΔMBQ,

Using pythagoras theorem,

=> $BQ^2 + BM^2 = QM^2$

Adding,

=> $81a^2 + 49a^2 = 4.5^2 + 3.5^2 + 3.375^2 + 2.625^2$

=> a = 0.625

Therefore then the distance between the two centers = 9a + 7a = 16a = 10cm

Shortcut TrickTransverse common tangent = $\sqrt{(D^2 - (R + r)^2}$

=> 6 = √(D2 - (4.5 + 3.5)2

Squaring both side

=> 36 = D2 - 64

=> D2 = 100

=> D = 10 cm

Therefore The Distance between the two centre is 10 cm.

Q24. Answer: (b) Ctrl + R

The correct answer is Ctrl + R.

• In Excel, shortcut key Ctrl + R is used to fill the selected cell with active cells to the right.

• In Microsoft Excel and other spreadsheet programs, pressing Ctrl+R fills the row cell to the right with the contents of the selected cell.

• To fill more than one cell, select the source cell and press the Ctrl+Shift+Right arrow to select multiple cells. Then press Ctrl+R to fill them with the contents of the original cell.

• In Microsoft Word, Excel, and other word processor programs, pressing Ctrl+R aligns the line or selected text to the right of the screen.

Shortcut key	Description
Ctrl + S	• In Microsoft Excel and other spreadsheet programs, pressing Ctrl+S saves the current worksheet. - If it has never been saved, the Save As the window opens, allowing you to choose a name and file extension for your worksheet.
Ctrl + D	• In Microsoft Excel and Google Sheets, pressing Ctrl+D fills and overwrites a cell(s) with the contents of the cell above it in a column. - To fill the entire column with the contents of the upper cell, press Ctrl+Shift+Down to select all cells below, and then press Ctrl+D.
Ctrl + V	• In Microsoft Excel and other spreadsheet programs, pressing Ctrl+V will paste anything stored in the clipboard into the currently-selected cell. - If you've copied more than one cell, Ctrl+V will paste them starting from your current position.

Q25. Answer: (b) 8/3

Shortcut Trick

If (a + b) : (a − b) = p : q, then directly a / b = (p + q) / (p − q).

Here, a = 3x, b = 2y, p = 5, and q = 3.

=> 3x / 2y = (5 + 3) / (5 − 3)

=> 3x / 2y = 8 / 2 = 4

=> x / y = (4 × 2) / 3 = 8 / 3

Therefore The correct answer is 8/3.

Alternate Method

Given:

=> (3x + 2y) : (3x − 2y) = 5 : 3

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Calculations:

Expressing the given ratio as a fraction:

=> (3x + 2y) / (3x − 2y) = 5 / 3

Cross multiplying to solve for x and y:

=> 3 × (3x + 2y) = 5 × (3x − 2y)

=> 9x + 6y = 15x − 10y

Bringing all x terms to one side and y terms to the other:

=> 6y + 10y = 15x − 9x

=> 16y = 6x

Finding the ratio of x to y:

=> x / y = 16 / 6

=> x / y = 8 / 3

Therefore The correct answer is 8/3.

Additional Information

Componendo and Dividendo Rule

If a/b = c/d, then (a + b) / (a − b) = (c + d) / (c − d). This rule is a powerful tool to quickly simplify complex ratio problems involving sums and differences.

Invertendo Rule

If a : b = c : d, then by Invertendo, b : a = d : c. The ratio is uniformly inverted on both sides of the equation.

Alternendo Rule

If a : b = c : d, then by Alternendo, a : c = b : d. This means swapping the means or the extremes keeps the proportion unchanged.

Compound Ratio

For two independent ratios a : b and c : d, their compound ratio is formed by multiplying antecedents together and consequents together: (a × c) : (b × d).

Q26. Answer: (c) 21 years

The correct answer is 21 years.

Key Points

• According to the Constitution of India, the minimum age requirement for being a member of Panchayat is 21 years.

• Panchayati Raj Institution or PRI is a system of local self-government in rural areas of the Indian subcontinent. Local Self Government helps in the management of local affairs.

• Such local bodies have representatives who have been elected by the local people and hence have a better understanding of grass-root level issues. Thus, the minimum age that a person should have for contesting elections is 21 years.

• A candidate for the seat of Member or Sarpanch of Gram Panchayat, you must be a registered voter in the electoral roll of that Gram Panchayat, and must not be less than 21 years of age. candidate age will be computed as on the date of scrutiny of nominations.

• The leader of the Panchayat was often called the president mukhiya, sarpanch, or pradhan, an elected or generally acknowledged position.

• The Panchayati Raj Institutions are the nodal point at the district level. Their role is to help plan, coordinate, monitor, and wherever required regulate the implementation of various national programs.

Additional Information

• Established in various states of India, the Panchayat Raj system has three tiers: Zila Parishad, at the district level; Nagar Palika, at the block level; and Gram Panchayat, at the village level.

• Gram Panchayats are at the lowest level of Panchayat Raj institutions (PRIs), whose legal authority is the 73rd Constitutional Amendment of 1992, which is concerned with rural local governments.

• The Gram Panchayat is divided into wards and each ward is represented by a Ward Member or Commissioner, also referred to as a Panch or Panchayat Member, who is directly elected by the villagers. The Panchayat is chaired by the president of the village, known as a Sarpanch.

• The term of the elected representatives is five years. The Secretary of the Panchayat is a non-elected representative, appointed by the state government, to oversee Panchayat activities.

Q27. Answer: (a) Ethology

The correct answer is Ethology.

Key Points

• Ethology is best describes the biological study of animal behaviour.

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• Ethology is the scientific study of animal behaviour, usually with a focus on behaviour under natural conditions, and viewing behaviour as an evolutionarily adaptive trait.

• The term "Ethology" derives from the Greek language ethos meaning "character" and logia meaning "the study of". The term was first popularized by American myrmecologist (a person who studies ants) William Morton Wheeler in 1902.

• The first modern ethologist was Charles Darwin (1809–1882) explored the expression of emotions in animals.

• Ethology is a rapidly growing field. Since the dawn of the 21st-century researchers have re-examined and reached new conclusions in many aspects of animal communication, emotions, culture, learning, and sexuality that the scientific community long thought it understood. New fields, such as neuroethology, have developed.

• Ethology combines laboratory and field science, with a strong relation to some other disciplines such as neuroanatomy, ecology, and evolutionary biology. Ethologists typically show interest in a behavioural process rather than in a particular animal group, and often study one type of behaviour, such as aggression, in a number of unrelated species.

Additional Information

Term	Description
Ethnology	• Ethnology is the branch of anthropology that deals with the study of the origin and descent of human races and ethnic groups and their distribution and relationships.
Entomology	• Entomology 'insect', and logia 'study of' is the scientific study of insects, a branch of zoology.
Etiology	• The Etiology of a disease is its cause or origin. Etiology is also the name for the study of the causes of diseases. - It can also refer to the study of the cause of things in other fields, such as philosophy and physics. But it is most commonly used in the context of medicine.

Q28. Answer: (a) 117

Calculation:

? = 10.53/0.09

= 1053/9

= 117

Therefore 10.53/0.09 = 117

Q29. Answer: (d) 1469

The correct answer is 1469.

Key Points

• Shree Guru Nanak Dev Ji was born in Rai Bhoi Ki Talvandi (present day Nankana Sahib) in 1469.

• Shree Guru Nanak Dev Ji was born April 15, 1469, Rai Bhoi di Talwandi (now Nankana Sahib), near Lahore, Pakistan, and died 22 September 1539, Kartarpur, Punjab, India.

• The township was founded by Rai Bhoi and thus was known as Rai Bhoi-Di-Talwandi. His great-grandson Rai Bular Bhatti renamed it 'Nankana Sahib' after the birth of Guru Nanak.

• The Gurdwara Nankana Sahib, originally constructed in around 1600 CE was renovated in 1819–20 CE by Gian-Punjab Maharaja Ranjit Singh The Sikh Conference of Panjab, Jammu and Kashmir, Peshawar, Kangra, and Hazara.

• He was the founder of Sikhism and is the first of the ten Sikh Gurus. His birth is celebrated worldwide as Guru Nanak Gurpurab on Katak Pooranmashi ('full-moon of Kattak'), around October–November.

Additional Information

• Shree Guru Nanak Dev was the founder of Sikhism and Indian spiritual teacher who was the first Guru of the Sikhs, a monotheistic religious group that combines Hindu and Muslim influences.

• He spread the message of oneness and purity, he travelled several miles. Mainly, his teachings involved three things, namely 'Vand Chakko', 'Kirat Karo' and 'Naam Japna'.

• 'Vand Chakko' means sharing with others and helping the needy person. 'Kirat Karo' is making a living honestly without exploiting anyone and without any fraud, and 'Naam Japna' involves controlling our evils by meditating on the name of God.

• In 2007, the Pakistan government announced a plan to set up a university on Sikh religion and culture at Nankana Sahib, the birthplace of Guru Nanak. Chairman of Pakistan's Evacuee Trust Property Board (ETPB), Gen (R) Zulfikar Ali Khan, said that "The international Guru Nanak University planned at Nankana Sahib would have the best architecture, curricula and research centre on Sikh religion and culture".

• In 2019 after prolonged efforts of the Sikh community the historical Gurudwara on Nankana sahib was given direct access to

pilgrims via the Kartarpur corridor project.

Q30. Answer: (d) Daniel Gabriel Fahrenheit

The correct answer is Daniel Gabriel Fahrenheit.

• Daniel Gabriel Fahrenheit invented the modern mercury thermometer with a standardised scale.

• In 1654 the first sealed glass tube was developed by Ferdinand II, the Grand Duke of Tuscany. It contained alcohol and had a numerical scale, but wasn't very accurate.

• The more modern thermometer was invented in 1709 by Daniel Fahrenheit. It was an enclosed glass tube that had a numerical scale, called the Fahrenheit scale.

• The early version of this thermometer contained alcohol and in 1714 Fahrenheit developed a mercury thermometer using the same scale. He assigned the freezing point of water at 32 degrees, the boiling point of water as 212 degrees, and the normal body temperature as 98.6 degrees.

• Later on, in that same century, the inventor Anders Celsius developed a numerical scale, called the Celsius or Centigrade scale.

• This scale was based on a scale of zero to one hundred where the freezing point of water is zero, the boiling point of water is 100 degrees and normal body temperature is 37 degrees.

• The first real medical thermometer was invented by Sir Thomas Allbut in 1867. It was six inches long and took about five minutes to take a person's temperature

Key Points

• Daniel Gabriel Fahrenheit:

• Daniel Gabriel Fahrenheit FRS was a physicist, inventor, and scientific instrument, maker.

• Fahrenheit was born on 24 May 1686, Gdansk, Poland, then a predominantly German-speaking city in the Pomeranian Voivodeship of the Polish–Lithuanian Commonwealth.

• Daniel Gabriel Fahrenheit received the Fellow of the Royal Society award.

Additional Information

Person Name	Details	Invention
Anders Celsius	Anders Celsius was a Swedish astronomer, physicist, and mathematician. He was a professor of astronomy at Uppsala University from 1730 to 1744 but travelled from 1732 to 1735 visiting notable observatories in Germany, Italy, and France.	The Celsius temperature scale.
Galileo Galilei	Galileo was an astronomer, physicist, and engineer, sometimes described as a polymath, from Pisa, in modern-day Italy. Galileo has been called the "father" of observational astronomy, modern physics, the scientific method, and modern science.	Celaton, Galileo's micrometre, Galileo's proportional compass, and Galileo's escapement.

Q31. Answer: (d) UNESCO

The correct answer is UNESCO.

Key Points

• Hampi was declared a World Heritage site by UNESCO.

• Hampi is the 14th century (around 1500 AD) capital of the Vijayanagar Empire, located in the Tungabhadra basin in Bellary District, Central Karnataka.

• In 1986, Hampi was declared a World Heritage site by UNESCO.

• Temples of Hampi are noted for their large dimensions, florid ornamentation, bold and delicate carvings, and stately pillars which include subjects from the Ramayana and the Mahabharata.

• The majority of these temples in Hampi were provided with widespread bazaars flanked on either side by storied Mandapas.

Additional Information

• Hampi is located on the banks of the Tungabhadra River. Famous for its massive, beautifully carved temples, Hampi tells the stories of its existing structures. Many a visitor climbs atop the Matangaparvata and gets a glimpse of Hampi and its environs.

• The Archaeological Survey of India (ASI) is about to install a wooden barricade around the stone chariot inside the Vittala Temple complex at the UNESCO World Heritage site of Hampi to protect it from damage.

• The Vittala Temple is among the most-visited and the most photographed-protected monuments at Hampi.

• The Mahanavami Dibba, a variety of ponds and tanks, and the row of pillared Mandapas are some of the important architectural

remains of Hampi.

Q32. Answer: (c) F is ranked third or fourth

Given:

A always scores more than B.

A > B

G always scores more than A.

G > A

Condition 1 - Each time either C scores the highest and E scores the least.

C > _ > _ > _ > _ > E

Condition 2: D scores the highest and F or B scores the least.

D > _ > _ > _ > _ > F/B

Given:

D is ranked sixth and B is ranked fifth.

_ > _ > _ > _ > B > D > _

So, condition 2 is false

Then,

C > _ > _ > _ > B > D > E.

We know that,

G always scores more than A.

So, arranging the order of rank according to the given information

Arrangement 1 : C > G > F/A > F/A > B > D > E

Arrangement 2 : C > F > G > A > B > D > E

Now check the options

Option (1) G is ranked first or fourth → False

Because in both arrangements, G is not ranked first or fourth.

Option (2) E is ranked fourth or third → False

Because in both arrangements, E is not ranked fourth or third

Option (3) F is ranked third or fourth → True

Because in arrangements 1 F is ranked third or fourth.

Option (4) A is ranked second or seventh → False

Because in both arrangements, A is not ranked second or seventh

Hence, “F is ranked third or fourth” is the correct answer.

Q33. Answer: (d) 48 hours

The correct answer is 48 hours.

Key Points

• According to India's Election Commission, political parties cannot release their manifesto in a pre-poll silence period of 48 hours.

• The Election Commission of India is an autonomous body under the ownership of the Ministry of Law and Justice, Government of India.

• It is established by the Constitution of India directly to ensure free and fair elections in the country and was formed on 25 January 1950.

• The Indian Election Commission jurisdiction comes under the Government of India.

• The Election commission's first executive is Sukuram Sen and Election Commission headquarters is located in Delhi.

• The Election Commissioner Amendment Act, 1989 was adopted on 1 January 1990 which turned the commission into a multi-member body: a 3-member Commission has been in operation since then and the decisions by the commission are made by a majority vote.

• The Chief Election Commissioner and the two Election Commissioners who are usually retired IAS officers draw salaries and allowances at par with those of the Judges of the Supreme Court of India.

• As per the Chief Election Commissioner and other Election Commissioners (Conditions of Service) Rules, 1992.

Key Points

• The Chief Election Commissioner of India:

• can be removed from their office in a manner similar to the removal of a judge of the Supreme Court of India which requires a

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resolution passed by the Parliament of India a two-thirds majority in both the Lok Sabha and the Rajya Sabha on the grounds of proven misbehaviour or incapacity.

• Other Election Commissioners can be removed by the President of India on the recommendation of the Chief Election Commissioner.

• A Chief Election Commissioner has never been impeached in India.

Q34. Answer: (b) 563201

The codes have been assigned as follows,

FMOPRA →

F	M	O	P	R	A
8	3	4	2	0	7

KQMATL →

K	Q	M	A	T	L
9	5	3	7	6	1

Similarly,

QTMPRL →

Q	T	M	P	R	L
5	6	3	2	0	1

Hence, QTMPRL is coded as 563201.

Q35. Answer: (d) Gateway of India

The correct answer is Gateway of India.

• The Gateway of India monument is built with some influence of Gujarati style to welcome King George V and Queen Mary to India.

• The Gateway of India is an arch monument built during the 20th century in Bombay, India.

• The monument was erected to commemorate the landing of King George V and Queen Mary at Apollo Bunder on their visit to India in 1911.

• The structure is an arch made of basalt, 26 meters (85 feet) high. The final design of George Wittet was sanctioned in 1914 and the construction of the monument was completed in 1924.

Key Points

• Facts about Gateway of India are:

• The foundation stone was laid on March 31, 1911, by the then-Governor of Mumbai, Sir George Sydenham Clarke.

• During the rule of the British government, this was used as the arrival point for the visitors from the west.

• The monument is surrounded by another of Mumbai's major tourist attractions, the Marine Drive, facing the vast Arabian Sea.

• The last British ships set to sail in 1947 to leave the country from the Gateway of India made it a legend.

Additional Information

Monument Name	Details
India Gate	• The India Gate is a war memorial located astride the Rajpath, on the eastern edge of the ceremonial axis of New Delhi, formerly called Kingsway. - The Imperial War Graves Commission (now called Commonwealth War Graves Commission) was established in 1917 as an organization responsible for burying and commemorating First World War dead and missing soldiers
Sun Temple	• Konark Sun Temple is a 13th-century CE Sun Temple at Konark. - The temple is attributed to king Narasimhadeva I of the Eastern Ganga dynasty about 1250 CE. - The name Konarka is derived from the Sanskrit word Kona (meaning angle) and the word Arka (meaning sun) in reference to the temple which was dedicated to the Sun god Surya.

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Jallianwala Bagh	• Jallianwala Bagh is a historic garden and 'memorial of national importance' close to the Golden Temple complex in Amritsar, Punjab. - It is preserved in the memory of those wounded and killed in the Jallianwala Bagh Massacre that occurred on the site on the festival of Baisakhi, 13 April 1919.

Q36. Answer: (a) T

Given:

Six students - P, Q, R, S, T, and U

i) Q and R are lighter than U but taller than P.

Weight – U > Q and R

Height – Q and R > P

ii) S is taller than Q and heavier than R.

Weight – S > R

Height – S > Q

iii) T is lighter than S but heavier than U.

Weight– S > T; T > U

iv) U is taller than S.

Height – U > S

v) P is lighter than T but heavier than U.

Weight – T > P; P > U

vi) P is taller than T.

Height – P > T

Arranging the information in sequence -

Weight – S > T > P > U > Q and R

Height – U > S > Q and R > P > T

Hence, "T" is the shortest among the students.

Q37. Answer: (b) 1784

The correct answer is 1784.

Key Points

• In 1784, Sir William Jones founded the Asiatic Society.

• Asiatic Society of Bengal, the scholarly society founded on Jan. 15, 1784, by Sir William Jones, a British lawyer, and Orientalist, to encourage Oriental studies. At its founding, Jones delivered the first of a famous series of discourses.

• At the time of its foundation, this Society was named as "Asiatick Society". In 1825, the society was renamed "The Asiatic Society". In 1832 the name was changed to "The Asiatic Society of Bengal" and again in 1936 it was renamed "The Royal Asiatic Society of Bengal".

• Finally, on 1 July 1951, the name of the society was changed to its present one.

• The Society is housed in a building at Park Street in Kolkata (Calcutta). The Society moved into this building in 1808.

• In 1823, the Medical and Physical Society of Calcutta was formed and all the meetings of this society were held in the Asiatic Society.

Additional Information

• The Asiatic Society had the support and encouragement of Warren Hastings, the governor-general (1772–85) of Bengal, though he declined its presidency.

• Until Jones's death (1794) it was the vehicle for his ideas about the importance of Hindu culture and learning and about the vital role of Sanskrit in the Aryan languages.

• The museum of the Society was founded in 1814 under the superintendence of Nathaniel Wallich. The rapid growth of its collection is evident from its first catalogue, published in 1849. By 1849, the Society had its own museum consisting of inscriptions in stone and metal, icons, old coins, and Sanskrit manuscripts, etc.

• The society owns an art collection that includes paintings by Peter Paul Rubens and Joshua Reynolds. The society's library contains some 100,000 general volumes, and its Sanskrit section has more than 27,000 books, manuscripts, prints, coins, and engravings.

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Q38. Answer: (a) 1739

The correct answer is 1739.

• In 1739 Nadir Shah invaded India and sacked Delhi.

• The Battle of Karnal, was a decisive victory for Nader Shah, the founder of the Afsharid dynasty of Iran, during his invasion of India.

• Nadir Shah advanced towards India in 1738. He captured the western frontiers of the Mughal Empire such as Kabul, Ghazni, Lahore in 1739.

• The two forces of Nadir Shah and Muhammad Shah met at Karnal. At the battle of Karnal on 13 February 1739, Nadir Shah easily outnumbered the Mughal forces.

• The battle lasted for less than three hours and the Mughal emperor, Muhammad Shah surrendered. Both the rulers now entered Delhi on 12 March 1739 and Delhi was handed over to Nadir Shah, along with all its treasures.

• In 1739, Nadir Shah, the emperor of Iran, conquered and enslaved the city of Delhi and took away immense quantities of money.

• Shah's army had easily defeated the Mughals in the battle of Karnal and in the aftermath of the battle, would eventually capture the Mughal Capital.

Key Points

• The whole city of Delhi was destroyed, looted, plundered, and ruined by the army of Nadir Shah.

• Nadir Shah took with him the Peacock throne built by Shah Jahan. He also took the legendary Koh-i-Noor diamond.

• Besides this, he plundered gold worth 10 million rupees, 600 million rupees worth of jewellery, and coins worth 6 million rupees.

• Historians said that his overall collection after invading India, was 700 million rupees worth, including 7000 craftsmen, 200 carpenters, 100 stone-cutters, and thousands of elephants, horses, and camels, which he took with him to Persia.

Additional Information

• Nader Shah Afshar was the founder of the Afsharid dynasty of Iran and one of the most powerful Iranian rulers in Iranian history.

• He was born on 22 November 1688 in Dargaz, Safavid Iran.

• In the spring of 1730, Nader attacked Iran's archrival the Ottomans and regained most of the territory lost during the recent chaos. At the same time, the Abdali Afghans rebelled and besieged Mashhad, forcing Nader to suspend his campaign and save his brother, Ebrahim.

Q39. Answer: (d) 25 years

Given:

Average age of A, B and C = 22 years

Average age of B and C = 25 years

Calculation:

Total age of A, B and C = 22 × 3 = 66 years

Total age of B and C = 25 × 2 = 50 years

A's present age = 66 - 50 = 16 years

Therefore A's age after 9 years = 16 + 9 = 25 years

Q40. Answer: (d) ISRO

The correct answer is ISRO.

Key Points

• ISRO has launched Samwad with students (SwS) as a part of its program on New Year Day, 2019.

• As part of the enhanced outreach program of the Indian Space Research Organisation (ISRO), a new platform named Samwad with Students (SwS) was launched in Bengaluru on 01, January 2019.

• SwS is the newly-launched outreach initiative of ISRO to propel scientific temper among youngsters. The first edition was held in Bengaluru on 01, January 2019, the second one at Kochi on 20, January 2019, and the third at Sriharikota on 24, January 2019

• Through the SwS initiative, ISRO aims to constantly engage youngsters across India to capture their scientific temperament. The new conversation mission will inspire students cutting across schools and colleges.

• Dr K Sivan explained the importance of the Indian space program and its benefits to society at large. He wanted the students to take up science and Mathematics with the seriousness which will enable them to take up challenging careers.

Additional Information

• The first SwS event saw 40 wards and 10 teachers from select schools interact with ISRO Chairman Dr K Sivan at the Anthariksh Bhavan. During the three-hour stay at ISRO HQ, the students were first briefed about the Indian space program and its benefits to the common man.

• ISRO Chairman Dr K Sivan held the third SwS event, over 300 students from schools in and around Sriharikota had an opportunity to interact with him.

• “Concentrate on the present with full sincerity. Dilemmas will disappear. A good student is not afraid of failure. Failures are important for learning as they open up new avenues,” Dr Sivan told the SwS participants.

Q41. Answer: (d) Anu Bandyopadhyaya

The correct answer is Anu Bandyopadhyaya.

Key Points

• Anu Bandyopadhyaya wrote the novel 'Bahuroopi Gandhi'.

• The first edition of the book was published in April 1964.

• The book "Bahuroopi Gandhi" vividly narrates how Gandhiji functioned in a variety of ways quite apart from politics and the public scene.

• For this amazing devotion to, and capacity for different ways of work, he won the title KARAMVIR from his South African colleagues.

• The book describes how multifaceted their personality he was as a barrister, author, Kisan, weaver, nurse, journalist, Mason, shoemaker, carpenter, blacksmith, and barber.

Additional Information

Person	Literary Works
Jawaharlal Nehru	The Discovery of India, Glimpses of World History, Letters for a Nation, A Bunch of Old Letters, Words of Freedom: Ideas of A Nation, Letters from a Father to his Daughter, etc.
Chakravarti Rajagopalachari	Ramayana (1957), Mahabharata (1951), Hinduism, Doctrine, and Way of Life, Stories for the Innocent, etc.
Amrita Pritam	The Skeleton and that Man, Rasidi Ticket, Kagaz te Canvas, etc.

Q42. Answer: (d) 4

The shaded part represents is the number of teachers who are not Indian and not Chinese.

The number of teachers who are not Indian and not Chinese = 4

Hence, ‘4’ number of teachers who are not Indian and not Chinese.

Q43. Answer: (d) disinvestment

The correct answer is disinvestment.

Key Points

• Privatisation of the public sector enterprises by selling off part of the equity of PSEs to the public is known as disinvestment.

• Privatisation means the transfer of ownership, management, and control of the public sector enterprises to the private sector.

• Objectives of Privatisation:

• Providing strong momentum for the inflow of FDI,

• Privatisation aims at providing a strong base for the inflow of FDI, The increased inflow of FDI improves the financial strength of the economy.

• Government companies are transformed into private companies in two ways:

1. By the withdrawal of the government from the ownership and management of public sector companies. and By the outright sale of public sector companies.

2. Privatisation of the public sector undertakings by selling off parts of the equity of PSUs to the private sector is known as disinvestment. The purpose of the sale is mainly to improve financial discipline and facilitate modernisation.

Additional Information

• Disinvesting is a strategy by which an investor offloads or disposes of an asset or a partial stake in the asset. Disinvesting is an exit strategy that means taking out an existing investment.

• Disinvestment policies are commonly followed by governments to allocate resources more efficiently.

• For example, the Indian government recently announce,d that they will carry out disinvestment in BPCL, a government oil and gas subsidiary.

• Some other examples of disinvestment are- INDIAN RAILWAY CATERING AND TOURISM CORPN. LTD., IRCON INTERNATIONAL LTD., GAIL (INDIA) LTD., TATA COMMUNICATIONS LTD., STEEL AUTHORITY OF INDIA LTD., etc.

Q44. Answer: (d) 425

Shortcut Trick As the question has asked about the passed student so, we will make the Venn diagram of passed student.

Let total student = 100%

Total passed student = 100 - 30 = 70

But, 65 + 58 = 123% passed

So, Passed in both subject = 123% - 70% = 53%

Passed in 1 subject = 12 + 5 = 17%

Passed in 1 subject = 17% of 2500 = 425

Therefore The correct answer is 425.

Given:

35% failed in one subject

42% failed in other subjects

Calculation:

% failed in only one subject = 35% of 2500

=> 875

% failed in only other subject = 42% of 2500

=> 1050

% failed in both subject

=> 30% of 2500

=> 750

Passed in one subject = (875 - 750) + (1050 - 750)

=> 425

Therefore Number of students passed only in one subject = 125 + 300 = 425

Alternate Method

Given:

35% failed in one subject

42% failed in other subjects

Calculation:

% failed in only one subject = 35% - 30% = 5%

% failed in only other subject = 42% - 30% = 12%

If someone fails in one subject, it means that he/she passed in the other one.

Thus, % of students who passed in only one subject = 5% + 12% = 17%

Therefore Number of students who passed only one subject = 17/100 × 2500 = 425

Confusion Points

You may think that the question should ask about the students who failed.

But the information asked in the question is apt.

If a student fails in only one subject, it also means that he is passed in one subject and failed in one. (as there are only 2 subjects)

Thus, the no. of students who fail in only one subject will be equal to the no.of students who passed in only one subject.

Therefore, the correct answer is 425.

Q45. Answer: (b) Storage and Dispersal

The correct answer is Storage and Dispersal.

• Major hazards of nuclear power generation:

• Storage and disposal of spent or used fuels: This is because the uranium used decays into harmful subatomic particles radiations which are harmful to health. Further, there is a risk of accidental leakage of nuclear radiation.

• Environmental contamination: improper nuclear-waste storage and disposal result in environmental contamination.

• High cost of installation: nuclear power plants require a lot of money for their setup. moreover, the limited availability of uranium adds to the disadvantage of not making it an economic fuel.

Key Points

• Nuclear Power plant:

Q46. Answer: (c) Bhagat Singh

The correct answer is Bhagat Singh.

Key Points

• Freedom fighter Bhagat Singh was not involved in the Kakori Train Robbery.

• The Kakori Train Action was a train robbery that took place at Kakori, a village near Lucknow, on 9 August 1925 during the

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Indian Independence Movement against the British Raj.

• The Kakori train action was organized by Hindustan Republican Association.

• The trial on the Kakori Conspiracy Case started on 21 May 1926 against 28 active members of the Hindustan Republican Association.

The objectives of the Kakori Kand/Conspiracy were to:

• Gain funds for the HRA by taking money from the British Administration through force.

• Create a positive image of the HRA among Indians by attacking a high-profile British government target with minimum collateral damage.

Key Points

Bhagat Singh:

• Bhagat Singh was born in a Sikh family in Banga village of Faisalabad district (previously called Lyallpur), now in Pakistan's Punjab province, on 27 September 1907.

• In 1926, Bhagat Singh established the Naujavan Bharat Sabha (Youth Society of India) and joined the Hindustan Republican Association (later known as the Hindustan Socialist Republican Association).

• In December 1928, Bhagat Singh, along with Sukhdev and Rajguru, planned to avenge the death of Indian nationalist leader Lala Lajpat Rai and plotted to assassinate the Superintendent of Police James Scott in Lahore.

• In April 1929, Singh and Batukeshwar Dutt bombed the Central Assembly Hall in Delhi, and shouted the slogan of Inquilab Zindabad!".

• Bhagat Singh was an Indian revolutionary freedom fighter who was hanged to death by British colonisers at the age of 23 years.

Q47. Answer: (b) 0

Calculation:

After 5! = One zero at the end of the number

After 10! = two Zeros at end of number

After 15! = three zeroes at end of number →

then,

19! we get minimum three zeros

Therefore The digit of hundred's place value of 19! = 0

Q48. Answer: (a) 128

Given:

LCM = 1920

HCF = 16

Formula:

LCM × HCF = product of numbers

Calculation:

Other number = (1920 × 16)/240 = 128

Therefore Other number is 128

Q49. Answer: (a) 1995

The correct answer is 1995.

Key Points

• WTO (World Trade Organization) was established in 1995.

• The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations.

• It acts as a forum for negotiating trade agreements, it settles trade disputes between its members and it supports the needs of developing countries.

• The WTO has over 160 members representing 98 per cent of world trade. Over 20 countries are seeking to join the WTO.

• Ngozi Okonjo-Iweala is the seventh Director-General of the WTO. She took office on 1 March 2021, becoming the first woman and the first African to serve as Director-General.

Additional Information

• The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations.

• At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business.

• Over the past 20 years, WTO members have agreed with major updates to the WTO rulebook to improve the flow of global trade. The WTO's membership has expanded to 164 members, representing over 98% of international trade. In 2015.

• The WTO reached a significant milestone with the receipt of its 500th trade dispute for settlement.

Q50. Answer: (b) Sri Lanka

The correct answer is Sri Lanka.

• Sri Lanka is separated from India by a narrow channel of sea formed by the Palk Strait and the Gulf of Mannar.

• The Indian peninsula is separated from mainland Asia by the Himalayas. The Country is surrounded by the Bay of Bengal in the east, the Arabian Sea in the west, and the Indian Ocean to the south.

• The Palk Strait is the Strait between Indian (Tamil Nadu) to Shi Lanka (Jaffna). The Gulf of Mannar is situated near manner island Sri Lanka.

• Palk Strait is a Strait that is part of the Indian Ocean and it acts as a bridge between two landmasses. It is located in the Laccadive Sea Bay of Bengal and has a maximum width of 82 km and a minimum width of 53 km.

• The Palk Strait and Gulf of Mannar are connected with the Adam bridge (Ram Setu) which length is 50 kilometres.

Key Points

Strait	Countries
Strait of Malacca	Indonesia and Malaysia
Bali Strait	Java and Bali
Palk Strait	India and Sri Lanka
Bering Strait	Russia and USA

Q51. Answer: (a) Pratibha Singh Patil

The correct answer is Pratibha Singh Patil.

• Pratibha Singh Patil received Mexico's highest civilian honour for foreigners in 2019.

• The Ambassador of Mexico to India, Melba Pria, conferred the award on Patil - who created history as this country's first woman President (2007-2012), at a special ceremony held in the MCCIA Bhavan, Pune.

• Patil becomes only the second Indian head of state to get the award. Earlier, the late President S. Radhakrishna had been conferred this honour.

• It was created by decree on December 29, 1933, by President Abelardo L. Rodríguez as a reward for the services given to Mexico or humankind by foreigners.

Key Points

• Pratibha Patil:

• Pratibha Patil was born on 19 December 1934, Nadgaon.

• In 1962, at the age of 27, she was elected to the Maharashtra Legislative Assembly for the Jalgaon constituency.

• Pratibha Devisingh Patil is an Indian politician and lawyer who served as the 12th president of India from 2007 to 2012.

• A member of the Indian National Congress, Patil is the only woman to have held the office. She had previously served as the Governor of Rajasthan from 2004 to 2007.

Additional Information

Person Name	Details
Narendra Modi	Narendra Damodardas Modi is an Indian politician serving as the 14th and current prime minister of India since 2014. Modi was the chief minister of Gujarat from 2001 to 2014 and is a Member of Parliament from Varanasi. He is a member of the Bharatiya Janata Party and its National Democratic Alliance.
Amitabh Bacchan	Amitabh Bachchan is an Indian film actor, film producer, television host, occasional playback singer and former politician known for his work in Hindi cinema. He is regarded as one of the most influential actors in the history of Indian cinema.
Pranab Mukherji	Pranab Kumar Mukherjee was born on11 December 1935 was an Indian statesman who served as the 13th president of India from 2012 until 2017.

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Q52. Answer: (b) –5460

Given:

? = $(–20)^3 + (13)^3 + (7)^3$

Formula:

$a^3 + b^3 + c^3 - 3abc = (a + b + c)(a^2 + b^2 + c^2 - ab - bc - ac)$

Calculation:

Where, a = -20, b = 13, c = 7

-20 + 13 + 7 = 0

Then,

=> $(–20)^3 + (13)^3 + (7)^3 = 3 \times (-20) \times 13 \times 7 = -5460$

Therefore The value of $(–20)^3 + (13)^3 + (7)^3$ is -5460.

Q53. Answer: (b) Marsilea

The correct answer is Marsilea.

Key Points

• Marsilea plants have hidden reproductive organs.

• In the Pteridophyta group, the plant body is differentiated into roots, stem, and leaves and has specialized tissue for the conduction of water and other substances from one part of the plant body to another. Some examples are Marsilea, ferns, and horsetails.

• The thallophytes, the bryophytes, and the pteridophytes have naked embryos that are called spores. The reproductive organs of plants in all these three groups are very inconspicuous, and they are therefore called cryptogame, or those with hidden reproductive organs.

• Marsilea is a genus of approximately 65 species of aquatic ferns of the family Marsileaceae.

• The name honours Italian naturalist Luigi Ferdinando Marsili (1656–1730).

Additional Information

Plants	Description
Ipomoea	• Ipomoea batatas or sweet potato Using its flowers, which contain both male and female reproductive organs, the sweet potato plant undergoes sexual reproduction. - Sexual reproduction occurs when genetic material from both male and female individuals comes together to create a new individual.
Pinus	• Pinus reproduces sexually. Pinus is mono-ecious, but the male and the female cones are produced on separate branches of the same plant. - The male cones develop on the lower branches, while the female cones are formed on the upper branches.
Deodar	• Deodar Cedar or Deodar tree (Family- Pinaceae) is a monoecious species – that means it has male and female flowers (cones or strobili) on the same tree. - Male cones are mainly bearing on the lower branches, while the female cones are at the ends of the highest.

Q54. Answer: (b) 450 m²

Shortcut Trick

Side of the rhombus = Perimeter ÷ 4

Side = 120 ÷ 4 = 30 m

Area = Base × Height = 30 × 15 = 450 m²

Therefore The correct answer is 450 m².

Alternate Method

Given: Perimeter = 120 m, Height (distance between parallel sides) = 15 m

Formula: Perimeter = 4 × side | Area = side × height

Base (Side) = 30 m

Height = 15 m

Rhombus

Area = 30 × 15 = 450 m²

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=> 4 × Side = 120

=> Side = 120 ÷ 4 = 30 m

=> Area = Side × Height

=> Area = 30 × 15

=> Area = 450 m²

Therefore The correct answer is 450 m².

Additional Information

Area using Diagonals

The area of a rhombus can also be calculated if diagonals d1 and d2 are known: Area = 1/2 × d1 × d2.

Side-Diagonal Relation

The sum of the squares of the diagonals is equal to four times the square of the side: $d1^2 + d2^2 = 4 \times side^2$.

Rhombus Properties

A rhombus is a parallelogram with all four sides equal. Its diagonals bisect each other at right angles (90°).

Q55. Answer: (d) Fermentation

The correct answer is Fermentation.

Key Points

• The process of converting sugar into alcohol is called Fermentation.

• The mechanism by which sugar is converted into alcohol is called fermentation.

• Ethanol Fermentation is a biological process that converts sugars such as glucose, fructose, and sucrose into cellular energy, producing ethanol and carbon dioxide as a side effect, also called alcoholic fermentation.

• To make sugar into alcohol, we need to put grains, fruits or vegetables through a process called fermentation, when yeast or bacteria react with the sugars in food - the by-products are ethanol and carbon dioxide.

• The Alcoholic fermentation converts one mole of glucose into two moles of ethanol and two moles of carbon dioxide, producing two moles of ATP in the process:

• The overall chemical formula for alcoholic fermentation is: $C6H12O6 \rightarrow 2\ C2H5OH + 2\ CO2$

Additional Information

• Fermentation is an anaerobic process where even though oxygen is not available, energy can be released from glucose. Fermentation occurs in yeast cells and bacteria and also in the muscles of animals. It is an anaerobic pathway in which glucose is broken down.

• In 1857, Louis Pasteur was the scientist who discovered the fermentation process.

• Alcoholic fermentation is the process of using yeast to convert sugars into alcohol. Distillation is a process used to higher-ABV beverages from already-fermented base products. For example, the distillation of beer wort creates whiskey, while the distillation of wine produces brandy.

• Some more examples of fermentation are alcoholic beverages, bread, yoghurt, sauerkraut, apple cider vinegar, and kombucha.

Q56. Answer: (a) 2015-16

The correct answer is 2015-16.

Key Points

• During the financial year 2015-16, the Jal Kranti Abhiyan was launched by the Government of India.

• Union Minister for Water Resources, River Development, and Ganga Rejuvenation Sushri Uma Bharti launched Jal Kranti Abhiyan on June 05, 2015.

• The aim of the scheme was to consolidate water conservation and management in the country through a holistic and integrated approach involving all stakeholders making it a mass movement.

• One of the main objectives of the Jal Kranti Abhiyan is “strengthening grass-root involvement of all stakeholders including Panchayati Raj institutions and local bodies for Participatory Irrigation Management.”

• There are four important components of Jal Kranti Abhiyan; Jal Gram Yojana, Development of Model Command Area, Pollution Abatement, and Mass Awareness Programme.

Additional Information

• Union Minister of Water Resources, River Development, and Ganga Rejuvenation Sushri Uma Bharti and her ministry identified those villages in the country which have done exemplary work in water conservation.

• Under Jal Gram Yojana two water-stressed villages in each district of the country are selected and a comprehensive water security plan is formulated to achieve water security for these villages.

• Participating in the conference representatives from water user associations, NGOs, and other agencies gave useful suggestions to make Jal Kranti Abhiyan a success.

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Q57. Answer: (a) 3/4

Given:

$16 \sec^2 \theta – 40 \sec \theta + 25 = 0$

Calculation:

$\Rightarrow 16 \sec^2 \theta – 40 \sec \theta + 25 = 0$

$\Rightarrow 16 \sec^2 \theta – 2 \times 4 \times 5 \sec \theta + 25 = 0$

$\Rightarrow (4\sec\theta - 5)^2 = 0$

$\Rightarrow 4\sec\theta = 5$

$\Rightarrow \sec\theta = 5/4$

Then,

$\Rightarrow 1 + \tan^2\theta = \sec^2\theta$

$\Rightarrow \tan^2\theta = 25/16 - 1 = 9/16$

Therefore $\tan\theta = 3/4$

Q58. Answer: (c) Rs. 768

Shortcut Trick

Equivalent discount for two successive discounts of 20% = 20 + 20 − (20 × 20) / 100 = 36%.

Purchasing Price = (100 − 36)% of MRP

=> Purchasing Price = 64% of 1200

=> 64/100 × 1200 = 768

Therefore The correct answer is Rs. 768.

Alternate Method

Given:

Marked Retail Price (MRP) = Rs. 1200

First discount (d1) = 20%

Second discount (d2) = 20%

Formula Used:

Selling Price (SP) = MRP × (100 − d1)/100 × (100 − d2)/100

Calculations:

=> First, apply a 20% discount on Rs. 1200

=> Reduced Price = 1200 × (100 − 20) / 100 = 1200 × 80 / 100 = Rs. 960

=> Second, apply an additional 20% discount on the reduced price of Rs. 960

=> Purchasing Price = 960 × (100 − 20) / 100 = 960 × 80 / 100 = Rs. 768

Therefore The correct answer is Rs. 768.

Additional Information

Equivalent Discount

When two successive discounts d1% and d2% are given, the single equivalent discount % = d1 + d2 − (d1 × d2) / 100.

Marked Price (MRP)

It is the printed price of an article. Any discount offered to the customer is always calculated on the Marked Price unless stated otherwise.

Profit / Loss Percentage

Profit % = (SP − CP) / CP × 100. Loss % = (CP − SP) / CP × 100. Both are strictly calculated on the Cost Price (CP).

Q59. Answer: (a) Gene revolution

The correct answer is Gene revolution.

Key Points

• The gene revolution is the application of biotechnology in food production.

• It is of great potential to farmers as it provides them with disease-free planting material and develops crops that resist pests and diseases, reducing use of chemicals that harm the environment and human health.

• It can provide help control devastating animal diseases.

Additional Information

• Genetic engineering involves the techniques to alter the chemistry of genetic material (DNA and RNA) and thus change the phenotype of the host organism.

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• It is the artificial manipulation, modification, and recombination of DNA or other nucleic acid molecules to modify an organism or population of organisms.

• It is a term that was first introduced into our languages in the 1970s to explain the emerging field of recombinant DNA technology and some other things that were going on.

• With the help of genetic engineering, scientists are able to move desirable genes from one plant or animal to another or from a plant to an animal or vice versa.

• The process of Genetic engineering consists of splicing an area of a chromosome, gene, that controls a particular characteristic of the body.

Q60. Answer: (c) Arundhati Roy

The correct answer is Arundhati Roy.

Key Points

• The first Indian woman to win the Booker Prize is Arundhati Roy.

• Suzanna Arundhati Roy was born on 24 November 1961, She is an Indian author best known for her novel The God of Small Things.

• Arundhati Roy won the prestigious Booker Prize in 1997 for her first novel The God of Small Things.

• Arundhati Roy began writing her first novel, The God of Small Things, in 1992, completing it in 1996.

• The book is semi-autobiographical and a major part captures her childhood experiences in Aymanam. The publication of The God of Small Things catapulted Roy to international fame.

• It received the 1997 Booker Prize for Fiction and was listed as one of The New York Times Notable Books of the Year.

• Arundhati Roy won the Man Booker Prize for Fiction in 1997 and became the best-selling book by a non-expatriate Indian author.

Additional Information

Name	Description
Anita Desai	• Anita Desai (born 24 June 1937) is an Indian novelist, As a writer, she has been shortlisted for the Booker Prize three times. - She received a Sahitya Akademi Award in 1978 for her novel "Fire on the Mountain", from the Sahitya Akademi, India's National Academy of Letters. - She won the British Guardian Prize for The Village by the Sea.
Amrita Pritam	• Amrita Pritam (31 August 1919 – 31 October 2005) was an Indian novelist, essayist, and poet, who wrote in Punjabi and Hindi. - She became the first woman to win the Sahitya Akademi Award for her "magnum opus", a long poem, "Sunehade", later she received the Bharatiya Jnanpith, one of India's highest literary awards, in 1982 for Kagaz Te Canvas ("The Paper and the Canvas").
Sarojini Naidu	• Sarojini Naidu (13 February 1879 – 2 March 1949) was an Indian political activist and poet. Her first book of poems was published in London in 1905, titled The "Golden Threshold". - She is also known as the 'Nightingale of India'.

Q61. Answer: (b) It is a set of programs that controls the way a computer works and runs other programs.

The correct answer is It is a set of programs that controls the way a computer works and runs other programs.

Key Points

• "A set of programs that controls the way a computer works and runs other programs" is known as an Operating system.

• The principal system software is the operating system. It manages the hardware, data and program files, and other system resources and provides means for the user to control the computer, generally via a graphical user interface (GUI).

• An operating system is a software program required to manage and operate a computing device like smartphones, tablets, computers, supercomputers, web servers, cars, network towers, smartwatches, etc.

• It is the operating system that eliminates the need to know coding language to interact with computing devices. It is a layer of graphical user interface (GUI), which acts as a platform between the user and the computer hardware.

Additional Information

• Computer software falls into two broad classes, system software, and application software.

• The principal system software is the operating system. Application software is a program designed to handle specific tasks for users.

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• The operating system is always present when a computer is running. It coordinates the operation of the other hardware and software components of the computer system. The operating system is responsible for starting up application programs, running them, and managing the resources that they need.

• Examples of Operating Systems are: Windows Linux BOSS etc.

Q62. Answer: (d) Saturday

Given:

Six cars - Swift, Santro, Creta, Audi, I10 and Magna.

1) Atleast four cars were sold after the car Santro. The car Magna was sold on Tuesday.

Days	Cars
Monday	Santro
Tuesday	Megna
Wednesday	
Thursday	
Friday	
Saturday	

2) The car Audi was sold immediately after the car Creta and car Creta was sold atleast before three cars.

Days	Cars
Monday	Santro
Tuesday	Megna
Wednesday	Creata
Thursday	Audi
Friday	
Saturday	

3) Both the cars Santro and I10 were sold atleast before one car.

Days	Cars
Monday	Santro
Tuesday	Megna
Wednesday	Creata
Thursday	Audi
Friday	I10
Saturday	Swift

Hence, “Saturday” was Swift car sold.

Q63. Answer: (a) Dengue

The correct answer is Dengue.

• U.S. FDA approved Dengvaxia as the first vaccine for Dengue disease in 2019..

• In May 2019, Dengvaxia was approved in the United States as the first vaccine approved for the prevention of dengue disease caused by all dengue virus serotypes.

• The vaccine was determined to be approximately 76 per cent effective in preventing symptomatic, laboratory-confirmed dengue disease in individuals 9 through 16 years of age who previously had laboratory-confirmed dengue disease.

Key Points

• Dengue is a mosquito-borne viral infection, found in tropical and sub-tropical climates worldwide, mostly in urban and semi-urban areas.

• The virus responsible for causing dengue is called dengue virus (DENV). There are four DENV serotypes, meaning that it is

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possible to be infected four times.

• Symptoms of Dengue: Bleeding; Pain behind the eyes.

• Severe dengue was first recognized in the 1950s during dengue epidemics in the Philippines and Thailand.

Additional Information

Disease Name	Details
Cholera	Cholera is an acute, diarrheal illness caused by infection of the intestine with the toxigenic bacterium Vibrio cholerae serogroup O1 or O139. An estimated 2.9 million cases and 95,000 deaths occur each year around the world. The infection is often mild or without symptoms, but can be severe.
Swine flu	Swine influenza virus (SIV) or swine-origin influenza virus (S-OIV) is any strain of the influenza family of viruses that is endemic in pigs. As of 2009, the known SIV strains include influenza C and the subtypes of influenza A known as H1N1, H1N2, H2N1, H3N1, H3N2, and H2N3.
Chikungunya	A viral infection is transmitted by mosquitoes. Chikungunya is found worldwide, particularly in Africa, Asia, and India. Symptoms usually appear within a week of infection. Fever and joint pain come on suddenly. Muscle pain, headache, fatigue, and rash may also occur. Treatment is aimed at relieving symptoms. Most people feel better within a week or so after the virus runs its course.

Q64. Answer: (c) 250000

Given:

394 × 394 + 2 × 394 × 106 + 106 × 106

Formula:

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

Calculation:

=> 394 × 394 + 2 × 394 × 106 + 106 × 106 = $(394 + 106)^2$

Therefore 394 × 394 + 2 × 394 × 106 + 106 × 106 = 250000

Q65. Answer: (a) 51°

Shortcut Trick

The angle subtended by a diameter at any point on the circumference of a circle is always a right angle.

=> angle PRQ = 90°

In ΔPQR, the sum of all internal angles is always 180°.

=> angle RQP = 180° − (angle PRQ + angle RPQ)

=> angle RQP = 180° − (90° + 39°) = 51°

Therefore The correct answer is 51°.

Alternate Method

Given:

PQ is the diameter of the circle with centre O.

angle RPO = 39°.

Formula Used:

Angles opposite to equal sides (radii) of an isosceles triangle are equal.

The exterior angle of a triangle is equal to the sum of the two opposite interior angles.

Calculations:

=> In ΔPOR, OP = OR (Radii of the same circle).

=> Therefore angle PRO = angle RPO = 39°

=> For ΔPOR, the exterior angle ROQ is equal to the sum of the interior opposite angles.

=> angle ROQ = angle RPO + angle PRO

=> angle ROQ = 39° + 39° = 78°

=> In ΔQOR, OQ = OR (Radii of the same circle).

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=> Therefore angle OQR = angle ORQ

=> The sum of internal angles in ΔQOR is 180°.

=> angle OQR + angle ORQ + angle ROQ = 180°

=> 2 × angle OQR + 78° = 180°

=> 2 × angle OQR = 102°

=> angle OQR = 51°

=> Since O lies directly on the diameter PQ, angle OQR is identical to angle RQP.

=> angle RQP = 51°

Therefore The correct answer is 51°.

Additional Information

Angle in a Semicircle

The angle subtended by a diameter at any point on the circumference of a circle is always exactly a right angle (90°).

Isosceles Triangle Property

In any triangle, if two sides are equal, the angles directly opposite those sides must also be equal. This is highly useful in circle geometry where multiple radii often form equal sides.

Exterior Angle Theorem

The measure of an exterior angle of a triangle is equal to the sum of the measures of its two remote (non-adjacent) interior angles.

Q66. Answer: (d) GPVIAJ

Table show alphabet serial number –

The pattern for the code is as follows,

So, HSBTQ is written as CNWOL

Similarly,

Hence, ENTGYH is coded as GPVIAJ.

Q67. Answer: (c) 41

Calculation:

From options:

1) 5970 - 9 = 5961 is not perfect square

2) 5970 - 25 = 5945 is not perfect square

3) 5970 - 41 = 5929 = √5929 = 77 is a perfect square

4) 5970 - 16 = 5954 is not perfect square

Therefore 41 is the smallest positive number.

Q68. Answer: (b) 435

Given:

Students participated in function = 30

Calculation:

Number of students not participated in function = 45 - 30 = 15

Arithmetic progression for number of hands shake = 1, 2, ..., 29

Number of terms in this AP =

=> 29 = 1 + (n - 1)1

=> n = 29

Sum of all terms in AP = 29/2 × [2 × 1 + (29 - 1) × 1)] = 435

Therefore Number of handshakes = 435

Shortcut TrickDirect formula used:

=> n(n - 1)/2

=> 30(30 - 1)/2

=> 435

Therefore Number of handshakes = 435

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Q69. Answer: (b) 1921

The correct answer is 1921.

Key Points

• In 1921 Moplah revolt (Malabar Rebellion) took place in Kerala.

• The Malabar Rebellion happened from August 20, 1921, to 1922 in the Malabar region of Kerala. It was also known as the Moplah massacre, Moplah riots, and Mappila riots.

• This was a peasant movement led by the Moplah community in Kerala. These people attacked their landlords and British premieres. It can also be called the first national movement in South India.

• The movement ended in 1921 and was crushed by the Britishers. They raised a special battalion called the Malabar Special Force for this riot.

Additional Information

• The span of the Movement are:

• The movement started as the resistance against British colonial rule and the course also changed when the peasants rose against the prevailing feudal system controlled by elite landlords who were basically Hindus.

• The riots led to the deaths of hundreds of people in the Malabar region as the movement was very unorganized and the farmers there used to generally attack the government buildings, or places controlled by British and the elite landlords.

• The rebels also attacked many institutions of the colonial state, such as telegraph lines, train stations, courts, and post offices.

• Keeping in mind a few historical accounts, it was found that this uprising led to a loss of 10,000 lives which included 2339 rebels.

Q70. Answer: (d) 100°

Given:

angle BAC = 60°

Calculation:

angle OBC = 2angle OBA

angle OCB = 2angle OCA

In ΔABC,

angle ABC + angle ACB + angle BAC = 180°

angle ABC + angle ACB = 120°

angle OBA + angle OBC + angle OCA + angle OCB = 120°

angle OBC/2 + angle OBC + angle OCB/2 + angle OCB = 120°

angle OBC + angle OCB = 80°

In ΔOBC,

angle OBC + angle OCB + angle BOC = 180°

Therefore angle BOC = 180° - 80° = 100°

Q71. Answer: (d) Odisha

The correct answer is Odisha.

Key Points

• The famous Sun Temple is situated in Odisha.

• Sun Temple is a 13th-century CE, at Konark about 35 kilometers (22 mi) northeast from Puri and 65 kilometers (40 mi) southeast of Bhubaneswar on the Bay of Bengal coastline in the Indian state of Odisha, India.

• Sun Temple was built in 1250 CE during the reign of the Eastern Ganga King Narsimhadeva-1 from stone in the form of a giant ornamented chariot dedicated to the Sun god, Surya and, conceived as a giant stone chariot with 12 wheels. In Hindu Vedic iconography Surya is represented as rising in the east and traveling rapidly across the sky in a chariot drawn by seven horses.

• This temple is dedicated to the sun god, Surya, the first rays of the sun fall on the entrance of the temple. Much of the temple has fallen into rack and ruin but what remains still holds enough charm to captivate.

• It is the most famous of the few sun temples built in India. The temple in its present state was declared by UNESCO a World Heritage Site in 1984 CE.

Additional Information

• The temple follows the Kalinga or Orissa style of architecture, which is a subset of the nagara style of Hindu temple architecture.

• Three kinds of stone were used in the temple's construction - chlorite, laterite, and Khondalite. Khondalite (though of poor quality) was used throughout the monument while chlorite was restricted to doorframes and to a few sculptures, while laterite was used in the foundation, the (invisible) core of the platform, and in the staircases.

• Today, this site is not only popular with tourists and pilgrims but also serves as a venue for cultural festivals, classical Indian dance performances, etc. Thus, even today the Sun Temple continues to play its role in preserving and furthering India's immense

cultural heritage.

Q72. Answer: (c) World Wide Web Consortium

The correct answer is World Wide Web Consortium.

Key Points

• In the field of computers and the Internet, W3C stands for World Wide Web Consortium.

• The World Wide Web Consortium (W3C) is an international community where Member organizations, a full-time staff, and the public work together to develop Web standards.

• Founded in 1994 and currently led by Web inventor and Director Tim Berners-Lee and CEO Jeffrey Jaffe, W3C's mission is to lead the Web to its full potential.

• The W3C is an industry consortium that seeks to promote standards for the evolution of the Web and interoperability between WWW products by producing specifications and reference software. Although W3C is funded by industrial members, it is vendor-neutral, and its products are freely available to all.

• The organization is guided by its open standards principles. It calls them OpenStand, which it refers to as “The Modern Paradigm for Standards".

Additional Information

• The World Wide Web Consortium (W3C) was founded in 1994 by Tim Berners-Lee after he left the European Organization for Nuclear Research (CERN) in October 1994.

• It was founded at the Massachusetts Institute of Technology Laboratory for Computer Science (MIT/LCS) with support from the European Commission, the Defense Advanced Research Projects Agency (DARPA), which had pioneered the ARPANET, one of the predecessors to the Internet.

• W3C also engages in education and outreach, develops software, and serves as an open forum for discussion about the Web.

Q73. Answer: (d) 16

Shortcut Trick

If a sum becomes x times in t years at Compound Interest, it becomes x^n times in n × t years.

Given: The sum becomes 2 times in 8 years.

We need to find when it becomes 4 times, which is 2^2 times.

Here, the power n = 2 and t = 8 years.

Required time = 2 × 8 = 16 years.

Therefore The correct answer is 16 years.

Alternate Method

Given:

A sum (P) doubles itself in 8 years at Compound Interest.

Formula Used:

Amount (A) = P(1 + R/100)^t

P

2P

4P

× 2 (8 years)

× 2 (8 years)

Total = 16 years

Calculation:

Case 1: The sum becomes twice (2P) in 8 years.

=> 2P = P(1 + R/100)^8

=> 2 = (1 + R/100)^8 ---- (Equation 1)

Case 2: Let the sum become 4 times (4P) in 't' years.

=> 4P = P(1 + R/100)^t

=> 4 = (1 + R/100)^t

=> 2^2 = (1 + R/100)^t

Substitute the value of 2 from Equation 1:

=> [(1 + R/100)^8]^2 = (1 + R/100)^t

=> (1 + R/100)^(16) = (1 + R/100)^t

Comparing the powers on both sides:

=> t = 16

Therefore The correct answer is 16 years.

Additional Information

Simple Interest vs Compound Interest

In Simple Interest, the principal remains constant. In Compound Interest, the interest of the previous period is added to the principal to compute interest for the next period.

Half-Yearly & Quarterly CI

If compounded half-yearly, Rate = R/2 and Time = 2t. If compounded quarterly, Rate = R/4 and Time = 4t.

Difference Between CI and SI

For 2 years, Difference = $P(R/100)^2$. For 3 years, Difference = $P(R/100)^2 \times (3 + R/100)$.

Q74. Answer: (b) 5/6

Calculation:

Let fraction be a/b.

New numerator = 150a/100

New denominator = 180b/100

New fraction = 5a/6b

Then,

5a/6b = a/b × ?

Therefore Required value = 5/6

Q75. Answer: (c) 6048

Given :

Range of number = 6000 to 7000

Calculation:

LCM of 12, 21, 32 and 18 = 2016

6048 = 2016 × 3

Therefore From options, 6048 is multiple of 2016, so it will be divisible by 12, 21, 32 and 18.

Q76. Answer: (a) NARD

Table show alphabets serial number –

The pattern followed is,

All follow the same pattern, except ‘ NARD’.

Hence, “NARD” is the odd one.

Q77. Answer: (b) 5 km/h

Given:

Time = 30h

Calculation:

Let distance between Delhi to Kanyakumari be a km.

Speed = a/30 kmph

New speed = a/30 × (1 - 1/15) = 14a/450 kmph

New distance = a - 10

Then,

=> 14a/450 = (a-10)/30

=> 14a = 15a - 150

=> a = 150 km

Therefore His original speed = 150/30 = 5 kmph

Q78. Answer: (c) Teacher

The logic followed here is:

Patient : Doctor → Doctor treats Patient.

Similarly,

Student : Teacher → Teacher teach to Student.

Hence, ‘Teacher’ is the correct answer.

Q79. Answer: (d) Delicious

The logic followed here is:

Option (1) Bitter → Type of taste.

Option (2) Salty → Type of taste.

Option (3) Sour → Type of taste.

Option (4) Delicious → Not type of taste.

Hence, “Delicious” is an odd one.

Key PointsThe seven most common flavors in food that are directly detected by the tongue are: sweet, bitter, sour, salty, meaty (umami), cool, and hot.

We have receptors for five kinds of tastes:

• Sweet.

• Sour.

• Salty.

• Bitter.

• Savory.

Q80. Answer: (c) villi

The correct answer villi.

• Intestinal villi are small, finger-like projections that extend into the lumen of the small intestine.

• The inner lining of the small intestine has many finger-like projections called villi.

• The villi increase the surface area for absorption.

• Each villus is covered by a layer of epithelium and contains blood vessels and lymphatic vessels.

• Food spreads through the epithelium into the blood vessels.

Additional Information

• Enzymes are proteins that help speed up metabolism, or chemical reactions, in our bodies. They build up some substances and break down others. All living things have enzymes. Our body naturally produces enzymes. But enzymes are also in manufactured products and food.

• Tissue can be defined as a group of cells with similar shapes and functions are termed as tissues.

• Cells are the basic building blocks of all living things. The human body is composed of trillions of cells.

Q81. Answer: (d) DPJ

Table show alphabet serial number –

The logic is shown below –

Hence, “DPJ” is the term that completes the series.

Q82. Answer: (d) 1976

The correct answer is 1976.

Key Points

• The National Informatics Centre (NIC) was established in 1976 under the Planning Commission by the Indian Government.

• Additional Secretary late Dr. N Shesagiri was the first to introduce a network system in India called NICNET.

• National Informatics Centre (NIC) under the Ministry of Electronics and Information Technology (MeitY) is the technology partner of the Government of India.

• The objective of NIC was to provide technology-driven solutions to Central and State Governments in various aspects of development.

• NIC has been instrumental in adopting and providing Information and Communication Technology (ICT) and eGovernance support to Central Government.

• Its state-of-art IT infrastructure includes Multi-Gigabit PAN India Network NICNET, National Knowledge Network, National Data Centres, National Cloud, Video Conferencing, Email and Messaging Services, Command and Control Centre, Multi-layered GIS-based Platform, Domain Registration and Webcast.

Additional Information

• In 2018, NIC opened its fourth data centre in Bhubaneshwar to complement its existing data centers in New Delhi, Hyderabad and Pune.

• In addition to the national data centres, there are NIC State Centres in 37 states or Union territories. This is supplemented by

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736 district offices.

• Dr. Neeta Verma is the Director-General of the National Informatics Centre, a premier Technology organization of the Government of India.

• Under her guidance, NIC has also worked closely with various national institutions such as the Indian Council of Medical Research (ICMR), the Ministry of Health and Family Welfare (MoHFW), National Centre for Disease Control (NCDC) to extend necessary technical advice and support during the COVID-19 pandemic.

Q83. Answer: (a) 6

Given:

Polynomial = $x^2 – 5x + m$

Calculation:

=> $\alpha + \beta = -b/a = -(-5/1) = 5$

=> $\alpha – \beta = 1$

Solving,

$\alpha = 3$ and $\beta = 2$

Then,

=> $\alpha\beta = c/a = m/1$

=> $3 \times 2 = m$

=> $m = 6$

Therefore m = 6

Q84. Answer: (d) 1,620 km

The correct answer is 1620 km.

• According to National Waterways 1 (NW1) in India, The length (stretch) of Allahabad (Prayagraj)-Haldia is 1620 km.

• National Waterway 1:

• Ganga-Bhagirathi-Hooghly river system from Allahabad to Haldia was declared as National Waterway No.1 via National Waterway (Allahabad-Haldia stretch of the Ganga Bhagirathi- Hooghly river) Act 1982 (49 of 1982).

• It became operative from 27th Oct 1986 after the formation of the IWAI.

• The Hooghly river portion of the waterway from Haldia to Nabadwip is tidal.

• Seagoing vessels navigate up to Calcutta (140 km) and the fairway up to Calcutta is maintained by the Calcutta Port Trust. From Calcutta up to Tribeni, there are no navigation restrictions by inland vessels of a loaded depth up to 4m.

• From Nabadwip to Jangipur the waterway is formed by the Bhagirathi river. Bhagirathi River is a regulated river because of the Barrages at Farakka and Jangipur.

• With the controlled discharge from the Farakka Barrage and limited river conservancy work, a navigable depth of 2m is maintained in this route throughout the year.

Key Points

• Kollam - Kottapuram waterway:

• The West Coast Canal from Kottapuram to Kollam was declared National Waterway No.3 via National Waterway (Kollam-Kottapuram stretch of West Coast Canal and Champakara) Udyogmandal Canals) Act 1992 (33-F of 1992) and notified on 1st Feb. 1993.

• From Kottapuram to Kollam including Champakara and Udyogmandal canals has a navigable length of 205 km. This waterway comprises natural lakes, back-waters, river sections, and man-made canal sections.

• The Champakara and Udyogmandal canals link industrial centres of Ambalamugal and Udyogmandal with the Kochi port.

• On the main West Coast Canal between Kollam and Kottapuram, the Kochi Edapallikota (120 km) stretch was opened for cargo movement during November 1994 consequent to improvement works carried out by IWAI.

Q85. Answer: (a) 132

Calculation:

Greatest four digit number = 9999

=> $9999 = 307 \times 32 + 175$

=> $307 - 175 = 132$

Therefore 132 is the number.

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Q86. Answer: (a) C

Calculation:

From above,

C and B has less % expenses but C has more sales than B so,

Therefore C is most profitable company.

Q87. Answer: (a) E

Calculation:

E has more expenses but it has no share in the sales.

Therefore E has more % loss.

Q88. Answer: (b) D

Calculation:

D has same % sales and expenses so,

Therefore D has reported no profit/loss.

Q89. Answer: (d) 2

The Venn diagrams best represent the relationship between - Mammals, Horse, Elephant figures are shown below:

Horses and Elephants both are mammal's animals.

Hence, 'option 4' is the correct answer.

Q90. Answer: (d) Punjab

The logic followed here is:

Option (1) Ranchi → Ranchi is the capital of Jharkhand state.

Option (2) Patna → Patna is the capital of Bihar state.

Option (3) Bhopal → Bhopal is the capital of Madhya Pradesh state.

Option (4) Punjab → Punjab is the state of India.

Hence, "Punjab" is an odd one

Q91. Answer: (b) No pot is a cat.

Given:

Statements:

(i) All children are cats.

(ii) All pots are children.

The least possible diagram for the given statements is as follows

Conclusions:

Option (1) Some children are pots → True (Because All pots are children so some children will be also pots)

Option (2) No pot is a cat → False (Because All pots are children and All children are cats so definitely all pots are cats)

Option (3) Some cats are pots → True (Because All pots are children and All children are cats so definitely Some cats will be also pots)

Option (4) All pots are cats → True (All pots are children and All children are cats so definitely all pots are cats)

Hence, "Option (2)" does NOT follow from the statements.

Additional Information

Q92. Answer: (c) YNWJA

Table show alphabet serial number –

The pattern for the code is as follows,

HSBTQ is written as CNWOL

Similarly,

DSBOF be written as:

Hence, DSBOF is coded as YNWJA.

Q93. Answer: (d) 55

Decoding the information,

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Sing	÷	•	×	•
Means	•	×	•	÷

Given:

40 ÷ 20 × 10 + 10 – 5

After replacing the signs from left to right and using the BODMAS rule,

40 + 20 – 10 ÷ 10 × 5

= 40 + 20 – 1 × 5

= 40 + 20 – 5

= 60 – 5

= 55

Hence, “55” is the correct answer.

Q94. Answer: (a) @

Given Series:-

9 B Q = 5 R $ J @ 4 * P & 9 M X # G

Exactly midway between B and X,

9 B Q = 5 R $ J @ 4 * P & 9 M X # G

Hence, the correct answer is '@'.

Q95. Answer: (b) F

Given:

7 members - A, B, C, D, E, F and G

1) E reached the office just after A and G reached the office just after E.

A > E > G

2) At least 3 members reached the office after G.

A > E > G > _ > _ > _

3) C reached the office in the end

A > E > G > _ > _ > C

4) F reached the office just before A but didn't reached the office after D.

F > A > E > G > D/B > D/B > C

Hence, “F” among them reached the office first.

Q96. Answer: (b) Bird

The logic followed here is:

'Cow' is related to 'Animal' → Because Cow is an animal

Similarly,

'Sparrow' is related to 'bird’ → Because Sparrow is a bird.

Hence, ‘Bird’ is the correct answer.

Q97. Answer: (c) R > K > P > N > M

Given information;

1) K is second tallest.

K – Second tallest

2) P is taller than M.

P > M

3) R is taller than M.

R > M

4) N is taller than P.

N > P

Now check the options :

Option (1) : R > K > N > P > M

Given information;

1) K – Second tallest → True → Follow by the option
2) P > M → True → Follow by the option
3) R > M → True → Follow by the option
4) N > P → True → Follow by the option
Option (2) : N > K > R > P > M
1) K – Second tallest → True → Follow by the option
2) P > M → True → Follow by the option
3) R > M → True → Follow by the option
4) N > P → True → Follow by the option
Option (3) : R > K > P > N > M
1) K – Second tallest → True → Follow by the option
2) P > M → True → Follow by the option
3) R > M → True → Follow by the option
4) N > P → True → Not follow by the option
Option (4) : N > K > P > R > M
1) K – Second tallest → True → Follow by the option
2) P > M → True → Follow by the option
3) R > M → True → Follow by the option
4) N > P → True → Follow by the option
Hence, “Option (3)” sequence about their height is not possible.

Q98. Answer: (b) 18

Decoding the information,

Sign	**×**	**•**	**•**	**÷**
Means	•	÷	×	•

Given:
16 × 15 + 5 – 2 ÷ 4
After replacing the signs from left to right and using the BODMAS rule,
16 + 15 ÷ 5 × 2 - 4
= 16 + 3 × 2 - 4
= 16 + 6 - 4
= 22 – 4
= 18
Hence, “18” is the correct answer.

Q99. Answer: (d) Spoil

Given words:
Sports → Spoil → Spouse → Spit → Sparrow
According to the sequence in the dictionary:
The correct order of the given words is:
Sparrow
Spit
Spoil
Sports
Spouse
Hence, ‘Spoil’ will come in the middle.

Q100. Answer: (a) 17 × 26

Table show alphabet serial number –
The pattern for the code is as follows,
L × V : 12 × 22
Similarly,

Q × Z : 17 × 26

Hence, KHWS is coded as “17 × 26”.

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