RRB NTPC CBT-I Official Paper (Held On: 5 April 2021 Shift 2) (Previous Year Paper)

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

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Q1. The smallest five digit number which is divisible by 12, 16, 24 and 28 is:

(a) 10090
(b) 10060
(c) 10070
(d) 10080

Q2. Which of the following solutions has the highest concentration of hydrogen ions?

(a) pH = 8
(b) pH = 10
(c) pH = 4
(d) pH = 5

Q3. Which of the following programmes was introduced in 2018 by the Ministry of Youth Affairs and Sports to revive sports culture in India at the grass-root level?

(a) Rajiv Gandhi Khel Abhiyan (RGKA)
(b) The Khelo India Programme
(c) Urban Sports Infrastructure Scheme (USIS)
(d) National Sports Talent Search Scheme (NSTSS)

Q4. The members of the society of Khudai Khidmatgars were popularly known as _____.

(a) Blue Shirts
(b) Red Shirts
(c) Black Shirts
(d) Green Shirts

Q5. If 3 tan θ = 2, then what will be the value of the following?

((√13 sin θ - 3tan θ))/((3tan θ + √13 cos θ))

(a) 0
(b) 2/√13
(c) 2/3
(d) 1/√13

Q6. Select the letter-pair that can replace the question mark (?) in the following series.

XC, VE, TG, RI, ?

(a) NL
(b) QJ
(c) OL
(d) PK

Q7. Dr Bindeshwar Pathak is associated with the:

(a) Farming Communities
(b) Women's Movement
(c) Sulabh Toilet Movement
(d) Bachpan Bachao Andolan

Q8. A generator is a device that converts:

(a) mechanical energy to electrical energy
(b) electrical energy to mechanical energy
(c) heat energy to mechanical energy
(d) electrical energy to heat energy

Q9. 11^8 - 13 when divided by 10 would leave the remainder:

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

Q10. Which of the following pairs is NOT correctly matched (important foreign travellers to the ruler's reign or dynasty when the travellers visited India)?

(a) John Jurdan - Shah Jahan
(b) Marco Polo - Pandya Kingdom
(c) Abdur Razzak - Devaraya II
(d) Ralph Fisch - Akbar

Q11. Who holds the record for India's youngest chess Grandmaster?

(a) Viswanathan Anand
(b) D Gukesh
(c) Parimarjan Negi
(d) GN Gopal

Q12. The first Secretary General of United Nations belonged to which of the following countries?

(a) Norway
(b) Sweden
(c) Finland
(d) Portugal

Q13. A dial-up connection uses a _____ to physically connect your computer to a phone line.

(a) Ethernet
(b) Modem
(c) Multiplexer
(d) Hub

Q14. Two workers X and Y are engaged to do a work. X working alone takes 12 hours more to complete the job than if both work together. If Y worked alone, he would need 27 hours more to complete the job than if they both worked together. How much time would they take to complete the work together?

(a) 18 hrs.
(b) 16 hrs.
(c) 15 hrs.
(d) 20 hrs.

Q15. Arrange the following words in a meaningful sequence.

A. Selection
B. Practice
C. Auditions/Trials

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D. Stage Performance

E. Rehearsal

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

Q16. If '>' denotes '+', '<' denotes '-', '+' denotes '÷', '^' denotes '×' and '-' denotes '=', then which of the following equations is correct?

(a) 6 < 18 + 3 > 12 ^ 3 - 48
(b) 6 < 18 + 3 > 10 ^ 3 - 32
(c) 7 < 18 + 2 ^ 12 > 3 - 2 < 100
(d) 10 < 9 + 3 ^ 6 > 5 - 47

Q17. 'Rafting' is related to 'Water' in the same way as 'Skiing' is related to '_____'.

(a) Snow
(b) Skis
(c) Sky
(d) Surface

Q18. Which of the following spacecrafts was used for orbiting Venus from the year 1990 to 1994?

(a) Atlantis spacecraft
(b) Dawn spacecraft
(c) Hayabusa
(d) Magellan spacecraft

Q19. If $\sec\theta + \tan\theta = 2 + \sqrt{3}$, then the value of $\sqrt{3}\sin\theta + \cos\theta$ is:

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

Q20. Five numbers are in the ratio 1 : 2 : 3 : 4 : 5 and their sum is 30. The sum of second and fifth number is equal to:

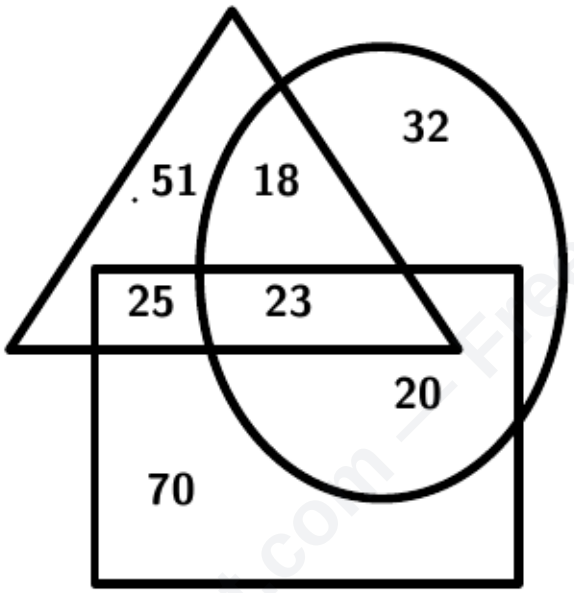
(a) 12
(b) 15
(c) 14
(d) 13

Q21. A sum of Rs. 7.25 is made up of 100 coins which are either 10 paise or 5 paise. How many coins are there of each kind respectively?

(a) 35, 65
(b) 15, 85
(c) 25, 75
(d) 45, 55

Q22. In the given diagram, the triangle represents red, the circle represents roses and the rectangle represents thorns.

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How many red roses do not have thorns?

(a) 61
(b) 43
(c) 23
(d) 18

Q23. Which one of the following is NOT an objective of the Paramparagat Krishi Vikas Yojana (PKVY)?

(a) To optimally utilise available natural resources for input production
(b) To promote export of organic farm produce
(c) To launch eco-friendly concept of cultivation reducing the dependency on agro-chemicals and fertilisers
(d) To create employment opportunities in the rural as well as urban sector

Q24. The present ages of Ram and Shyam are in the ratio 7 : 8 respectively. After nine years this ratio will become 8 : 9. The present ages (in years) of Ram and Shyam respectively are:

(a) 72, 63
(b) 73, 64
(c) 63, 72
(d) 64, 73

Q25. Pointing to a picture, Sumit said, "The man in the picture is the father-in-law of my mother-in-law". How is the man in the picture related to Sumit's wife?

(a) Husband's Father
(b) Father
(c) Maternal Grandfather
(d) Paternal Grandfather

Q26. How many cubes of side 2 cm can be formed by melting a cuboid of length 6 cm, breadth 4 cm and height 4 cm?

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

Q27. The Indian Standard Meridian passes through 5 States. Which of these states is NOT among the five?

(a) Andhra Pradesh
(b) Odisha
(c) Chhattisgarh
(d) Bihar

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Q28. Find four consecutive numbers such that twice the first, three times the second, four times the third and five times the fourth together make 236.

(a) 15, 16, 17, 18
(b) 19, 20, 21, 22
(c) 17, 18, 19, 20
(d) 18, 19, 20, 21

Q29. Glycogen is the storage form of _____ in the body.

(a) lipid
(b) protein
(c) vitamins
(d) carbohydrates

Q30. What is the meaning of the word 'Mohenjo-daro'?

(a) A market area
(b) Mount of the dead
(c) Favourite city
(d) Place of living

Q31. The National Waterway 1 (NW 1) in the country are already operational/ navigable between which stretch among the following?

(a) Dhubri - Sadiya
(b) Kottapuram - Kollam
(c) Haldia - Prayagraj
(d) Kakinada - Puducherry

Q32. Which is the largest joint in the human body?

(a) Knee Joint
(b) Neck Joint
(c) Pelvic Joint
(d) Shoulder Joint

Q33. Which of the following resources is a fossil fuel?

(a) Coal
(b) Wind Power
(c) Hydropower
(d) Nuclear Power

Q34. 'Saw' is related to 'Wood' in the same way as Knife is related to '_____'.

(a) Steel
(b) Vegetable
(c) Cutter
(d) Cloth

Q35. Find the square root of (((0.091)(0.11)))/(((0.91)(1.331))).

(a) 3/11
(b) 2/11
(c) 1/11
(d) 4/11

Q36. Read the given statement and decisions carefully and decide which of the two decisions logically follow(s) from the statement.

Statement:

Students are confused regarding the choice of appropriate course/stream for higher education.

Decisions:

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I. Consider their interests, aptitudes and competencies while deciding on their choice.

II. Seek guidance from an education and career counsellor.

(a) Both decisions I and II follow.
(b) None of the given decisions follow.
(c) Only decision I follows.
(d) Only decision II follows.

Q37. If (15)300 is divided by 16 then the remainder is:

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

Q38. Select the letter-cluster that can replace the question mark (?) in the following series.

MURV, JVOW, GWLX, ?

(a) DTIU
(b) EZJA
(c) EUJV
(d) DXIY

Q39. Sarva Siksha Abhiyan is a significant step towards providing elementary education to all the children in the age group of _____ years.

(a) 6-15
(b) 8-15
(c) 6-14
(d) 7-15

Q40. Find the volume of a cuboid, if its length is 2 times more than its breadth and the breadth is 12 cm which is twice its height.

(a) 2295 cm^3
(b) 2952 cm3
(c) 2692 cm3
(d) 2592 cm3

Q41. Which of these continents is correctly matched with its biggest country (in area)?

(a) Asia : India
(b) Africa : Democratic Republic of Congo (DRC)
(c) South America : Brazil
(d) North America : United States

Q42. In which city did freedom fighter Chandra Shekhar Azad shoot himself on being besieged by the British Police?

(a) Allahabad
(b) Bhopal
(c) Jabalpur
(d) Kanpur

Q43. Triveni Sangam of Uttar Pradesh is the place of confluence of which of the following rivers?

(a) Ganga, Yamuna, Saraswati
(b) Ganga, Yamuna, Tapti
(c) Ganga, Yamuna, Sindhu
(d) Ganga, Yamuna, Narmada

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Q44. The Forest Survey of India under the ministry of Environment of India is located in which city?

(a) Guwahati
(b) Bhopal
(c) Dehradun
(d) New Delhi

Q45. In which country are the Inca ruins of Machu Picchu located?

(a) Guatemala
(b) Greece
(c) Mexico
(d) Peru

Q46. The International Civil Aviation Organisation has its headquarters at:

(a) Montreal
(b) Geneva
(c) London
(d) Amsterdam

Q47. What is the source of energy in the Sun or other stars?

(a) Nuclear Fission
(b) Burning of helium gas
(c) Burning of hydrogen gas
(d) Nuclear Fusion

Q48. If n is a natural number, then $n^3 - n$ is always divisible by _____.

(a) 4
(b) 6
(c) 8
(d) 5

Q49. The simplified value of $4/21 \times 7/8 \times 6 + 17 - 12$ is:

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

Q50. The difference between the interior and exterior angles at a vertex of a regular polygon is 160^?. The number of the sides of the polygon is:

(a) 36
(b) 40
(c) 38
(d) 42

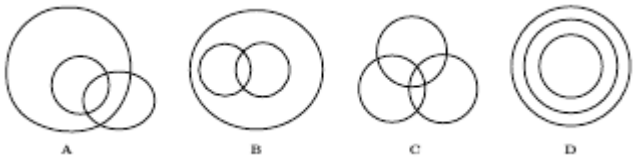
Q51. Who came to India during the reign of Harshavardhana?

(a) Itsing
(b) Fa-hien
(c) Hiuen Tsang
(d) Alberuni

Q52. Select the Venn diagram that best represents the relationship between the following classes.

Vegetables, Carrots, Eatables

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

Q53. Who among the following became the third Cricketer to hit six sixes in an over in International Cricket?
(a) Kieron Pollard
(b) Herschelle Gibbs
(c) Yuvraj Singh
(d) Virendra Sehwag

Q54. With which musical instrument is the noted musician Mrs. N. Rajam associated?
(a) Flute
(b) Sitar
(c) Violin
(d) Tanpura

Q55. If the length, breadth and height of a room are 30 m, 20 m, and 40 m respectively, then what will be the area of the four walls of the room?
(a) 4500 m^2
(b) 1800 m2
(c) 4000 m2
(d) 3600 m2

Q56. In which year was the Trade Union Act passed in India?
(a) 1964
(b) 1911
(c) 1926
(d) 1947

Q57. Who was the vice-chairman of the constituent assembly that wrote the Indian constitution?
(a) G Durgabai Deshmukh
(b) Rajendra Prasad
(c) H C Mookherjee
(d) Jaipal Singh

Q58. (53)^(15) - 1 is exactly divisible by:
(a) 11
(b) 19
(c) 13
(d) 14

Q59. Sachin and Anil start at the same time riding from Chandigarh to Kalka that is 50 km away from Chandigarh. Sachin travels 6 km an hour slower than Anil. Anil reaches Kalka, and immediately embarks on the journey back to Chandigarh. He meets Sachin 20 km from Kalka. Find Sachin's speed.
(a) 5.0 km/h
(b) 5.1 km/h
(c) 4.9 km/h
(d) 4.5 km/h

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Q60. Who was the first to discuss the concept of poverty in pre-independent India?

(a) Surendranath Bannerjee
(b) GV Joshi
(c) Dadabhai Naoroji
(d) D Wacha

Q61. Which of the following passes connects Sikkim with China?

(a) Bara Lacha Pass
(b) Nathu La Pass
(c) Mana Pass
(d) Debsa Pass

Q62. 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:

1. Some cots are tables.

2. No table is a chair.

Conclusions:

I. Only some cots are chairs.

II. No chair is a cot.

III. No cot is a chair.

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

Q63. In the following list of numerals, how many 3s are followed by 3, but NOT preceded by 3?

2 9 6 3 3 4 5 7 8 3 3 3 4 6 2 3 3 3 3 8 6 2 3

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

Q64. If θ is an acute angle and tanθ + cotθ = 2, then what will be the value of the following?

tan^(15)θ + cot^(20)θ + 2 tan^(20)θcot^(15)θ

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

Q65. If a : b is equal to 3 : 4 and b : c is equal to 7 : 9, then c : a is equal to:

(a) 7 : 12
(b) 11 : 7
(c) 7 : 11
(d) 12 : 7

Q66. Who appoints the State Election Commissioner?

(a) Chief Minister
(b) Governor
(c) Chief Election Commissioner
(d) President

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Q67. The ratio of the incomes of two persons is 7 : 5 and that of their respective expenditures is 9 : 7. Find the respective income of each person if they save Rs. 1,700 and

Rs. 1,100 respectively.

(a) Rs. 4,500, Rs. 3,500
(b) Rs. 3,500, Rs. 2,500
(c) Rs. 5,000, Rs. 2,000
(d) Rs. 5,500, Rs. 4,500

Q68. Which of the following expresses the prime factorisation of 54?

(a) 5.4 × 10
(b) 3 × 3 × 6
(c) 9 × 6
(d) 3 × 3 × 3 × 2

Q69. The idea of Rule of Law in the Indian Constitution has been borrowed from which of the following constitutions?

(a) Canadian
(b) British
(c) French
(d) German

Q70. Four words have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) Fan
(b) Desk
(c) Chair
(d) Table

Q71. The short-cut key Ctrl+X can be used to _____.

(a) Copy selected text
(b) Italicize selected text
(c) Cut selected text
(d) Paste copied text

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

122, 59, 28, 13, ?

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

Q73. Homogenous mixture of a solute and a solvent is called:

(a) Solution
(b) Suspension
(c) Electrolyte
(d) Emulsion

Q74. The difference between two numbers is 30% to their sum. The ratio of the larger number to the smaller number is:

(a) 2 : 1
(b) 15 : 7
(c) 13 : 7
(d) 17 : 15

Q75. The measure of the angle between the graph of linear equation 35x - 35y + 15 = 0 and the x-axis is:

(a) 45^?
(b) 35^?
(c) 50^?

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(d) 55^?

Q76. 'Tsomgo Lake' is located in which state of India?

(a) Sikkim
(b) Arunachal Pradesh
(c) Goa
(d) Nagaland

Q77. In a certain code language, BATTLE is written as WTSSKL. Which of the given options show how TABLET is written in that code language?

(a) TSWKLT
(b) LSKTWL
(c) STWKLS
(d) SWTLKS

Q78. If the income of Sachin is 50/7 % more than that of Sohan, the income of Sohan is less than that of Sachin approximately by:

(a) 5.67%
(b) 8.67%
(c) 6.67%
(d) 7.67%

Q79. If cos^4θ - sin^4θ = 3/5, then what will be the value of the following?

$1 - 2\sin^2\theta + 2\sin\theta\cos\theta$

(a) 9/5
(b) 7/5
(c) 8/5
(d) 0

Q80. The Physical Research Laboratory (PRL) which is a National Research Institute for space and allied sciences, is situated at:

(a) Thiruvananthapuram
(b) Bangalore
(c) Hyderabad
(d) Ahmedabad

Q81. If a : b = c : d = e : f = g : h = 1 : 3, then what will be the value of the following?

(pa + qc + re + sg) : (pb + qd + rf + sh)

(a) 1 : 4
(b) 1 : 3
(c) 1 : 2
(d) 1 : 5

Q82. Gross Domestic Production is the total value of:

(a) all intermediate goods and services produced during a particular year
(b) all intermediate and final goods and services produced during a particular year
(c) all goods and services produced during a particular year
(d) all final goods and services produced during a particular year

Q83. Amritsar Shatabdi Express leaves Delhi at 4:30 p.m. and reaches Amritsar at 10:30 p.m. The average speed of the train is 75 km/h. What is the distance from Delhi to Amritsar?

(a) 500 km
(b) 400 km
(c) 450 km
(d) 550 km

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Q84. Which of the following is an example of a Primary Storage Device?

(a) Hard Disk
(b) Random Access Memory
(c) Optical Disc
(d) Magnetic Tape

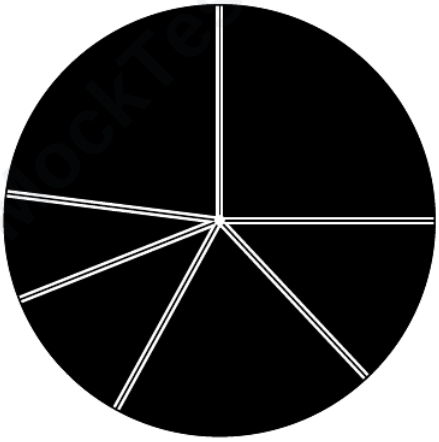
Q85. If $x + y + z = 5$ and $xy + yz + zx = 8$, then the value of $x^3 + y^3 + z^3 - 3xyz$ is:

(a) 5
(b) 7
(c) 11
(d) 9

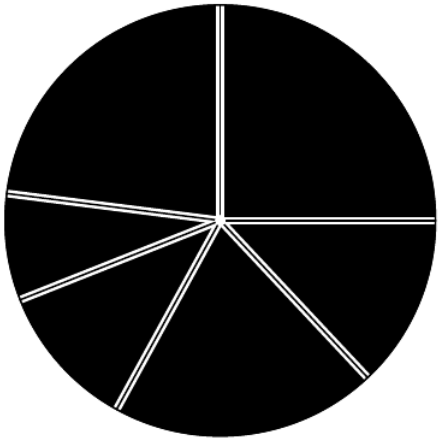
Directions

Study the following pie diagrams and answer the question.

UG Students in 6 Colleges (Total = 28400)



PG Students in 6 Colleges (Total = 25600)



Q86. What is the difference between the number of UG and the number of PG students in college F?

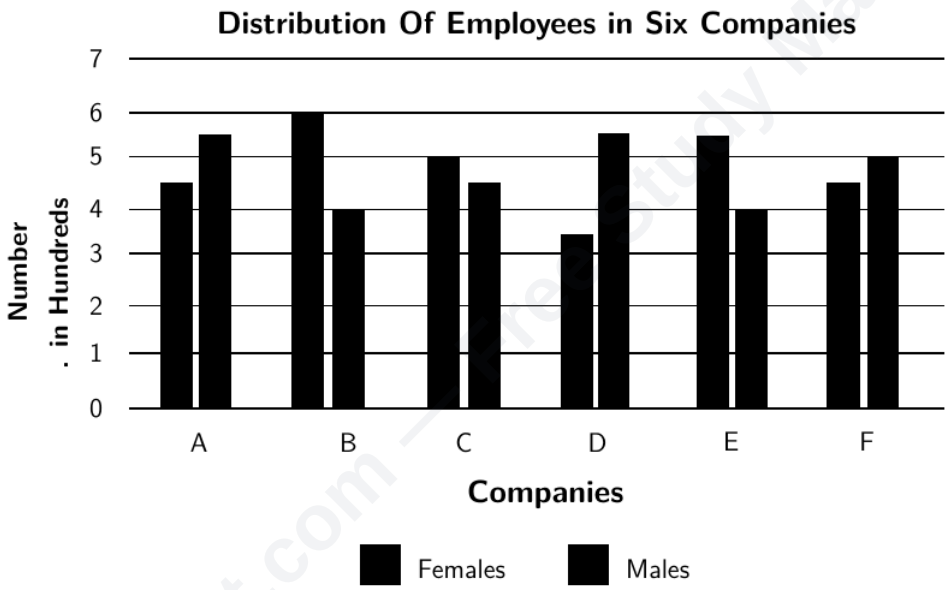
(a) 2048
(b) 1481
(c) 2692
(d) 2272

Q87. What is the ratio of the number of PG students to that of UG students in college C?

(a) 71 : 64
(b) 12 : 10
(c) 416 : 355
(d) 13 : 10

Directions

Study the following graph and answer the question.



Q88. What is the approximate ratio of the difference between the number of Females and Males employed in Company B to that in Company E?

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

Q89. Which of the following statements is TRUE?

(a) Across all 6 companies, the total number of male employees is greater than that of total number of female employees.
(b) Across all 6 companies, the total number of female employees is less than that of total number of male employees.
(c) Females outnumber male employees in 3 of the given 6 companies.
(d) Males outnumber female employees in 4 of the given 6 companies.

Q90. Six professors of management O, P, Q, R, S and T teach two subjects each, one major and one minor. R teaches Finance as a minor subject, while three others teach it as a major. Operations is a major subject for T and a minor for both Q and S. O and R teach the same subjects-Finance and IT. Both S and T teach marketing. Only one of the professors teaches Strategy as a minor subject.

Which minor subject does P teach?

(a) Operations
(b) IT
(c) Strategy
(d) Finance

Q91. Consider the given statement and decide which of the given assumptions is/are implicit.

Statement:

People are getting addicted to social media.

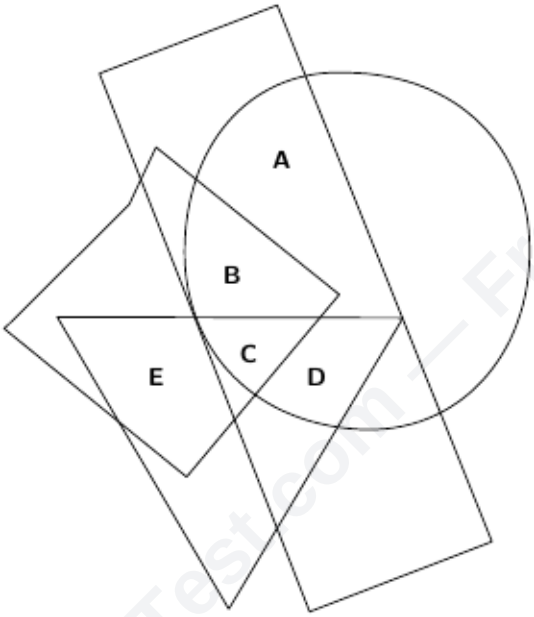
Assumptions:

I. Being active on social media is pleasurable.

II. Access to social media is becoming easier.

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

Q92. In the following figure, the circle represents post-graduates, the square represents graduates, the triangle represents teachers, and the rectangle represents honest persons.



Which region represents post-graduate teachers who are also honest?

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

Q93. Select the number that can replace the question mark (?) in the following series.

9, 11, 14, 18, ?, 29, 36

(a) 23
(b) 24
(c) 25
(d) 26

Q94. In a certain code language, 'RQN' is written as '53', 'DLP' is written as '36'. What is the code for 'SRF' in that code language?

(a) 49
(b) 53
(c) 51
(d) 47

Q95. If 'Q' denotes 'addition', 'J' denotes 'multiplication', 'T' denotes 'subtraction' and 'K' denotes 'division', then find the value of

18K 6J 7Q 5T2

(a) 24
(b) 26
(c) 30
(d) 34

Q96. In a certain code language, ALPHABET is coded as YJNFYZCR. What would be coded as RCBGMSQ in the same code language?

(a) OUTSIDE
(b) STUDIES
(c) PAZEKQO
(d) TEDIOUS

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

(a) Anger
(b) Fear
(c) Thought
(d) Sadness

Q98. 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:

1. All goats are cows.

2. All cows are sheep.

Conclusions:

I. All sheep are goats.

II. All goats are sheep.

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

Q99. Seven friends P, Q, R, S, T, U and V were born in seven different months March, April, June, July, August, September and December not necessarily in the given order. R was born in the month having days less than 31 days but before August. Only three friends were born after T. U was born just before V but after T. More than three friends were born between P and S. R was not born just before T and T was born before S.

How many friends were born between Q and S?

(a) Two
(b) Three
(c) Five
(d) Four

Q100. Four words have been given, out of which three are alike in some manner and one is different. Select the odd one.

(a) Tongue
(b) Leg
(c) Nose
(d) Eyes

ANSWER KEY

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

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SOLUTIONS

Q1. Answer: (d) 10080

Given:

We need to find the smallest five-digit number divisible by 12, 16, 24, and 28.

Formula Used:

Smallest number divisible by multiple numbers = LCM of the numbers

Calculation:

First, find the LCM of 12, 16, 24, and 28.

Prime factorization of each number:

12 = $2^2 \times 3$

16 = 2^4

24 = $2^3 \times 3$

28 = $2^2 \times 7$

LCM is found by taking the highest power of each prime factor:

LCM = 2^4 × 3 × 7

=> LCM = 16 × 3 × 7

=> LCM = 336

We need the smallest five-digit number divisible by 336.

Smallest five-digit number = 10000

Divide 10000 by 336 and round up to the nearest whole number:

10000 / 336 ≈ 29.76

Round up to 30:

30 × 336 = 10080

The smallest five-digit number which is divisible by 12, 16, 24, and 28 is 10080.

Q2. Answer: (c) pH = 4

The correct answer is pH=5

Key Points

• pH = 4: This is acidic, with a higher concentration of hydrogen ions.

• The solution with the highest concentration of hydrogen ions has the lowest pH.

• For example, gastric juice has a pH of around 1.5 to 3, which is lower than lemon juice (pH 2-3), milk of magnesia (pH 12), and sodium hydroxide (pH 14).

• This means that gastric juice has the highest concentration of hydrogen ions.

• The pH scale ranges from 0 to 14, and the equation to calculate pH from hydrogen ion concentration is pH = − log 10 [H+].

• Here are some other examples of solutions with different concentrations of hydrogen ions:

• 1M HCl

• Has a higher concentration of hydrogen ions than other acids because it's a stronger acid and releases protons more easily

• Supersaturated solution

• Contains more solute than the solvent can dissolve, so it has the highest concentration

Q3. Answer: (b) The Khelo India Programme

The correct answer is The Khelo India Programme

Key Points

• The Khelo India Programme was launched by the Ministry of Youth Affairs and Sports in 2018 with the goal of improving sports infrastructure and nurturing young talent across India.

• The program aims to create a strong foundation for sports at the grassroots level, ensuring that young athletes receive the training, resources, and support necessary to excel in national and international competitions.

• Components of the Khelo India Programme:

• Khelo India Youth Games:

• A multi-disciplinary sporting event held annually for youth athletes under the age of 18.

• This event brings together athletes from across the country to compete in a variety of sports.

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• Khelo India School Games:

• Focuses on school-level athletes, providing them with a platform to perform and get recognized for their potential.

• Khelo India Talent Development Scheme:

• Focuses on providing long-term training and scholarships for talented athletes identified during the Khelo India Games.

• Khelo India Centres of Excellence (KICEs):

• These centers provide state-of-the-art infrastructure and expert coaching to young athletes, offering them the opportunity to train and hone their skills.

• State-Level Initiatives:

• The programme has provisions for states to launch their own initiatives and competitions under the Khelo India umbrella to promote sports at the regional level.

Additional Information

• Rajiv Gandhi Khel Abhiyan (RGKA):

• The Rajiv Gandhi Khel Abhiyan was launched in 2008 to improve sports infrastructure at the district and block levels across India.

• The focus was on creating basic sports facilities, enhancing sports participation, and identifying talented athletes at the grassroots.

• It aimed to establish sports complexes in every district of the country and promote sports awareness.

• Urban Sports Infrastructure Scheme (USIS):

• The Urban Sports Infrastructure Scheme (USIS) was introduced to develop sports infrastructure in urban areas, especially in cities where the sports facilities were inadequate. The scheme aimed at upgrading and developing sports facilities such as stadiums, playgrounds, and indoor sports arenas in urban centers to boost sports participation and performance in metropolitan areas.

• It was a part of the government's effort to improve sports facilities and infrastructure for the youth across different sections of the country. This was more focused on urban areas as compared to grassroots programs.

• National Sports Talent Search Scheme (NSTSS):

• The National Sports Talent Search Scheme (NSTSS) was introduced in 2011 to identify and nurture young talent in various sports across India. Under this scheme, talented children in the age group of 8-12 years were selected from different regions of the country, especially from rural and remote areas, and provided training in various sports disciplines.

Q4. Answer: (b) Red Shirts

The correct answer is Redshirts.

Key Points

• The Khan Abdul Ghaffar Khan formed a clan of non-violent revolutionaries called Khudai Khidmatgars known as Red Shirts.

• The Khuda Khidmatgar was a non-violent movement led by Khan Abdul Ghaffar Khan, a Pashtun freedom fighter in the North-West Frontier Province.

• The members of Khudai Khidmatgar were organized and men wore bright red shirts as uniforms whereas women wore black garments.

• The Khudai Khidmatgar was against the partition and creation of the independent nation of Pakistan.

• Abdul Ghaffar Khan (1890-1988) was a follower of Mahatma Gandhiji and was called the Frontier Gandhi.

• The Ghaffar Khan entered politics in 1919 during the agitation over the Rowlatt Act (which Allows the confinement of political dissidents without trial).

• In 1920 he joined the Khilafat Movement and in 1921 he was elected president of a district khilafat committee in his native North-West Frontier Province.

• In 1987 he was awarded the Bharat Ratna (the highest civilian award in India).

• Abdul Ghaffar Khan was the first Foreigner to receive Bharat Ratna.

Additional Information

Persons	Shirts
Hitler	Brown
Abdul Ghaffar Khan	Red
Mussolini	Black

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Q5. Answer: (a) 0

Given:

3tan(θ) = 2

We need to find the value of:

((√13 sin θ - 3tan θ))/((3tan θ + √13 cos θ))

Solution:

Step 1: Solve for tan(θ), sin(θ), and cos(θ):

From 3tan(θ) = 2, we get tan(θ) = 2/3.

Using the identity 1 + tan²(θ) = sec²(θ):

1 + (2/3)² = sec²(θ).

1 + 4/9 = sec²(θ).

sec²(θ) = 13/9.

sec(θ) = √(13)/3.

cos(θ) = 1/sec(θ) = 3/√13.

sin(θ) = tan(θ) × cos(θ) = (2/3) × (3/√13) = 2/√13.

Step 2: Substitute the values:

Numerator: √13sin(θ) - 3tan(θ):

= √13(2/√13) - 3(2/3).

= 2 - 2 = 0.

Denominator: 3tan(θ) + √13cos(θ):

= 3(2/3) + √13(3/√13).

= 2 + 3 = 5.

Step 3: Simplify the expression:

((√13 sin θ - 3tan θ))/((3tan θ + √13 cos θ)) = 0 / 5 = 0.

The value of the expression is 0.

Q6. Answer: (d) PK

The logic followed here is:

Hence, the correct answer is "PK".

Q7. Answer: (c) Sulabh Toilet Movement

The correct answer is Sulabh Toilet Movement

Key Points

• Dr. Bindeshwar Pathak is associated with the Sulabh International Social Service Organization, a non-profit organization that promotes sanitation, human rights, and social reforms:

• Pathak founded Sulabh International in 1970. The organization was originally called Sulabh Shauchalaya Sansthan.

• Pathak's work focused on improving sanitation in India and other countries.

• He developed cost-effective toilet systems that replaced open defecation and dry toilets with safer, more hygienic options.

• Pathak's work also promoted social reform, including:

• Ending the practice of manual scavenging

• Improving the lives of former scavengers and their families

• Promoting non-conventional sources of energy

• Educating people on waste management

• Pathak received many awards for his work, including:

• The Padma Bhushan, India's third-highest civilian award, in 1991

• The Padma Vibhushan, India's second-highest civilian award, posthumously in 2024

• The Lal Bahadur Shastri National Award for Excellence in Public Administration, Academics and Management in 2017

Additional Information

• Farming Communities Movement

• This refers to the collective actions of agricultural communities advocating for better rights, conditions, and policies for farmers. Movements like the Farmers' Protest in India (2020–2021) are examples where farmers demanded the repeal of certain farm laws they believed would lead to exploitation. These movements aim to address issues such as land rights, agricultural pricing, loan waivers, and better wages.

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• Women's Movement

• The Women's Movement is a collective effort to improve the rights, roles, and status of women in society. This movement has evolved over time and addresses issues such as gender equality, reproductive rights, sexual harassment, access to education, and economic empowerment. Famous movements include the Suffrage Movement for voting rights, #MeToo movement, and global initiatives for equal pay and representation in leadership.

• Bachpan Bachao Andolan

• The Bachpan Bachao Andolan (Save Childhood Movement) was founded by Kailash Satyarthi to combat child labor, child trafficking, and exploitation of children. The movement works toward the eradication of child labor through legal measures, advocacy, and awareness. It has been instrumental in rescuing children and providing them with education, rehabilitation, and safe environments.

Q8. Answer: (a) mechanical energy to electrical energy

The correct answer is mechanical energy to electrical energy

Key Points

• A generator converts mechanical energy into electrical energy:

• A generator uses mechanical energy to rotate a turbine, which produces electricity.

• The mechanical energy used by a generator is the energy of a body due to its motion or position.

• The principle of electromagnetic induction, discovered by Michael Faraday in 1831, is the basis of a generator's operation.

• The conversion of mechanical energy into electrical energy produces a magnetic field and generates voltage, which helps the generator function.

Q9. Answer: (d) 8

To Find:

The remainder when 118 - 13 is divided by 10.

Solution:

Step 1: Simplify 118 mod 10:

11 mod 10 = 1 (since 11 divided by 10 leaves a remainder of 1).

11^8 mod 10 = 1^8 mod 10 = 1.

Step 2: Subtract 13:

11^8 - 13 mod 10 = 1 - 13 mod 10.

1 - 13 = -12.

Step 3: Simplify the remainder:

-12 mod 10 = 10 - 2 = 8 (convert negative remainder to positive).

The remainder when 11^8 - 13 is divided by 10 is 8.

Q10. Answer: (a) John Jurdan - Shah Jahan

The correct answer is John Jurdan - Shah Jahan.

Key Points

• John Jurdan - Shah Jahan: John Jurdan was an Englishman who visited India during the reign of Jahangir (1608-1617). Hence, this pair is incorrectly matched.

• Marco Polo - Pandya Kingdom: Marco Polo is an Italian traveller who visited India during 1288-1292 AD under the reign of Pandya Kingdom. This pair is correctly matched.

• Abdur Razzak - Devaraya II: Abdur Razzak was a Persian traveller who visited the Vijayanagara Empire from the 14th to 16th century. This pair is correctly matched.

• Ralph Fisch - Akbar: Ralph Fisch, an English traveler, visited India during the reign of Emperor Akbar (1556–1605). This pair is correctly matched.

Additional Information

Traveler	Country	King/Empire in whose reign they visited India
Ibn Battuta	Morocco	Muhammad bin Tughlaq (1325–1351)
Fa-Hien	China	Chandragupta II (4th century)
Hiuen Tsang	China	Harshavardhan (7th century)
Al-Biruni	Persia (Iran)	Mahmud of Ghazni (early 11th century)

Niccolò de' Conti	Italy (Venice)	Vijayanagara Empire (14th century, under King Devaraya I)

Q11. Answer: (b) D Gukesh

The correct answer is D Gukesh

Key Points

• D Gukesh is the youngest chess Grandmaster in India, becoming one at the age of 12 years, 7 months, and 17 days on January 15, 2019.

• He is also the second youngest person in the world to receive the title of Grandmaster from FIDE.

• Some other notable Indian chess players:

• Rameshbabu Praggnanandhaa: Born in Chennai, Tamil Nadu on August 10, 2005, he became India's youngest Grandmaster in June 2018.

• Viswanathan Anand: The first Grandmaster of India in 1988.

• Koneru Humpy: A top female player in the world.

• Arjun Erigaisi: A top male player in the world.

• Vidit Gujrathi: A top male player in the world.

• Aravindh Chithambaram: A top male player in the world.

• Pentala Harikrishna: A top male player in the world.

• Nihal Sarin: A top male player in the world.

• Raunak Sadhwani: A top male player in the world.

• S. L. Narayanan: A top male player in the world.

Additional Information

• Viswanathan Anand

• Known as the "Tiger of Madras", Anand is India's first Grandmaster (GM), achieving the title in 1988.

• A former World Chess Champion, he held the title from 2000–2002 and again from 2007–2013 in various formats.

• Anand's contributions to Indian chess are monumental, inspiring a generation of players.

• Parimarjan Negi

• Parimarjan Negi became a Grandmaster in 2006 at the age of 13 years, 4 months, and 22 days, making him the youngest Indian to achieve the title at the time.

• Known for his deep theoretical knowledge, Negi transitioned from active chess to academics and is currently pursuing a career in mathematics.

• GN Gopal

• Gopal Narayan Gopal, commonly known as GN Gopal, became a Grandmaster in 2007.

• He has represented India in several international tournaments, including the Chess Olympiads, and has won numerous national and international titles.

Q12. Answer: (a) Norway

The correct answer is Norway

Key Points

• The first Secretary-General of the United Nations was Trygve Lie, a Norwegian lawyer and politician who served from 1946 to 1953.

• Lie resigned in 1952, but remained in office until Dag Hammarskjöld took over in April 1953.

• Lie was a member of the Norwegian Parliament and led the country's delegation to the United Nations Conference on International Organization in San Francisco in April 1945.

• He was also the Chairman of Commission III, which drafted the Security Council provisions of the Charter.

• Lie famously described the role of UN Secretary-General as "the most difficult job in the world".

Q13. Answer: (b) Modem

The correct answer is Modem

Key Points

• A dial-up connection uses a modem to connect a computer to a phone line:

• Modem

• A modem is a device that encodes and decodes information into and from audio frequency signals.

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• The modem on the computer takes digital data from the computer and modulates it into an audio signal that can be transmitted over the phone line.
• Telephone line
• A dial-up connection uses a standard telephone line to connect to the internet.
• Internet service provider (ISP) software
• To establish a dial-up connection, you also need the software provided by your ISP.
• Dial-up was a form of internet access that used the public switched telephone network (PSTN).
• It paved the way for modern networking, but compared to today's technical development, it lacks in business requirements.
Additional Information
• Ethernet
• Definition: A widely used technology for local area networks (LANs).
• Purpose: It enables devices in a network to communicate with each other via a standard protocol.
• Features: Ethernet cables, switches, and routers are typically used to establish wired connections for data transfer.
• Multiplexer
• Definition: A device that combines multiple input signals into a single output signal.
• Purpose: Used in communication systems to optimize the use of bandwidth by transmitting multiple data streams over a single channel.
• Example: A TV cable signal that carries multiple channels.
• Hub
• Definition: A basic networking device that connects multiple devices in a LAN.
• Purpose: It receives a data packet from one port and broadcasts it to all the other connected ports.
• Limitation: It operates at the physical layer of the OSI model and does not differentiate between devices, leading to potential network congestion.

Q14. Answer: (a) 18 hrs.

Given:
Time taken by X alone = Time taken by both together + 12 hours
Time taken by Y alone = Time taken by both together + 27 hours
Formula Used:
Work done by X and Y together in 1 hour = 1 / (Time taken by both together)
Work done by X alone in 1 hour = 1 / (Time taken by X alone)
Work done by Y alone in 1 hour = 1 / (Time taken by Y alone)
Work done by X and Y together = Work done by X alone + Work done by Y alone
Calculation:
Let the time taken by both together be T hours.
Time taken by X alone = T + 12 hours
Time taken by Y alone = T + 27 hours
Work done by X in 1 hour = 1 / (T + 12)
Work done by Y in 1 hour = 1 / (T + 27)
Work done by X and Y together in 1 hour = 1 / T
According to the formula:
Work done by X and Y together = Work done by X alone + Work done by Y alone
1/T = 1/(T + 12) + 1/(T + 27)
Let's solve the equation:
1/T = (T + 27) + (T + 12)/(T + 12)(T + 27)
1/T = (2T + 39)/(T + 12)(T + 27)
Cross multiplying to solve for T:
(T + 12)(T + 27) = T(2T + 39)
$T^2 + 39T + 324 = 2T^2 + 39T$
$T^2 + 324 = 2T^2$
$324 = T^2$
T = 18

The correct answer is option 1, 18 hours.

Q15. Answer: (d) C, A, B, E, D

The logic followed here is:

C. Auditions/Trials - This is the initial phase where participants are evaluated.

A. Selection - Based on the auditions/trials, participants are selected.

B. Practice - The selected participants then start practicing.

E. Rehearsal - After practice, rehearsals are conducted to refine the performance.

D. Stage Performance - Finally, the refined performance is presented on stage.

So, the order would be: 'C, A, B, E, D'.

Hence, the correct answer is "Option 4".

Q16. Answer: (c) 7 < 18 + 2 ^ 12 > 3 - 2 < 100

Given equation: 13 - 3 ÷ 19 × 6 + 2 = 67

Option 1) 6 < 18 + 3 > 12 ^ 3 - 48

'>' denotes '+', '<' denotes '-', '+' denotes '÷', '^' denotes '×' and '-' denotes '=',

=> 6 - 18 ÷ 3 ÷ 12 × 3 = 48

=> 6 - 0.5 × 3 = 48

=> 6 - 1.5 = 48

=> 4.5 = 48

Option 2) 6 < 18 + 3 > 10 ^ 3 - 32

'>' denotes '+', '<' denotes '-', '+' denotes '÷', '^' denotes '×' and '-' denotes '=',

=> 6 - 18 ÷ 3 + 10 × 3 = 32

=> 6 - 6 + 10 × 3 = 32

=> 6 - 6 + 30 = 32

=> 30 = 32

Option 3) 7 < 18 + 2 ^ 12 > 3 - 2 < 100

'>' denotes '+', '<' denotes '-', '+' denotes '÷', '^' denotes '×' and '-' denotes '=',

=> 7 - 18 ÷ 2 × 12 + 3 = 2 - 100

=> 7 - 9 × 12 + 3 = 2 - 100

=> 7 - 108 + 3 = 2 - 100

=> 10 - 108 = 2 - 100

=> -98 = -98

Option 4) 10 < 9 + 3 ^ 6 > 5 - 47

'>' denotes '+', '<' denotes '-', '+' denotes '÷', '^' denotes '×' and '-' denotes '=',

=> 10 - 9 ÷ 3 × 6 + 5 = 47

=> 10 - 3 × 6 + 5 = 47

=> 10 - 18 + 5 = 47

=> -3 = 47

Hence, the correct answer is "7 < 18 + 2 ^ 12 > 3 - 2 < 100".

Q17. Answer: (a) Snow

The logic followed here is:

Logic: Activity and its Environment.

Here,

Rafting : Water → Rafting is an activity that takes place in Water.

Similarly,

Skiing : Snow → Skiing is an activity that takes place in Snow.

Hence, the correct answer is "Option 1".

Q18. Answer: (d) Magellan spacecraft

The correct answer is the Magellan spacecraft

Key Points

• The Magellan spacecraft orbited Venus from 1990 to 1994:
• The Magellan spacecraft was launched from the Space Shuttle Atlantis on May 4, 1989.
• It was the first planetary spacecraft to be launched from a space shuttle.
• Magellan reached Venus on August 10, 1990.
• Magellan mapped 98% of Venus's surface, including the planet's gravity field.
• The spacecraft used a special radar technique called Synthetic Aperture Radar (SAR) to gather detailed pictures of the planet's terrain.
• Magellan's findings included:
• Venus's surface is relatively young, possibly formed by lava flows from volcanic eruptions
• Venus has little evidence of wind erosion
• Venus's interior differs from Earth's interior
• End of mission
• In October 1994, Magellan intentionally plunged into Venus's atmosphere to gather data on the planet's atmosphere before it ceased operations

Additional Information

• Atlantis Spacecraft
• Type: Space Shuttle
• Operator: NASA (United States)
• Purpose: Atlantis was part of NASA's Space Shuttle Program, which conducted various missions, including deploying satellites, servicing the Hubble Space Telescope, and assembling the International Space Station (ISS).
• Notable Mission: The final space shuttle mission (STS-135) in 2011, marking the end of the Shuttle Program.
• Dawn Spacecraft
• Type: Space Probe
• Operator: NASA
• Purpose: The Dawn spacecraft was launched in 2007 to study two key objects in the asteroid belt: Vesta and Ceres.
• Notable Achievements:
• First spacecraft to orbit two extraterrestrial bodies (Vesta and Ceres).
• Provided valuable data on the formation and evolution of our solar system.
• Hayabusa
• Type: Spacecraft
• Operator: JAXA (Japan Aerospace Exploration Agency)
• Purpose: Hayabusa was launched in 2003 to study and return samples from the asteroid Itokawa.
• Notable Achievements:
• First mission to return a sample from an asteroid to Earth.
• It successfully brought back microscopic particles of asteroid material in 2010.
• Its successor, Hayabusa2, also achieved remarkable success with asteroid Ryugu.

Q19. Answer: (a) 2

Shortcut Trick

If $\sec\theta + \tan\theta = k$, then $\sec\theta - \tan\theta = 1/k$.

Given $k = 2 + \sqrt{3}$, then $1/k = 1/(2 + \sqrt{3}) = 2 - \sqrt{3}$.

Adding equations: $2\sec\theta = (2 + \sqrt{3}) + (2 - \sqrt{3}) = 4 \Rightarrow \sec\theta = 2$.

For $\sec\theta = 2$, the angle is $\theta = 60°$.

Required value: $\sqrt{3}\sin 60° + \cos 60° = \sqrt{3}(\sqrt{3}/2) + 1/2 = 3/2 + 1/2 = 2$.

Therefore The correct answer is 2.

Alternate Method

Given: $\sec\theta + \tan\theta = 2 + \sqrt{3}$

Formula: $\sec^2\theta - \tan^2\theta = 1$

$\Rightarrow (\sec\theta + \tan\theta)(\sec\theta - \tan\theta) = 1$

$\Rightarrow (2 + \sqrt{3})(\sec\theta - \tan\theta) = 1$

$\Rightarrow \sec\theta - \tan\theta = 1 / (2 + \sqrt{3}) = 2 - \sqrt{3}$

$\Rightarrow (\sec\theta + \tan\theta) + (\sec\theta - \tan\theta) = (2 + \sqrt{3}) + (2 - \sqrt{3}) \Rightarrow 2\sec\theta = 4 \Rightarrow \sec\theta = 2$

=> cos θ = 1 / sec θ = 1/2

=> tan θ = (sec θ + tan θ) − sec θ = (2 + √3) − 2 = √3

=> sin θ = tan θ × cos θ = √3 × 1/2 = √3/2

=> Expression = √3 sin θ + cos θ = √3(√3/2) + 1/2 = 3/2 + 1/2 = 4/2 = 2

Therefore The correct answer is 2.

Additional Information

Fundamental Identity

The relation $\sec^2 \theta - \tan^2 \theta = 1$ is valid for all values of θ where sec θ and tan θ are defined.

Reciprocal Property

If sec θ + tan θ = x, then sec θ − tan θ = 1/x. This is frequently used to isolate sec θ or tan θ by adding or subtracting the two equations.

Trigonometric Ratios for 60°

Standard values include sin 60° = √3/2, cos 60° = 1/2, and tan 60° = √3.

Q20. Answer: (c) 14

Given:

The numbers are in the ratio 1 : 2 : 3 : 4 : 5.

Their sum is 30.

Formula Used:

Sum of the numbers = Sum of the ratios × Common ratio

Calculation:

Let the common ratio be x.

The numbers are x, 2x, 3x, 4x, 5x.

Sum of the numbers = 30

=> x + 2x + 3x + 4x + 5x = 30

=> 15x = 30

=> x = 2

The second number = 2x = 2 × 2 = 4

The fifth number = 5x = 5 × 2 = 10

Sum of the second and fifth numbers = 4 + 10 = 14

The sum of the second and fifth number is 14.

Q21. Answer: (d) 45, 55

Given:

Total sum = Rs. 7.25 = 725 paise

Total number of coins = 100

Let the number of 10 paise coins be x.

Then, the number of 5 paise coins = 100 - x.

Formula Used:

Total value of coins = (Number of 10 paise coins × 10) + (Number of 5 paise coins × 5)

Calculation:

Total value of coins = 725 paise

=> (x × 10) + ((100 - x) × 5) = 725

=> 10x + 500 - 5x = 725

=> 5x + 500 = 725

=> 5x = 225

=> x = 45

Therefore, Number of 10 paise coins = 45

Number of 5 paise coins = 100 - 45 = 55

Hence, the correct answer is option 4: 45, 55.

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Q22. Answer: (d) 18

According to the given information:

The shaded part represents red roses do not have thorns.

Thus, red roses do not have thorns = 18

Hence, the correct answer is "18".

Q23. Answer: (d) To create employment opportunities in the rural as well as urban sector

The correct answer is To create employment opportunities in the rural as well as the urban sector

Key Points

• Creating employment opportunities in the rural and urban sectors is not an objective of the Paramparagat Krishi Vikas Yojana (PKVY):

• The objectives of the PKVY are to:

• Promote organic farming

• Improve soil health

• Increase soil fertility

• Produce healthy food

• Use eco-friendly low cost technologies

• Promote the Participatory Guarantee System (PGS) for India

• The PKVY is a Centrally Sponsored Scheme (CSS) launched in 2015 under the National Mission on Sustainable Agriculture (NMSA).

• It is a sub-component of the Soil Health Management (SHM) scheme.

• The PKVY aims to develop sustainable organic farming models by combining traditional wisdom and modern science.

Q24. Answer: (c) 63, 72

Given:

Present ages of Ram and Shyam are in the ratio 7 : 8.

After nine years, the ratio will become 8 : 9.

Formula Used:

Let the present ages of Ram and Shyam be 7x and 8x respectively.

After 9 years:

Age of Ram = 7x + 9

Age of Shyam = 8x + 9

Given ratio after 9 years is 8 : 9, so:

(7x + 9)/(8x + 9) = 8/9

Calculation:

(7x + 9)/(8x + 9) = 8/9

Cross-multiply to get:

9(7x + 9) = 8(8x + 9)

63x + 81 = 64x + 72

=> 64x - 63x = 81 - 72

=> x = 9

Present age of Ram = 7x = 7 × 9 = 63

Present age of Shyam = 8x = 8 × 9 = 72

The present ages (in years) of Ram and Shyam respectively are: 63 and 72.

Q25. Answer: (d) Paternal Grandfather

Family Chart:

Given: Pointing to a picture, Sumit said, "The man in the picture is the father-in-law of my mother-in-law".

So, the man in the picture is the "Paternal Grandfather" of Sumit's wife.

Hence, the correct answer is "Paternal Grandfather".

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Q26. Answer: (b) 12

Given:

Length of the cuboid = 6 cm

Breadth of the cuboid = 4 cm

Height of the cuboid = 4 cm

Formula Used:

Number of smaller cubes = Volume of the cuboid / Volume of one smaller cube

Calculation:

Volume of the cuboid = Length × Breadth × Height

Volume of the cuboid = 6 × 4 × 4

Volume of the cuboid = 96 cm^3

Side of the smaller cube = 2 cm

Volume of one smaller cube = $Side^3$

Volume of one smaller cube = 2^3

Volume of one smaller cube = 8 cm^3

Number of smaller cubes = Volume of the cuboid / Volume of one smaller cube

Number of smaller cubes = 96 / 8

=> Number of smaller cubes = 12

The correct answer is option 2.

Q27. Answer: (d) Bihar

The correct answer is Bihar

Key Points

• Bihar is not one of the five states that the Indian Standard Meridian (ISM) passes through:

• ISM states: The ISM passes through the following states: Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Odisha, and Andhra Pradesh

• ISM location: The ISM is located at 82°30'E longitude

• ISM entry point: The ISM enters India through the Shankargarh Fort in Mirzapur, Uttar Pradesh

• ISM purpose: The ISM establishes the standard time for the entire country

• ISM time: The ISM is 5 hours and 30 minutes ahead of Greenwich Mean Time

Q28. Answer: (a) 15, 16, 17, 18

Given:

Four consecutive numbers: Let the numbers be x, x + 1, x + 2, x + 3.

Formula Used:

Twice the first number: 2x

Three times the second number: 3(x + 1)

Four times the third number: 4(x + 2)

Five times the fourth number: 5(x + 3)

Sum of these expressions equals 236.

Calculation:

According to the problem:

2x + 3(x + 1) + 4(x + 2) + 5(x + 3) = 236

Simplifying the left-hand side, we get:

2x + 3x + 3 + 4x + 8 + 5x + 15 = 236

Combining like terms:

2x + 3x + 4x + 5x + 3 + 8 + 15 = 236

14x + 26 = 236

Subtracting 26 from both sides:

14x = 210

Dividing both sides by 14:

x = 15

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Therefore, the four consecutive numbers are:

15, 16, 17, 18

The correct answer is option 1.

Q29. Answer: (d) carbohydrates

The correct answer is Carbohydrates

Key Points

• Glycogen is the storage form of carbohydrates in the body:

• Glycogen is a complex carbohydrate made up of many glucose molecules that are stored in the liver and muscles.

• The body creates glycogen from glucose through a process called glycogenesis and breaks it down for use through a process called glycogenolysis.

• Glycogen's primary function is to provide glucose for glucose homeostasis.

• When the body needs a quick boost of energy, or when it isn't getting glucose from food, glycogen is broken down to release glucose into the bloodstream.

• Muscles use glycogen for energy during intense exercise.

• The amount of glycogen stored in the body varies depending on size, eating habits, fitness level, and recent exercise.

• On average, the body stores around 600 grams of glycogen, with the liver storing about 80 grams and the muscles storing about 500 grams.

• To replenish muscle glycogen stores after exercise, you can consume a CHO supplement as soon as possible.

• The addition of protein to a CHO supplement can help limit muscle damage and promote muscle protein accretion.

Additional Information

• Lipids

• The main source of stored energy in the body, lipids also contribute to cellular structure and function, regulate temperature, and protect body organs. Lipids include fats, oils, waxes, phospholipids, and steroids.

• Proteins

• Essential for the growth and repair of tissue, proteins also contribute to structural and mechanical function, regulate processes in the cells and body, and provide energy if necessary.

• Vitamins

• Essential for certain body functions and act as catalysts in all body tissues. Some examples of vitamins include:

• Vitamin A: Found in carrots, green leafy vegetables, papaya, eggs, and butter

• Vitamin B: Found in meat, potatoes, soybeans, and milk

• Vitamin C: Found in lemons, tomatoes, guava, and oranges

• Vitamin D: Found in sunlight, eggs, cod liver oil, and fish

• Vitamin E: Found in bananas, soybeans, and eggs

• Vitamin K: Found in spinach, meat, turnips, and lettuce

Q30. Answer: (b) Mount of the dead

The correct answer is Mount of the dead

Key Points

• The word Mohenjo-daro translates to "the mound of the dead".

• The name comes from the mounds at the site where archaeologists discovered bones and artefacts.

• Mohenjo-daro was one of the largest cities in the Indus Valley Civilization, developed around 3,000 BCE.

• It was known for its advanced urban planning and civil engineering.

• The archaeological importance of the site was recognized in 1922, and excavations began in 1924.

• In 2015, engineers discovered that much of the city remains underground.

Q31. Answer: (c) Haldia - Prayagraj

The correct answer is Haldia- Prayagraj

Key Points

• The National Waterway 1 (NW-1) is operational and navigable between Haldia and Prayagraj:

• NW-1 is the Ganga-Bhagirathi-Hooghly river system that runs from Prayagraj in Uttar Pradesh to Haldia in West Bengal. I

• t was declared as a National Waterway in 1986 and is 1,620 kilometres long.

• The Indian Waterways Authority (IWAI) is responsible for the development and maintenance of the waterway, including navigation aids and terminal facilities.

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• Other National Waterways in India include:
• NW-2: The Brahmaputra River from Dhubri to Sadiya
• NW-3: The West Coast Canal from Kottapuram to Kollam, plus the Champakara and Udyogmandal Canals
• NW-4: The Phase-1 development of the stretch Muktiyala to Vijayawada of the river Krishna

Q32. Answer: (a) Knee Joint

The correct answer is Knee Joint

Key Points

• The knee is the largest joint in the human body:
• The knee is the largest joint in the body.
• The knee is one of the most complex joints in the body.
• The knee helps you stand, move, and keep your balance. It also allows you to sit, squat, walk, or jump.
• The knee connects the thigh bone (femur) to the shin bone (tibia), fibula (on the outer side of the shin), and kneecap (patella).
• The knee is a synovial joint, which means it contains a fluid-filled capsule.
• Because you use your knee so much, it is vulnerable to injury.

Additional Information

• Neck Joint
• Type: Pivot Joint (primarily at the atlantoaxial joint)
• Location: Between the first two cervical vertebrae (atlas and axis).
• Function: Allows rotational movement of the head, such as shaking the head "no."
• Pelvic Joint
• Type: Ball-and-Socket Joint (at the hip joint, where the femur meets the pelvis)
• Location: Connection between the pelvic bone and the femur.
• Function: Provides a wide range of motion, including flexion, extension, rotation, abduction, and adduction.
• Note: The pelvis also has other joints like the sacroiliac joint and pubic symphysis, which have limited movement.
• Shoulder Joint
• Type: Ball-and-Socket Joint
• Location: Where the head of the humerus fits into the glenoid cavity of the scapula.
• Function: Offers the greatest range of motion of any joint in the body, including rotation, flexion, extension, abduction, and adduction.
• Special Feature: It is stabilized by muscles and tendons, known as the rotator cuff.

Q33. Answer: (a) Coal

The correct answer is Coal

Key Points

• Coal is a fossil fuel:
• Fossil fuels are non-renewable energy sources that were formed from the remains of ancient plants and animals that died and were buried under layers of rock millions of years ago. Coal, oil, and natural gas are all examples of fossil fuels.
• Other sources of energy include:
• Thermal power: Generated from coal and oil at power stations
• Hydroelectric power: Produced by building dams on flowing rivers
• Nuclear power: Uses uranium as fuel

Q34. Answer: (b) Vegetable

The logic followed here is:

Logic: Tools and their primary uses.

Here,

Saw : Wood → Saw is a tool used to cut Wood.

Similarly,

Knife : Vegetable → Knife is a tool used to cut Vegetable.

Hence, the correct answer is "Option 2".

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Q35. Answer: (c) 1/11

Given:

(((0.091)(0.11)))/(((0.91)(1.331)))

Calculation:

=> (((0.091)(0.11)))/(((0.91)(1.331)))

=> ((91× 11)/100000)/((91× 1331)/100000)

=> (91× 11)/(91× 1331)

=> 11/1331

=> 1/121

Square Root of 1/121:

=> √(1/121) = 1/11

Therefore The correct answer is option 3.

Q36. Answer: (a) Both decisions I and II follow.

Given,

Statement:

Students are confused regarding the choice of appropriate course/stream for higher education.

Decisions:

I. Consider their interests, aptitudes and competencies while deciding on their choice - True (Because, it is logical to consider students' interests, aptitudes, and competencies to help them make a more informed and suitable choice for their higher education).

II. Seek guidance from an education and career counsellor - True (Because, seeking guidance from an education and career counsellor can provide professional advice and help students make better decisions regarding their higher education).

So, Both decisions I and II follow.

Hence, the correct answer is "Option 1".

Q37. Answer: (c) 1

Given:

If (15)^(300) is divided by 16, then the remainder is:

Formula Used:

Using Fermat's Little Theorem: a^(p-1) ≡ 1 mod p if a is not divisible by p.

Calculation:

Let's use Fermat's Little Theorem where a = 15 and p = 16.

Since 16 is not a prime number, we use the property of mod:

15 ^4 ≡ 1 (mod 16)

Since 300 = 4 × 75, we have:

15^(300) ≡ (15^4)^(75) (mod 16)

=> 15^(300) ≡ 1^(75) (mod 16)

=> 15^(300) ≡ 1 (mod 16)

The remainder when (15)^(300) is divided by 16 is 1.

The correct answer is option 3.

Q38. Answer: (d) DXIY

The logic followed here is:

Hence, the correct answer is "DXIY".

Q39. Answer: (c) 6-14

The correct answer is 6-14

Key Points

• Sarva Shiksha Abhiyan (SSA) is a government program that aims to provide elementary education to children in the age group of 6 to 14 years:

• The program was launched in 2001–2002 by the Government of India in partnership with state and local governments.

• The program's goal was to provide elementary education to all children in this age group by 2010.

• However, the time limit has been extended indefinitely.

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• The program's objectives include:

• Ensuring that every child in India has access to free and compulsory elementary education

• Fostering an inclusive and equitable educational environment for children

• The 86th Amendment to the Constitution of India made free and compulsory education for children in the age group of 6–14 a fundamental right.

Q40. Answer: (d) 2592 cm3

Given:

Length = 3 × Breadth

Breadth = 12 cm

Breadth = 2 × Height

Formula Used:

Volume of a cuboid = Length × Breadth × Height

Calculation:

Height = Breadth / 2

=> Height = 12 cm / 2

=> Height = 6 cm

Length = 3 × Breadth

=> Length = 3 × 12 cm

=> Length = 36 cm

Volume = Length × Breadth × Height

=> Volume = 36 cm × 12 cm × 6 cm

=> Volume = 2592 cm^3

The volume of the cuboid is 2592 cm^3.

Q41. Answer: (c) South America : Brazil

The correct answer is South America: Brazil

Key Points

• Asia: India

• Incorrect. The largest country in Asia by area is Russia, which spans both Asia and Europe.

• The second-largest in Asia is China. India ranks third in Asia by area.

• Africa: Democratic Republic of Congo (DRC)

• Incorrect. The largest country in Africa by area is Algeria, not the DRC. Algeria covers approximately 2.38 million square kilometres, while the DRC is about 2.34 million square kilometres.

• South America: Brazil

• Correct. Brazil is the largest country in South America, covering about 8.5 million square kilometres, which is nearly half of the continent's area.

• North America: United States

• Incorrect. The largest country in North America is Canada, with an area of about 9.98 million square kilometres, compared to the United States 9.83 million square kilometers.

Q42. Answer: (a) Allahabad

The correct answer is Allahabad

Key Points

• Freedom fighter Chandra Shekhar Azad shot himself in Allahabad on February 27, 1931:

• Azad was a member of the Hindustan Socialist Republican Association (HSRA) and was known for his bravery against British rule.

• He was betrayed by an associate and surrounded by British police in Alfred Park, Allahabad.

• A gunfight broke out, and Azad killed three policemen but was also wounded.

• With only one bullet left, Azad chose to die rather than surrender to the British.

• He pointed his pistol at his head and pulled the trigger.

• Azad's death is an example of patriotism and sacrifice, and his life and contributions are important to the history of India's struggle for independence.

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Q43. Answer: (a) Ganga, Yamuna, Saraswati

The correct answer is Ganga, Yamuna, Saraswati

Key Points

• The Triveni Sangam in Prayagraj (formerly Allahabad), Uttar Pradesh, is the confluence of three rivers:

• Ganga: A sacred river of India, revered in Hinduism.

• Yamuna: Another major river of northern India, meeting the Ganga at this point.

• Saraswati: A mythical river believed to flow underground and merge with the other two at this confluence.

• While the Saraswati river is not visible, it holds significant spiritual and cultural importance in Indian tradition.

• Significance:

• The Kumbh Mela, one of the largest religious gatherings in the world, is held at the Triveni Sangam.

• The confluence is considered highly sacred in Hinduism, and devotees believe that taking a dip at the Sangam purifies the soul and washes away sins

Q44. Answer: (c) Dehradun

The correct answer is Dehradun

Key Points

• The Forest Survey of India (FSI) is located in Dehradun, Uttarakhand

• The FSI is a national organization under the Ministry of Environment, Forest and Climate Change that assesses forest resources, conducts studies, and researches.

• The FSI also assesses forest carbon to report to UNFCC.

• The FSI has four zonal offices: Shimla in the north, Kolkata in the east, Nagpur in the centre, and Bangalore in the south.

• The FSI has been assessing forest cover every two years since 1987 and publishes its findings in the India State of Forest Report (ISFR).

Q45. Answer: (d) Peru

The correct answer is Peru

Key Points

• The Inca ruins of Machu Picchu are located in Peru

• Machu Picchu is situated in the Andes Mountains of Peru, approximately 50 miles northwest of Cusco.

• The site stands at an elevation of 2,430 meters above sea level, offering breathtaking views of its surroundings.

• Machu Picchu is a citadel perched on a hilltop, nestled between two peaks—Machu Picchu, meaning "Old Peak," and Huayna Picchu, meaning "New Peak."

• Recognized as a UNESCO World Heritage Site, it is one of the few major pre-Columbian ruins that remain nearly intact to this day.

• Machu Picchu is considered the most significant tangible legacy of the Inca civilization. It's also known as the “Lost City of the Incas”.

Q46. Answer: (a) Montreal

The correct answer is Montreal

Key Points

• The International Civil Aviation Organization (ICAO) has its headquarters in Montreal, Quebec, Canada.

• The ICAO is a specialized agency of the United Nations, established in 1944 by the Chicago Convention to promote safe and orderly development of international civil aviation.

• Its main functions include setting international standards for aviation safety, security, efficiency, and environmental protection.

• Canada played a significant role in the formation of ICAO. Montreal was chosen due to its strategic location in North America and its accessibility to international aviation hubs.

• Montreal has a strong history in aviation, hosting several key aviation organizations, such as the International Air Transport Association (IATA) and major aerospace companies.

• The city provides excellent logistical support and facilities to host an international organization of this scale.

Q47. Answer: (d) Nuclear Fusion

The correct answer is Nuclear Fusion

Key Points

• The source of energy in the Sun and other stars is nuclear fusion:

• Nuclear fusion is a process where two light atomic nuclei merge to form a heavier nucleus, releasing energy in the process.

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• The energy released comes from the difference in mass between the original nuclei and the resulting nucleus.
• How it works in the Sun
• In the Sun, hydrogen atoms fuse together at temperatures of around 10 million degrees Celsius to form helium.
• This process is called the proton-proton chain and occurs in three steps.
• Benefits
• Nuclear fusion releases a huge amount of energy, which heats the star and prevents it from collapsing under gravity.
• Scientists are studying nuclear fusion as a potential source of clean, safe, and affordable energy.
Additional Information
• Nuclear fusion
• The process of combining two or more light atomic nuclei to create a heavier nucleus. This process releases a massive amount of energy from a small amount of matter. Nuclear fusion is the opposite of nuclear fission, which is when heavy elements break down to form lighter elements.
• Burning of helium gas
• In stars, helium is consumed in a shell around the core, which produces heavier elements like carbon and oxygen.
• Burning of hydrogen gas
• Hydrogen is converted into helium through a series of nuclear reactions. These reactions occur at temperatures of about 10,000,000 to 20,000,000 K.

Q48. Answer: (b) 6

Given:
n is a natural number.
Formula Used:
To find the number by which $n^3 - n$ is always divisible.
Calculation:
Let's simplify $n^3 - n$:
$n^3 - n = n(n^2 - 1)$
$n^2 - 1 = (n - 1)(n + 1)$
Therefore, $n^3 - n = n(n - 1)(n + 1)$
In any three consecutive numbers, one must be divisible by 2 and one by 3.
Hence, their product is always divisible by $2 \times 3 = 6$.
Therefore, $n^3 - n$ is always divisible by 6.

Q49. Answer: (c) 6

Given:
$(4/21) \times (7/8) \times 6 + 17 - 12$
Formula used:
Simplification of the expression step-by-step
Calculations:
=> $(4/21) \times (7/8) = 28/168 = 1/6$
=> $(1/6) \times 6 = 1$
=> $1 + 17 - 12$
=> $1 + 5 = 6$
The value of the expression is 6.

Q50. Answer: (a) 36

Given:
The difference between the interior and exterior angles at a vertex of a regular polygon is 160?.
Formula Used:
Sum of interior and exterior angles at a vertex = 180?
Interior angle - Exterior angle = 160?
Number of sides of the polygon = 360? / Exterior angle
Calculation:
Let the interior angle be I and the exterior angle be E.

Given: I - E = 160

Also, I + E = 180

Adding these two equations:

(I - E) + (I + E) = 160 + 180

=> 2I = 340

=> I = 170

Now, E = 180 - I

=> E = 180 - 170

=> E = 10

Number of sides of the polygon = 360 / E

=> Number of sides = 360 / 10

=> Number of sides = 36

The number of sides of the polygon is 36.

Q51. Answer: (c) Hiuen Tsang

The correct answer is Hiuen Tsang

Key Points

• Hiuen Tsang, a Chinese Buddhist pilgrim, visited India during the reign of Harshavardhana:

• Hiuen Tsang arrived in India in 630 AD.

• He stayed in India for 15 years.

• He studied Hinayana and Mahayana Buddhism in monasteries in Kashmir, Sialkot, Kanauj, and Nalanda.

• He also taught at Nalanda for nine years.

• He returned to China through the same route he took to arrive in India, via Afghanistan and central Asia.

• He wrote a book called Shi-Yu-Ki (the world of the west). In the book, he praised the generosity and justice of King Harsha, as well as Narsimha Varman of the Pallava dynasty and Pulkesin II of the Chalukya dynasty.

• He took 657 parts of Buddhist literature to China, including Hinayana Sutras, commentaries, disciplinary rules, Mahayana texts, commentaries, and treatises on logic and etymology.

Additional Information

• Itsing (I Ching)

• Period: 7th century CE

• Origin: China

• Purpose of Visit: A Buddhist monk and traveller, Itsing came to India to study Buddhism and translate Buddhist texts.

• Notable Achievements:

• Travelled to Nalanda University, the renowned centre of learning.

• Recorded details about Indian society, education, and Buddhist practices in his works like "A Record of Buddhist Practices Sent Home from the Southern Sea."

• Fa-Hien (Faxian)

• Time Period: 5th century CE

• Origin: China

• Purpose of Visit: A Chinese Buddhist monk who travelled to India to obtain authentic Buddhist scriptures.

• Notable Achievements:

• Described his journey in the book "Record of Buddhist Kingdoms."

• Provided insights into Indian society, religion, and the Gupta Empire during his visit.

• Mentioned the flourishing Buddhist monasteries and the practice of Dharma during Chandragupta II’s reign.

• Alberuni (Al-Biruni)

• Time Period: 11th century CE

• Origin: Khwarezm (modern Uzbekistan)

• Purpose of Visit: Invited by Mahmud of Ghazni, Alberuni travelled to India to study its culture, sciences, and religion.

• Notable Achievements:

• Authored "Kitab al-Hind" (The Book of India), a comprehensive study of Indian society, mathematics, astronomy, and religion.

• His work is a valuable resource for understanding medieval India.

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Q52. Answer: (b) D

Given: Vegetables, Carrots, Eatables

Carrots are a subset of Vegetables, and Vegetables are a subset of Eatables.

The best possible Venn diagram:

Hence, the correct answer is "D".

Q53. Answer: (a) Kieron Pollard

The correct answer is Kieron Pollard

Key Points

• Kieron Pollard became the third cricketer to hit six sixes in an over in international cricket:

• Kieron Pollard

• The West Indies captain achieved this feat in 2021, in a Twenty20 international match against Sri Lanka.

• Pollard's six sixes came in the sixth over, bowled by Sri Lanka's Akila Dananjaya.

• Herschelle Gibbs

• The South African cricketer achieved this feat in 2007 during the World Cup against the Netherlands.

• Yuvraj Singh

• The Indian cricketer achieved this feat in 2007 during the Twenty20 World Cup against England.

Q54. Answer: (c) Violin

The correct answer is Violin

Key Points

• The noted musician Mrs. N. Rajam is associated with the violin:

• N. Rajam is an Indian violinist who performs Hindustani classical music.

• She has received the Padma Shri (1984), Padma Bhushan (2004), and Sangeet Natak Akademi Award (1990).

• She was a professor of music at Banaras Hindu University, where she later became the head of the department and the dean of the Faculty of Performing Arts.

• Her technique is considered extraordinary, and many professional violinists seek her guidance.

• She passed on her musical legacy to her daughter, Dr. Sangeeta Shankar, and her granddaughters, Ragini and Nandini.

Q55. Answer: (c) 4000 m2

Given:

Length of the room (l) = 30 m

Breadth of the room (b) = 20 m

Height of the room (h) = 40 m

Formula Used:

Area of four walls = 2h(l + b)

Calculation:

Area of four walls = 2 × 40 × (30 + 20)

Area of four walls = 2 × 40 × 50

Area of four walls = 2 × 2000

Area of four walls = 4000 m²

The area of the four walls of the room is 4000 m².

Q56. Answer: (c) 1926

The correct answer is 1926

Key Points

• The Trade Unions Act was passed in India in 1926:

• The Indian Trade Unions Bill was passed by the Legislature on March 25, 1926.

• The act came into force on June 1, 1927.

• Significance: The act provided statutory recognition to the cause of labor, and allowed for the registration and governance of unions. It also:

• Enabled collective bargaining

• Conferred certain protection and privileges on registered trade unions

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• Allowed registered trade unions to make agreements that are not void or voidable, even if they restrain trade activities
• Allowed registered trade unions to maintain two types of funds: a General Fund and a Political Fund

Q57. Answer: (c) H C Mookherjee

The correct answer is H C Mookherjee
Key Points
• Harendra Coomar Mookerjee was the vice-president of the Constituent Assembly of India that wrote the Constitution of India:
• Mookerjee was a Christian from Bengal and a former vice-chancellor of Calcutta University.
• He chaired the assembly's Minorities Committee and represented non-Anglo-Indian Christians.
• After India became a republic, he was appointed governor of West Bengal.
Additional Information
• Other notable members of the Constituent Assembly include:
• Dr. Rajendra Prasad
• Elected as the president of the assembly
• B. N. Rau
• Appointed as the constitutional adviser to the assembly and prepared the original draft of the constitution
• B. R. Ambedkar
• Chaired the drafting committee
• Jawaharlal Nehru
• A prominent leader involved in the drafting
• Sarojini Naidu
• A prominent leader involved in the drafting
• Vallabhbhai Patel
• A senior leader who played a large role in shaping the constitution
• The Constituent Assembly first met on December 9, 1946, to draft the constitution.
• The constitution was adopted on November 26, 1949, and came into effect on January 26, 1950.

Q58. Answer: (c) 13

Given:
(53)^(15) - 1
Formula used:
Using the difference of powers formula: $a^n - b^n = (a - b)(a^{(n-1)} + a^{(n-2)} + ... + b^{(n-1)})$
Calculations:
=> (53)15 - 1 = (53 - 1)((53)^(14) + $(53)^{13}$ + ... + 1)
=> (53)^(15) - 1 = 52((53)^(14) + $(53)^{13}$ + ... + 1)
(53)^(15) - 1 is exactly divisible by 52.
Since 52 is divisible by 13.
Therefore The correct answer is 13.

Q59. Answer: (d) 4.5 km/h

Given:
Distance from Chandigarh to Kalka = 50 km
Sachin's speed = S km/h
Anil's speed = S + 6 km/h
Sachin and Anil meet 20 km from Kalka
Formula Used:
Distance = Speed × Time
Calculation:
Let the time taken by Sachin to meet Anil be T hours.
Distance traveled by Sachin = S × T
Distance traveled by Anil = (S + 6) × T
Anil travels 50 km to Kalka and then 20 km back, so total distance traveled by Anil = 70 km
Anil's time to travel 70 km = 70 / (S + 6)

Since they meet after T hours, we have:

S × T = 30 (because Sachin meets Anil 20 km from Kalka, so Sachin has traveled 30 km)

=> T = 30 / S

Also, time taken by Anil to meet Sachin = 70 / (S + 6)

=> 30 / S = 70 / (S + 6)

=> 30(S + 6) = 70S

=> 30S + 180 = 70S

=> 180 = 40S

=> S = 4.5

Sachin's speed is 4.5 km/h.

Q60. Answer: (c) Dadabhai Naoroji

The correct answer is Dadabhai Naoroji

Key Points

• Dadabhai Naoroji was the first person to discuss the concept of poverty line in pre-independent India.

• He introduced the concept in his book "Poverty and Un-British Rule in India" published in 1901.

• Naoroji defined poverty line as the minimum income required to meet the basic needs of an individual.

• He argued that poverty was not due to the laziness or incompetence of the Indian people but was a result of the economic policies of the British rule.

Additional Information

• Surendranath Bannerjee (1848–1925): A prominent leader in India's early nationalist movement, Bannerjee was a key figure in the formation of the Indian National Congress (INC). He was known for his moderate views, advocating for gradual reforms through constitutional means, and was a pioneer in the development of Indian education and journalism. He was also a major figure in the fight for civil services reform and represented the growing Indian middle class's aspirations during the British colonial period.

• G.V. Joshi (Unknown dates): A less widely known figure, G.V. Joshi was an Indian social reformer and a part of the Indian nationalist movement, particularly active in the fields of education and social reform. He contributed to the efforts of empowering the Indian masses through better education and was part of the larger social reform movement in the 19th and 20th centuries.

• D. Wacha (1851–1938): Dattatraya Wacha was a prominent social reformer and educator in British India. He was known for his work in the fields of education, particularly for women, and was deeply involved in various movements to address social issues such as caste discrimination. Wacha also contributed significantly to the cause of Indian independence and worked alongside other social reformers to challenge social inequalities.

Q61. Answer: (b) Nathu La Pass

The correct answer is Nathu La Pass

Key Points

• Nathu La Pass connects Sikkim to China's Tibet Autonomous Region:

• In the East Sikkim district of the Himalayas, on the Old Silk Route

• A trading border post between India and China, and one of three open border posts between the two countries

• Closed for almost 40 years after the People's Republic of China suppressed a Tibetan uprising in 1959, but reopened in 2006

Additional Information

• Bara Lacha Pass: Located in Himachal Pradesh, this pass is 16,400 ft (5,000 m) tall.

• Mana Pass: Located in Uttarakhand, this is the highest pass in India that vehicles can access. It's near the India-Tibet border.

• Debsa Pass: Located in Himachal Pradesh.

Important Points

• Other mountain passes in India include:

• Zoji La

• Connects Ladakh and Kashmir Valley. It's important for Ladakh's connectivity in the winter when it's often blocked by snow.

• Khardung La

• Located in Ladakh, this is one of the world's highest motorable passes. It's important for military supplies to the Siachen Glacier.

• Jalori Pass

• Located in Himachal Pradesh, it connects the Kullu Valley with the Shimla district.

• Shipki La

• Located in Himachal Pradesh, this was once an ancient trade route and is now a strategic point on the India-China border.

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• Panchpatmali Pass
• Located in the Eastern Ghats, Koraput district, this pass is known for its bauxite reserves.
• Chanshal Pass
• Located in Himachal Pradesh, this pass is also known as Chanshal Valley. It's a beautiful destination for a weekend getaway.
• Lanak La
• Located in the Aksai Chin region, this pass is claimed by India as its border pass.

Q62. Answer: (c) None of the given conclusions follow.

Given Statements:

1. Some cots are tables.

2. No table is a chair.

The least possible Venn diagram:

Conclusions:

I. Only some cots are chairs. - False (Because there is no direct relation between cots and chairs, so it can be possible but not definite)

II. No chair is a cot. - False (Because there is no direct relation between cots and chairs, so it can be possible but not definite)

III. No cot is a chair. - False (Because there is no direct relation between cots and chairs, so it can be possible but not definite)

So, None of the given conclusions follow.

Hence, the correct answer is "None of the given conclusions follow."

Q63. Answer: (c) 3

Given series:

2 9 6 3 3 4 5 7 8 3 3 3 4 6 2 3 3 3 3 8 6 2 3

Condition to be checked:

3s that are followed by 3, but NOT preceded by 3

Not Preceded by 3 → 3 → 3

2 9 6 3 3 4 5 7 8 3 3 3 4 6 2 3 3 3 3 8 6 2 3

Thus, three such patterns (6 3 3, 8 3 3 and 2 3 3) follow the above conditions.

Hence, the correct answer is "Option (3)".

Mistake Points

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

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

Q64. Answer: (d) 4

Given:

$\tan(\theta) + \cot(\theta) = 2$

Formula used:

We can use the identity $\tan(\theta) \times \cot(\theta) = 1$ and manipulate the given equation to simplify the expression.

Calculations:

Let $\tan(\theta) = x$, so $\cot(\theta) = 1/x$.

$\Rightarrow x + 1/x = 2$

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

$\Rightarrow x^2 - 2x + 1 = 0$

$\Rightarrow (x - 1)^2 = 0$

$\Rightarrow x = 1$

Thus, $\tan(\theta) = 1$ and $\cot(\theta) = 1$.

Now substitute $\tan(\theta) = 1$ and $\cot(\theta) = 1$ into the expression:

$\tan^{(15)}(\theta) + \cot^{(20)}(\theta) + 2 \tan^{(20)}(\theta)\cot^{(15)}(\theta)$

$\Rightarrow 1^{(15)} + 1^{(20)} + 2 \times 1^{(20)} \times 1^{(15)}$

$\Rightarrow 1 + 1 + 2$

$\Rightarrow 4$

The value of the expression is 4.

Q65. Answer: (d) 12 : 7

Given:

a : b = 3 : 4

b : c = 7 : 9

Formula Used:

To find c : a, we need to combine the ratios by making the common term (b) equal in both ratios.

Calculation:

a : b = 3 : 4

b : c = 7 : 9

To make the common term (b) equal, we can multiply the terms of a : b by 7 and the terms of b : c by 4.

=> a : b = 3 × 7 : 4 × 7 = 21 : 28

=> b : c = 7 × 4 : 9 × 4 = 28 : 36

Now, we have:

=> a : b : c = 21 : 28 : 36

=> c : a = 36 : 21

=> c : a = 12 : 7

The correct answer is option 4: 12 : 7

Q66. Answer: (b) Governor

The correct answer is Governor

Key Points

• The State Election Commissioner is appointed by the Governor of the respective state under Article 243K of the Constitution of India.

• The State Election Commission is responsible for conducting elections to local bodies such as Panchayats and Municipalities.

• The article states that the Governor of the state appoints the SEC, ensuring that this authority functions independently from the state government.

• The SEC's role includes overseeing elections for local bodies, such as Panchayats and Municipal Corporations, ensuring free and fair elections.

Additional Information

• Chief Minister

• The Chief Minister is the head of the elected state government and leads the Council of Ministers. However, the Chief Minister has no role in appointing constitutional or quasi-judicial authorities like the State Election Commissioner.

• The appointment process of the SEC is kept independent of the executive wing of the government (headed by the Chief Minister) to ensure impartiality and neutrality in conducting elections for local bodies like Panchayats and Municipalities.

• Chief Election Commissioner (CEC)

• The Chief Election Commissioner (CEC) is the head of the Election Commission of India (ECI), a central body that oversees:

• Elections to the Parliament.

• Elections to State Legislative Assemblies.

• Elections to the offices of the President and Vice-President of India.

• The CEC has no jurisdiction or role in local body elections, which are managed by the State Election Commission at the state level.

• President

• The President of India appoints the Chief Election Commissioner and other Election Commissioners who constitute the Election Commission of India (ECI).

• The President does not appoint the State Election Commissioner, as local body elections are a state subject, and the power for such appointments is delegated to the Governor under the Constitution.

Q67. Answer: (b) Rs. 3,500, Rs. 2,500

Given:

Ratio of incomes of two persons = 7 : 5

Ratio of their expenditures = 9 : 7

Saving of the first person = Rs. 1,700

Saving of the second person = Rs. 1,100

Formula Used:

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Income - Expenditure = Savings
Let the income of the first person be 7x and the income of the second person be 5x.
Let the expenditure of the first person be 9y and the expenditure of the second person be 7y.
Income - Expenditure = Savings
Calculation:
For the first person:
7x - 9y = 1700
For the second person:
5x - 7y = 1100
To solve these equations:
Multiply the first equation by 5 and the second equation by 7:
35x - 45y = 8500
35x - 49y = 7700
Subtract the second equation from the first:
35x - 45y - (35x - 49y) = 8500 - 7700
4y = 800
y = 200
Substitute y = 200 into the second equation:
5x - 7×200 = 1100
5x - 1400 = 1100
5x = 2500
x = 500
Therefore, the incomes are:
Income of first person = 7x = 7×500 = Rs. 3,500
Income of second person = 5x = 5×500 = Rs. 2,500
The respective incomes of each person are Rs. 3,500 and Rs. 2,500.

Q68. Answer: (d) 3 × 3 × 3 × 2

Given:
Number to be factorized = 54
Formula Used:
Prime Factorization: Express a number as a product of its prime factors.
Calculation:
54 is divisible by the smallest prime number 2:
54 ÷ 2 = 27
27 is divisible by the next smallest prime number 3:
27 ÷ 3 = 9
9 is divisible by 3:
9 ÷ 3 = 3
Finally, 3 is divisible by 3:
3 ÷ 3 = 1
So, the prime factorization of 54 is:
54 = 2 × 3 × 3 × 3
54 = 2×3^3
The correct answer is option 4.

Q69. Answer: (b) British

The correct answer is British
Key Points
• The concept of the Rule of Law in the Indian Constitution has been borrowed from the British Constitution.
• The principle is a cornerstone of the British legal system and was popularized by A.V. Dicey, a British jurist.
• The Rule of Law is reflected in Article 14 of the Indian Constitution, which guarantees equality before the law and equal

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protection of the laws.

• It ensures that no individual, including government officials, is above the law and promotes a system of checks and balances.

Additional Information

• Canadian Constitution

• Federal System with a Strong Center:

• India adopted the idea of a federal system where the central government holds significant power (e.g., the power to legislate on residuary subjects).

• This is different from the American model of federation, which is based on equal powers for the center and states.

• Appointment of Governors by the Centre:

• The idea of appointing state governors by the central government is inspired by Canada's system.

• Advisory Jurisdiction of the Supreme Court:

• The practice of referring constitutional matters to the Supreme Court for advisory opinions (Article 143) is based on the Canadian model.

• French Constitution

• Liberty, Equality, and Fraternity:

• These principles are enshrined in the Preamble of the Indian Constitution and were inspired by the ideals of the French Revolution.

• These values also emphasize India's commitment to justice and human rights.

• Secularism:

• The French concept of secularism (or laïcité) influenced India's understanding of secularism, where the state maintains a neutral stance towards all religions.

• German Constitution

• Emergency Provisions:

• The emergency powers outlined in Articles 352, 356, and 360 of the Indian Constitution were influenced by the Weimar Constitution of Germany.

• These provisions allow the central government to assume greater powers during times of crisis.

• Suspension of Fundamental Rights during Emergencies:

• Similar to the Weimar model, India allows the suspension of certain fundamental rights during a national emergency (e.g., Article 19 is suspended under Article 358).

Q70. Answer: (a) Fan

The logic followed here is:

Fan	Appliance
Desk	Furniture
Chair	Furniture
Table	Furniture

Desk, Chair, Table all are types of Furniture,

Whereas,

Fan is an Appliance, not Furniture.

Hence, the correct answer is "Fan".

Q71. Answer: (c) Cut selected text

The correct answer is Cut Selected text

Key Points

• The keyboard shortcut Ctrl+X cuts the selected text:

• To use this shortcut, select the text or file you want to cut, and then press and hold the Ctrl key while pressing the X key.

• The selected item is removed from its original location and copied to your computer's clipboard.

• You can then paste it into another location using the Ctrl+V shortcut.

• Other keyboard shortcuts

• Here are some other keyboard shortcuts for working with text:

• Ctrl+C: Copies the selected text

• Ctrl+V: Pastes the copied or cut text

• Ctrl+A: Selects all of the text on the page or in the active window
• Ctrl+B: Bolds the selected text
• Ctrl+I: Italicizes the selected text
• Ctrl+U: Underlines the selected text

Q72. Answer: (d) 6

The logic followed here is:
Hence, the correct answer is "6".

Q73. Answer: (a) Solution

The correct answer is Solution
Key Points
• A homogeneous mixture of a solute and a solvent is called a solution.
• In a solution, the solute and solvent molecules are so mixed that they cannot be distinguished, even under a microscope.
• For example, when sugar is dissolved in water, it forms a solution.
• Solutions can be gaseous, liquid, or solid. They have many uses, including:
• Food industry
• Solvents are used to extract compounds like caffeine, vanilla, and spices from natural sources.
• Cosmetic industry
• Solvents are used to extract essential oils and fragrance molecules for perfumes, skincare products, and toiletries.
• Oil industry
• Solvents are used to separate desired products or undesired components in the final product.
• Environmental
• Solutions are used to treat exhaust gas, wastewater, and solid waste.

Q74. Answer: (c) 13 : 7

Given:
The difference between two numbers is 30% of their sum.
Formula Used:
Let the larger number be L and the smaller number be S.
According to the given condition: L - S = 0.30(L + S)
Calculation:
L - S = 0.30(L + S)
=> L - S = 0.30L + 0.30S
=> L - 0.30L = 0.30S + S
=> 0.70L = 1.30S
=> L / S = 1.30 / 0.70
=> L / S = 13 / 7
The ratio of the larger number to the smaller number is 13:7.

Q75. Answer: (a) 45^?

Given:
Linear equation: 35x - 35y + 15 = 0
Formula Used:
The slope of the line (m) in the equation ax + by + c = 0 is given by: m = -a/b
Angle θ with the x-axis is given by: θ = tan ^(-1)(m)
Calculation:
The given linear equation is 35x - 35y + 15 = 0.
Rewriting in the form y = mx + c:
=> 35y = 35x + 15
=> y = x + 15/35
=> y = x + 3/7
The slope (m) of the line is 1.

Now, calculate the angle θ with the x-axis:

θ = tan ^(-1)(1)

θ = 45°

The measure of the angle between the graph of the linear equation 35x - 35y + 15 = 0 and the x-axis is 45°.

Q76. Answer: (a) Sikkim

The correct answer is Sikkim

Key Points

• Tsomgo Lake is located in the Indian state of Sikkim. It's in the East Sikkim district, about 40 kilometers from the capital city of Gangtok.

• Here are some facts about Tsomgo Lake:

• Elevation: Tsomgo Lake is at an elevation of 3,753 meters (12,313 feet).

• Frozen: The lake freezes during the winter season.

• Sacred site: Tsomgo Lake is a sacred site for the Sikkimese. Legends say the lake was formed from the tears of gods who wept for the local villagers.

• Activities: Visitors can take rides in yaks and mules, and buy snacks from stalls.

• Best time to visit: Some say the best time to visit is in autumn, when the weather is pleasant and the leaves are golden. Others say to avoid visiting in spring, when heavy rainfall makes travel difficult and dangerous.

Q77. Answer: (c) STWKLS

The logic followed here is:

BATTLE is written as WTSSKL.

Similarly, TABLET will is written as:

Hence, the correct answer is "STWKLS".

Q78. Answer: (c) 6.67%

Given:

Income of Sachin is (50/7)% more than that of Sohan.

Formula used:

Let the income of Sohan be S.

The income of Sachin will be: S + (50/7)% of S = S(1 + 50/700) = S(750/700) = (15/14)S.

Calculations:

Income of Sachin = (15/14)S

Income of Sohan = S

The difference in income = (15/14)S - S = (15/14 - 14/14)S = (1/14)S

Therefore, the income of Sohan is less than that of Sachin by (1/14) of Sohan's income.

Now, we calculate the percentage difference:

Difference = (1/14)S

Percentage difference = ((1/14)S / (15/14)S) × 100 = (1/15) × 100 = 6.67%

The income of Sohan is less than that of Sachin approximately by 6.67%.

Q79. Answer: (b) 7/5

Given:

cos^4(θ) - sin^4(θ) = 3/5

Formula used:

We can simplify cos^4(θ) - sin^4(θ) using the difference of squares formula: a^4 - b^4 = (a² - b²)(a² + b²).

1 - 2sin²θ = cos2θ

2sinθcosθ = sin2θ

cos²θ - sin²θ = cos2θ

Calculations:

cos^4(θ) - sin^4(θ) = (cos²(θ) - sin²(θ))(cos²(θ) + sin²(θ))

Since cos²(θ) + sin²(θ) = 1, the equation simplifies to:

cos²(θ) - sin²(θ) = 3/5.

=> cos 2θ = 3/5

=> sin 2θ = 4/5 (Using Pythagorean triple)

Now, we need to find the value of:

=> 1 - 2sin²(θ) + 2sin(θ)cos(θ)

Using the formulas:

=> cos 2θ + sin 2θ

=> 3/5 + 4/5

=> 7/5

The value of the expression is 7/5.

Q80. Answer: (d) Ahmedabad

The correct answer is Ahmedabad

Key Points

• The Physical Research Laboratory (PRL) is located in Ahmedabad, Gujarat.

• It is a national research institute that conducts basic research in space-related sciences and allied fields.

• The Physical Research Laboratory (PRL) is located in Ahmedabad, Gujarat.

• PRL focuses on diverse research areas, including astronomy, astrophysics, space and atmospheric sciences, geosciences, and planetary sciences.

• It was established on November 11, 1947, by the renowned scientist Dr. Vikram Sarabhai.

• The institute is currently led by Dr. Anil Bhardwaj as its Director.

• PRL operates under the support of the Department of Space, Government of India.

• Notable contributions of PRL include managing the Udaipur Solar Observatory and participating in the PLANEX planetary science and exploration program.

• The laboratory is conveniently located about 15 km from Ahmedabad Airport, with pre-paid taxi services available for transportation.

Q81. Answer: (b) 1 : 3

Given:

Ratio: a : b = c : d = e : f = g : h = 1 : 3

Formula Used:

Given the ratios, we can express each variable in terms of the ratios:

a = k, b = 3k

c = m, d = 3m

e = n, f = 3n

g = p, h = 3p

Calculation:

We need to find the value of (pa + qc + re + sg) : (pb + qd + rf + sh)

Substitute the values:

=> (p(k) + q(m) + r(n) + s(p)) : (p(3k) + q(3m) + r(3n) + s(3p))

=> (pk + qm + rn + sp) : (3pk + 3qm + 3rn + 3sp)

=> (pk + qm + rn + sp) : 3(pk + qm + rn + sp)

=> 1 : 3

The correct answer is option 2.

Q82. Answer: (d) all final goods and services produced during a particular year

The correct answer is all final goods and services produced during a particular year

Key Points

• Gross Domestic Product (GDP) is the total monetary value of all final goods and services produced within a country's borders during a specific time period, typically a year.

• Final Goods and Services: These are goods and services that are consumed by the end-users and not used as inputs in the production of other goods. For example, a car sold to a customer is a final good, whereas the tires purchased by the car manufacturer are intermediate goods.

• Exclusion of Intermediate Goods: Including intermediate goods (like raw materials) would lead to double counting, as their value is already included in the price of final goods.

• Produced Within a Country's Borders: GDP accounts for production within the geographic boundaries of a country, regardless of

whether the producers are domestic or foreign.

Q83. Answer: (c) 450 km

Given:

Departure time from Delhi = 4:30 p.m.

Arrival time at Amritsar = 10:30 p.m.

Average speed = 75 km/h

Formula Used:

Distance = Speed × Time

Calculation:

Travel time = Arrival time - Departure time

Travel time = 10:30 p.m. - 4:30 p.m.

Travel time = 6 hours

Distance = Speed × Time

=> Distance = 75 km/h × 6 hours

=> Distance = 450 km

The distance from Delhi to Amritsar is 450 km.

Q84. Answer: (b) Random Access Memory

The correct answer is Random Access Memory

Key Points

• Random Access Memory (RAM) is an example of a primary storage device:

• Primary storage devices are internal to a computer system and are the fastest storage devices.

• They store data and instructions that are currently being processed by the CPU. RAM is a volatile memory, meaning it loses its contents when the computer is turned off.

• Other examples of primary storage devices include cache memory.

• Secondary storage devices include: Hard disk drives (HDDs), Solid state drives, Removable USB drives, CDs, and DVDs.

Additional Information

Device	Type	Usage	Volatility	Speed
Hard Disk	Magnetic	Long-term storage	Non-volatile	Moderate
RAM	Volatile	Temporary, fast processing	Volatile	Very fast
Optical Disc	Optical	Media storage and backup	Non-volatile	Slow
Magnetic Tape	Magnetic	Backup and archival storage	Non-volatile	Very slow

Q85. Answer: (a) 5

Given:

$x + y + z = 5$

$xy + yz + zx = 8$

Formula Used:

$x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$

Calculation:

$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$\Rightarrow (5)^2 = x^2 + y^2 + z^2 + 2(8)$

$\Rightarrow 25 = x^2 + y^2 + z^2 + 16$

$\Rightarrow x^2 + y^2 + z^2 = 25 - 16$

$\Rightarrow x^2 + y^2 + z^2 = 9$

$x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$

$\Rightarrow x^3 + y^3 + z^3 - 3xyz = (5)(9 - 8)$

$\Rightarrow x^3 + y^3 + z^3 - 3xyz = 5 \times 1$

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=> $x^3 + y^3 + z^3 - 3xyz = 5$

The correct answer is option 1.

Q86. Answer: (c) 2692

Given:

Total UG students = 28400

Total PG students = 25600

Percentage of UG students in college F = 23%

Percentage of PG students in college F = 15%

We need to find the difference between the number of UG and PG students in college F.

Formula used:

Number of students in a college = (Percentage × Total students) / 100

Difference = Number of UG students in F - Number of PG students in F

Calculations:

Number of UG students in F = (23 × 28400) / 100

= 6532

Number of PG students in F = (15 × 25600) / 100

= 3840

Difference = 6532 - 3840

= 2692

The difference between the number of UG and PG students in college F is 2692.

Q87. Answer: (c) 416 : 355

Given:

Total UG students = 28400

Total PG students = 25600

Percentage of UG students in college C = 20%

Percentage of PG students in college C = 26%

We need to find the ratio of the number of PG students to UG students in College C.

Formula used:

Number of students in a college = (Percentage × Total students) / 100

Ratio = Number of PG students in C : Number of UG students in C

Calculations:

Number of UG students in C = (20 × 28400) / 100

= 5680

Number of PG students in C = (26 × 25600) / 100

= 6656

Ratio = 6656 : 5680

Simplify the ratio by dividing both numbers by their greatest common divisor (GCD):

GCD of 6656 and 5680 = 16

Ratio = (6656 ÷ 16) : (5680 ÷ 16)

Ratio = 416 : 355

The ratio of the number of PG students to that of UG students in College C is 416 : 355.

Q88. Answer: (a) 4 : 3

Formula used:

Difference = Number of Females - Number of Males

Ratio = Difference in Company B : Difference in Company E

Calculations:

Data from the graph:

From the graph:

Company B: Females = 6 (in hundreds), Males = 4 (in hundreds)

Company E: Females = 5.5 (in hundreds), Males = 4 (in hundreds)

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Calculate the differences:
For Company B:
=> Difference = Females - Males = 6 - 4 = 2 (in hundreds)
For Company E:
=> Difference = Females - Males = 5.5 - 4 = 1.5 (in hundreds)
Calculate the ratio:
Ratio = Difference in Company B : Difference in Company E
=> Ratio = 2 : 1.5
=> Ratio = 4 : 3
Therefore The approximate ratio is 4 : 3.

Q89. Answer: (c) Females outnumber male employees in 3 of the given 6 companies.

Data from the graph:
Company A: Females = 4.5, Males = 5.5
Company B: Females = 6, Males = 4
Company C: Females = 5, Males = 4.5
Company D: Females = 3.5, Males = 5.5
Company E: Females = 5.5, Males = 4
Company F: Females = 4.5, Males = 5
Calculate total employees across all companies
Total Females = 4.5 + 6 + 5 + 3.5 + 5.5 + 4.5 = 29 (in hundreds)
Total Males = 5.5 + 4 + 4.5 + 5.5 + 4 + 5 = 28.5 (in hundreds)
Analyze the options
1. Across all 6 companies, the total number of male employees is greater than that of total number of female employees:
=> FALSE (Females = 29, Males = 28.5).
2. Across all 6 companies, the total number of female employees is less than that of total number of male employees:
=> FALSE (Females = 29, Males = 28.5).
3. Females outnumber male employees in 3 of the given 6 companies:
Check individual companies:
Company B: Females > Males (6 > 4).
Company C: Females > Males (5 > 4.5).
Company E: Females > Males (5.5 > 4).
=> TRUE (Females outnumber males in 3 companies: B, C, E).
4. Males outnumber female employees in 4 of the given 6 companies:
Check individual companies:
Company A: Males > Females (5.5 > 4.5).
Company D: Males > Females (5.5 > 3.5).
Company F: Males > Females (5 > 4.5).
=> FALSE (Males outnumber females in 3 companies: A, D, F).
The correct statement is: "Females outnumber male employees in 3 of the given 6 companies."

Q90. Answer: (c) Strategy

Given: Six professors of management O, P, Q, R, S and T teach two subjects each, one major and one minor.
1) R teaches Finance as a minor subject, while three others teach it as a major.
2) Operations is a major subject for T and a minor for both Q and S.
3) O and R teach the same subjects-Finance and IT.
4) Both S and T teach marketing.
5) Only one of the professors teaches Strategy as a minor subject.
Then final arrangement:
So, P teaches Strategy minor subject.
Hence, the correct answer is "Strategy".

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Q91. Answer: (d) Both assumptions I and II are implicit.

Given Statement: People are getting addicted to social media.

Now,

Assumptions:

1.Being active on social media is pleasurable: This assumption is valid because one of the reasons people get addicted to social media is the pleasure and gratification they receive from interacting with it. Social media platforms are designed to be engaging, with features like likes, shares, and comments that provide immediate rewards, which are pleasurable for users and often lead to repeated use.

2 Access to social media is becoming easier: This assumption is also valid. With the advancement of technology, smartphones, and the increasing availability of the internet, people can access social media from almost anywhere at any time. This ease of access makes it more likely for people to spend more time on social media, contributing to the addiction.

Here, Both assumptions I and II are implicit.

Hence, the correct answer is "Option 4".

Q92. Answer: (c) D

According to the given information:

The shaded region represents post-graduate teachers who are also honest.

So, post-graduate teachers who are also honest = D.

Hence, the correct answer is "D".

Q93. Answer: (a) 23

The logic followed here is:

Hence, the correct answer is "23".

Q94. Answer: (d) 47

The logic followed here is:

Sum of place value of letters + 4

'RQN' is written as '53',

'DLP' is written as '36'

Similarly, the code for 'SRF':

Hence, the correct answer is "47".

Q95. Answer: (a) 24

Given Equation: 18K 6J 7Q 5T 2 = ?

BODMAS Rule:

Decoding the given information:

Alphabet	Q	J	T	K
Meaning	•	×	•	÷

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

=> 18 ÷ 6 × 7 + 5 - 2 = ?

=> 3 × 7 + 5 - 2 = ?

=> 21 + 5 - 2 = ?

=> 26 - 2 = 24.

Hence, the correct option is "Option 1".

Q96. Answer: (d) TEDIOUS

The logic followed here is:

ALPHABET is coded as YJNFYZCR.

Similarly, ? would be coded as RCBGMSQ:

Hence, the correct answer is "TEDIOUS".

Q97. Answer: (c) Thought

The logic followed here is:

Anger	Emotion
Fear	Emotion
Thought	Mental Process
Sadness	Emotion

Anger, Fear, Sadness all are Emotions,

Whereas, Thought is a Mental Process.

Hence, the correct answer is "Thought".

Q98. Answer: (c) Only conclusion II follows.

Statements:

1. All goats are cows.

2. All cows are sheep.

The least possible Venn diagram:

Conclusions:

I. All sheep are goats. - False (Because All goats are cows and All cows are sheep. So, Some sheep are goats it is definite but All sheep are goats it is not definite)

II. All goats are sheep. - True (Because All goats are cows and All cows are sheep. So, All goats are sheep it is definite)

So, Only conclusion II follows.

Hence, the correct answer is "Only conclusion II follows."

Q99. Answer: (b) Three

Given: Seven friends P, Q, R, S, T, U and V were born in seven different months March, April, June, July, August, September and December not necessarily in the given order.

1) Only three friends were born after T.

2) U was born just before V but after T.

Months	Friends
March	
April	
June	
July	T
August	U
September	V
December	

3) R was born in the month having days less than 31 days but before August.

4) R was not born just before T and T was born before S.

Months	Friends
March	
April	R
June	
July	T
August	U
September	V
December	S

5) More than three friends were born between P and S.

Months	Friends

March	P
April	R
June	
July	T
August	U
September	V
December	S

So, Q is left then final arrangement:

Months	Friends
March	P
April	R
June	Q
July	T
August	U
September	V
December	S

So, Three friends were born between Q and S.

Hence, the correct answer is "Three".

Q100. Answer: (b) Leg

The logic followed here is:

Tongue	Sense organ
Leg	Limb
Nose	Sense organ
Eyes	Sense organ

Tongue, Nose, Eyes all are Sense organs.

Whereas, Leg is a Limb..

Hence, the correct answer is "Leg".

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