RRB NTPC CBT-I Official Paper (Held On: 14 Mar 2021 Shift 2) (Previous Year Paper)

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

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

Q1. What is the value of x in the following equation?

$8.5 - \{51/2 - (71/2 + 2.8 \div x)\} \times 4.25 \div (0.2)^2 = 306$

(a) 2.5
(b) 3.08
(c) 3.5
(d) 1.8

Q2. A train 'R' leaves Chennai at 5 a.m. and reaches Vijayawada at 12 p.m. Another train 'S' leaves Vijayawada at 7 a.m. and reaches Chennai at 5:30 p.m. At what time do the two trains cross each other?

(a) 12:25 p.m.
(b) 9:36 a.m.
(c) 12 p.m.
(d) 10 a.m.

Q3. In Computers, files when deleted are moved to:

(a) My documents
(b) Inbox
(c) Outbox
(d) Recycle Bin

Q4. In a certain code language, PEN is written as 8. How will PENCIL be written as in that language?

(a) 15
(b) 25
(c) 14
(d) 17

Q5. Find the value of 3 times of 3 tenths of 3 hundredths of 3 thousandths of 30.

(a) 0.000243
(b) 0.00243
(c) 0.0000243
(d) 0.0243

Q6. In a certain code language, 'Man is mortal' is written as '+ ga lp', 'James is Man' is written as 'lp ga ku', 'James is mortal' is written as 'ku + lp'. What is the code for 'Man James' in that code language?

(a) ga ku
(b) ku +
(c) • lp
(d) lp ku

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Q7. Divide Rs. 1,162 among A, B and C in the ratio of 35 : 28 : 20.

(a) A = Rs. 490, B = Rs. 392 and C = Rs. 280
(b) A = Rs. 512, B = Rs. 365 and C = Rs. 285
(c) A = Rs. 450, B = Rs. 425 and C = Rs. 327
(d) A = Rs. 512, B = Rs. 385 and C = Rs. 265

Q8. Find the least value of x where 7x5462 is divisible by 9.

(a) 4
(b) 5
(c) 3
(d) 6

Q9. A and B are two alloys of gold and copper prepared by mixing the metals in the ratio of 7 : 2 and 7 : 11, respectively. Equal quantities of the alloys are melted to form a third alloy, C. If the amount of copper in C is 10 kg, then what is the amount of gold in C?

(a) 10 kg
(b) 8 kg
(c) 14 kg
(d) 12 kg

Q10. The sum of two angles angle A and angle B of a triangle ΔABC is equal to its third angle. Find the measure of the third angle?

(a) 90°
(b) 60°
(c) 100°
(d) 50°

Q11. If $x = (\sqrt{3} + 1)/(\sqrt{3} - 1)$ and $y = (\sqrt{3} - 1)/(\sqrt{3} + 1)$, then the value of $x^2 + y^2$ is:

(a) 14
(b) 13
(c) 15
(d) 10

Q12. A person is standing at point 'P' looking at the vertex 'S' of a pillar. Now the person travels a distance of $40\sqrt{3}$ m towards the pillar and comes to point 'Q'. Progression from point 'Q' to point 'S' is 60°. If the height of the pillar is 60 m, find the elevation from point 'P' to 'S'.

(a) 75°
(b) 60°
(c) 30°
(d) 45°

Q13. Before the constitution of India, an “Objectives Resolution” was proposed by _____ in 1946.

(a) B R Ambedkar
(b) Rajendra Prasad
(c) Jawaharlal Nehru
(d) Vallabhbhai Patel

Q14. Which of the following conditions is NOT caused by a virus?

(a) Cholera
(b) AIDS
(c) Cold
(d) Dengue fever

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Q15. In which year was Tata Iron and Steel Company Limited (TISCO) established in India?

(a) 1900
(b) 1905
(c) 1907
(d) 1904

Q16. Pick the odd one out.

(a) Table
(b) Chair
(c) Cupboard
(d) Glass

Q17. If R is the mother of F; G is the father of K; L is brother of F and son of G, then how is R related to G?

(a) Husband's Sister
(b) Mother
(c) Sister
(d) Wife

Q18. UNO's former Secretary - General Kofi Annan belongs from the African Country of _____.

(a) Ghana
(b) Kenya
(c) Egypt
(d) Namibia

Q19. Pick the odd one out.

(a) Goat
(b) Cat
(c) Cow
(d) Buffalo

Q20. Which article of the Indian Constitution had been impacted by the 44th Amendment (1978)?

(a) 298
(b) 300 A
(c) 299
(d) 301

Q21. In which book did Mahatma Gandhi write that the British rule in India was the result of cooperation extended by Indians?

(a) Hind Swaraj
(b) India of My Dreams
(c) The Story of My Experiments with Truth
(d) Village Swaraj

Q22. For which book has the Sahitya Akademi Award 2019 been awarded to Shashi Tharoor?

(a) Vanity Bagh
(b) The Vicks Mango Tree
(c) An era of Darkness
(d) The Small Town Sea

Q23. Ravi earned 50% more money than Ajay. Ajay earned 30% less money than Madhan. By what percentage did Ravi earn more money than Madhan?

(a) 11%
(b) 3%
(c) 5%
(d) 9%

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Q24. A sum of Rs. 2,700 is lent out in two parts in such a way that, the simple interest on one part at 15% for 4 years is equal to the simple interest on the second part at 10% for 6 years. The part of the sum lent out at 15% is:

(a) Rs. 1,350
(b) Rs. 1,450
(c) Rs. 1,150
(d) Rs. 1,250

Q25. The four circles with r cm radius are such that their centers form a square. Find the ratio of the area of the square by joining the circular centers and the area of the rhombus by joining the tangent points of the circle.

(a) $(4 - \pi) : 1$
(b) 4 : 1
(c) π:1
(d) 2:1

Q26. In a certain code language, 'DKVCTR' is written as 'VXGZOH'. What is the code for 'FRSTYD' in that code language?

(a) HCXWVL
(b) HBXWMK
(c) HBXVWK
(d) HCXWVJ

Q27. Which of the following plant hormones helps in the growth of plant stems?

(a) Abscisic acid
(b) Cytokinin
(c) Ethylene
(d) Gibberellin

Q28. Pradhan Mantri Matru Vandana Yojana was launched on:

(a) 1^(st) Jan 2016
(b) 1st Jan 2017
(c) 1st Jan 2018
(d) 1st Jan 2015

Q29. What is the population density of India as per the 2011 Census?

(a) 382 persons per sq km
(b) 482 persons per sq km
(c) 282 persons per sq km
(d) 582 persons per sq km

Q30. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some roses are pink.

All pink are pigs.

Some pigs are birds.

Conclusions:

I. Some birds are pink.

II. Some pigs are pink.

III. Some pigs are roses.

IV. Some birds are roses.

(a) Only II and III follow.
(b) Only IV follows.
(c) Only I and II follow.
(d) Only I follows.

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Q31. Find the LCM of $2^2 \times 3^3 \times 5 \times 7^2$, $2^3 \times 3^2 \times 5^2 \times 7^4$ and $2 \times 3 \times 5^3 \times 7 \times 11$.

(a) $2^3 \times 3^3 \times 5^3 \times 7^4 \times 11$
(b) $2^3 \times 3^3 \times 5^3 \times 7^4$
(c) $2 \times 3 \times 5 \times 7$
(d) $2 \times 3 \times 5 \times 7 \times 11$

Q32. In which year was the name 'Pakistan' coined?

(a) 1933
(b) 1931
(c) 1930
(d) 1932

Q33. Which of the following awards was conferred to former Foreign Secretary of India, Shyam Saran by Japan?

(a) Order of the Rising Sun
(b) Order of the Paulownia Flowers
(c) Order of the Precious Crown
(d) Person of Cultural Merit

Q34. Internet uses:

(a) telex switching
(b) telephone switching
(c) packet switching
(d) circuit switching

Q35. In a certain code language, 'BDT' means 'girls play toy', 'TSM' means 'girls are angry' and 'BTC' means 'girls like toy'. Which of the following letters will mean 'like' in that language?

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

Q36. In which year was the National Organic Chemicals Industries Limited (NOCIL) established?

(a) 1971
(b) 1961
(c) 1982
(d) 1951

Q37. Select the option that is related to the third term in the same way as the second term is related to the first term.

Plants : Garden :: Animals : ?

(a) Cage
(b) Zoo
(c) Wild
(d) Pet

Q38. Two men start walking together to a certain destination, one at the speed of 6 km/h, and the other at 7.5 km/h. The latter arrives 1 h 4 min before the former. The distance covered is:

(a) 38 km
(b) 24 km
(c) 32 km
(d) 44 km

Q39. Among the following words, which one will come second if they are arranged as per their order in an English dictionary?

Exit, Exercise, Excuse, Exempt

(a) Exit

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(b) Exempt
(c) Excuse
(d) Exercise

Q40. Who is known as the 'Father of Modern Genetics'?

(a) Robert Brown
(b) Rosalind Franklin
(c) James Watson
(d) Gregor Mendel

Q41. Read the given information carefully and answer the question that follows.

There are 9 members M, N, O, P, Q, R, S, T and U, in a joint family. There are three married couples in the family. N is a doctor and the brother of O and P. Q is the mother of S. T is the wife of M, and M is the grandfather of S. O is the only daughter of M. U is the daughter of P and R.

Who is the wife of the doctor?

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

Q42. Paika Dance belongs from the Indian State of _____

(a) Jharkhand
(b) West Bengal
(c) Odisha
(d) Bihar

Q43. Which of the following Indian NGOs has won the UN's Equator Prize for 2019?

(a) Deccan Development Society
(b) Sahyadri Nisarga Mitra
(c) Jeeva Karunya Trust
(d) Save Your Soul Society

Q44. If $\cos(x + y) = 1/2$ and $\sin(x - y) = 0$, where x and y are positive acute angles and $x \geq y$, then x and y are:

(a) 30° and 30°
(b) 60° and 60°
(c) 60° and 45°
(d) 90° and 30°

Q45. From certain number of apples, a man sells 1/3 of the apples to the first customer. He sells 1/2 of the remaining apples to the second customer, and 1/3 of the remaining apples plus 5 to the third customer. He then finds himself left with 3 apples. How many apples did the man have initially?

(a) 30
(b) 18
(c) 24
(d) 36

Q46. If $\sin A + \sin B = x$ and $\cos A + \cos B = y$, then $\cos (A - B) = ?$

(a) $(x^2 + y^2 - 2)/2$
(b) $(x^2 + y^2 + 2)/2$
(c) $(x^2 - y^2 - 2)/2$
(d) $(x^2 - y^2 + 2)/2$

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Q47. There is a time lag of _____ from Gujarat to Arunachal Pradesh.

(a) 1.30 hours
(b) 2 hours
(c) 2.30 hours
(d) 1 hour

Q48. In which year was the Planning Commission of India set up?

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

Q49. In which year was the Asiatic Cheetah declared extinct in India?

(a) 1952
(b) 1947
(c) 1950
(d) 1948

Q50. The LCM of two prime numbers x and y (x > y) is 319. The value of 2x - 5y is:

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

Q51. Which of the following mountain passes forms the 'tri-junction' of India, China and Myanmar?

(a) Pensi La
(b) Diphu
(c) Bum La
(d) Imis La

Q52. The All-India Muslim League adopted the Lahore Resolution in the year _____.

(a) 1940
(b) 1941
(c) 1942
(d) 1939

Q53. The time period between full moon to another full moon is:

(a) 29 days
(b) 28 days
(c) 30 days
(d) slightly longer than 29 days

Q54. Find the surface area of a cuboid that is 16 m long, 14 m broad and 7 m high.

(a) 866 m^2
(b) 1568 m2
(c) 868 m2
(d) 434 m2

Q55. Who is the chairperson of the RBI constituted committee on development of housing finance securitisation market?

(a) Harsh Vardhan
(b) Pranjul Bhandari
(c) Sanjaya Gupta
(d) Naresh Thakkar

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Q56. Which of the following statements related to the Constitution of India is true?

(a) Fundamental Rights set social and economic democracy, while Directive Principles establish political democracy.
(b) Fundamental Rights are moral and political sanctions, but Directive Principles are legal sanctions.
(c) Fundamental Rights are justiciable, whereas Directive Principles of State are non-justiciable.
(d) Fundamental Rights promote the welfare of the community, while Directive Principles promote individual welfare.

Q57. Government grants 51^(st) Tiger reserve status for sanctuaries spanning forests of _____.

(a) Andhra Pradesh
(b) Madhya Pradesh
(c) Uttar Pradesh
(d) Tamilnadu

Q58. The value of √625/11 × 14/√25 × 11/√196 is:

(a) 9
(b) 7
(c) 10
(d) 5

Q59. As of Dec 2020 who was the Union Minister of Parliamentary Affairs in the Union Cabinet?

(a) Kiren Rijiju
(b) Pralhad Joshi
(c) Arvind Ganpat Sawant
(d) Mahendra Nath Pandey

Q60. What will be the remainder when 17^(200) is divided by 18?

(a) 17
(b) 2
(c) 16
(d) 1

Q61. In which year was the World Wide Web invented?

(a) 1987
(b) 1988
(c) 1989
(d) 1986

Q62. A sphere of radius 10 cm is melted and 'n' number of small spheres of radius 2.5 cm are formed. What is the value of n?

(a) 8
(b) 32
(c) 64
(d) 16

Q63. If the radius of a circle is reduced by 15%, then its area is reduced by:

(a) 27.75%
(b) 17%
(c) 17.75%
(d) 12.75%

Q64. The Cabinet Mission sent to India in 1946 by the British Government comprised of _____ members.

(a) three
(b) six
(c) four
(d) five

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Q65. Who said the following?

"No society can surely by flourishing and happy, of which the far greater part of the members are poor and miserable."

(a) Adam Smith
(b) Jagdish Bhagwati
(c) Amartya Sen
(d) Jean Drèze

Q66. The United Nations organisation was set up through the signing of the United Nations Charter by _____ states.

(a) 180
(b) 51
(c) 84
(d) 200

Q67. Which earthquake waves involve transverse displacement?

(a) S - Waves
(b) L -Waves
(c) Rayleigh surface waves
(d) P - Waves

Q68. A and B working together can finish a task in 18 days. B and C working together can finish it in 24 days. A and C working together can finish it in 36 days. In how many days will A, B and C finish the same task, working separately?

(a) A = 284/5, B = 48 and C = 144
(b) A = 48, B = 144 and C = 284/5
(c) A = 284/5, B = 144 and C = 48
(d) A = 48, B = 284/5 and C = 144

Q69. 1/10 of a pole is coloured red, 1/20 is white, 1/30 is blue, 1/40 is black and the rest is green. If the length of the green portion of the pole is 4.75 m, then the length of the pole is:

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

Q70. Who was the second person to land on the moon?

(a) Buzz Aldrin
(b) Charles Conrad
(c) Alan Shepard
(d) Alan L Bean

Q71. On selling a chair at 5% loss and a table at 15% gain, a man gains Rs. 300. If he sells the chair at 5% gain and the table at 5% gain, then he gains Rs. 180. The actual cost of the table is:

(a) Rs. 2,200
(b) Rs. 2,400
(c) Rs. 1,600
(d) Rs. 1,800

Q72. One question is followed by two arguments. Set what arguments are strong in terms of statements

Question:

Is it necessary to have an employee union in every government institution?

Logic:

1. No, it prevents certain activities of the organization.

2. 2: Yes, it promotes the rights of workers.

(a) Answer 1 and 2 is strong

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(b) Only 1 is strong
(c) Neither 1 nor 2 is strong
(d) Only 2 is strong

Q73. The ratio of the income of A to B is 5 : 4, and the ratio of their respective expenditure is 3 : 2. If, at the end of the year, each saves Rs. 1,600, then the income of A is:
(a) Rs. 3,400
(b) Rs. 4,400
(c) Rs. 4,000
(d) Rs. 3,600

Q74. The Constituent Assembly formed the Drafting Committee to prepare a Draft Constitution of India on:
(a) 29^(th) August 1949
(b) 29th August 1947
(c) 29th August 1950
(d) 29th August 1948

Q75. When were the caves of Bhimbetka discovered?
(a) 1957-58
(b) 1954-55
(c) 1955-56
(d) 1953-54

Q76. Which of the following hormones inhibits growth and is responsible for wilting of leaves?
(a) Oxine
(b) Abscisic acid
(c) Cytokinin
(d) Gibberellin

Q77. If '*' stands for 'addition', '/' stands for 'subtraction', '+' stands for 'multiplication' and '-' stands for 'division', then find the value of 22 * 10 / 10 - 2 + 4.
(a) 12
(b) 14
(c) 10
(d) 16

Q78. In a certain code language, ADG is written as ZWT. How will BEH be written as in that language?
(a) PQR
(b) SVY
(c) VYS
(d) YVS

Q79. Which of the following Nuclear Power Plant is situated in the state of Uttar Pradesh?
(a) Thumba
(b) Narora
(c) Tarapur
(d) Rawatbhata

Q80. In a certain code language, SHANU is written as 3969. How will TAPLG be written as in that language?
(a) 3945
(b) 3166
(c) 3939
(d) 3136

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Q81. Find the simple interest on Rs. 3,000 at 61/4 % p.a. for the period from 5 Feb 2005 to 18 April 2005, both dates included.

(a) Rs. 37.50
(b) Rs. 40
(c) Rs. 42.80
(d) Rs. 35.50

Q82. A 'light year' is a unit that is used to measure:

(a) distance
(b) speed
(c) motion
(d) time

Q83. 'n' number of persons stand on the circumference of a circle at distinct points. Each possible pair of persons, not standing next to each other, sings a two-minute song, one pair after the other. If the total time taken for singing is 40 minutes, then what is the value of 'n'?

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

Q84. The mean of 5 observations is 20. If another observation is added, then the mean increases by 2. What is the value of the 6^(th) observation that is added?

(a) 42
(b) 32
(c) 22
(d) 52

Q85. With which of the following sports is Ezra Cup associated?

(a) Equestrian show jumping
(b) Foot volleyball (Sepak Takraw)
(c) Rugby
(d) Polo

Q86. Out of the four numbers listed, three are alike in some manner and one is different. Select the odd one.

67, 41, 39, 17

(a) 41
(b) 39
(c) 67
(d) 17

Q87. Read the given statements and conclusions carefully and decide which of the conclusions logically follow(s) from the statements.

Statements:

a. Some printers are laser.

b. Some printers are inkjet.

c. No inkjet is a laser.

Conclusions:

i. Some inkjet are laser.

ii. Some laser are inkjet.

iii. Some laser are not inkjet.

(a) Only (iii) follows.
(b) Only (i) follows.
(c) None of (i), (ii) and (iii) follows.

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(d) Only (ii) follows.

Q88. Six students, Maira, Amaira, Sara, Zara, Tara and Kiara, are made to sit against a wall. All of them are facing north.

Amaira is sitting 2^(nd) to the left of Maira.

Sara is sitting 4^(th) to the right of Tara.

Kiara is sitting to the immediate left of Amaira.

Tara is sitting at one of the ends.

Which 2 students are sitting at the extreme ends?

(a) Tara and Zara
(b) Tara and Maira
(c) Amaira and Kiara
(d) Tara and Sara

Q89. Abhishek is the brother of Ashu who is the son of Jai. Swati is the daughter of Jyoti. Malti is the mother of Ashu and Jyoti.

How is Abhishek related to Swati?

(a) Father
(b) Brother's Son
(c) Mother's Brother
(d) Brother

Q90. A question is given followed by two arguments. Decide which of the arguments is/are strong with respect to the question.

Question:

Should education at primary level be in mother tongue?

Arguments:

1: Yes, it helps the students to understand the concepts easily.

2: No, finding tuition teachers in mother tongue is difficult.

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

Q91. Read the given information carefully and answer the question that follows.

There are six persons A, B, C, D, E and F, in a family. There is one teacher, one business person and one accountant. B and D are unmarried males and are not employed. None of the ladies are in business or accountancy. A is the only child in the family. C is the wife of E, and F is the brother of C.

Who is the teacher?

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

Q92. Select the number that will come next in the following series.

12, 15, 21, 30, 42, 57, ?

(a) 67
(b) 80
(c) 65
(d) 75

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

15 : 8 :: 25 : ?

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

Q94. O is the mother of A. B is the mother of C and E. C and D are the brothers and son's of A. G is the daughter of E and cousin of F. F is the son of D. How is B related to F?

(a) Son's Son
(b) Father's Mother
(c) Mother
(d) Mother's Mother

Q95. Select the option that is related to the third letter-cluster in the same way as the second letter-cluster is related to the first letter-cluster.

RAM : PBO :: SPQ : ?

(a) QQT
(b) QQS
(c) QPS
(d) QQR

Q96. Select the option that can replace the question mark (?) in the following series.

B7E, D11G, F15I, ?

(a) H19K
(b) H19L
(c) G18I
(d) H18J

Q97. Four words have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) Principal
(b) Director
(c) Dean
(d) Students

Q98. 'Cold' is related to 'Refrigerator' in the same way as 'Hot' is related to '_____'.

(a) Fire
(b) Oven
(c) Air conditioner
(d) Grinder

Q99. Select the option that is related to the third term in the same way as the second term is related to the first term.

Author : Pen :: Surgeon : ?

(a) Stitch
(b) Scalpel
(c) Operation
(d) Cut

Q100. Select the number that can replace the question mark (?) in the following series.

1, 1, 2, 4, 6, 36, 42, ?

(a) 168
(b) 1764
(c) 48

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(d) 1664

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) 3.5

Given Equation:

8.5 - { 5½ - (7½ + 2.8 / x) } × 4.25 ÷ (0.2)² = 306

Convert mixed numbers to improper fractions:

5½ = 11/2 and 7½ = 15/2

Rewrite the equation:

8.5 - { 11/2 - (15/2 + 2.8 / x) } × 4.25 ÷ (0.2)² = 306

Calculate (0.2)²:

(0.2)² = 0.04

Rewrite the equation with 0.04:

8.5 - { 11/2 - (15/2 + 2.8 / x) } × 4.25 / 0.04 = 306

Calculate 4.25 / 0.04:

4.25 / 0.04 = 106.25

Rewrite the equation:

8.5 - { 11/2 - (15/2 + 2.8 / x) } × 106.25 = 306

Move 8.5 to the right side:

{ 11/2 - (15/2 + 2.8 / x) } × 106.25 = 306 - 8.5

{ 11/2 - (15/2 + 2.8 / x) } × 106.25 = 297.5

Divide both sides by 106.25:

{ 11/2 - (15/2 + 2.8 / x) } = 297.5 / 106.25

Calculate (297.5 / 106.25):

{ 11/2 - (15/2 + 2.8 / x) } = 2.8

Set up the final equation:

11/2 - (15/2 + 2.8 / x) = -2.8

Convert -2.8 to fraction:

-2.8 = -14/5

Substitute:

11/2 - (15/2 + 2.8 / x) = -14/5

Find a common denominator:

The common denominator for 2 and 5 is 10:

55/10 - (75/10 + 2.8 / x) = -28/10

Simplifying:

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55/10 - 75/10 - 2.8 / x = -28/10
Combine terms:
-20/10 - 2.8 / x = -28/10
Which simplifies to:
-2 - 2.8 / x = -2.8
Add 2 to both sides:
-2.8 / x = -0.8
Multiply both sides by -1:
2.8 / x = 0.8
Cross-multiplying gives:
2.8 = 0.8x
Now, divide both sides by 0.8:
x = 2.8 / 0.8 = 3.5
Conclusion:
The correct value of x is 3.5.

Q2. Answer: (d) 10 a.m.

Shortcut Trick
Time taken by Train R = 7 hours; Time taken by Train S = 10.5 hours.
Let the total distance be LCM(7, 10.5) = 21 units.
Speed of R = 21 ÷ 7 = 3 units/hr; Speed of S = 21 ÷ 10.5 = 2 units/hr.
Distance covered by R by 7 a.m. (in 2 hours) = 3 × 2 = 6 units.
Remaining distance = 21 − 6 = 15 units. Time to meet = 15 ÷ (3 + 2) = 3 hours.
Therefore The correct answer is 10 a.m.
Alternate Method
Given:
Departure of Train R (Chennai) = 5 a.m.; Arrival at Vijayawada = 12 p.m.
Departure of Train S (Vijayawada) = 7 a.m.; Arrival at Chennai = 5:30 p.m.
Formula Used:
Distance = Speed × Time | Relative Speed (Opposite Direction) = Speed1 + Speed2
Calculations:
=> Travel time for Train R = 12 p.m. − 5 a.m. = 7 hours
=> Travel time for Train S = 5:30 p.m. − 7 a.m. = 10.5 hours = 21/2 hours
=> Let Distance = D; Speed_R = D/7 and Speed_S = D/(21/2) = 2D/21
=> Distance covered by R in 2 hours (5 a.m. to 7 a.m.) = (D/7) × 2 = 2D/7
=> Remaining Distance at 7 a.m. = D − 2D/7 = 5D/7
=> Relative Speed = D/7 + 2D/21 = (3D + 2D)/21 = 5D/21
=> Time taken to meet after 7 a.m. = (5D/7) ÷ (5D/21) = (5D/7) × (21/5D) = 3 hours
=> Meeting Time = 7 a.m. + 3 hours = 10 a.m.
Therefore The correct answer is 10 a.m.
Additional Information
Relative Speed Principle
When two objects move towards each other, their relative speed is the sum of their individual speeds: V_(rel) = V1 + V2.
Meeting Time Calculation
To find the meeting time, always equalize the starting time of both objects by calculating the distance covered by the first object before the second starts.
LCM Method for Distance
Assuming distance as the LCM of individual travel times simplifies calculations by avoiding complex algebraic variables and fractions.

Q3. Answer: (d) Recycle Bin

The correct answer is Recycle Bin.
Key Points

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• The Recycle Bin is a special folder used to store deleted files temporarily.
• When files are deleted from the computer, they are moved to the Recycle Bin instead of being permanently erased, allowing users to recover them if needed.
• The Recycle Bin is typically represented by an icon on the desktop, resembling a trash can.
• Files in the Recycle Bin can be restored to their original location or permanently deleted to free up space on the hard drive.
Additional Information
• My Documents
• My Documents is a default folder in Windows operating systems used to store personal documents and files.
• It is typically located in the user's profile directory and serves as a centralized location for documents.
• Files stored here are not deleted when moved to the Recycle Bin.
• Inbox
• The Inbox is a folder in email applications where incoming messages are stored.
• It is the primary location for new emails received by the user.
• Deleting emails from the inbox usually moves them to a Trash or Deleted Items folder within the email application.
• Outbox
• The Outbox is a folder in email applications where outgoing messages are temporarily stored before being sent.
• Emails in the Outbox are waiting to be processed and sent to their recipients.
• Once the emails are successfully sent, they are typically moved to the Sent Items folder.

Q4. Answer: (c) 14

The logic followed here is:
PEN is written as 8
Similarly,
PENCIL will be written as
Hence, "Option 3" is the correct answer.

Q5. Answer: (b) 0.00243

Given:
Find the value of 3 times of 3 tenths of 3 hundredths of 3 thousandths of 30.
Formula used:
Value = 3 × (3 / 10) × (3 / 100) × (3 / 1000) × 30
Calculations:
1. 3 thousandths of 30:
=> 3 thousandths of 30 = (3 / 1000) × 30 = 90 / 1000 = 0.09
2. 3 hundredths of 0.09:
=> 3 hundredths of 0.09 = (3 / 100) × 0.09 = 0.27 / 100 = 0.0027
3. 3 tenths of 0.0027:
=> 3 tenths of 0.0027 = (3 / 10) × 0.0027 = 0.00081
4. Finally, multiply by 3:
=> 3 × 0.00081 = 0.00243
Therefore The value of 3 times of 3 tenths of 3 hundredths of 3 thousandths of 30 is 0.00243.

Q6. Answer: (a) ga ku

According to the given information,
Thus, according to the given codes the code 'ga ku' is for the word 'Man James'.
Hence, the correct answer is "Option 1".

Q7. Answer: (a) A = Rs. 490, B = Rs. 392 and C = Rs. 280

Given:
Total amount = Rs. 1,162
Ratio of A : B : C = 35 : 28 : 20
Formula used:
Let the amounts for A, B, and C be 35x, 28x, and 20x respectively.

Total ratio = 35 + 28 + 20 = 83
Calculations:
35x + 28x + 20x = 1162
=> 83x = 1162
=> x = 1162 / 83
=> x = 14
Now, calculate the amounts:
A's share = 35x = 35 × 14 = 490
B's share = 28x = 28 × 14 = 392
C's share = 20x = 20 × 14 = 280
Therefore The amounts are:
A = Rs. 490
B = Rs. 392
C = Rs. 280

Q8. Answer: (c) 3

Given:
Find the least value of x where 7x5462 is divisible by 9.
Rule for Divisibility by 9:
A number is divisible by 9 if the sum of its digits is divisible by 9.
Calculations:
Digits in 7x5462: 7, x, 5, 4, 6, 2
Sum of the digits = 7 + x + 5 + 4 + 6 + 2 = x + 24
We need x + 24 to be divisible by 9.
24 mod 9 = 6 (since 24 ÷ 9 = 2 remainder 6)
Set up the equation:
x + 6 ≡ 0 mod 9
=> x ≡ -6 mod 9
=> x ≡ 3 mod 9
Possible Values for x:
Valid digit: x = 3
Conclusion:
The least value of x for which 7x5462 is divisible by 9 is 3.

Q9. Answer: (c) 14 kg

Given:
Alloy A: Gold and Copper ratio = 7 : 2
Alloy B: Gold and Copper ratio = 7 : 11
Equal quantities of A and B are mixed to form Alloy C.
Amount of Copper in C = 10 kg
Formula used:
Total Gold and Copper in C = (Gold in A + Gold in B) : (Copper in A + Copper in B)
Assume each of Alloy A and B has an equal weight, let it be 1 unit for simplicity.
Calculation:
Step 1: Calculate Gold and Copper in 1 unit of Alloy A
=> Gold in A = 7/9 units
=> Copper in A = 2/9 units
Step 2: Calculate Gold and Copper in 1 unit of Alloy B
=> Gold in B = 7/18 units
=> Copper in B = 11/18 units
Step 3: Calculate total Gold and Copper in Alloy C (combined alloys A and B)
=> Gold in C = (7/9 + 7/18) = (14 + 7)/18 = 21/18 = 7/6 units

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=> Copper in C = (2/9 + 11/18) = (4 + 11)/18 = 15/18 = 5/6 units

Step 4: Calculate Total Weight of Alloy C

Let the actual copper in C (5/6 of total weight) be 10 kg:

=> (5/6)x = 10

=> x = (10 × 6)/5 = 12 kg (Total weight of Alloy C)

Step 5: Calculate Amount of Gold in Alloy C

=> Gold in C = (7/6) × 12 = 14 kg

Therefore The amount of Gold in Alloy C is 14 kg.

Q10. Answer: (a) 90°

Given:

In ΔABC, angle A + angle B = angle C

Formula used:

Sum of angles in a triangle = 180°

Calculation:

=> angle A + angle B + angle C = 180°

Since angle A + angle B = angle C, substitute angle C:

=> angle C + angle C = 180°

=> 2angle C = 180°

=> angle C = 180° ÷ 2

=> angle C = 90°

Therefore The measure of the third angle angle C is 90°.

Q11. Answer: (a) 14

Given:

$x = (\sqrt{3} + 1) / (\sqrt{3} - 1)$

$y = (\sqrt{3} - 1) / (\sqrt{3} + 1)$

Formula used:

$x^2 + y^2 = (x + y)^2 - 2xy$

Calculation:

First, simplify x and y by rationalizing the denominators.

Step 1: Simplify x

$x = (\sqrt{3} + 1) / (\sqrt{3} - 1) \times (\sqrt{3} + 1) / (\sqrt{3} + 1)$

$=> x = (3 + 2\sqrt{3} + 1) / (3 - 1)$

$=> x = (4 + 2\sqrt{3}) / 2$

$=> x = 2 + \sqrt{3}$

Step 2: Simplify y

$y = (\sqrt{3} - 1) / (\sqrt{3} + 1) \times (\sqrt{3} - 1) / (\sqrt{3} - 1)$

$=> y = (3 - 2\sqrt{3} + 1) / (3 - 1)$

$=> y = (4 - 2\sqrt{3}) / 2$

$=> y = 2 - \sqrt{3}$

Step 3: Calculate x + y

$x + y = (2 + \sqrt{3}) + (2 - \sqrt{3})$

$=> x + y = 4$

Step 4: Calculate xy

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

$=> xy = 4 - 3$

$=> xy = 1$

Step 5: Calculate $x^2 + y^2$

$x^2 + y^2 = (x + y)^2 - 2xy$

$=> x^2 + y^2 = 4^2 - 2 \times 1$

$=> x^2 + y^2 = 16 - 2$

=> $x^2 + y^2 = 14$

Therefore The value of $x^2 + y^2$ is 14.

Q12. Answer: (c) 30°

Given:

P' looking at the vertex 'S' of a pillar. Now the person travels a distance of 40√3 m towards the pillar and comes to point 'Q'. Progression from point 'Q' to point 'S' is 60°.

Formula Used:

Tan 60° = √3

tan θ = P/B

Calculation:

According the question,

tan 60° = 60/x

√3 = 60/x

x = 60/√3

tan θ = 60/(40 √3 + 60/√3)

tanθ = 1/√3

θ = 30°

Q13. Answer: (c) Jawaharlal Nehru

The correct answer is Jawaharlal Nehru.

Key Points

• Jawaharlal Nehru proposed the "Objectives Resolution" on 13th December 1946.

• The resolution outlined the aims and objectives of the Constituent Assembly and laid down the philosophy and ideals for the Constitution of India.

• The Objectives Resolution was unanimously adopted by the Constituent Assembly on 22nd January 1947.

• This resolution later became the preamble of the Indian Constitution.

Additional Information

• Constituent Assembly

• The Constituent Assembly of India was set up to draft the Constitution of India.

• The assembly was established in 1946 and consisted of representatives from various regions and communities of India.

• Dr. Rajendra Prasad was elected as the President of the Constituent Assembly.

• Objectives Resolution

• The Objectives Resolution was a resolution adopted by the Constituent Assembly of India on 22nd January 1947.

• The resolution was proposed by Jawaharlal Nehru on 13th December 1946.

• It outlined the fundamental principles and philosophy on which the Indian Constitution was to be based.

• The resolution declared India as a sovereign, democratic republic and guaranteed its citizens justice, equality, and freedom.

• Preamble of the Indian Constitution

• The preamble is an introductory statement in the Constitution that outlines the guiding principles and philosophy of the document.

• It declares India to be a sovereign, socialist, secular, and democratic republic.

• The preamble highlights the objectives of the Constitution, which include justice, liberty, equality, and fraternity for all citizens.

• The wording of the preamble is based on the Objectives Resolution proposed by Jawaharlal Nehru.

Q14. Answer: (a) Cholera

The correct answer is Cholera.

Key Points

• Cholera is an infectious disease caused by the bacterium Vibrio cholerae.

• It is not caused by a virus but by a bacterium.

• Cholera typically spreads through contaminated water and food.

• The main symptoms of cholera are severe diarrhea and dehydration, which can be fatal if not treated promptly.

Additional Information

• AIDS (Acquired Immunodeficiency Syndrome):

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• It is caused by the Human Immunodeficiency Virus (HIV).
• HIV attacks the body's immune system, specifically the CD4 cells (T cells), which can lead to AIDS.
• There is currently no cure for HIV/AIDS, but it can be managed with proper medical care.
• Cold (Common Cold):
• The common cold is caused by a variety of viruses, most commonly the rhinoviruses.
• Symptoms include runny nose, sore throat, coughing, and sneezing.
• It is a mild, self-limiting syndrome, meaning it resolves without specific treatment.
• Dengue fever:
• It is caused by the dengue virus, which is transmitted by Aedes mosquitoes.
• Symptoms include high fever, severe headache, pain behind the eyes, joint and muscle pain, rash, and mild bleeding.
• Severe dengue can be life-threatening and requires proper medical care.

Q15. Answer: (c) 1907

The correct answer is 1907.

Key Points

• The Tata Iron and Steel Company Limited (TISCO), now known as Tata Steel, was established in the year 1907.
• The company was founded by the visionary Indian industrialist Jamsetji Tata in Jamshedpur, Jharkhand.
• TISCO was one of the first integrated steel plants in Asia and played a crucial role in the industrialization of India.
• Tata Steel is now one of the leading steel manufacturers in the world, known for its high-quality products and sustainable practices.

Additional Information

• Jamsetji Tata
• Jamsetji Tata was an Indian pioneer industrialist who founded the Tata Group, India's biggest conglomerate company.
• He is regarded as the "Father of Indian Industry" due to his significant contributions to the country's industrial sector.
• His vision included establishing an iron and steel plant, a hydroelectric plant, and an educational institution, all of which have left a lasting legacy.
• Jamshedpur
• Jamshedpur, named after Jamsetji Tata, is a city in Jharkhand, India, and is known as the "Steel City" due to the presence of Tata Steel.
• The city is one of the first planned industrial cities in India and is known for its infrastructure and quality of life.
• Steel Industry in India
• The steel industry is a critical sector in India's economy, providing employment to millions and contributing significantly to the GDP.
• India is one of the largest producers of steel in the world, and companies like Tata Steel have played a pivotal role in this achievement.
• Tata Steel
• Tata Steel is a multinational steel-making company headquartered in Mumbai, India, and a subsidiary of the Tata Group.
• It operates in 26 countries with key operations in India, the Netherlands, and the United Kingdom.
• The company is known for its innovative products, sustainable practices, and commitment to social responsibility.

Q16. Answer: (d) Glass

The logic followed here is:

Table	Furniture
Chair	Furniture
Cupboard	Furniture
Glass	Utensil

Table, Chair, Cupboard are all types of Furniture,

Whereas,

Glass is a type of Utensil.

Hence, the correct answer is "Glass".

Q17. Answer: (d) Wife

Given:

1) R is the mother of F

2) L is brother of F and son of G

3) G is the father of K

Thus, R is G's wife.

Hence, the correct answer is "Option 4".

Q18. Answer: (a) Ghana

The correct answer is Ghana.

Key Points

• Kofi Annan was born in Kumasi, Ghana on April 8, 1938.

• He served as the 7th Secretary-General of the United Nations from January 1997 to December 2006.

• Annan was the first person from sub-Saharan Africa to hold the position of UN Secretary-General.

• He was awarded the Nobel Peace Prize in 2001, along with the United Nations, for their work for a better organized and more peaceful world.

Additional Information

• United Nations (UN)

• The United Nations is an international organization founded in 1945 and currently made up of 193 Member States.

• Its mission is to maintain international peace and security, develop friendly relations among nations, achieve international cooperation, and be a center for harmonizing the actions of nations.

• The UN's headquarters is in New York City, USA.

• The United Nations operates through various specialized agencies, programs, and funds like UNESCO, UNICEF, WHO, etc.

• Secretary-General of the United Nations

• The Secretary-General is the chief administrative officer of the United Nations.

• The role is defined in Chapter XV (Articles 97 to 101) of the United Nations Charter.

• The Secretary-General is appointed by the General Assembly on the recommendation of the Security Council.

• The role includes providing leadership to the UN Secretariat, representing the UN at international levels, and implementing decisions of the UN bodies.

• Nobel Peace Prize

• The Nobel Peace Prize is one of the five Nobel Prizes established by the will of Alfred Nobel, the inventor of dynamite.

• It is awarded annually to individuals or groups who have made significant contributions to the promotion of peace.

• The prize includes a medal, a diploma, and a monetary award.

• Notable recipients include Martin Luther King Jr., Mother Teresa, Malala Yousafzai, and the United Nations.

Q19. Answer: (b) Cat

The logic followed here is:

Goat	Domestic Animal
Cat	Pet Animal
Cow	Domestic Animal
Buffalo	Domestic Animal

Goat, Cow, Buffalo all are Domestic Animals,

Whereas,

Cat is a Pet Animal.

Hence, the correct answer is "Cat".

Q20. Answer: (b) 300 A

The correct answer is Option 2: Article 300 A.

Key Points

• The 44th Amendment of the Indian Constitution was enacted in 1978 and brought significant changes to the Constitution of India.

• Article 300 A was introduced through this amendment, which ensures that no person shall be deprived of their property except by authority of law.

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• Prior to this amendment, the right to property was a fundamental right under Article 31, but the 44th Amendment moved it to a constitutional right under Article 300 A.

• This amendment was significant as it reduced the scope of the right to property, making it less stringent and allowing the state more flexibility in acquiring private property for public purposes.

Additional Information

• Article 298:

• This article deals with the executive power of the Union and the States to carry on trade or business and the acquisition, holding, and disposal of property.

• Article 299:

• This article outlines the manner in which contracts can be made by the Union or State governments and ensures that such contracts are legally enforceable.

• Article 301:

• This article guarantees the freedom of trade, commerce, and intercourse throughout the territory of India.

• 44th Amendment Act, 1978:

• It was enacted to correct the excesses of the 42nd Amendment and restore the balance between the Parliament and the judiciary.

• It restored the power of judicial review to the Supreme Court and High Courts.

• It also redefined the emergency provisions, ensuring greater protection against misuse of these powers.

Q21. Answer: (a) Hind Swaraj

The correct answer is Hind Swaraj.

Key Points

• Hind Swaraj is a book written by Mahatma Gandhi in 1909.

• In this book, Gandhi critiques modern civilization and lays out his vision for Indian self-rule (Swaraj).

• Gandhi argues that British rule in India was possible only because of the cooperation and acceptance by Indians.

• He emphasizes the importance of self-reliance and nonviolent resistance to achieve true independence.

Additional Information

• India of My Dreams

• This is a book by Mahatma Gandhi that provides a collection of his thoughts and ideas on various aspects of Indian society and its future.

• It covers his vision for India's political, social, and economic development.

• The Story of My Experiments with Truth

• This is an autobiography by Mahatma Gandhi, covering his life from early childhood through to 1921.

• It details his personal journey and the development of his philosophy of nonviolence (Satyagraha).

• Village Swaraj

• This book comprises writings and speeches by Gandhi on the subject of rural development and the importance of self-sufficient village communities.

• Gandhi believed that the foundation of India's development lay in the empowerment of its villages.

Q22. Answer: (c) An era of Darkness

The correct answer is An Era of Darkness.

Key Points

• An Era of Darkness is a book authored by Shashi Tharoor.

• It is a detailed critique of the British colonial rule in India.

• The book was awarded the Sahitya Akademi Award in 2019.

• Shashi Tharoor is a renowned Indian author, politician, and former diplomat.

Additional Information

• Sahitya Akademi Award

• The Sahitya Akademi Award is a literary honor in India, awarded annually by the Sahitya Akademi (India's National Academy of Letters).

• The award recognizes and promotes excellence in Indian writing and acknowledges new trends in Indian literature.

• The award is given in 24 languages, including English and the 22 languages listed in the Eighth Schedule of the Indian Constitution.

• Winners receive a plaque and a cash prize.

• Shashi Tharoor
• Shashi Tharoor is an Indian politician, diplomat, and author.
• He has served as a Member of Parliament and has also held the position of Minister of State for External Affairs.
• Tharoor has authored several books, including "The Great Indian Novel" and "Inglorious Empire".
• He is known for his eloquent speeches and writings on Indian history and politics.
• British Colonial Rule in India
• The British colonial rule in India lasted from 1858 to 1947.
• During this period, India was controlled by the British Crown and administered by the British government.
• The colonial rule had a significant impact on India's economy, society, and culture.
• It also led to the Indian independence movement, which eventually resulted in India's independence in 1947.

Q23. Answer: (c) 5%

Given:
Ravi earned 50% more than Ajay.
Ajay earned 30% less than Madhan.
Formula used:
Percentage difference = [(Difference in earnings) / Madhan's earnings] × 100
Calculation:
Step 1: Assume Madhan's earnings
Let Madhan's earnings = 100 units.
Step 2: Calculate Ajay's earnings
Ajay earned 30% less than Madhan, so:
=> Ajay's earnings = 100 - 30% of 100
=> Ajay's earnings = 100 - 30
=> Ajay's earnings = 70 units
Step 3: Calculate Ravi's earnings
Ravi earned 50% more than Ajay, so:
=> Ravi's earnings = 70 + 50% of 70
=> Ravi's earnings = 70 + 35
=> Ravi's earnings = 105 units
Step 4: Calculate the percentage by which Ravi earned more than Madhan
Difference in earnings = Ravi's earnings - Madhan's earnings
=> Difference = 105 - 100
=> Difference = 5 units
Percentage difference = (5 / 100) × 100
=> Percentage difference = 5%
Therefore Ravi earned 5% more than Madhan.

Q24. Answer: (a) Rs. 1,350

Given:
Total sum = Rs. 2,700
Interest on one part at 15% for 4 years = Interest on the other part at 10% for 6 years
Formula used:
Simple Interest (SI) = (Principal × Rate × Time) / 100
Calculation:
Let the part lent at 15% be Rs. x.
Then, the part lent at 10% will be Rs. (2700 - x).
Step 1: Calculate interest on both parts
Interest on the first part (at 15% for 4 years):
=> SI1 = (x × 15 × 4) / 100
=> SI1 = (60x) / 100
=> SI1 = 0.6x

Interest on the second part (at 10% for 6 years):
=> SI2 = ((2700 - x) × 10 × 6) / 100
=> SI2 = (60 × (2700 - x)) / 100
=> SI2 = 0.6 × (2700 - x)
Step 2: Set the interests equal to each other
0.6x = 0.6 × (2700 - x)
Step 3: Solve for x
=> 0.6x + 0.6x = 0.6 × 2700
=> 1.2x = 1620
=> x = 1620 / 1.2
=> x = 1350
Therefore The part of the sum lent out at 15% is Rs. 1,350.

Q25. Answer: (d) 2:1

Given:
Radius of each circle (r) = r cm
Distance between centers of adjacent circles = 2r
Formula used:
Area of square = side²
Area of rhombus = (1/2) × d1 × d2
Calculations:
According to figure ABCD is a square and PQRS is a Rhombus.
Side of square = 2r
Area of square = $(2r)^2$
=> Area of square = $4r^2$
Diagonals of rhombus = 2r
Area of rhombus = (1/2) × 2r × 2r
=> Area of rhombus = $2r^2$
Ratio of areas = Area of square : Area of rhombus
=> Ratio = $4r^2 : 2r^2$
=> Ratio = 2 : 1
Therefore The ratio of the area of the square to the area of the rhombus is 2:1.

Q26. Answer: (d) HCXWVJ

The logic followed here is:
'DKVCTR' is written as 'VXGZOH'
Similarly,
'FRSTYD' will be written as
Hence, "Option 4" is the correct answer.

Q27. Answer: (d) Gibberellin

The correct answer is Gibberellin.
Key Points
• Gibberellin is a plant hormone that regulates growth and influences various developmental processes, including stem elongation.
• It plays a crucial role in the elongation of cells in plant stems, leading to increased plant height.
• Gibberellins are involved in breaking seed dormancy and promoting germination.
• They also facilitate flowering and fruiting, influencing the maturation of fruits and flowers.
Additional Information
• Abscisic Acid (ABA)
• Abscisic acid is a plant hormone that primarily acts as a growth inhibitor.
• It plays a significant role in seed dormancy and helps plants respond to stress conditions such as drought.
• ABA is involved in the closing of stomata to prevent water loss in plants.
• Cytokinin

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• Cytokinins are a class of plant hormones that promote cell division and growth.

• They are involved in the regulation of cell differentiation and delay the aging of leaves.

• Cytokinins work in conjunction with auxins to control various aspects of plant growth and development.

• Ethylene

• Ethylene is a gaseous plant hormone that influences fruit ripening and leaf abscission.

• It plays a role in the response to mechanical stress and aids in the regulation of plant growth.

• Ethylene is also involved in the senescence (aging) process of plants.

Q28. Answer: (b) 1st Jan 2017

The correct answer is 1st Jan 2017.

Key Points

• Pradhan Mantri Matru Vandana Yojana (PMMVY) is a maternity benefit program introduced by the Government of India.

• The scheme was launched on 1st January 2017 to provide partial compensation for the wage loss in terms of cash incentives.

• It aims to improve the health and nutrition status of pregnant women and lactating mothers.

• Under the PMMVY, a cash incentive of Rs. 5,000/- is provided directly to the bank/post office account of Pregnant Women and Lactating Mothers (PW&LM) for the first living child of the family subject to fulfilling specific conditions relating to Maternal and Child Health.

Additional Information

• Maternity Benefit Programme

• Before PMMVY, the Indira Gandhi Matritva Sahyog Yojana (IGMSY) was a central government scheme for pregnant and lactating women to provide partial wage compensation to women for wage-loss during childbirth and childcare and to provide conditions for safe delivery and good nutrition and feeding practices.

• On 31 December 2016, the Prime Minister of India, Narendra Modi, announced that the scheme would be extended to all states and union territories of India with effect from 1 January 2017.

• The PMMVY is implemented using the platform of Anganwadi Services scheme of Umbrella ICDS under the Ministry of Women and Child Development in respect of States/UTs implementing scheme through Women and Child Development Department/ Social Welfare Department and through the health sector in respect of States/ UTs where the scheme is implemented by Health & Family Welfare Department.

• Integrated Child Development Services (ICDS)

• Launched on 2nd October 1975, ICDS is one of the world's largest and unique programmes for early childhood care and development.

• It is a centrally sponsored scheme and the cost is shared between the Central and State governments in the ratio of 60:40 for all States & UTs with the legislature except North Eastern and Himalayan States where the ratio is 90:10. For UTs without legislature, the Central Government bears 100% cost.

• ICDS offers a package of six services: Supplementary Nutrition, Pre-school non-formal education, Nutrition & health education, Immunization, Health check-up, and Referral services.

Q29. Answer: (a) 382 persons per sq km

The correct answer is 382 persons per sq km.

Key Points

• According to the 2011 Census, India has a population density of 382 persons per square kilometer.

• The population density is calculated as the number of people living per unit area of land.

• India saw a growth in population density from 324 persons per sq km in 2001 to 382 persons per sq km in 2011.

• Higher population density indicates a higher concentration of people in a specific area, which can impact resources and infrastructure.

Additional Information

• Population Density

• Population density is a measurement of the number of people per unit area, usually per square kilometer or square mile.

• It is used to measure how crowded or sparsely populated an area is.

• High population density can lead to challenges such as congestion, pressure on resources, and environmental degradation.

• Conversely, low population density may indicate underutilization of resources and potentially lesser economic development.

• Census

• A census is an official count or survey of a population, typically recording various details of individuals.

• In India, the census is conducted every 10 years by the Office of the Registrar General and Census Commissioner under the Ministry of Home Affairs.

• The data collected includes demographic, economic, and social information.

• The census provides vital statistics that aid in policy making and planning for the country's development.

• 2011 Census of India

• The 2011 Census of India was the 15th National Census since 1871.

• It was conducted in two phases: the house listing phase and the population enumeration phase.

• The data collected includes population size, density, sex ratio, literacy rate, and employment statistics.

• It provides a comprehensive picture of India's demographic and socio-economic status, which is crucial for governance and development planning.

Q30. Answer: (a) Only II and III follow.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

I. Some birds are pink → Does not follow (As some pigs are birds and all pink are pigs. So it is possible but not definite.)

II. Some pigs are pink → Follow (As all pink are pigs. As whole pinks comes in pigs, therefore it is true.)

III. Some pigs are roses → Follow (As some roses are pink and all pink are pigs. As whole pinks comes in pigs and has some part common with roses, therefore it is true.)

IV. Some birds are roses → Does not follow (As some roses are pink, all pink are pigs and some pigs are birds. So it is possible but not definite.)

Therefore Here, Only II and III follow.

Hence, "Option 1" is the correct answer.

Q31. Answer: (a) $2^3 \times 3^3 \times 5^3 \times 7^4 \times 11$

Given:

Expressions:

1) $2^2 \times 3^3 \times 5 \times 7^2$

2) $2^3 \times 3^2 \times 5^2 \times 7^4$

3) $2 \times 3 \times 5^3 \times 7 \times 11$

Formula used:

To find the LCM, select the highest power of each prime factor from all expressions.

Calculation:

Step 1: Identify the highest power of each prime factor

• For 2: Highest power is 2^3 (from expression 2)

• For 3: Highest power is 3^3 (from expression 1)

• For 5: Highest power is 5^3 (from expression 3)

• For 7: Highest power is 7^4 (from expression 2)

• For 11: Highest power is 11 (from expression 3)

Step 2: Write the LCM using the highest powers

LCM = $2^3 \times 3^3 \times 5^3 \times 7^4 \times 11$

Therefore The LCM is $2^3 \times 3^3 \times 5^3 \times 7^4 \times 11$.

Q32. Answer: (a) 1933

The correct answer is 1933.

Key Points

• The name 'Pakistan' was coined by Choudhry Rahmat Ali in 1933.

• He was a prominent figure in the Pakistan Movement, which sought to create a separate Muslim state.

• The term 'Pakistan' is an acronym composed of letters taken from the names of the five northern regions of the British India: Punjab, Afghania (North-West Frontier Province), Kashmir, Sindh, and Baluchistan.

• The name also means 'Land of the Pure' in Urdu and Persian, reflecting the desire for a state that would uphold Islamic values.

Additional Information

• Pakistan Movement

• The Pakistan Movement was a political movement in the 1940s that aimed for the creation of Pakistan, a separate nation for Muslims, from the regions of British India.

• The movement was led by the All-India Muslim League under the leadership of Muhammad Ali Jinnah.

• The demand for Pakistan was formalized on March 23, 1940, through the Lahore Resolution.

• The movement culminated in the creation of Pakistan on August 14, 1947, following the partition of India.

• Choudhry Rahmat Ali

• Choudhry Rahmat Ali was an Indian Muslim nationalist who is credited with creating the name 'Pakistan' for the separate Muslim state.

• He was born in 1897 in the Punjab Province of British India.

• He published a pamphlet titled "Now or Never" in 1933, in which he articulated his vision for a separate Muslim state and proposed the name 'Pakistan'.

• Rahmat Ali's vision played a significant role in shaping the aspirations of Muslims in British India and the eventual creation of Pakistan.

Q33. Answer: (a) Order of the Rising Sun

The correct answer is Order of the Rising Sun.

Key Points

• The Order of the Rising Sun is a Japanese order, established in 1875 by Emperor Meiji.

• It was the first national decoration awarded by the Japanese government.

• This award recognizes distinguished achievements in international relations, promotion of Japanese culture, advancements in their field, development in welfare or preservation of the environment.

• The Order of the Rising Sun features rays of sunlight from the rising sun. It symbolizes energy and vitality.

Additional Information

• Order of the Paulownia Flowers

• This is a Japanese order, which is a subset of the Order of the Rising Sun.

• It was established in 1888 and is awarded for exceptional contributions to national or public interests.

• The badge of the order is similar to that of the Order of the Rising Sun, but it features paulownia flowers instead of rays of sunlight.

• Order of the Precious Crown

• This is a Japanese order established in 1888.

• It is awarded exclusively to women for distinguished service or achievements in various fields.

• The badge of the order features a five-pointed star with a central medallion depicting a phoenix.

• Person of Cultural Merit

• This is a prestigious Japanese title awarded to individuals who have made significant contributions to Japan's culture.

• It was established in 1951 to recognize and honor outstanding cultural achievements.

• Recipients of this title are entitled to certain privileges and benefits, such as a monetary award and a special annual pension.

Q34. Answer: (c) packet switching

The correct answer is packet switching.

Key Points

• Packet switching is a digital networking communications method that groups all transmitted data into suitably sized blocks, called packets, which are transmitted via a medium that may be shared by multiple simultaneous communication sessions.

• Unlike circuit switching, which establishes a dedicated circuit for the duration of a transmission, packet switching allows the same data path to be shared among many users in the network.

• The internet primarily uses packet switching to transfer data efficiently and reliably.

• Packet switching helps in reducing network congestion and improving the robustness of data transmission.

Additional Information

• Telex Switching:

• Telex is a switched network of teleprinters similar to a telephone network, for the purposes of sending text-based messages.

• It was widely used for international business communication before email and fax became common.

• Telephone Switching:

• Telephone switching refers to the process of connecting telephone calls between the calling and the called party in a telephone network.

• This system uses circuit switching technology, where a dedicated path is established for the duration of the call.

• Circuit Switching:

• Circuit switching is a method of implementing a telecommunications network in which two network nodes establish a dedicated communications channel (circuit) through the network before the nodes may communicate.

• This type of switching is used in traditional telephone networks.

• Packet Switching:

• Packet switching is a method of grouping data that is transmitted over a digital network into packets.

• Packets are sent independently over the network and can take different paths to the destination, where they are reassembled in the correct order.

• This method is more efficient and robust than circuit switching and is the foundation of the internet and most modern data networks.

Q35. Answer: (a) C

According to the given information,

Thus, according to the given codes the code 'C' is for the word 'like'.

Hence, the correct answer is "Option 1".

Q36. Answer: (b) 1961

The correct answer is 1961.

Key Points

• National Organic Chemicals Industries Limited (NOCIL) was established in the year 1961.

• NOCIL is one of the oldest and largest rubber chemical manufacturers in India.

• The company has a strong presence in both the domestic and international markets.

• NOCIL is known for its commitment to quality and innovation in the chemical industry.

Additional Information

• National Organic Chemicals Industries Limited (NOCIL)

• NOCIL is a part of the Arvind Mafatlal Group, one of the oldest industrial houses in India.

• The company is engaged in the manufacturing and sale of rubber chemicals.

• Its products are used in various industries, including automotive, construction, and manufacturing.

• NOCIL's manufacturing facilities are located in Navi Mumbai, Maharashtra, and Dahej, Gujarat.

• Rubber Chemicals

• Rubber chemicals are essential additives used in the processing and production of rubber products.

• They include accelerators, antioxidants, vulcanizing agents, and processing aids.

• These chemicals enhance the properties of rubber, making it more durable, flexible, and resistant to heat and aging.

• Rubber chemicals are critical in the production of tires, hoses, belts, and other rubber goods.

• Arvind Mafatlal Group

• The Arvind Mafatlal Group is a diversified business conglomerate with interests in textiles, chemicals, and information technology.

• The group has a rich history dating back to the early 20th century.

• It is known for its commitment to quality, innovation, and sustainability in all its business ventures.

• The group has a strong focus on corporate social responsibility and community development initiatives.

Q37. Answer: (b) Zoo

The logic followed here is:

Logic: Relationship between living entities and their habitats.

Here,

Plants : Garden → Garden is a place where plants are typically found or cultivated.

Similarly,

Animals : Zoo → Zoo is a place where animals are typically kept and displayed.

Hence, the correct answer is "Option 2".

Q38. Answer: (c) 32 km

Given:

Speed of first man = 6 km/h

Speed of second man = 7.5 km/h

Time difference between their arrivals = 1 hour 4 minutes = 1.0667 hours (64 minutes converted to hours)

Formula used:

Distance = Speed × Time

Let the time taken by the faster man (second man) be T hours.

Calculation:

Step 1: Set up the time equations for both men

For the second man (faster): Distance = 7.5 × T

For the first man (slower): Distance = 6 × (T + 1.0667)

Since both cover the same distance, set the equations equal to each other:

7.5 × T = 6 × (T + 1.0667)

Step 2: Solve for T

=> 7.5T = 6T + 6.4

=> 7.5T - 6T = 6.4

=> 1.5T = 6.4

=> T = 6.4 / 1.5

=> T = 4.2667 hours

Step 3: Calculate the distance

Distance = 7.5 × 4.2667

=> Distance ≈ 32 km

Therefore The distance covered is approximately 32 km.

Q39. Answer: (b) Exempt

The correct Dictionary order is:

1. Exercise
2. Exempt
3. Excuse
4. Exit

So, 'Exempt' is the second word after rearranging in English dictionary order.

Hence, the correct answer is "Option 2".

Q40. Answer: (d) Gregor Mendel

The correct answer is Gregor Mendel.

Key Points

• Gregor Mendel is known as the 'Father of Modern Genetics' for his groundbreaking work in the study of heredity and inheritance patterns in pea plants.

• His experiments and observations laid the foundation for the laws of inheritance, now known as Mendel's Laws.

• Mendel's work was initially overlooked but later recognized as crucial to the development of the field of genetics.

• He introduced key concepts such as dominant and recessive traits, and the segregation of alleles during reproduction.

Additional Information

• Gregor Mendel

• Gregor Johann Mendel (1822-1884) was an Austrian monk who discovered the basic principles of heredity through experiments with pea plants.

• He published his findings in 1866 in a paper titled "Experiments on Plant Hybridization," which described how traits are inherited from one generation to the next.

• Mendel's work introduced the concept of genes as the units of heredity, although the term "gene" was coined later.

• His findings were rediscovered at the turn of the 20th century, leading to the birth of modern genetics.

• Robert Brown

• Robert Brown (1773-1858) was a Scottish botanist who discovered the cell nucleus in 1831.

• He is also known for describing the random movement of particles in a fluid, a phenomenon now known as Brownian motion.

• Rosalind Franklin

• Rosalind Franklin (1920-1958) was a British scientist who made critical contributions to the understanding of the molecular structures of DNA, RNA, viruses, coal, and graphite.

• Her X-ray diffraction images of DNA led to the discovery of the DNA double helix by James Watson and Francis Crick.

• James Watson

• James Watson (born 1928) is an American molecular biologist, geneticist, and zoologist who co-discovered the structure of DNA with Francis Crick in 1953.

• They were awarded the Nobel Prize in Physiology or Medicine in 1962 for their discovery.

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Q41. Answer: (b) Q

Given: There are 9 members M, N, O, P, Q, R, S, T and U, in a joint family. There are three married couples in the family.

1) N is a doctor and the brother of O and P.

2) O is the only daughter of M.

3) U is the daughter of P and R.

4) T is the wife of M, and M is the grandfather of S.

5) Q is the mother of S.

Thus, Q is the Doctor's i.e. N's wife.

Hence, the correct answer is "Option 2".

Q42. Answer: (c) Odisha

The correct answer is Odisha.

Key Points

• Paika Dance is a traditional martial dance form that originates from the state of Odisha.

• The dance is performed by the Paika community, who were historically known as warriors and served as militia for the Gajapati rulers of Odisha.

• Paika Dance is characterized by its vigorous movements and the use of traditional weapons like swords, shields, and spears, showcasing the warrior skills of the performers.

• This dance form is typically performed during festive occasions and cultural events in Odisha, symbolizing valor and cultural heritage.

Additional Information

• Traditional Dance Forms of India

• Bharatanatyam: Originating from Tamil Nadu, it is one of the oldest classical dance forms in India, known for its fixed upper torso, bent legs, and intricate footwork.

• Kathak: A classical dance form from North India, characterized by intricate footwork, spins, and expressive gestures.

• Kathakali: A classical dance-drama from Kerala, known for its elaborate costumes, detailed gestures, and well-defined body movements.

• Kuchipudi: Originating from Andhra Pradesh, it is a classical dance form that combines fast rhythms with fluid movements and sculpturesque poses.

• Manipuri: A classical dance form from Manipur, known for its graceful and fluid movements, often depicting themes from the Hindu epics.

• Odissi: A classical dance form from Odisha, characterized by its lyrical grace, sculpturesque poses, and intricate movements.

• Sattriya: A classical dance form from Assam, rooted in the Vaishnavism monasteries of Assam, known for its devotional themes and rhythmic movements.

• Importance of Cultural Heritage

• Preservation of traditional dance forms like Paika Dance helps in maintaining the rich cultural heritage of a region.

• These dance forms serve as a medium to pass down historical narratives, traditions, and values from one generation to another.

• They also play a crucial role in promoting cultural tourism and enhancing the cultural identity of a community or region.

• Understanding and appreciating diverse cultural practices foster unity, respect, and harmony within a multicultural society.

Q43. Answer: (a) Deccan Development Society

The correct answer is Deccan Development Society.

Key Points

• The Deccan Development Society (DDS) is a grassroots organization working in about 75 villages with women's sanghams (voluntary village level associations) in the Medak District of Telangana, India.

• DDS has been focusing on issues such as food sovereignty, ecological agriculture, and women's empowerment.

• The society has set up a network of community grain banks and promoted traditional millet farming to ensure food security and nutritional well-being for marginalized communities.

• DDS received the UN's Equator Prize in 2019 for its efforts in promoting sustainable agriculture and empowering women farmers, making them leaders in the fight against climate change.

Additional Information

• UN's Equator Prize

• The Equator Prize is awarded biennially by the United Nations Development Programme (UNDP) to recognize outstanding community efforts to reduce poverty through the conservation and sustainable use of biodiversity.

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• The prize is aimed at showcasing local and indigenous community initiatives that can be replicated and scaled up to achieve sustainable development goals.

• It highlights the role of local communities in addressing global environmental challenges, emphasizing the importance of community-led action in achieving sustainable development.

• The award includes a monetary prize, international recognition, and an opportunity to participate in global advocacy and knowledge exchange events.

• Food Sovereignty

• Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods.

• It emphasizes the right to define their own food and agriculture systems, prioritizing local food production and consumption.

• Food sovereignty is a critical concept in the fight against global hunger, advocating for the rights of small-scale farmers and local communities.

• This approach contrasts with the industrial agriculture model, promoting biodiversity, sustainable practices, and local control over food systems.

• Ecological Agriculture

• Ecological agriculture refers to farming practices that aim to produce food while maintaining the health of ecosystems.

• It involves techniques such as crop rotation, organic farming, agroforestry, and the use of natural pest control methods.

• Ecological agriculture seeks to reduce environmental impacts, enhance biodiversity, and improve soil fertility.

• It is a sustainable alternative to conventional farming, addressing issues such as soil degradation, water scarcity, and climate change.

Q44. Answer: (a) 30° and 30°

Given:

cos(x + y) = 1/2

sin(x - y) = 0

x and y are positive acute angles, and x ≥ y

Formula used:

1. cos(θ) = 1/2 when θ = 60° (for acute angles)

2. sin(θ) = 0 when θ = 0°

Calculation:

Step 1: Solve for x + y

cos(x + y) = 1/2, so:

=> x + y = 60°

Step 2: Solve for x - y

sin(x - y) = 0, so:

=> x - y = 0°

=> x = y

Step 3: Substitute x = y in x + y = 60°

=> x + x = 60°

=> 2x = 60°

=> x = 30°

=> y = 30°

Therefore The values of x and y are 30° each.

Q45. Answer: (d) 36

Given:

Let the initial number of apples be x.

Calculations:

Step 1: Sell 1/3 of x to the first customer

Apples sold to the first customer = x/3

Remaining apples after the first customer = x - x/3 = 2x/3

Step 2: Sell 1/2 of the remaining apples to the second customer

Apples sold to the second customer = (1/2) × (2x/3) = x/3

Remaining apples after the second customer = (2x/3) - (x/3) = x/3

Step 3: Sell 1/3 of the remaining apples plus 5 to the third customer

Apples sold to the third customer = (1/3) × (x/3) + 5 = x/9 + 5

Remaining apples after the third customer = (x/3) - (x/9 + 5)

Step 4: Set up the equation for the remaining apples

According to the problem, the man is left with 3 apples after all sales:

(x/3) - (x/9 + 5) = 3

Step 5: Solve for x

Multiply through by 9 to eliminate fractions:

3x - (x + 45) = 27

3x - x - 45 = 27

2x - 45 = 27

2x = 27 + 45

2x = 72

x = 36

Therefore The man initially had 36 apples.

Q46. Answer: (a) $(x^2 + y^2 - 2)/2$

Given:

sin A + sin B = x

cos A + cos B = y

Formula used:

To find cos (A - B), we use the identity:

cos (A - B) = cos A cos B + sin A sin B

Calculation:

Step 1: Square both given equations

$(\sin A + \sin B)^2 = x^2$

$\Rightarrow \sin^2 A + \sin^2 B + 2 \sin A \sin B = x^2$

$(\cos A + \cos B)^2 = y^2$

$\Rightarrow \cos^2 A + \cos^2 B + 2 \cos A \cos B = y^2$

Step 2: Use the Pythagorean identity for $\sin^2 A + \cos^2 A = 1$ and $\sin^2 B + \cos^2 B = 1$

$\sin^2 A + \cos^2 A + \sin^2 B + \cos^2 B = 2$

Substitute into the sum of the squared equations:

$x^2 + y^2 = 2 + 2 (\sin A \sin B + \cos A \cos B)$

Step 3: Simplify to find cos (A - B)

$x^2 + y^2 = 2 + 2 \cos (A - B)$

$\Rightarrow \cos (A - B) = (x^2 + y^2 - 2) / 2$

Therefore $\cos (A - B) = (x^2 + y^2 - 2) / 2$

Q47. Answer: (b) 2 hours

The correct answer is 2 hours.

Key Points

• India spans longitudinally from approximately 68°E to 97°E, covering a distance of about 30 degrees of longitude.

• Each degree of longitude corresponds to a time difference of 4 minutes.

• Gujarat is located near the western edge of India, while Arunachal Pradesh is located near the eastern edge.

• The time difference between Gujarat (western India) and Arunachal Pradesh (eastern India) is thus around 2 hours.

Additional Information

• Time Zones

• Time zones are regions of the Earth that have the same standard time.

• They are generally centered on meridians of longitudes that are multiples of 15°.

• India only has one time zone (Indian Standard Time - IST), which is 5 hours and 30 minutes ahead of GMT (Greenwich Mean Time).

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• Indian Standard Time (IST)
• IST is the time observed throughout India and Sri Lanka.
• It is calculated from the Allahabad Observatory in Mirzapur (82.5°E longitude).
• The IST is 5 hours and 30 minutes ahead of GMT.
• Longitude and Time Difference
• The Earth is divided into 360 degrees of longitude.
• Each degree of longitude represents a time difference of 4 minutes.
• When traveling eastward, time increases, and when traveling westward, time decreases.

Q48. Answer: (b) 1950

The correct answer is 1950.

Key Points

• The Planning Commission of India was established in the year 1950.
• It was set up by a resolution of the Government of India in March 1950.
• The primary objective of the Planning Commission was to promote a rapid rise in the standard of living of the people by efficient exploitation of the resources of the country, increasing production, and offering opportunities to all for employment in the service of the community.
• The first Five-Year Plan was launched in 1951 based on the model recommended by the Planning Commission.

Additional Information

• Planning Commission:
• The Planning Commission was an institution in the Government of India, which formulated India's Five-Year Plans, among other functions.
• The Planning Commission was set up in 1950 and was responsible for assessing the resources of the country and formulating plans for the most effective and balanced utilization of those resources.
• It was headed by the Prime Minister of India and included other key ministers and experts in various fields.
• Five-Year Plans:
• These are centralized and integrated national economic programs. The first such plan was launched in 1951, and there have been twelve such plans since then.
• The plans were aimed at targeted growth and development in various sectors such as agriculture, industry, and services.
• The Planning Commission oversaw the implementation of these plans.
• NITI Aayog:
• The Planning Commission was replaced by the NITI Aayog (National Institution for Transforming India) in 2015 by the Government of India.
• NITI Aayog aims to involve states in economic policy-making in India and is a think-tank of the government.
• The emphasis shifted from planning to monitoring and evaluation of policies and programs.

Q49. Answer: (a) 1952

The correct answer is 1952.

Key Points

• In 1952 cheetahs were declared extinct in India.
• The last cheetah died in the country in 1947 and the species was declared extinct in 1952.
• The cheetah population in India dwindled during the 19th century, largely because of bounty hunting by local Indian kings and ruling British officials.
• The last three Asiatic cheetahs were hunted down in 1948 by an Indian king in central India.

Additional Information

• The Asiatic cheetah once ranged from the Arabian Peninsula and Near East to Iran, the Caucasus, Central Asia, Afghanistan, and Pakistan to India.
• It is considered regionally extinct in all of its former range, with the only known surviving population being Iran.
• The Asiatic cheetah diverged from the cheetah population in Africa between 32,000 and 67,000 years ago.

Q50. Answer: (c) 3

Given:

The LCM of two prime numbers x and y (where x > y) is 319.

Formula used:

The LCM of two prime numbers is the product of the numbers themselves since they have no common factors other than 1.

Calculation:

Step 1: Find the prime factors of 319

319 can be factored as:

319 = 11 × 29

Since both 11 and 29 are prime numbers, and 29 > 11, we can let x = 29 and y = 11.

Step 2: Calculate the value of 2x - 5y

Substitute x = 29 and y = 11:

2x - 5y = (2 × 29) - (5 × 11)

=> 2x - 5y = 58 - 55

=> 2x - 5y = 3

Therefore The value of 2x - 5y is 3.

Q51. Answer: (b) Diphu

The correct answer is Diphu.

Key Points

• Diphu Pass is located at the tri-junction of India, China, and Myanmar.

• It is an important strategic location for the three countries, marking the meeting point of their borders.

• The pass lies on the McMahon Line, which is the demarcation line between Tibet and India in the eastern sector of the border.

• Diphu Pass has historical significance, as it was a part of the ancient trade routes that connected India with China and Southeast Asia.

Additional Information

• Pensi La

• Pensi La is a mountain pass in the Ladakh region of India.

• It connects the Zanskar Valley to the Suru Valley in the Union Territory of Ladakh.

• The pass is situated at an elevation of about 4,400 meters (14,400 feet) above sea level.

• Pensi La is primarily used for travel between these valleys and is not located at any international boundary.

• Bum La

• Bum La Pass is located in the Tawang district of Arunachal Pradesh, India.

• It is situated near the Indo-China border and is historically significant for being part of the route taken by the Dalai Lama when he fled from Tibet to India in 1959.

• The pass is at an elevation of 4,633 meters (15,200 feet).

• Bum La Pass is a crucial point for trade and military activities between India and China.

• Imis La

• Imis La is not widely known or recognized as a significant mountain pass.

• It does not hold strategic or historical importance in the context of international borders involving India, China, or Myanmar.

• There is limited information available about Imis La.

Q52. Answer: (a) 1940

The correct answer is 1940.

Key Points

• The Lahore Resolution was adopted by the All-India Muslim League during its three-day general session held between 22nd and 24th March 1940.

• The resolution is also known as the Pakistan Resolution because it called for the creation of independent states for Muslims in the north-western and eastern zones of India.

• The resolution was presented by A. K. Fazlul Huq, the then Prime Minister of Bengal, and was supported by prominent leaders such as Muhammad Ali Jinnah.

• This resolution laid the foundation for the demand for Pakistan, which eventually led to the creation of the separate nation in 1947.

Additional Information

• All-India Muslim League:

• The All-India Muslim League was a political party in British India that played a crucial role in the creation of Pakistan.

• Founded in 1906 in Dhaka, the league initially sought to protect the rights of Muslims in India.

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• Under the leadership of Muhammad Ali Jinnah, the league adopted the demand for a separate Muslim state.

• Lahore Resolution:

• The Lahore Resolution, also known as the Pakistan Resolution, was a formal political statement adopted by the Muslim League in 1940.

• It called for the establishment of "independent states" in the north-western and eastern zones of India where Muslims were in the majority.

• This resolution is considered a significant step towards the creation of Pakistan.

• Muhammad Ali Jinnah:

• Muhammad Ali Jinnah was a prominent leader of the All-India Muslim League and played a pivotal role in the creation of Pakistan.

• He is also known as the "Father of the Nation" in Pakistan.

• Jinnah's leadership and advocacy for a separate Muslim state were instrumental in the partition of India in 1947.

Q53. Answer: (d) slightly longer than 29 days

The correct answer is slightly longer than 29 days.

Key Points

• The average time between successive full moons is about 29.53 days, commonly referred to as a synodic month.

• This period is slightly longer than the sidereal month, which is about 27.32 days and is the time taken for the Moon to orbit Earth relative to the stars.

• The discrepancy arises because the Earth-Moon system is also orbiting the Sun, causing the Moon to travel further to align with the same phase.

• Understanding the synodic month is crucial for calendars, astronomy, and timekeeping.

Additional Information

• Full Moon:

• A full moon occurs when the Moon is on the opposite side of the Earth from the Sun, so its face is fully illuminated.

• This happens approximately once every 29.53 days, the length of a synodic month.

• Synodic Month:

• The synodic month is the time taken for the Moon to return to the same phase (e.g., full moon to full moon).

• It is about 29.53 days, slightly longer than the sidereal month due to the Earth's orbit around the Sun.

• Sidereal Month:

• The sidereal month is the time taken for the Moon to orbit Earth relative to the stars.

• It is approximately 27.32 days.

• Importance in Calendars:

• Many calendars, including the Islamic and Hebrew calendars, are based on lunar cycles.

• Understanding the synodic month is essential for predicting lunar phases and events.

Q54. Answer: (c) 868 m2

Given:

Length (l) = 16 m

Breadth (b) = 14 m

Height (h) = 7 m

Formula used:

The surface area of a cuboid = 2(lb + bh + hl)

Calculation:

Surface area = 2 × (16 × 14 + 14 × 7 + 7 × 16)

=> Surface area = 2 × (224 + 98 + 112)

=> Surface area = 2 × 434

=> Surface area = 868 m^2

Therefore The surface area of the cuboid is 868 m^2.

Q55. Answer: (a) Harsh Vardhan

The correct answer is Harsh Vardhan.

Key Points

• Harsh Vardhan is a seasoned banker with extensive experience in the financial sector.

• He has been actively involved in the development of the housing finance market in India.

• Harsh Vardhan has served in various capacities in different financial institutions, contributing to their growth and development.

• He was appointed as the chairperson of the committee constituted by the Reserve Bank of India (RBI) to develop and enhance the housing finance securitisation market.

Additional Information

• Reserve Bank of India (RBI)

• The Reserve Bank of India is India's central banking institution, which controls the issuance and supply of the Indian rupee.

• It was established on April 1, 1935, in accordance with the provisions of the Reserve Bank of India Act, 1934.

• The RBI plays a crucial role in the development and regulation of the financial sector in India.

• It aims to foster financial stability and ensure adequate flow of credit to productive sectors.

• Securitisation Market

• Securitisation is the financial practice of pooling various types of contractual debt such as mortgages, auto loans, or credit card debt obligations and selling their related cash flows to third-party investors as securities.

• These securities are backed by the underlying debt obligations, providing investors with a stream of income.

• The securitisation market enables financial institutions to manage their capital more efficiently and diversify their risk.

• It also provides investors with access to a diversified portfolio of debt instruments.

• Housing Finance

• Housing finance refers to the funding of housing projects and the provision of loans to individuals for purchasing or constructing homes.

• It plays a critical role in the development of the housing sector, which is a key component of the economy.

• Financial institutions such as banks and housing finance companies provide housing loans to individuals and developers.

• The development of a robust housing finance market is essential for ensuring adequate and affordable housing for the population.

Q56. Answer: (c) Fundamental Rights are justiciable, whereas Directive Principles of State are non-justiciable.

The correct answer is Fundamental Rights are justiciable, whereas Directive Principles of State are non-justiciable.

Key Points

• Fundamental Rights are enforceable by the courts and can be challenged if violated. This means individuals can approach the judiciary if they feel their Fundamental Rights are infringed.

• Directive Principles of State Policy (DPSP), on the other hand, are guidelines for the state to follow in governance and policy-making but are not legally enforceable in a court of law.

• Fundamental Rights are primarily aimed at ensuring individual freedoms and rights, while DPSP are aimed at establishing a welfare state and achieving social and economic democracy.

• The conflict between Fundamental Rights and DPSP has been a subject of judicial interpretation, with courts balancing the need to protect individual rights with the aim to promote socio-economic welfare.

Additional Information

• Fundamental Rights:

• These are enshrined in Part III of the Indian Constitution (Articles 12 to 35).

• They are justiciable, meaning they can be enforced through the judiciary.

• Include rights such as right to equality, right to freedom, right against exploitation, right to freedom of religion, cultural and educational rights, and right to constitutional remedies.

• Directive Principles of State Policy (DPSP):

• Found in Part IV of the Indian Constitution (Articles 36 to 51).

• These principles are not enforceable by any court, but they are considered fundamental in the governance of the country.

• Aim to create social and economic conditions under which citizens can lead a good life.

• Include provisions for securing a living wage, equitable distribution of resources, right to work, education, public assistance in cases of unemployment, old age, sickness, and disablement, etc.

• Justiciability:

• Refers to the ability of a matter to be adjudicated by a court of law.

• Fundamental Rights being justiciable means that individuals can seek redressal from the courts if these rights are violated.

• Non-justiciable:

• Refers to matters that cannot be adjudicated or enforced by the courts.

• DPSP being non-justiciable means that while they provide important guidelines for governance, they cannot be legally enforced by the judiciary.

Q57. Answer: (d) Tamilnadu

The correct answer is Tamil Nadu.

Key Points

• The government of India granted the status of the 51st Tiger Reserve to the sanctuaries spanning the forests of Tamil Nadu.

• This newly designated tiger reserve is aimed at bolstering conservation efforts for the endangered tiger species in the region.

• The reserve includes areas from the Megamalai Wildlife Sanctuary and Srivilliputhur Grizzled Squirrel Wildlife Sanctuary.

• This move is expected to enhance biodiversity, protect wildlife habitats, and promote eco-tourism in the state of Tamil Nadu.

Additional Information

• Tiger Reserves in India

• India is home to more than 70% of the world's tiger population.

• Tiger reserves are protected areas dedicated to the conservation of tigers and their habitats.

• The Project Tiger initiative, launched in 1973, aims to safeguard and increase the population of tigers in India.

• As of the latest data, there are 51 tiger reserves in India, which are monitored and managed by the National Tiger Conservation Authority (NTCA).

• Megamalai Wildlife Sanctuary

• Located in the Western Ghats in Tamil Nadu, it is known for its rich biodiversity and scenic landscapes.

• The sanctuary is home to several species of flora and fauna, including elephants, leopards, and various bird species.

• It plays a critical role in water conservation and maintaining ecological balance in the region.

• Srivilliputhur Grizzled Squirrel Wildlife Sanctuary

• Established in 1989, it is named after the endangered grizzled giant squirrel that inhabits the sanctuary.

• The sanctuary spans across the districts of Virudhunagar and Madurai in Tamil Nadu.

• It provides a habitat for diverse wildlife, including tigers, leopards, Indian giant squirrels, and several bird species.

• National Tiger Conservation Authority (NTCA)

• NTCA is a statutory body under the Ministry of Environment, Forest and Climate Change, established in 2005.

• It oversees the implementation of Project Tiger and other conservation measures across India.

• The authority works towards ensuring a viable population of tigers in their natural habitats and protecting them from extinction.

Q58. Answer: (d) 5

Given:

Expression: (√625 / 11) × (14 / √25) × (11 / √196)

Calculation:

Step 1: Simplify each square root

√625 = 25

√25 = 5

√196 = 14

Step 2: Substitute these values into the expression

= (25 / 11) × (14 / 5) × (11 / 14)

Step 3: Simplify the expression by canceling terms

= (25 × 14 × 11) / (11 × 5 × 14)

Cancel 11, 14, and 5 in the numerator and denominator:

= 25 / 5

= 5

Therefore The value of the expression is 5.

Q59. Answer: (b) Pralhad Joshi

The correct answer is Pralhad Joshi.

Key Points

• Pralhad Joshi has been serving as the Union Minister of Parliamentary Affairs since May 30, 2019.

• He is also the Minister of Coal and Minister of Mines in the Government of India.

• He represents the Dharwad constituency of Karnataka in the Lok Sabha.

• Pralhad Joshi is a member of the Bharatiya Janata Party (BJP) and has been actively involved in politics since the 1990s.

Additional Information

• Union Minister of Parliamentary Affairs

• The Union Minister of Parliamentary Affairs is responsible for the functioning of the parliamentary system in India.

• The ministry ensures smooth functioning of both the Houses of Parliament (Lok Sabha and Rajya Sabha).

• The Minister is responsible for coordinating with various political parties and facilitating discussions and debates in the Parliament.

• The ministry also plays a significant role in managing the legislative business of the government in the Parliament.

• Pralhad Joshi

• Pralhad Joshi is a senior politician from Karnataka, representing the Dharwad constituency in the Lok Sabha.

• He has held various important positions within the BJP and has been an active member of the party since the 1990s.

• In addition to his role as Union Minister of Parliamentary Affairs, he also holds the portfolios of Minister of Coal and Minister of Mines.

• He has been instrumental in various legislative and policy-making processes related to his ministries.

• Ministry of Parliamentary Affairs

• The Ministry of Parliamentary Affairs is one of the key ministries in the Government of India.

• It was established in 1949 and plays a crucial role in the functioning of the Indian Parliament.

• The ministry is responsible for the coordination of legislative activities and ensuring the smooth functioning of parliamentary proceedings.

• It also acts as a bridge between the government and the opposition parties, facilitating dialogue and cooperation.

Q60. Answer: (d) 1

Given:

We need to find the remainder when 17^(200) is divided by 18.

Concept used:

Since we are dealing with powers of 17 mod 18, observe the pattern in powers of 17 modulo 18 to simplify.

Calculation:

Step 1: Calculate initial powers of 17 modulo 18

$17^1 \bmod 18 = 17$

$17^2 \bmod 18 = 289 \bmod 18 = 1$

Step 2: Identify the pattern

We observe that $17^2 \equiv 1 \pmod{18}$. This pattern implies that every even power of 17 will be congruent to 1 mod 18.

Step 3: Apply this pattern to 17^(200)

Since 200 is even, we can write 17^(200) as $(17^2)^{(100)}$.

Therefore, $17^{(200)} \equiv 1^{(100)} \equiv 1 \pmod{18}$

Therefore The remainder when 17^(200) is divided by 18 is 1.

Q61. Answer: (c) 1989

The correct answer is 1989.

Key Points

• The World Wide Web (WWW) was invented by Tim Berners-Lee in 1989.

• Tim Berners-Lee was a computer scientist working at CERN (the European Organization for Nuclear Research) when he invented the World Wide Web.

• The primary goal of the World Wide Web was to enable researchers to share data and information easily across the globe.

• The first website, created by Tim Berners-Lee, provided information about the World Wide Web project and was launched on August 6, 1991.

Additional Information

• World Wide Web (WWW)

• The World Wide Web, commonly known as the web, is a system of interlinked hypertext documents that are accessed via the internet.

• Users can access web pages that contain text, images, videos, and other multimedia, and navigate between them using hyperlinks.

• The web operates on the Hypertext Transfer Protocol (HTTP), which defines how messages are formatted and transmitted, and how web servers and browsers should respond to various commands.

• Tim Berners-Lee also developed the first web browser, called WorldWideWeb (later renamed Nexus), and the first web server, known as CERN httpd.

• Tim Berners-Lee

• Sir Timothy John Berners-Lee, an English engineer and computer scientist, is best known for inventing the World Wide Web.

• He is also the director of the World Wide Web Consortium (W3C), which oversees the development of web standards to ensure the long-term growth of the web.

• In 2004, he was knighted by Queen Elizabeth II for his pioneering work on the World Wide Web.

• Berners-Lee continues to advocate for an open and accessible internet for everyone.

• CERN

• The European Organization for Nuclear Research, known as CERN, is one of the world's largest and most respected centers for scientific research in particle physics.

• Located on the border between France and Switzerland, CERN is home to the Large Hadron Collider (LHC), the world's largest and most powerful particle accelerator.

• CERN's primary mission is to explore the fundamental structure of the universe by studying the smallest particles that make up matter.

• Hypertext Transfer Protocol (HTTP)

• HTTP is the foundation of data communication for the World Wide Web.

• It is an application layer protocol used for transmitting hypermedia documents, such as HTML.

• HTTP defines how messages are formatted and transmitted, and how web servers and browsers should respond to various commands.

• It was developed by Tim Berners-Lee and his team at CERN as part of the World Wide Web project.

Q62. Answer: (c) 64

Given:

Radius of the large sphere (R) = 10 cm

Radius of each small sphere (r) = 2.5 cm

Formula used:

The volume of a sphere = $(4/3)\ \pi\ r^3$

Since the large sphere is melted to form small spheres, the volume of the large sphere will be equal to the total volume of all small spheres.

Total volume of small spheres = n × volume of one small sphere

Calculation:

Step 1: Calculate the volume of the large sphere

Volume of large sphere = $(4/3)\ \pi\ R^3$

$= (4/3) \times \pi \times (10)^3$

$= (4/3) \times \pi \times 1000$

$= 4000\pi / 3\ cm^3$

Step 2: Calculate the volume of one small sphere

Volume of small sphere = $(4/3)\ \pi\ r^3$

$= (4/3) \times \pi \times (2.5)^3$

$= (4/3) \times \pi \times 15.625$

$= 62.5\pi / 3\ cm^3$

Step 3: Set up the equation for the number of small spheres (n)

Total volume of large sphere = n × volume of one small sphere

$\Rightarrow 4000\pi / 3 = n \times 62.5\pi / 3$

Cancel π and divide both sides by 62.5/3:

$\Rightarrow n = 4000 / 62.5$

$\Rightarrow n = 64$

Therefore The value of n is 64.

Q63. Answer: (a) 27.75%

Given:

The radius of a circle is reduced by 15%.

Formula used:

The area of a circle = πr^2

If the radius is reduced by 15%, the new radius will be 85% of the original radius.

New radius = 0.85r

Calculation:

Step 1: Calculate the original area

Original area = πr^2

Step 2: Calculate the new area with the reduced radius

New area = $\pi(0.85r)^2$

= $\pi \times 0.7225r^2$

= $0.7225 \times \pi r^2$

Step 3: Calculate the percentage reduction in area

Percentage reduction = [(Original area - New area) / Original area] × 100

= $[(\pi r^2 - 0.7225\pi r^2) / \pi r^2] \times 100$

= $[(1 - 0.7225) \times \pi r^2 / \pi r^2] \times 100$

= 0.2775×100

= 27.75%

Therefore The area is reduced by 27.75%.

Q64. Answer: (a) three

The correct answer is three.

Key Points

• The Cabinet Mission was sent to India in 1946 by the British Government.

• The mission comprised three members: Lord Pethick-Lawrence, Sir Stafford Cripps, and A.V. Alexander.

• Its primary aim was to discuss the transfer of power from British rule to Indian leadership.

• The mission also aimed to discuss the setup of a constituent assembly to draft the constitution of India.

Additional Information

• Lord Pethick-Lawrence

• He was the Secretary of State for India and Burma at the time of the mission.

• He played a key role in the discussions regarding India's independence.

• Sir Stafford Cripps

• He was the President of the Board of Trade and had previously led the Cripps Mission in 1942.

• Cripps was known for his efforts to secure Indian cooperation during World War II.

• A.V. Alexander

• He was the First Lord of the Admiralty during the time of the mission.

• Alexander had a significant influence on British naval policies during and after World War II.

• Cabinet Mission's Objectives

• The mission sought to resolve the political deadlock between Indian leaders and the British government.

• It aimed to discuss the framework for the transfer of power and the future governance structure of India.

• The mission proposed a federal structure for India, which was later rejected by the Indian National Congress.

• Impact of the Cabinet Mission

• The mission's proposals led to significant discussions and debates among Indian leaders.

• Though the mission did not achieve all its objectives, it paved the way for further negotiations.

• Ultimately, it contributed to the process leading to India's independence in 1947.

Q65. Answer: (a) Adam Smith

The correct answer is Adam Smith.

Key Points

• Adam Smith is often considered the father of modern economics.

• He is best known for his influential work, The Wealth of Nations, published in 1776.

• Smith introduced the idea of the invisible hand, which describes the unintended social benefits of individual actions.

• His work laid the foundation for the classical free market economic theory.

Additional Information

• Invisible Hand:

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• The concept of the invisible hand was introduced by Adam Smith in The Wealth of Nations.

• It refers to the self-regulating nature of the marketplace, where individual self-interest and freedom of production and consumption result in the overall economic well-being of society.

• Classical Economics:

• Classical economics is a school of thought that originated with Adam Smith and is based on the idea that free markets can regulate themselves through the forces of supply and demand.

• Other prominent economists in this school include David Ricardo and John Stuart Mill.

• The Wealth of Nations:

• Published in 1776, this work is considered the cornerstone of classical economics.

• In it, Adam Smith discusses the division of labor, productivity, and free markets.

• Poverty and Inequality:

• Adam Smith's quote highlights the issue of poverty and inequality, suggesting that a society cannot truly prosper if the majority of its members are suffering.

• This idea is a precursor to modern discussions on economic inequality and social justice.

Q66. Answer: (b) 51

The correct answer is 51.

Key Points

• The United Nations Charter was signed on 26 June 1945 in San Francisco at the conclusion of the United Nations Conference on International Organization.

• The UN Charter came into force on 24 October 1945, when the United Nations officially came into existence.

• Initially, 51 countries signed the United Nations Charter, making them the founding members of the UN.

• The purpose of the United Nations, as outlined in its Charter, is to maintain international peace and security, develop friendly relations among nations, achieve international cooperation, and be a center for harmonizing the actions of nations.

Additional Information

• United Nations Charter

• The United Nations Charter is the foundational treaty of the United Nations, an intergovernmental organization.

• It establishes the structure and purpose of the UN, including the General Assembly, the Security Council, the Economic and Social Council, the International Court of Justice, and the Secretariat.

• The Charter outlines the principles of international relations in the aftermath of World War II, emphasizing the importance of peace, human rights, and social progress.

• It was signed by 50 original member countries at the United Nations Conference on International Organization in San Francisco, and Poland signed it later, bringing the total number of founding members to 51.

• United Nations (UN)

• The United Nations is an international organization founded in 1945 after World War II by 51 countries committed to maintaining international peace and security, developing friendly relations among nations, and promoting social progress, better living standards, and human rights.

• The UN now has 193 member states, and its work is guided by the principles and purposes contained in its founding Charter.

• The UN's main bodies include the General Assembly, the Security Council, the Economic and Social Council, the International Court of Justice, and the UN Secretariat.

• The UN system also encompasses specialized agencies, programs, and funds such as WHO, UNICEF, and UNESCO, which work on various global issues including health, education, and cultural heritage.

• San Francisco Conference

• The United Nations Conference on International Organization, commonly known as the San Francisco Conference, was held from 25 April to 26 June 1945 in San Francisco, United States.

• The conference was attended by representatives of 50 countries, who were involved in drafting and signing the United Nations Charter.

• The conference aimed to create an international organization that would replace the League of Nations and prevent another global conflict.

• It resulted in the creation of the United Nations and the adoption of its Charter, which laid the groundwork for the post-war international order.

Q67. Answer: (a) S - Waves

The correct answer is S - Waves.

Key Points

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• S-waves, or secondary waves, are a type of seismic wave that move through the body of an object and involve transverse displacement.
• Transverse displacement means the particles move perpendicular to the direction of wave propagation.
• S-waves can only move through solid materials and are slower than P-waves (primary waves).
• They are responsible for the shaking felt during an earthquake and are typically more destructive than P-waves.

Additional Information

• P - Waves
• Also known as primary waves, P-waves are the fastest type of seismic wave and the first to be detected by seismographs.
• They involve compressional displacement, meaning the particles move back and forth in the same direction as the wave propagation.
• P-waves can travel through both solid and liquid materials, including the Earth's core.
• L - Waves
• L-waves, or Love waves, are a type of surface seismic wave that cause horizontal shearing of the ground.
• They travel slower than body waves (P and S waves) but are usually more destructive due to their larger amplitude and longer duration.
• Rayleigh Surface Waves
• Rayleigh waves are a type of surface wave that travel along the free surface of solids.
• They cause both vertical and horizontal ground movement in a rolling motion, similar to ocean waves.
• Rayleigh waves typically cause the most damage during an earthquake.

Q68. Answer: (d) A = 48, B = 284/5 and C = 144

Given:

A and B can finish a task in 18 days.

B and C can finish the same task in 24 days.

A and C can finish the task in 36 days.

Formula used:

Let the total work be 1 unit (the entire task).

Work done per day:

A + B = 1/18

B + C = 1/24

A + C = 1/36

Calculations:

Step 1: Add all three equations

(A + B) + (B + C) + (A + C) = 1/18 + 1/24 + 1/36

2A + 2B + 2C = 1/18 + 1/24 + 1/36

Step 2: Calculate the right-hand side

LCM of 18, 24, 36 = 72

1/18 = 4/72

1/24 = 3/72

1/36 = 2/72

So, 1/18 + 1/24 + 1/36 = (4 + 3 + 2)/72 = 9/72 = 1/8

Step 3: Solve for A, B, and C

2(A + B + C) = 1/8

=> A + B + C = 1/16

Step 4: Express A, B, and C

From A + B = 1/18:

A + B = 1/18 (i)

From B + C = 1/24:

B + C = 1/24 (ii)

From A + C = 1/36:

A + C = 1/36 (iii)

Step 5: Solve for B

From (i): B = 1/18 - A
Substitute B in (ii):
(1/18 - A) + C = 1/24
=> C = 1/24 - (1/18 - A)
=> C = A - 1/18 + 1/24
Step 6: Substitute C in (iii)
A + (A - 1/18 + 1/24) = 1/36
=> 2A - 1/18 + 1/24 = 1/36
Step 7: Combine fractions
1/18 = 4/72, 1/24 = 3/72, 1/36 = 2/72
2A - 4/72 + 3/72 = 2/72
=> 2A - 1/72 = 2/72
=> 2A = 3/72
=> A = 3/144 = 1/48
Step 8: Find B
B = 1/18 - A = 1/18 - 1/48
Convert to a common denominator (144):
1/18 = 8/144, 1/48 = 3/144
B = (8 - 3)/144 = 5/144
Step 9: Find C
B + C = 1/24
5/144 + C = 6/144
=> C = 6/144 - 5/144 = 1/144
Final Calculation:
A = 1/48 → A takes 48 days.
B = 144/5 = 28.8 days = 28 4/5 days (mixed fraction).
C = 144 days.
Therefore A takes 48 days, B takes 284/5 days, C takes 144 days.

Q69. Answer: (b) 6 m

Given:
1/10 of a pole is coloured red, 1/20 is white, 1/30 is blue, 1/40 is black, and the rest is green. Length of the green portion = 4.75 m.
Formula used:
Total length of the pole = Length of green portion / Fraction of the pole that is green.
Calculations:
Fraction of the pole that is coloured = 1/10 + 1/20 + 1/30 + 1/40.
Find a common denominator for 10, 20, 30, 40. The LCM is 120.
1/10 = 12/120, 1/20 = 6/120, 1/30 = 4/120, 1/40 = 3/120.
Total coloured fraction = 12/120 + 6/120 + 4/120 + 3/120 = 25/120.
Fraction that is green = 1 - 25/120 = (120 - 25) / 120 = 95/120.
Let the total length of the pole be L m.
Green portion length = (95/120) × L = 4.75.
=> L = 4.75 × (120/95).
120/95 = 24/19.
=> L = 4.75 × (24/19).
=> L = (4.75 × 24) / 19 = 114 / 19.
114 / 19 = 6.00 m.
Therefore The total length of the pole is 6 m.

Q70. Answer: (a) Buzz Aldrin

The correct answer is Buzz Aldrin.
Key Points

• Buzz Aldrin was the second person to set foot on the moon, following Neil Armstrong, during the Apollo 11 mission.

• The Apollo 11 mission took place on July 20, 1969, marking the first time humans landed on the moon.

• Buzz Aldrin and Neil Armstrong spent approximately 2 hours and 15 minutes outside the Lunar Module on the moon's surface.

• Buzz Aldrin's real name is Edwin Eugene Aldrin Jr., and he was a part of NASA's third group of astronauts selected in 1963.

Additional Information

• Apollo 11 Mission

• The Apollo 11 mission was the first mission where humans landed on the moon and safely returned to Earth.

• The mission was launched by NASA, the United States' National Aeronautics and Space Administration.

• The spacecraft consisted of the Command Module (Columbia) and the Lunar Module (Eagle).

• Neil Armstrong, Buzz Aldrin, and Michael Collins were the astronauts on this mission. Collins remained in lunar orbit while Armstrong and Aldrin descended to the moon's surface.

• Neil Armstrong

• Neil Armstrong was an American astronaut and aeronautical engineer, and the first person to walk on the moon.

• He was the mission commander of Apollo 11, and his famous words upon stepping onto the lunar surface were, "That's one small step for man, one giant leap for mankind."

• NASA

• The National Aeronautics and Space Administration (NASA) is an independent agency of the U.S. federal government responsible for the civilian space program, as well as aeronautics and aerospace research.

• NASA was established in 1958 and has been responsible for many notable space missions, including the Apollo moon-landing missions, the Skylab space station, and the Space Shuttle program.

• Space Race

• The Space Race was a 20th-century competition between two Cold War rivals, the Soviet Union (USSR) and the United States (USA), to achieve superior spaceflight capability.

• It began with the Soviet Union's launch of Sputnik 1 in 1957 and concluded with the USA's Apollo 11 moon landing in 1969.

• The Space Race was a significant aspect of the larger geopolitical rivalry between the two superpowers and spurred rapid advancements in space technology and exploration.

Q71. Answer: (b) Rs. 2,400

Given:

Let C = cost price of chair, T = cost price of table.

Information:

• 5% loss on chair and 15% gain on table results in Rs. 300 gain.

• 5% gain on chair and 5% gain on table results in Rs. 180 gain.

Equations:

(1) -0.05C + 0.15T = 300

(2) 0.05C + 0.05T = 180

Calculation:

Step 1: Solve equation (2)

0.05(C + T) = 180 => C + T = 3600

Step 2: Substitute C in equation (1)

-0.05(3600 - T) + 0.15T = 300

=> -180 + 0.05T + 0.15T = 300

=> 0.20T - 180 = 300

=> 0.20T = 480

=> T = 2400

Therefore The actual cost of the table is Rs. 2400.

Q72. Answer: (a) Answer 1 and 2 is strong

Given question: Is it necessary to have an employee union in every government institution?

Given logic:

1. No, it prevents certain activities of the organization. → Strong

This argument suggests that unions may limit or interfere with some organizational activities. It highlights a practical concern. Employee unions might impose certain limitations on organizational operations, which could lead to inefficiencies or delays in decision-making.

2. Yes, it promotes the rights of workers. → Strong

This argument highlights the core role of unions: protecting workers' rights. Unions often play a critical role in advocating for fair wages, safe working conditions, and job security, which are essential for employee well-being. This reason is specific and directly supports the need for unions, especially in government settings where standardized rights protection may be expected.

Thus, both arguments 1 and 2 are strong.

Hence, "Option 1" is the correct answer.

Q73. Answer: (c) Rs. 4,000

Given:

The ratio of the income of A to B = 5 : 4

The ratio of the expenditure of A to B = 3 : 2

Both A and B save Rs. 1,600 at the end of the year.

Calculation:

Step 1: Let the incomes of A and B be represented as:

Income of A = 5x

Income of B = 4x

Step 2: Let the expenditures of A and B be represented as:

Expenditure of A = 3y

Expenditure of B = 2y

Step 3: Set up equations based on savings:

For A: Income - Expenditure = Savings

5x - 3y = 1600 (Equation 1)

For B: Income - Expenditure = Savings

4x - 2y = 1600 (Equation 2)

Step 4: Solve Equation 2 for y:

4x - 2y = 1600

=> 2y = 4x - 1600

=> y = 2x - 800

Step 5: Substitute y in Equation 1:

5x - 3(2x - 800) = 1600

=> 5x - 6x + 2400 = 1600

=> -x + 2400 = 1600

=> -x = 1600 - 2400

=> -x = -800

=> x = 800

Step 6: Calculate income of A:

Income of A = 5x = 5 × 800 = 4000

Therefore The income of A is Rs. 4,000.

Q74. Answer: (b) 29th August 1947

The correct answer is 29th August 1947.

Key Points

• The Constituent Assembly of India was formed in 1946 to draft the Constitution of India.

• The Drafting Committee was one of the most significant committees formed by the Constituent Assembly.

• Dr. B.R. Ambedkar was appointed as the Chairman of the Drafting Committee.

• The Drafting Committee was formed on 29th August 1947 to prepare the draft of the Indian Constitution.

Additional Information

• Constituent Assembly:

• The Constituent Assembly was a body of representatives elected to draft the Constitution of India.

• It was formed under the Cabinet Mission Plan of 1946.

• The Assembly had 389 members, which later reduced to 299 after the partition of India.

• It was presided over by Dr. Rajendra Prasad.

• Drafting Committee:

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• The Drafting Committee was one of the eight major committees formed by the Constituent Assembly.
• It was responsible for drafting the text of the Constitution.
• Dr. B.R. Ambedkar, known as the principal architect of the Indian Constitution, was the Chairman of this committee.
• The committee included other prominent members like Alladi Krishnaswami Ayyar, K.M. Munshi, and Muhammad Saadullah.
• Dr. B.R. Ambedkar:
• Dr. Bhimrao Ramji Ambedkar was an Indian jurist, economist, politician, and social reformer.
• He was the principal architect of the Indian Constitution.
• He served as the first Law and Justice Minister of independent India.
• Dr. Ambedkar played a key role in framing the Constitution, ensuring the protection of fundamental rights and social justice.
• Key Dates:
• The Constituent Assembly held its first meeting on 9th December 1946.
• The Drafting Committee was formed on 29th August 1947.
• The final draft of the Constitution was adopted on 26th November 1949.
• The Constitution of India came into effect on 26th January 1950, celebrated as Republic Day.

Q75. Answer: (a) 1957-58

The correct answer is 1957-58.

Key Points

• The Bhimbetka rock shelters were discovered by Indian archaeologist Dr. Vishnu Shridhar Wakankar in 1957-58 during an archaeological survey.
• These caves are located in the Raisen District in the Indian state of Madhya Pradesh.
• The Bhimbetka rock shelters are a UNESCO World Heritage Site and exhibit the earliest traces of human life in India.
• The site consists of a group of rock shelters with paintings that date back to the Stone Age, showcasing the life and activities of early humans.

Additional Information

• Dr. Vishnu Shridhar Wakankar
• Dr. Wakankar was an Indian archaeologist who is often referred to as the "Pitamaha" of Indian rock art studies.
• He discovered the Bhimbetka rock shelters in 1957-58, which are now recognized as one of the most significant archaeological sites in India.
• His work brought to light the rich prehistoric heritage of India, especially in terms of rock art.
• Bhimbetka Rock Shelters
• The Bhimbetka rock shelters are an archaeological site that spans the prehistoric paleolithic and mesolithic periods, as well as the historic period.
• The site contains more than 500 rock shelters, many of which are adorned with paintings that are estimated to be over 30,000 years old.
• The paintings depict scenes of everyday life, such as hunting, dancing, and communal activities, as well as animals and mythical creatures.
• The site is significant for understanding the early human life in the Indian subcontinent and the development of art and culture.
• UNESCO World Heritage Site
• The Bhimbetka rock shelters were declared a UNESCO World Heritage Site in 2003.
• This recognition was due to their cultural significance and the insight they provide into the prehistoric period.
• Being a UNESCO World Heritage Site helps in the preservation and protection of these ancient rock shelters.
• Stone Age
• The Stone Age is a broad prehistoric period during which stone was widely used to make tools and weapons.
• The period is generally divided into three parts: the Paleolithic, Mesolithic, and Neolithic.
• The Bhimbetka rock shelters provide significant evidence of Stone Age human life, particularly during the Paleolithic and Mesolithic periods.

Q76. Answer: (b) Abscisic acid

The correct answer is Abscisic acid.

Key Points

• Abscisic acid (ABA) is a plant hormone that plays a crucial role in inhibiting growth and promoting leaf abscission (leaf fall).
• ABA is involved in various plant developmental processes, including seed dormancy and germination.

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• It acts as a signaling molecule in response to environmental stress conditions such as drought, salinity, and cold temperatures.
• ABA helps in stomatal closure, reducing water loss through transpiration during stress conditions.

Additional Information

• Oxine
• Oxine is not a plant hormone but is sometimes used as a term related to oxins, which are chemicals.
• Abscisic Acid (ABA)
• ABA is a naturally occurring plant hormone belonging to the group of terpenoids.
• It is synthesized in plastids from carotenoids and is present in various parts of the plant including leaves, stems, roots, and fruits.
• The hormone plays a significant role in the abscission of leaves, fruits, and flowers.
• ABA also induces the production of proteins that help in stress tolerance and dormancy.
• Cytokinin
• Cytokinins are a class of plant growth substances (phytohormones) that promote cell division, or cytokinesis, in plant roots and shoots.
• They are involved in cell growth and differentiation, leaf senescence, and the stimulation of shoot initiation.
• Gibberellin
• Gibberellins are a group of plant hormones that promote growth and elongation of cells.
• They are involved in various developmental processes, including stem elongation, germination, dormancy, flowering, enzyme induction, and leaf and fruit senescence.

Q77. Answer: (a) 12

Given Equation: 22 * 10 / 10 - 2 + 4 = ?

BODMAS Rule:

Decoding the given information:

Symbol	**'*'**	**'/'**	**'+'**	**'-'**
Meaning	Addition	Subtraction	Multiplication	Division

Now replacing the signs from left to right using BODMAS Rule, we get:

=> 22 + 10 - 10 ÷ 2 × 4 = ?

=> 22 + 10 - 5 × 4 = ?

=> 22 + 10 - 20 = ?

=> 32 - 20 = 12.

Hence, the correct option is "Option 1".

Q78. Answer: (d) YVS

The logic followed here is:

ADG is written as ZWT

Similarly,

BEH is written as

Hence, "Option 4" is the correct answer.

Q79. Answer: (b) Narora

The correct answer is Narora.

Key Points

• Narora Atomic Power Station (NAPS) is located in Narora, in the Bulandshahar district of Uttar Pradesh.
• NAPS is operated by the Nuclear Power Corporation of India Limited (NPCIL).
• The plant has two reactors, each with a capacity of 220 MW, making a total capacity of 440 MW.
• It uses Pressurized Heavy Water Reactors (PHWR) technology, which uses heavy water (D2O) as both moderator and coolant.

Additional Information

• Thumba
• Thumba is known for the Thumba Equatorial Rocket Launching Station (TERLS), which is located in Kerala, not a nuclear power plant.
• Tarapur
• Tarapur Atomic Power Station (TAPS) is located in Maharashtra and is the oldest atomic power station in India.

• Rawatbhata
• Rawatbhata Atomic Power Station (RAPS) is located in Rajasthan and has a series of PHWR reactors.
• Nuclear Power Corporation of India Limited (NPCIL)
• NPCIL is a government-owned corporation responsible for the generation of nuclear power for electricity.
• It operates under the Department of Atomic Energy (DAE), Government of India.
• NPCIL was created in September 1987 under the Companies Act 1956, with the objective of operating atomic power stations and implementing atomic power projects for electricity generation.
• Pressurized Heavy Water Reactor (PHWR)
• PHWR is a type of nuclear reactor that uses heavy water (deuterium oxide D2O) as its neutron moderator and coolant.
• This type of reactor is capable of using natural uranium as fuel, which is an advantage in terms of resource availability.
• India has developed expertise in PHWR technology and has several PHWR-based nuclear power plants.

Q80. Answer: (d) 3136

The logic followed here is:
SHANU is written as 3969
Similarly,
TAPLG is written as
Hence, "Option 4" is the correct answer.

Q81. Answer: (a) Rs. 37.50

Given:
Principal (P) = Rs. 3000
Rate of Interest (R) = 6 1/4% = 6.25%
Time period from 5 Feb 2005 to 18 April 2005, both dates included.
Formula used:
Simple Interest (SI) = (P × R × T) / 100
Calculations:
Step 1: Calculate the time period in days
From 5 Feb to 18 April:
February: 24 days (5th to 28th)
March: 31 days
April: 18 days
Total days = 24 + 31 + 18 = 73 days
Step 2: Convert the time period to years
Time (T) = 73 days = 73/365 years
Step 3: Substitute values into the SI formula
SI = (3000 × 6.25 × (73/365)) / 100
Step 4: Calculate SI
SI = (3000 × 6.25 × 73) / (365 × 100)
SI = (1368750) / 36500
SI = 37.5
Therefore The simple interest is Rs. 37.50.

Q82. Answer: (a) distance

The correct answer is distance.
Key Points
• A light year is a unit of distance used in astronomy.
• It represents the distance that light travels in a vacuum in one year.
• One light year is approximately 5.88 trillion miles (9.46 trillion kilometers).
• Light years are used to express astronomical distances, such as the distance between stars and galaxies.
Additional Information
• Speed of Light
• The speed of light in a vacuum is approximately 299,792 kilometers per second (km/s) or 186,282 miles per second (mi/s).

• This speed is a fundamental constant of nature and is denoted by the symbol 'c'.
• Astronomical Unit (AU)
• An astronomical unit is another unit of distance used in astronomy.
• It is defined as the average distance between the Earth and the Sun, which is about 93 million miles (150 million kilometers).
• Parsec (pc)
• A parsec is a unit of distance used to measure large astronomical distances.
• One parsec is approximately equal to 3.26 light years or 31 trillion kilometers (19 trillion miles).
• The term 'parsec' is derived from "parallax of one arcsecond".
• Redshift
• Redshift is a phenomenon where the wavelength of light from an object is increased (shifted towards the red part of the spectrum).
• It is commonly used to measure the distance to faraway galaxies and the expansion of the universe.

Q83. Answer: (a) Eight

Given:
Total time for singing = 40 minutes
Each song duration = 2 minutes
Calculation:
Step 1: Calculate the number of pairs of persons singing
Total number of songs = Total time / Duration of each song
=> Total number of songs = 40 / 2 = 20
Step 2: Determine the number of persons (n)
Let n be the number of persons standing on the circumference of the circle. The number of ways to choose pairs of persons is given by:
Number of pairs = C(n, 2) = n(n - 1) / 2
However, since pairs cannot stand next to each other, we must exclude pairs that consist of adjacent persons.
Number of adjacent pairs = n
Thus, the effective pairs that can sing = Total pairs - Adjacent pairs
=> n(n - 1) / 2 - n = 20
Step 3: Simplify the equation
n(n - 1) / 2 - n = 20
=> n(n - 1) / 2 - 2n/2 = 20
=> (n(n - 1) - 2n) / 2 = 20
=> n(n - 3) = 40
Step 4: Solve the equation
$n^2 - 3n - 40 = 0$
Step 5: Factor the quadratic equation
(n - 8)(n + 5) = 0
Step 6: Determine the value of n
n - 8 = 0 => n = 8
n + 5 = 0 => n = -5 (not applicable since n must be positive)
Therefore The value of n is 8 i.e Eight.

Q84. Answer: (b) 32

Given:
Mean of 5 observations = 20
New mean after adding 6^(th) observation = 20 + 2 = 22
Calculation:
Step 1: Calculate the total of the first 5 observations
Total of 5 observations = Mean × Number of observations = 20 × 5 = 100
Step 2: Calculate the new total after adding the 6^(th) observation
Let the 6^(th) observation be x.
New total = 100 + x

Step 3: Set up the equation for the new mean

New mean = (Total of 6 observations) / 6 = 22

=> (100 + x) / 6 = 22

Step 4: Solve for x

100 + x = 22 × 6

=> 100 + x = 132

=> x = 132 - 100

=> x = 32

Therefore The value of the 6^(th) observation that is added is 32.

Q85. Answer: (d) Polo

The correct answer is Polo.

Key Points

• The Ezra Cup is one of the oldest and most prestigious polo tournaments in India.

• It was first instituted in 1880 by the Calcutta Polo Club, which is one of the oldest polo clubs in the world.

• The tournament is named after Sir David Ezra, a prominent Jewish businessman and philanthropist in Calcutta.

• The Ezra Cup has a rich history and is an important event in the Indian polo calendar, attracting top players and teams from around the world.

Additional Information

• Polo

• Polo is a team sport played on horseback where the objective is to score goals against an opposing team.

• Players score by driving a small white ball into the opposing team's goal using a long-handled mallet.

• The traditional sport of polo originated in Persia (Iran) and has a history dating back over 2,000 years.

• Modern polo is played in over 77 countries, with professional leagues and tournaments held worldwide.

• Equestrian Show Jumping

• Equestrian show jumping is a part of horse riding sports where riders on horseback aim to jump over a series of obstacles within a set time.

• The sport requires a combination of horse training, rider skills, and precision.

• It is one of the three equestrian disciplines featured at the Olympic Games.

• Foot Volleyball (Sepak Takraw)

• Sepak Takraw is a sport native to Southeast Asia, combining elements of soccer and volleyball.

• Players use their feet, knees, chest, and head to hit a rattan ball over a net.

• The game is typically played with three players on each side and requires agility, coordination, and precise ball control.

• Rugby

• Rugby is a team sport that originated in England and is played with an oval-shaped ball.

• There are two main types of rugby: Rugby Union and Rugby League, each with its own set of rules.

• The game involves running with the ball, passing, and tackling to score points by grounding the ball over the opponent's goal line or kicking it through their goalposts.

Q86. Answer: (b) 39

The logic followed here is:

67 → Prime number

41 → Prime number

39 → Composite number (Factor are 1, 3, 13, and 39)

17 → Prime number

Thus, out of all the options, '39' is the odd one out.

Hence, "Option 2" is the correct answer.

Q87. Answer: (a) Only (iii) follows.

The least possible Venn diagram for the given statements is as shown below :

Conclusions:

I. Some inkjet are laser → Does not follow (As no inkjet is a laser. As direct relation is given between inject and laser, therefore it is true.)

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II. Some laser are inkjet → Does not follow (As no inkjet is a laser. As direct relation is given between inject and laser, therefore it is true.)

III. Some laser are not inkjet → Follow (As no inkjet is a laser. As direct relation is given between inject and laser thus can be proved, therefore it is true)

Therefore Here, Only (iii) follows.

Hence, "Option 1" is the correct answer.

Q88. Answer: (b) Tara and Maira

Given: Six students, Maira, Amaira, Sara, Zara, Tara and Kiara, are made to sit against a wall. All of them are facing north.

1) Tara is sitting at one of the ends.

2) Sara is sitting 4th to the right of Tara.

3) Amaira is sitting 2nd to the left of Maira.

4) Kiara is sitting to the immediate left of Amaira.

After positioning Amaira, Maira and Kiara only one position is left which will be occupied by the only student left i.e. Zara.

Thus, according to the final arrangement Tara and Maira are sitting at the extreme ends.

Hence, "Option 2" is the correct answer.

Q89. Answer: (c) Mother's Brother

Given:

1) Abhishek is the brother of Ashu who is the son of Jai.

2) Malti is the mother of Ashu and Jyoti.

3) Swati is the daughter of Jyoti.

Thus, Abhishek is the Swati's uncle.

As out of all the options mother's brother is given, therefore Abhishek is the Swati's maternal uncle or mother's brother.

Hence, the correct answer is "Option 3".

Q90. Answer: (d) Only 1 is strong.

Given:

Statement :

Should education at primary level be in mother tongue?

Now,

Arguments :

1: Yes, it helps the students to understand the concepts easily. - True (Because, providing education in the mother tongue at the primary level can indeed help students understand concepts more easily, as they are learning in a language they are already familiar with.).

2: No, finding tuition teachers in mother tongue is difficult. - False (Because, the difficulty in finding tuition teachers in the mother tongue is not a strong reason to avoid using the mother tongue for primary education. The availability of teachers does not outweigh the potential benefits to the students' understanding.)

So, Only 1 is strong..

Hence, the correct answer is "Option 4".

Q91. Answer: (d) C

Given: There are six persons A, B, C, D, E and F, in a family. There is one teacher, one business person and one accountant.

1) B and D are unmarried males and are not employed.

Profession	Person
Teacher	
Business	
Accountancy	
Not employed	B and D

2) C is the wife of E, and F is the brother of C.

Profession	Person

Teacher	
Business	
Accountancy	
Not employed	B and D

3) A is the only child in the family.

As B and D are unmarried, therefore A is the child of couple C and E.

Profession	Person
Teacher	
Business	
Accountancy	
Not employed	B and D

4) None of the ladies are in business or accountancy.

As A is a child, therefore will not have any profession yet.

Profession	Person
Teacher	C
Business	F / E
Accountancy	F / E
Not employed	B and D

Thus, according to the final arrangement C is the teacher.

Hence, "Option 4" is the correct answer.

Q92. Answer: (d) 75

The logic followed here is:

Hence, "Option 4" is the correct answer.

Q93. Answer: (d) 10

The logic followed here is:

Logic: (1st number + 25) ÷ 5 = 2nd number.

Now,

For 15 : 8

=> (15 + 25) ÷ 5

=> 40 ÷ 5 = 8.

For 25 : ?

=> (25 + 25) ÷ 5

=> 50 ÷ 5 = 10.

Hence, the correct answer is "Option 4".

Q94. Answer: (b) Father's Mother

Given:

1) O is the mother of A.

2) C and D are the brothers and sons of A.

3) B is the mother of C and E.

4) G is the daughter of E and cousin of F.

5) F is the son of D.

Thus, B is the F's paternal grandmother or father's mother.

Hence, the correct answer is "Option 2".

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Q95. Answer: (b) QQS

The logic followed here is:
RAM : PBO
Similarly,
SPQ : ?
Hence, "Option 2" is the correct answer.

Q96. Answer: (a) H19K

The logic followed here is:
Hence, "Option 1" is the correct answer.

Q97. Answer: (d) Students

The logic followed here is:

Principal	Administrative role
Director	Administrative role
Dean	Administrative role
Students	Non-administrative role

Principal, Director, Dean all are Synonyms of Administrative roles,
Whereas,
Students is different from all the given roles.
Hence, the correct answer is "Students".

Q98. Answer: (b) Oven

The logic followed here is:
Logic: Temperature control appliances.
Here,
Cold : Refrigerator → Refrigerator is a device used to control and maintain cold temperature.
Similarly,
Hot : Oven → Oven is a device used to control and maintain hot temperature.
Hence, the correct answer is "Option 2".

Q99. Answer: (b) Scalpel

The logic followed here is:
Logic: Tools used by professionals.
Here,
Author : Pen → Pen is a tool used by Author.
Similarly,
Surgeon : Scalpel → Scalpel is a tool used by Surgeon.
Hence, the correct answer is "Option 2".

Q100. Answer: (b) 1764

The logic followed here is:
Hence, "Option 2" is the correct answer.

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