SSC CHSL Tier-1 2024: Official Paper (Held On: 09 Jul, 2024 Shift 1) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2024 • 100 questions • 60 minutes • Answer key and solutions

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ENGLISH LANGUAGE

Q1. The following sentence has been split into four segments. Identify the segment that contains a grammatical error.

In geography class, / the teacher told the students, / "Switzerland lies / inside Germany, France, Austria, and Italy."

(a) Switzerland lies
(b) In geography class,
(c) the teacher told the students,
(d) inside Germany, France, Austria, and Italy.

Q2. Parts of the following sentence have been given as options. Select the option that contains an error.

There are eight planets in our solar system and a Earth is the third planet from the Sun.

(a) and a Earth is the third
(b) in our solar system
(c) There are eight planets
(d) planet from the Sun.

Q3. The following sentence has been split into four segments. Identify the segment that contains a grammatical error.

'You expressed your opinion/ very clearly /but I am sorry/ I cannot agree to you'.

(a) but I am sorry
(b) very clearly
(c) You expressed your opinion
(d) I cannot agree to you

Q4. Select the most appropriate option to fill in the blank.

Serena _____ from fever since the 5^(th) of this month.

(a) suffers
(b) is suffering
(c) has been suffering
(d) suffered

Directions

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

The disclaimer read that no animals were harmed (1)_____ the filming of that scene. However, they forgot that the brand of lipstick that was applied (2)____ the heroines lips for that scene was manufactured from crushed cochineal bugs, which release a pigment commonly used in red lipstick. The other items in the film studio (3)____ used animal fats during their manufacturing. The actors who (4)____ that they are vegan in past interviews are unaware of their indirect involvement in such acts of cruelty against animals. The indirect cruelty against animals does not stop here. For example, the extensive disposal of plastic waste in oceans has made plastic a part of the animal food chain, which is detrimental (5)_____ our entire ecosystem.

Q5. Select the most appropriate option to fill in blank number 1.

(a) from
(b) around
(c) for
(d) during

Q6. Select the most appropriate option to fill in blank number 2.

(a) to
(b) on
(c) upon
(d) over

Q7. Select the most appropriate option to fill in blank number 3.

(a) long
(b) also
(c) too
(d) least

Q8. Select the most appropriate option to fill in blank number 4.

(a) are confessing
(b) had confessed
(c) were confessing
(d) confessed

Q9. Select the most appropriate option to fill in blank number 5.

(a) to
(b) in
(c) for
(d) on

Q10. Select the option that will improve the underlined part of the given sentence.

It is my custom to get up early in the morning.

(a) oddity
(b) habit
(c) addiction
(d) perfection

Q11. Which of the following sentences contains the ANTONYM of the word ‘important’?

(a) Choose the right colour to make your bike stand out!
(b) Namita also makes some very salient points in her newly revised preface.
(c) I have some urgent questions for you.
(d) You always make me do all the trivial stuff.

Q12. Select the INCORRECTLY spelt word.

(a) Clandestine
(b) Pronounciation
(c) Dissociation
(d) Denunciation

Q13. Select the most appropriate ANTONYM of the underlined word in the sentence.

She was asked by the elders to wear a skirt covering her knees.

(a) Expecting
(b) Expounding
(c) Exposing
(d) Expanding

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Q14. Select the correct spelling of the underlined word in the following sentence.

I am in a hurry so I will see you tomorow.

(a) tomoorrow
(b) tomoorow
(c) tomorrow
(d) toomorow

Q15. Select the most appropriate ANTONYM of the given word

Abundance

(a) Excitement
(b) Scarcity
(c) Fortune
(d) Prosperity

Q16. Select the most appropriate ANTONYM of the underlined word.

The army advanced into enemy territory.

(a) Retreated
(b) Protruded
(c) Commuted
(d) Arose

Q17. Select the most appropriate option that can substitute the underlined word in the given sentence.

There was enough room in the spacious flat for all of our furniture.

(a) cramped
(b) tiny
(c) cozy
(d) roomy

Q18. Identify the most appropriate synonym of the following word.

Sceptical

(a) Stoic
(b) Garrulous
(c) Insensitive
(d) Incredulous

Q19. Select the appropriate option that can substitute the underlined phrase in the following sentence.

Even though she’s a celebrity, she doesn’t draw any attention towards herself.

(a) keeps hot under the collar
(b) keeps a low profile
(c) keeps up with the Joneses
(d) is hard to come by

Q20. Read the given sentence carefully. Change the meaning of the sentence by replacing the underlined word with its ANTONYM from the following options.

William Shakespeare is considered to be the most celebrated dramatist in the world of literature.

(a) laureate
(b) inglorious
(c) illustrious
(d) acclaimed

Q21. Select the most appropriate option that can substitute the underlined word in the following sentence.

If it is sunny tomorrow, we go for a picnic.

(a) will go
(b) will went

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(c) will going
(d) goes

Q22. Select the most appropriate option that can substitute the underlined segment in the given sentence. If there is no need to substitute it, select 'No substitution required'.

There is an old rivalry between the three families for ages.

(a) in the three families
(b) No substitution required
(c) of the three families
(d) among the three families

Q23. Select the most appropriate option to fill in the blank.

The teacher asked the students to _____ attention towards the instructions given for the project.

(a) make
(b) had
(c) keen
(d) pay

Q24. Select the most appropriate ANTONYM of the underlined word in the given sentence.

The company has to be able to compete globally.

(a) Pervert
(b) Attack
(c) Support
(d) Impede

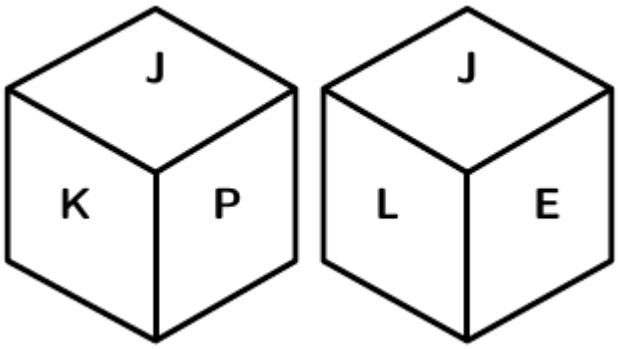
Q25. Select the most appropriate option to substitute the underlined segment in the following sentence.

A gift from my teacher on the eve of the new year was a complete surprise.

(a) like a cat on hot bricks
(b) like striking one's colours
(c) spilling of beans
(d) a bolt from the blue

GENERAL INTELLIGENCE

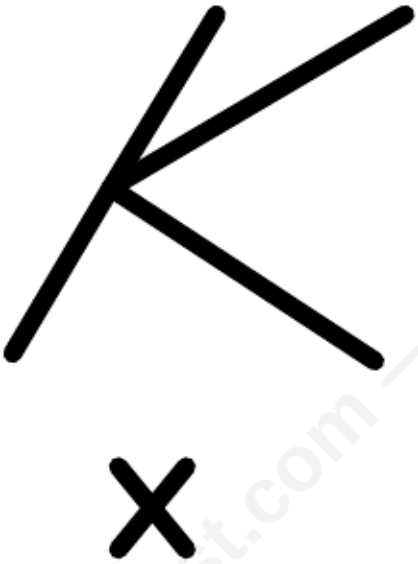
Q26. Six letters E, J, K, L, M and P are written on different faces of a dice. Two positions of this dice are shown in the figure. Which is the letter on the face opposite to the face containing M?



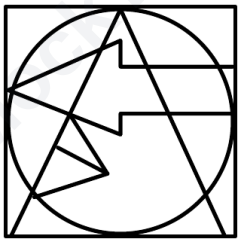
(a) E
(b) J
(c) K
(d) P

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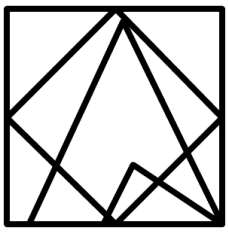
Q27. Select the option in which the given figure (X) is embedded. (Rotation is NOT allowed).



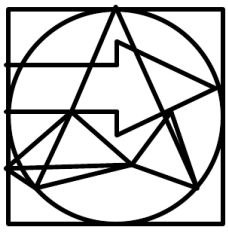
(a)



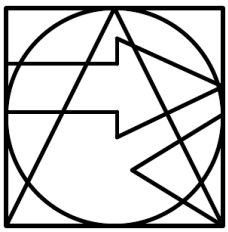
(b)



(c)



(d)



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Q28. What should come in place of the question mark (?) in the given series?

69, 78, 103, 152, ?

(a) 332
(b) 323
(c) 231
(d) 233

Q29. Select the set in which the numbers are related in the same way as are the numbers of the following sets.

(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13 – Operations on 13 such as adding/subtracting/multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.)

(2, 3, 36)

(1, 7, 49)

(a) (5, 4, 260)
(b) (3, 5, 225)
(c) (1, 9, 59)
(d) (4, 4, 252)

Q30. In a certain code language,

'A + B' means 'A is the sister of B',

'A – B' means 'A is the brother of B',

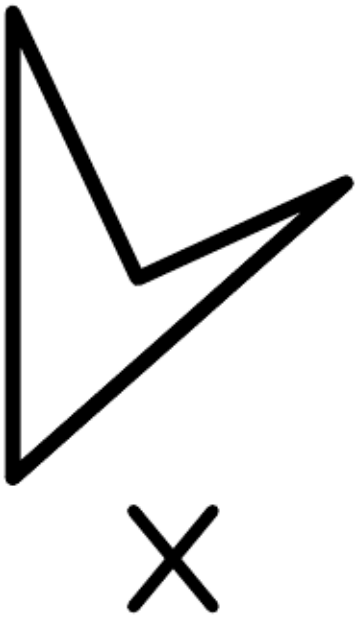
'A × B' means 'A is the father of B',

'A ÷ B' means 'A is the wife of B'.

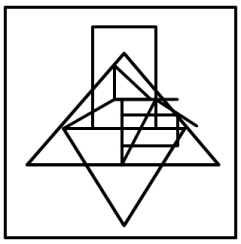
Based on the above, how is P related to T if 'P + Q ÷ R × S − T'?

(a) Mother's sister
(b) Mother
(c) Sister
(d) Father's sister

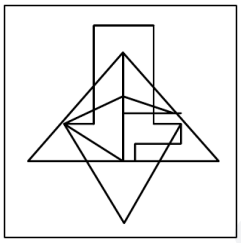
Q31. Select the option in which the given figure (X) is embedded. (Rotation is NOT allowed).



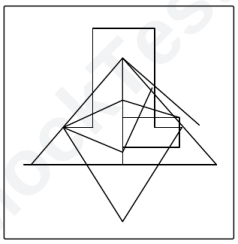
(a)



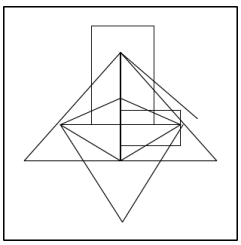
(b)



(c)



(d)



Q32. Select the combination of letters that when sequentially placed in the blanks of the given series will complete the series.

ABC_C_CC_DCBG_CA

(a) DCEE
(b) ECDC
(c) DCED
(d) EDCE

Q33. What will come in the place of '?' in the following equation, if '+' and '-' are interchanged?

47 + 10 × 3 - 32 ÷ 8 = ?

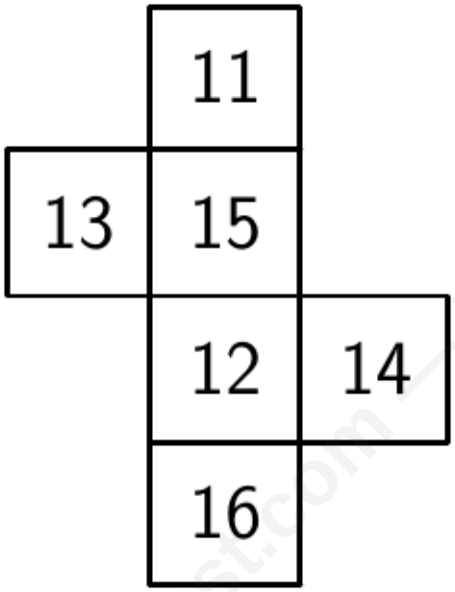
(a) 19
(b) 31
(c) 21
(d) 27

Q34. The position of how many letters will remain unchanged if each of the letters in the word ENGLISH is arranged in alphabetical order?

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

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Q35. What would be the number on the opposite side of '16' if the given sheet is folded to form a cube?



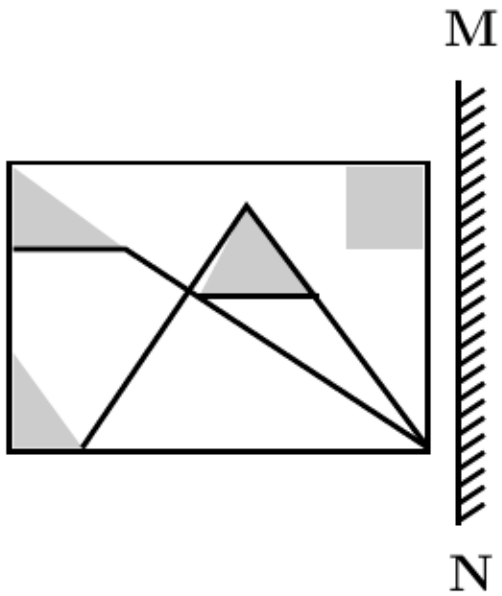
(a) 15
(b) 14
(c) 13
(d) 11

Q36. What will come in the place of the question mark (?) in the following equation, if '+' and '-' are interchanged and '×' and '÷' are interchanged?

20 - 80 × 16 ÷ 5 + 15 = ?

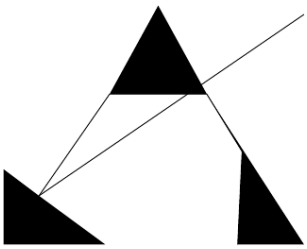
(a) 35
(b) 30
(c) 32
(d) 36

Q37. Select the correct mirror image of the given figure when the mirror is placed at MN as shown below.

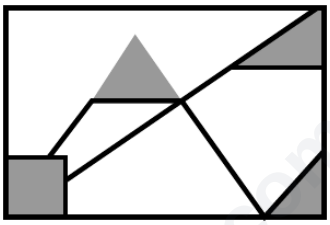


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(a)



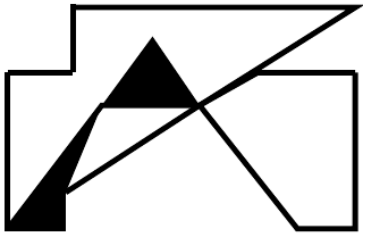
(b)



(c)



(d)



Q38. If 'Y' stands for '÷', 'N' stands for '×', 'M' stands for '+' and 'G' stands for '–', what will come in place of the question mark (?) in the following equation?

100 N 80 G 40 Y 20 M 10 = ?

(a) 8976
(b) 5776
(c) 8008
(d) 987

Q39. Based on the alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which letter-cluster does not belong to that group?

(Note: The odd one out is not based on the number of consonants/vowels or their position in the letter cluster.)

(a) EBD
(b) LIK
(c) ROS
(d) PMO

Q40. Which of the following numbers will replace the question mark (?) in the given series?

41 49 65 89 121 161 ?

(a) 209
(b) 215
(c) 195

(d) 189

Q41. What should come in place of the question mark (?) in the given series based on the English alphabetical order?

GDJ, KHN, OLR, SPV, ?

(a) VSX
(b) WTZ
(c) VTY
(d) WUZ

Q42. How many rectangles are there in the given figure?



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

Q43. In a certain code language, 'BILLION' is coded as '3264581' and 'MILLION' is coded as '3249581'. What is the code for 'M' in that language?

(a) 5
(b) 6
(c) 9
(d) 3

Q44. Select the option that is related to the third number in the same way as the second number is related to the first number.

10 : 26 :: 50 : ?

(a) 343
(b) 341
(c) 342
(d) 344

Q45. What should come in place of the question mark (?) in the given series?

24, 40, 56, 72, ?, 104

(a) 86
(b) 89
(c) 88
(d) 87

Q46. 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:

All papers are charts.

Some charts are notebooks.

Some notebooks are files.

Conclusions:

(I) Some charts are files.

(II) All papers being notebooks is a possibility.

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

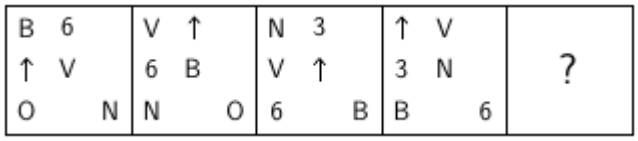
Q47. Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below.

(The words must be considered as meaningful English words and must not be related to each other based on the number of letters/number of consonants/vowels in the word)

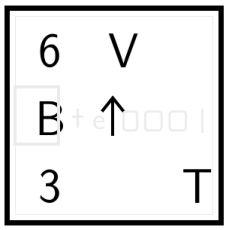
Engage : Involve

(a) Diverse : Varied
(b) Shrink : Grow
(c) Entirety : Fragment
(d) Secure : Vulnerable

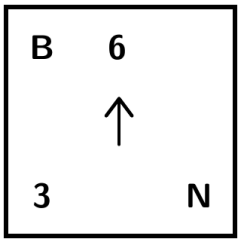
Q48. Identify the figure given in the options that when put in place of the question mark (?) will logically complete the series.



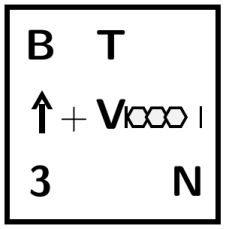
(a)



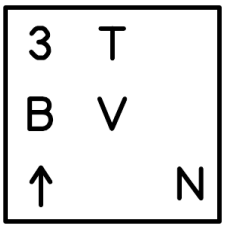
(b)



(c)



(d)



Q49. If 19 February 2004 was a Thursday, then what was the day of the week on 2 March 2019?

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

Q50. JNLO is related to ILIK in a certain way based on the English alphabetical order. In the same way, NRPS is related to MPMO. To which of the following is LPNQ related, following the same logic?

(a) KMKN
(b) KMKO
(c) KOKM
(d) KNKM

QUANTITATIVE APTITUDE

Q51. A trader buys 500 kg cotton for Rs. 8,000. If 10% of this cotton is spoiled due to rain, at what rate (Rs./kg) should he sell the rest to earn a 20% profit?

(a) 21 1/3
(b) 23 1/3
(c) 22 1/3
(d) 25 1/3

Q52. A natural number n divides 732 and leaves 12 as a remainder. How many values of n are possible?

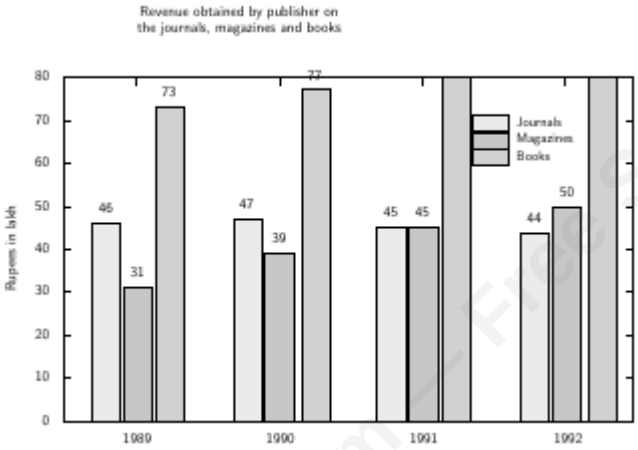
(a) 18
(b) 22
(c) 20
(d) 16

Q53. A covered wooden box has the inner measures as 128 cm, 90 cm, 25 cm and the thickness of wood is 5.5 cm. Find the volume of the wood.

(a) 819832 cm3
(b) 217404 cm3
(c) 329431 cm3
(d) 192392 cm^3

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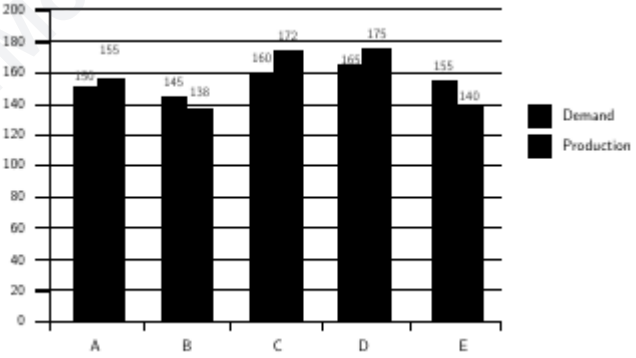
Q54. Answer the following question on the basis of the bar graph given.



The number of years in which there was an increase in the revenue from at least two categories is:

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

Q55. The following graph shows the demand and production of buses of five companies in 2022 (in thousands). Study the given graph carefully and answer the question that follows



The number of companies whose production of buses is equal to or more than the average demand of buses of all five companies is:

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

Q56. If lateral surface area of a cube is 144 cm^2, then find its volume.

(a) 117.58 cm3
(b) 864 cm3
(c) 216 cm3
(d) 1728 cm^3

Q57. Rohan can alone finish a work in 12 days and Hari can alone in 16 days. They both work for 3 days and then Rohan left. After that only Hari works and finishes the work. The total work will be completed in:

(a) 9 days
(b) 121/3 days
(c) 12 days
(d) 122/3 days

Q58. If 6428A83 is divisible by 9, then the value of A is equal to :

(a) 6
(b) 5
(c) 7
(d) 3

Q59. A cylinder has a curved surface area equal to 350% of the curved surface area of another cylinder. If their radii are in the ratio 3 : 1, then the volume of the smaller cylinder is approximately _____% of the larger cylinder (the smaller cylinder has its radius and height smaller when compared to the larger).

(a) 7.28
(b) 8.86
(c) 9.52
(d) 10.16

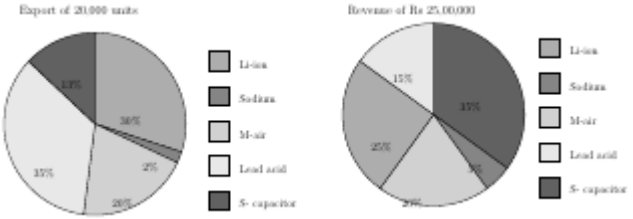
Q60. Two numbers are, respectively, 30% and 60% more than a third number. The ratio of the two numbers is:

(a) 12 : 13
(b) 13 : 16
(c) 11 : 15
(d) 13 : 17

Q61. In what proportion must tea worth Rs. 27 and Rs. 31 per kg be mixed so as to gain 25% by selling the mixture at Rs. 36 per kg?

(a) 2 : 11
(b) 3 : 7
(c) 9 : 11
(d) 11 : 9

Q62. A battery manufacturer manufactures five different types of batteries. The total revenue for the year 2020 is Rs. 25,00,000 and 20,000 units were exported in 2020. The distribution of revenue and units for the five different types of batteries is shown in the charts.



Which type of the battery provides the highest revenue per unit of export?

(a) Li-ion
(b) Sodium
(c) M-Air
(d) Lead acid

Q63. In an election between two candidates, 10% of the voters did not cast their votes and 5% of the votes polled were found invalid. The successful candidate got 52.5% of the valid votes and won by a majority of 1710 votes. The number of voters enrolled on the voters list was:

(a) 42000
(b) 48000
(c) 40000
(d) 36000

Q64. In a 2 km linear race, if P completes the race in 200 second and Q in 220 seconds, then the distance by which P beats Q is:

(a) 167 6/11 metres
(b) 191 7/11 metres
(c) 181 9/11 metres

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(d) 173 7/11 metres

Q65. The marked price of an item is 1.4 times the cost price. In order to earn 23.2% profit, what per cent discount can a shopkeeper allow?

(a) 13%
(b) 17%
(c) 15%
(d) 12%

Q66. A person saves 45% of his income. Next year, his income increases by 200%. He increases his savings by five times the previous year's savings. By what percentage (correct to one place of decimal) has he increased/decreased his expenditure?

(a) Decreased, 63.4%
(b) Decreased, 36.4%
(c) Increased, 36.4%
(d) Increased, 63.4%

Q67. A bigger circle centre at O and a smaller circle centre at P touch each other externally such that the length of their common tangent LM is 12 cm. If the radius of the bigger circle is 18 cm, then what will be the radius (in cm) of the smaller circle?

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

Q68. In a circle, the chords AB and CD intersect each other at point L (internally). If AL = 9 cm, LB = 7 cm and LD = 3 cm, then find CL (in cm).

(a) 19
(b) 21
(c) 20
(d) 18

Q69. In how much time (in years) will Rs. 7,200 amount to Rs. 8,928 at simple interest at the rate of 8% per annum?

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

Q70. The hypotenuse of a right triangle is 6m more than twice the shortest side. If the third side is 2 m less than the hypotenuse, find the area(in m^2) of the triangle.

(a) 100
(b) 110
(c) 120
(d) 130

Q71. Find the length of the sides of a triangle, if its angles are in the ratio 2 : 4 : 6 and its circumradius is 12 cm.

(a) 5 cm, 6 cm, 10 cm
(b) 6 cm, 6√3 cm, 12 cm
(c) 15 cm, 15√3 cm, 30 cm
(d) 12 cm, 12√3 cm, 24 cm

Q72. The table shows the percentage distribution of the population (only male and female) according to Gender and Literacy.

State	Percentage literate	Gender	
Literate	Illiterate		

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M : F	M : F		
A	55	5 : 6	4 : 5
B	72	1 : 1	3 : 2
C	78	4 : 3	3 : 2

The total population in state C, if the illiterate female count in state C is 4,40,000, is:

(a) 5000000
(b) 4600000
(c) 3600000
(d) 6000000

Q73. If the areas of three adjacent faces of a cuboid are 5 cm^2, 15 cm^2, 27 cm^2, respectively, the surface area of the cuboid is:

(a) 47 cm2
(b) 45 cm2
(c) 94 cm2
(d) 75 cm^2

Q74. If cot α=P/Q, then find the value of (P cos α-Q sin α)/(P cos α+Q sin α) - (P^2-Q^2)/(P^2+Q^2)+3.

(a) P/Q
(b) (P^2)/(P^2+Q^2)
(c) 3
(d) 0

Q75. The length of a rectangular shaped park exceeds its breadth by 15 m. If the perimeter of the park is 110 m, find the length of the park (in m).

(a) 25
(b) 35
(c) 20
(d) 40

GENERAL AWARENESS

Q76. The Preamble of the Constitution describes India as:

(a) a unitary state
(b) a federal state
(c) a secular state
(d) an atheist state

Q77. Oil India Limited (OIL) is under the administrative structure of:

(a) Ministry of Petroleum and Natural Gas
(b) Ministry of Power
(c) Ministry of New and Renewable Energy
(d) Ministry of Commerce and Industry

Q78. Which of the following organisations said that India CANNOT have a parallel judicial system - one for the rich and the other for the poor?

(a) Kerala High Court
(b) Himachal High Court
(c) Supreme Court
(d) Gujarat High Court

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Q79. Who is known as the Father of Modern Dance in India?

(a) Atombapu Sharma
(b) Uday Shankar
(c) Kelucharan Mohapatra
(d) Pandit Birju Maharaj

Q80. Who calculated the approximate location of the planet Neptune by studying gravity - induced disturbances in the motion of Uranus?

(a) John Couch Adams
(b) Johann Gottfried Galle
(c) Urbain-Jean-Joseph Le Verrier
(d) Percival Lowell

Q81. In November 2022, the Supreme Court upheld the 10% reservation of EWS quota. This EWS reservation was granted on the basis of recommendations from which of the following commissions?

(a) Sinho commission
(b) Sarkaria commission
(c) Mandal commission
(d) Kelkar commission

Q82. Which of the following rivers is called ‘Singi Khamban’ in Tibet?

(a) Kosi
(b) Sutlej
(c) Brahmaputra
(d) Indus

Q83. What was India’s population growth rate (in percentage) during 2001-2011?

(a) 23.87%
(b) 21.54%
(c) 24.66%
(d) 17.64%

Q84. According to the Census of India-2011, what is the sex ratio (Females per 1000 males) of India?

(a) 943
(b) 934
(c) 933
(d) 927

Q85. The Press and Periodicals Registration Bill, 2023 replaced which act with a simplified law that decriminalizes various provisions and brings digital media under its ambit?

(a) Press and Registration of Books Act, 1867
(b) Newspaper (Incitement to Offences) Act, 1908
(c) Censorship of Press Act, 1799
(d) Press (Objectionable Matters) Act, 1951

Q86. Judicial Review, a salient feature of the Constitution of India, has been borrowed from which of the following countries?

(a) The US
(b) Canada
(c) Ireland
(d) South Africa

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Q87. In which year was the All India Football Federation (AIFF) formed?

(a) 1947
(b) 1957
(c) 1937
(d) 1967

Q88. Which Act opposed by Mahatma Gandhi in 1919 was a direct attack on the civil liberties and democratic rights of the Indian people?

(a) Pitt's India Act
(b) Criminal Tribes Act
(c) Rowlatt Act
(d) Defence of India Act

Q89. The founder of the Pallava dynasty was:

(a) Singhamvishnu
(b) Simharaj
(c) Balasimha
(d) Simhavishnu

Q90. The number of white pawns in chess is _____.

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

Q91. What should you click to choose the date for sorting in Gmail?

(a) The filter icon
(b) The '1 Day' dropdown menu
(c) The calendar icon
(d) The 'Date within' field

Q92. Which of the following refers to the purchase and sale of government securities?

(a) High powered money
(b) Reserve ratio
(c) Open market operations
(d) Bank rate

Q93. Identify the INCORRECT pair regarding the material media and their refractive index?

(a) Sapphire – 1.77
(b) Benzene – 2.42
(c) Ruby – 1.71
(d) Kerosene – 1.44

Q94. On the 74^(th) republic day of India, President of Egypt, _____ was the Chief Guest at the Republic Day parade.

(a) Muhammad Hosni El Sayed Mubarak
(b) Adly Mahmoud Mansour
(c) Gamal Abdel Nasser Husain
(d) Abdel Fattah El-Sisi

Q95. In which year was MS Dhoni awarded Padma Shri Award?

(a) 2007
(b) 2009
(c) 2012
(d) 2010

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Q96. Which of the following is called the cyclic arrangement of time units in Hindustani Classical music?

(a) Jati
(b) Alap
(c) Raga
(d) Tala

Q97. In honey bees, _____

(a) males are diploid and females are haploid.
(b) males are triploid and females are tetraploid.
(c) males are haploid and females are diploid.
(d) males are tetraploid and females are triploid.

Q98. Which of the following is a style of Carnatic music?

(a) Svarajati
(b) Chaturang
(c) Dhamar
(d) Dhrupad

Q99. Where can you find the options 'From Beginning' and 'From Current Slide' to run a slide show in MS PowerPoint?

(a) Home tab
(b) Slide Sorter tab
(c) Slide Show tab
(d) View tab

Q100. Which of the following statements are true about the positive impact of the Green Revolution (GR) on yield levels in India?

i. During the post GR period, the yield of rice grew at a much faster rate than that of wheat.

ii. GR technology had penetrated more in wheat crop than in the rice crop.

iii. During post GR period, the area under rice achieved a relatively slow growth when compared to the area under wheat.

(a) i, ii and iii
(b) Only i and iii
(c) Only i and ii
(d) Only ii and iii

ANSWER KEY

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

SOLUTIONS

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Q1. Answer: (d) inside Germany, France, Austria, and Italy.

The correct answer is Option 4)

Key Points

• The segment "inside Germany, France, Austria, and Italy" is incorrect.

• The correct preposition to use here is "between" or "among" rather than "inside".

• Switzerland is not located inside these countries but is bordered by them.

• Therefore, the sentence should correctly state: "Switzerland lies between Germany, France, Austria, and Italy."

Hence, the correct answer is 'option 4.'

Q2. Answer: (a) and a Earth is the third

The correct answer is Option 1)

Key Points

• In the first part of the given sentence, the article 'a' is incorrect.

• The correct article to use before the word 'Earth' is 'the' because Earth is a unique object.

• Example: The Earth is the third planet from the Sun.

• Therefore, the article 'a' should be replaced with the article 'the'.

Hence, the correct statement is: There are eight planets in our solar system and the Earth is the third planet from the Sun.

Additional Information

• If a noun is unique or one of a kind, the definite article 'the' is used before it.

• Example: The Sun rises in the east.

• When referring to planets or celestial bodies by name, the definite article 'the' is usually used.

• Example: The Mars rover is sending back data.

Q3. Answer: (d) I cannot agree to you

The correct answer is Option 4)

Key Points

• In the given sentence, the phrase 'agree to you' is incorrect. The correct phrase should be 'agree with you'.

• The verb 'agree' is typically followed by the preposition 'with' when referring to a person.

• Example: I cannot agree with your opinion.

• Therefore, the correct form should be 'agree with you' instead of 'agree to you'.

Hence, the correct answer is: You expressed your opinion very clearly, but I am sorry, I cannot agree with you.

Q4. Answer: (c) has been suffering

The correct answer is Option 3)

Key Points

• The sentence is in the present perfect continuous tense because it describes an action that started in the past and is still continuing.

• The correct form of the verb to use in this case is "has been suffering".

• This tense is used to talk about actions that began in the past and are still continuing at the present moment.

• Example: She has been living in London since 1995.

Hence, the correct statement is: Serena has been suffering from fever since the 5th of this month.

Additional Information

• The present perfect continuous tense is often used with time expressions such as "since" and "for".

• "Since" is used to indicate the starting point of the action, while "for" is used to indicate the duration.

• Example with "for": He has been working here for three years.

Q5. Answer: (d) during

The correct answer is Option 4)

Key Points

• The word "during" is used to indicate the entire time something happens or the period of time something occurs.

• In the context of the sentence, the filming of a scene is a process that takes some duration, hence "during" accurately captures the timeframe when the action (harming animals) is to be considered.

• The phrase "no animals were harmed during the filming" is a standardized declaration typically used in film productions.

• Other options like "from," "around," and "for" do not effectively convey the intended continuity of time associated with the filming process.

• "During" provides a clear, time-bound reference, making it the most appropriate choice for the context of ensuring no animals were harmed while the film was being made.

Therefore, the correct answer is 'Option 4'.

Additional Information

• "From" suggests a starting point but does not fit the idea of the timeframe of filming.

• "Around" refers to something being near or surrounding, which doesn't apply to the timing of filming.

• "For" typically indicates purpose or duration but does not appropriately fit the context here.

Q6. Answer: (a) to

The correct answer is Option 1)

Key Points

• "To" is used to indicate the place, person, or thing that someone or something moves toward, or the direction of something.

• In the context of this sentence, the lipstick is applied "to" the heroines lips, denoting the target or end point where the lipstick is placed.

• The phrase "applied to" is a common collocation, meaning it is a standard and correct usage in the English language.

• Using "to" ensures clarity in meaning, directly stating the action and the destination of the application.

• Prepositions like "on," "upon," and "over" either imply a different type of placement or are not commonly used with the verb "applied" in this context.

• "To" seamlessly fits into the sentence structure, maintaining grammatical correctness and ease of understanding.

Therefore, the correct answer is 'Option 1'.

Additional Information

• "On" suggests a surface placement, but "applied to" is more precise and commonly used.

• "Upon" is an elevated, somewhat archaic form of "on" and doesn't fit modern usage with "applied".

• "Over" implies covering something, which is not the intended meaning in this context.

Q7. Answer: (b) also

The correct answer is Option 2)

Key Points

• "Also" is used to indicate that something is in addition to something else, fitting seamlessly into this sentence.

• The context implies that multiple items in the film studio used animal fats, so "also" appropriately conveys the additional inclusion.

• Using "also" makes it clear that the lipstick wasn't the only product made with animal derivatives, reinforcing the argument of widespread indirect cruelty.

• The pre-existing flow of the sentence discusses one item (the lipstick) and then moves on to mention other items, making "also" the logical connector for addition.

• "Also" ensures the sentence retains its intended meaning, suggesting that animal fats were commonly used across various items in the studio.

• By emphasizing the word, readers understand the extent of animal-derived materials used, thus highlighting the irony of the showbiz environment concerning vegan actors.

Therefore, the correct answer is 'Option 2'.

Additional Information

• "Long" suggests duration or extent, which is irrelevant here.

• "Too" is informal for this specific construction and less precise compared to "also".

• "Least" connotes minimal availability or extent, which contradicts the idea of additional items being involved.

Q8. Answer: (d) confessed

The correct answer is Option 4)

Key Points

• "Confessed" is the simple past tense of the verb "to confess," indicating a completed action in the past.

• The passage is in past tense, as seen with phrases like "were harmed," "was applied," and "were used." Thus, "confessed" maintains this consistency.

• "Confessed" accurately reflects that the actors' admissions about being vegan occurred before the current context of being unaware of their indirect involvement in cruelty.

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• The structure of the sentence suggests that the confession is a point of fact that happened in the past, harmonizing with the past-tense narrative.

• Using "confessed" ensures clarity and maintains the coherence and flow of the passage.

• The simple past tense is typically used in narratives to recount completed actions, making "confessed" the most appropriate for historical statements.

Therefore, the correct answer is 'Option 4'.

Additional Information

• "Are confessing" implies ongoing action, which is unsuitable given the past context.

• "Had confessed" is the past perfect tense, which indicates an action completed before another past action; this adds unnecessary complexity here.

• "Were confessing" suggests a continuous action in the past, which does not fit the point-in-time admission being described.

Q9. Answer: (a) to

The correct answer is Option 1)

Key Points

• " To" is used to indicate effect or relation, which is suitable in this context to show how something negatively impacts something else.

• The phrase “detrimental to” correctly expresses harm or damage towards something, in this case, the ecosystem.

• "To" accurately connects the cause (plastic becoming part of the animal food chain) and effect (detriment to the ecosystem) in a cause-effect relationship.

• This usage fits well within the passage's structure, maintaining clarity and grammatical correctness.

• The term "detrimental to" is a common collocation, meaning it is often used together in similar contexts to indicate harmful effects.

• By using "to," the sentence succinctly conveys the overall negative impact without ambiguity.

Therefore, the correct answer is 'Option 1'.

Additional Information

• "In" suggests location or position, which doesn't express the cause-effect relationship needed here.

• "For" implies purpose or benefit, which is contrary to the intended negative connotation.

• "On" indicates a surface or topic but does not correctly convey the relationship of harm or impact in this context.

Q10. Answer: (b) habit

The solution is in Hindi. Read it online.

Q11. Answer: (d) You always make me do all the trivial stuff.

The solution is in Hindi. Read it online.

Q12. Answer: (b) Pronounciation

The solution is in Hindi. Read it online.

Q13. Answer: (c) Exposing

The solution is in Hindi. Read it online.

Q14. Answer: (c) tomorrow

The solution is in Hindi. Read it online.

Q15. Answer: (b) Scarcity

The solution is in Hindi. Read it online.

Q16. Answer: (a) Retreated

The solution is in Hindi. Read it online.

Q17. Answer: (d) roomy

The solution is in Hindi. Read it online.

Q18. Answer: (d) Incredulous

The solution is in Hindi. Read it online.

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Q19. Answer: (b) keeps a low profile

The solution is in Hindi. Read it online.

Q20. Answer: (b) inglorious

The solution is in Hindi. Read it online.

Q21. Answer: (a) will go

The correct answer is Option 1)

Key Points

• In the given sentence, the verb form should match the conditional structure.

• The sentence uses a future conditional structure "If it is sunny tomorrow," which should be followed by "will" + base form of the verb.

• Hence, the correct form is "will go" instead of just "go."

Hence, the correct statement: If it is sunny tomorrow, we will go for a picnic.

Additional Information

• The future conditional structure in English often follows the pattern "If + present simple, will + base verb."

• Example: If it rains, we will stay indoors.

Q22. Answer: (d) among the three families

The correct answer is '4' i.e. among the three families.

Key Points

• In the given sentence, the underlined segment "between the three families" is incorrect because the preposition "between" is typically used when referring to two entities.

• When referring to more than two entities, the correct preposition is "among".

• Therefore, the correct phrase should be "among the three families".

Hence, the correct answer is option 4.

Correct sentence: There is an old rivalry among the three families for ages.

Additional Information

• The preposition "between" is used to indicate a relationship involving two people or things. For example: "The book is between the two shelves".

• The preposition "among" is used for relationships involving more than two people or things. For example: "She is popular among her friends".

Q23. Answer: (d) pay

The correct answer is Option 4)

Key Points

• The verb "pay" is commonly used with the noun "attention" to form the phrase "pay attention."

• The sentence is instructing students to focus on the instructions given, which fits the usage of "pay attention."

• Options 1, 2, and 3 are grammatically incorrect in this context.

Therefore, the correct answer is "The teacher asked the students to pay attention towards the instructions given for the project."

Additional Information

• Option 1: "make" is incorrect because we do not "make" attention.

• Option 2: "had" is incorrect because it does not fit the sentence structure appropriately.

• Option 3: "keen" is incorrect as "keen attention" is not a standard phrase and does not fit grammatically.

Q24. Answer: (c) Support

The solution is in Hindi. Read it online.

Q25. Answer: (d) a bolt from the blue

The solution is in Hindi. Read it online.

Q26. Answer: (b) J

The logic followed here is :-

From the given two different cubes the adjacent sides are as shown below :

As J is common on both the dice, it is clear that K, P, L, and E are adjacent to it, and the remaining i.e., M will be opposite to it.

Opposite pairs:

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P → E
K → L
J → M
So, the opposite side of "M" will be side "J".
Hence, the correct answer is "J".

Q27. Answer: (d) [figure]

The image embedded in the given figure is as shown below :
Therefore Here, the given figure is embedded in option Figure - 4.
Hence, the correct answer is "Option 4".

Q28. Answer: (d) 233

Logic : Squares of odd number series are added subsequently.
Hence, "233" is the correct answer.

Q29. Answer: (b) (3, 5, 225)

The logic followed here is:
Logic: (1st number)² × (2nd number)² = 3rd number.
Now,
For, (2, 3, 36)
=> (2)² × (3)²
= 4 × 9 = 36.
For, (3, 5, 225)
=> (3)² × (5)²
= 9 × 25 = 225.
Similarly, for (1, 7, 49)
=> (1)² × (7)²
= 1 × 49 = 49.
Hence, the correct answer is "Option 2".

Q30. Answer: (a) Mother's sister

Decoding the Symbols:

Symbol	•	–	×	÷
Meaning	Sister	Brother	Father	Wife

Given: P + Q ÷ R × S − T
P + Q → P is the sister of Q.
Q ÷ R → Q is the wife of R.
R × S → R is the father of S.

S − T → S is the brother of T.
Here, P is the maternal aunt or mother's sister of T.
Hence, the correct answer is "Option 1".

Q31. Answer: (b) [figure]

The image embedded in the given figure is as shown below :
Therefore Here, the given figure is embedded in option Figure - 2.
Hence, the correct answer is "Option 2".

Q32. Answer: (a) DCEE

Given: ABC_C_CC_DCBG_CA
By checking options :
1) DCEE → ABCDCCCCEDCBGECA → (It follows the pattern of) :
2) ECDC → ABCECCCCDDCBGCCA → (It doesn't Follow the pattern)

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3) DCED → ABCDCCCCEDCBGDCA → (It doesn't Follow the pattern)

4) EDCE → ABCECDCCCDCBGECA → (It doesn't Follow the pattern)

So, out of all the options "Option 1" follows the pattern.

Hence, "DCEE" is the correct answer.

Q33. Answer: (c) 21

Given : 47 + 10 × 3 - 32 ÷ 8 = ?

According to the question, after replacing the signs :

'+' and '-' are interchanged

So,

47 - 10 × 3 + 32 ÷ 8 = ?

47 - 10 × 3 + 4 = ?

47 + 4 - 30 = ?

51 - 30 = ?

21 = ?

Hence, "21" is the correct answer.

Q34. Answer: (d) One

Given word: 'ENGLISH'

After arranged in alphabetical order:

Alphabets	E	N	G	L	I	S	H
Alphabetical order	E	G	H	I	L	N	S

Now,

there is One alphabet "E" will remain unchanged if each of the letters in the word 'ENGLISH' is arranged in English alphabetical order.

Hence, the correct answer is "Option 4".

Q35. Answer: (a) 15

The faces opposite to each other are shown below:

=> As the alternate positions become opposite to each other, the remaining two faces become opposite to each other.

So, opposite pairs are:

11 → 12

15 → 16

13 → 14

Therefore, '15' is the opposite of '16'.

Hence, "15" is the correct answer.

Q36. Answer: (b) 30

Given : 20 - 80 × 16 ÷ 5 + 15 = ?

According to the question, after replacing the signs :

'+' and '-' are interchanged

'×' and '÷' are interchanged

So,

20 + 80 ÷ 16 × 5 - 15 = ?

20 + 5 × 5 - 15 = ?

20 + 25 - 15 = ?

45 - 15 = ?

30 = ?

Hence, "30" is the correct answer.

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Q37. Answer: (c) [figure]

The correct mirror image of the given figure is:

Hence, the correct answer is "Option 3".

Q38. Answer: (c) 8008

Given Equation: 100 N 80 G 40 Y 20 M 10 = ?

BODMAS Rule:

Decoding the given information:

Alphabet	Y	N	M	G
Meaning	÷	×	•	•

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

=> 100 × 80 - 40 ÷ 20 + 10 = ?

=> 100 × 80 - 2 + 10 = ?

=> 8000 - 2 + 10 = ?

=> 8010 − 2 = 8008.

Hence, the correct option is "Option 3".

Q39. Answer: (c) ROS

Logic:

Option (1): EBD

Option (2): LIK

Option (3): ROS

Option (4): PMO

Thus, out of all the options "ROS" is the odd one out.

Hence, "Option 3" is the correct answer.

Q40. Answer: (a) 209

Logic : Consecutive multiples of (8) are added subsequently.

Hence, "209" is the correct answer.

Q41. Answer: (b) WTZ

Logic: (4) is added to the position values according to the English alphabetic series.

So,

Hence, "Option 2" is the correct answer.

Q42. Answer: (b) 6

The number of rectangles in the given figure is shown below :

Here, as marked there are a total of 6 rectangles.

Hence, "6" is the correct answer.

Q43. Answer: (c) 9

The logic followed here is: No specific pattern is followed here, random digits are assigned to each letter of the word.

'BILLION' is coded as '3264581'

Letters	I / L / L / I / O / N	B
Codes	3 / 2 / 4 / 5 / 8 / 1	6

And,

'MILLION' is coded as '3249581'

Letters	I / L / L / I / O / N	M
Codes	3 / 2 / 4 / 5 / 8 / 1	9

Therefore it can be concluded that :

M is coded as → 9

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So, the code for 'M' is '9'.

Hence, "Option 3" is the correct answer.

Q44. Answer: (c) 342

The logic followed here is: √(1st number - 1) = cbrt(2nd number + 1)

So,

10 : 26

√(10 - 1) = cbrt(26 + 1)

√9 = cbrt27

3 = 3 (LHS = RHS)

Similarly,

50 : ?

√(50 - 1) = cbrt(? + 1)

√49 = cbrt(? + 1)

$(7)^3 - 1 = ?$

343 - 1 = ?

342 = ?

Hence, "Option 3" is the correct answer.

Q45. Answer: (c) 88

Logic : (16) is added to each number subsequently.

Hence, "88" is the correct answer.

Q46. Answer: (c) Only conclusion II follows

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

Conclusions:

I. Some charts are files → Does not follow (As some charts are notebooks and some notebooks are files. So it is possible but not definite)

II. All papers being notebooks is a possibility → Follow (As all papers are charts and some charts are notebooks. As whole papers comes in charts which has some parts common with notebooks therefore all papers can be notebooks is true.)

Therefore Here, Only conclusion II follow.

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

Q47. Answer: (a) Diverse : Varied

The logic followed here is:

Logic: Synonyms

Here,

Engage and Involve are synonyms, meaning they have similar meanings.

Similarly,

Diverse and Varied are synonyms, meaning they have similar meanings.

Hence, the correct answer is "Option 1".

Q48. Answer: (c) [figure]

The logic followed here is :

1) First box alternate series → Bottom element interchange positions and rest of the elements interchange positions diagonally.

2) Second box alternate series → First column elements shift in the clockwise direction, rest elements shift in an anticlockwise direction, and the bottom right corner element is replaced by a new element.

Thus, the final series is :

Hence, "Option 3" is the correct answer.

Q49. Answer: (d) Saturday

Given: 19 February 2004 was Thursday.

Now,

2004 to 2019 = 15 Years (11 Ordinary Years and 4 Leap Years).

And, In 15 Years = 4 Leap years and 11 Ordinary Years.

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So, 4 Leap Years have 8 odd days,
And, 11 Ordinary Years have 11 odd days.
Total odd days = 8 + 11 = 19.
19 odd days → 19/7 = 2 weeks and 5 odd days.
then, 19 February 2019 will be Thursday + 5 = Tuesday.
Now, the number of days between 19 February 2019 to 2 March 2019
= 9(February) + 2(March) = 11 days.
= 11 days → 11/7 = 1 week and 4 odd days.
So, 2 March 2019 will be Tuesday + 4 = Saturday.
Hence, the correct answer is "Option 4".

Q50. Answer: (d) KNKM

Logic: Increasing number series is subtracted from the position values according to the English alphabetic series.
So,
JNLO is related to ILIK

And,
NRPS is related to MPMO

Similarly,
LPNQ is related to

Hence, "Option 4" is the correct answer.

Q51. Answer: (a) 21 1/3

Given:
A trader buys 500 kg cotton for Rs. 8,000. 10% of this cotton is spoiled due to rain. He wants to earn a 20% profit.
Formula Used:
Profit Percentage (P%) = (Profit / Cost Price) × 100
Selling Price (SP) = Cost Price (CP) + Profit
Calculation:
Total cotton = 500 kg
=> Cost Price (CP) = Rs. 8,000
=> Spoiled cotton = 10% of 500 kg = 0.10 × 500 = 50 kg
=> Usable cotton = 500 kg - 50 kg = 450 kg
=> Desired Profit = 20%
=> Desired Profit Amount = 20% of Rs. 8,000 = 0.20 × 8,000 = Rs. 1,600
=> Total Selling Price (SP) = CP + Profit = Rs. 8,000 + Rs. 1,600 = Rs. 9,600
=> Selling Price per kg = Total SP / Usable cotton
=> Selling Price per kg = Rs. 9,600 / 450 kg
=> Selling Price per kg = Rs. 21 (1/3)
Therefore The correct answer is option 1.

Q52. Answer: (c) 20

Formula Used:
N = $a^p \times b^q \times c^r$
The total number of factors = $(p + 1) \times (q + 1) \times (r + 1)$
Calculation:
When 732 is divided by a positive integer x, the remainder is 12. So,
732 – 12 = 720
So 720 will be completely divisible by x
$720 = 2^4 \times 3^2 \times 5^1$
Total number of factors of 720 = $(4 + 1) \times (2 + 1) \times (1 + 1) = 5 \times 3 \times 2 = 30$

Number of factors 12 or less than 12 are (10) = 1, 2, 3, 4, 5, 6, 8, 9, 10, 12

So x cannot have these values because x is greater than 12

So, we can say that there are 30 - 10 = 20 possible values of x

Q53. Answer: (b) 217404 cm3

Shortcut Trick

For a covered box, outer dimensions = inner dimensions + (2 × thickness).

Outer L, B, H = (128+11), (90+11), (25+11) = 139, 101, 36 cm.

Volume of wood = Outer Volume − Inner Volume.

Volume = (139 × 101 × 36) − (128 × 90 × 25) = 505404 − 288000.

Therefore The correct answer is 217404 cm^3.

Alternate Method

Given:

Inner Length (l) = 128 cm, Inner Breadth (b) = 90 cm, Inner Height (h) = 25 cm.

Thickness of wood (t) = 5.5 cm.

Formula Used:

Volume of wood = (Outer Length × Outer Breadth × Outer Height) − (Inner Length × Inner Breadth × Inner Height)

Calculations:

=> Total increase in each dimension = 2 × 5.5 = 11 cm

=> Outer Length (L) = 128 + 11 = 139 cm

=> Outer Breadth (B) = 90 + 11 = 101 cm

=> Outer Height (H) = 25 + 11 = 36 cm

=> Inner Volume = 128 × 90 × 25 = 288000 cm^3

=> Outer Volume = 139 × 101 × 36 = 505404 cm^3

=> Volume of Wood = 505404 − 288000 = 217404 cm^3

Therefore The correct answer is 217404 cm^3.

Additional Information

Volume of a Cuboid

The volume of a rectangular cuboid is calculated as Length × Breadth × Height.

Open vs. Closed Box

For a closed box, add 2 × thickness to all dimensions. For an open box, add 2 × thickness to L and B, but only 1 × thickness to the Height.

Total Surface Area

The total surface area of a cuboid is 2(lb + bh + hl), where l, b, and h are its dimensions.

Q54. Answer: (c) 2

Calculation:

Sum of all categories in 1989 = 46 + 31 + 73 = 150

Sum of all categories in 1990 = 47 + 39 + 77 = 163

Sum of all categories in 1991 = 45 + 45 + 80 = 170

Sum of all categories in 1992 = 44 + 50 + 80 = 174

In 1991 is increase the revenue from 1989 and 1990

In 1992 is increase revenue from 1990, 1991, and 1992

According to the question,

1991 and 1992 was an increase the revenue from at least two categories.

Therefore The required answer is 2.

Q55. Answer: (c) 3

Calculation:

The average of demand of buses of all companies

=> (150 + 145 + 160 + 165 + 155)/5

=> 155

According to the question,

The number of companies whose production of buses is equal to or more than the average demand of buses of all five companies

Companies A, C, and D are equal and more than average demand of buses of all five companies.

Therefore The correct answer is 3.

Q56. Answer: (c) 216 cm3

Given:

Lateral surface area of a cube = 144 cm^2

Concept:

The lateral surface area of a cube is given by $4a^2$, where 'a' is the length of a side of the cube.

Formula Used:

Volume of a cube = a^3

Calculation:

We have,

=> $4a^2 = 144\ cm^2$

=> $a^2 = 144\ cm^2 / 4$

=> $a^2 = 36\ cm^2$

=> $a = \sqrt{36}$ cm

=> a = 6 cm

Volume of the cube,

=> $a^3 = 6^3\ cm^3$

=> $a^3 = 216\ cm^3$

Therefore The volume of the cube is 216 cm^3.

Q57. Answer: (c) 12 days

Shortcut Trick

Let T be the total duration of the work (time Hari worked).

Fractional work equation: (Rohan time ÷ Rohan total) + (Hari time ÷ Hari total) = 1.

(3 ÷ 12) + (T ÷ 16) = 1

1/4 + T/16 = 1 => T/16 = 3/4.

T = (3 × 16) ÷ 4 = 12 days.

Therefore The correct answer is 12 days.

Alternate Method

Given: Rohan alone = 12 days, Hari alone = 16 days. They work together for 3 days.

Formula: Efficiency = Total Work ÷ Time taken.

Person	Days	Total Work	Efficiency
Rohan	12	48	4
Hari	16	3	

=> Total Work = LCM of 12 and 16 = 48 units.

=> Combined efficiency of Rohan and Hari = 4 + 3 = 7 units/day.

=> Work done in 3 days = 7 × 3 = 21 units.

=> Remaining work = 48 − 21 = 27 units.

=> Time taken by Hari alone to finish remaining work = 27 ÷ 3 = 9 days.

=> Total time to complete work = Initial 3 days + Hari's 9 days = 12 days.

Therefore The correct answer is 12 days.

Additional Information

Work and Efficiency Relationship

Efficiency is inversely proportional to time. If a person is twice as efficient as another, they take half the time to complete the same work.

Work and Wages

Wages are always distributed according to the ratio of the actual work done by each individual (Efficiency × Time).

Pipes and Cisterns

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This follows the same logic as Time and Work, where an outlet pipe (leak) has negative efficiency and reduces the total work done.

Q58. Answer: (b) 5

Shortcut Trick

Sum of digits of 6428A83 = 6 + 4 + 2 + 8 + A + 8 + 3 = 31 + A.

According to the Divisibility Rule of 9, the sum of digits must be a multiple of 9.

The nearest multiple of 9 after 31 is 36.

31 + A = 36 => A = 5.

Therefore The correct answer is 5.

Alternate Method

Given number: 6428A83

Property: A number is divisible by 9 only if the sum of its digits is divisible by 9.

=> Sum = 6 + 4 + 2 + 8 + A + 8 + 3

=> Sum = 31 + A

=> For the number to be divisible by 9, (31 + A) ÷ 9 must leave a remainder of 0.

=> Multiples of 9 are 9, 18, 27, 36, 45, ...

=> Since A is a single digit (0 to 9), the only possible value for 31 + A is 36.

=> 31 + A = 36

=> A = 36 − 31

=> A = 5

Therefore The correct answer is 5.

Additional Information

Divisibility Rule of 3

Similar to 9, a number is divisible by 3 if the sum of its digits is a multiple of 3.

Divisibility Rule of 11

A number is divisible by 11 if the difference between the sum of digits at odd places and the sum of digits at even places is either 0 or a multiple of 11.

Digital Root Concept

The digital root of a number is the single-digit sum obtained by adding digits repeatedly. For any number divisible by 9, the digital root is always 9.

Q59. Answer: (c) 9.52

Shortcut Trick

Ratio of Radii (R : r) = 3 : 1

Ratio of CSA (C1 : C2) = 350 : 100 = 3.5 : 1

Ratio of Heights (H : h) = (C1/R) : (C2/r) = (3.5/3) : (1/1) = 3.5 : 3

Ratio of Volumes (V1 : V2) = (R^2 × H) : (r^2 × h) = (3^2 × 3.5) : (1^2 × 3) = 31.5 : 3

Required percentage = (3 ÷ 31.5) × 100 = (1 ÷ 10.5) × 100 ≈ 9.52%

Therefore The correct answer is 9.52.

Alternate Method

Given:

=> Radius ratio of Larger (R) to Smaller (r) cylinder = 3 : 1

=> CSA of Larger cylinder (C_L) = 350% of CSA of Smaller cylinder (C_S)

Formula Used:

=> Curved Surface Area (CSA) = 2πrh

=> Volume (V) = $\pi r^2 h$

Calculations:

=> Let R = 3x and r = x

=> $C_L = 3.5 \times C_S$

=> $2\pi RH = 3.5 \times 2\pi rh$

=> $3x \times H = 3.5 \times x \times h$

=> H/h = 3.5/3 = 7/6

=> Volume of Larger Cylinder (V_L) = $\pi R^2H = \pi(3x)^2(7/6)h = \pi(9x^2)(7/6)h = 10.5\pi x^2h$

=> Volume of Smaller Cylinder (V_S) = $\pi r^2h = \pi x^2h$

=> Percentage = (V_S / V_L) × 100

=> Percentage = (πx^2h / $10.5\pi x^2h$) × 100 = 100 / 10.5

=> Percentage = 1000 / 105 ≈ 9.52%

Therefore The correct answer is 9.52.

Additional Information

Cylinder Properties

Total Surface Area (TSA) of a cylinder = $2\pi r(h + r)$. It includes both the curved surface and the two circular bases.

Volume and CSA Relationship

The volume of a cylinder can also be expressed as Volume = (CSA × r) ÷ 2. This is useful when CSA and radius are known.

Ratio Scaling

If radius is scaled by 'k' and height by 'm', the CSA scales by (k × m) and the volume scales by (k^2 × m).

Q60. Answer: (b) 13 : 16

Shortcut Trick

Assume the third number is 100.

Then the first number becomes 130 and the second number becomes 160.

The required ratio is 130 : 160.

Simplified ratio => 13 : 16.

Therefore The correct answer is 13 : 16.

Alternate Method

Given:

Increase in first number = 30%

Increase in second number = 60%

Let the third number be x.

=> First number = x + 30% of x = 1.3x

=> Second number = x + 60% of x = 1.6x

=> Ratio = First number / Second number

=> Ratio = 1.3x / 1.6x

=> Ratio = 13 / 16

Therefore The correct answer is 13 : 16.

Additional Information

Percentage Increase Formula

New Value = Original Value × (1 + Rate/100). In this case, the third number acts as the original base.

Ratio Simplification

To simplify a ratio a : b, divide both terms by their Highest Common Factor (HCF) to get the simplest form.

Comparing Percentages

When multiple values are compared to a common reference, that reference is often assumed as 100 for easier calculation.

Q61. Answer: (d) 11 : 9

Given:

Tea worth Rs. 27 per kg and Rs. 31 per kg

Selling price of the mixture to gain 25% = Rs. 36 per kg

Concept:

We use the concept of alligation to find the ratio in which two varieties must be mixed.

Formula Used:

Alligation rule:

If two ingredients are mixed, then the ratio of the quantities of the two ingredients is given by:

=> (C_1 - C_m) : (C_m - C_2)

where C_1 and C_2 are the costs of the two ingredients, and C_m is the mean cost of the mixture.

Calculation:

Let the cost price of the mixture be C_m.

Given selling price of mixture = Rs. 36 per kg

Gain = 25%

=> Cost price of mixture (C_m) = Selling price / (1 + Gain)

=> C_m = 36 / (1 + 0.25)

=> C_m = 36 / 1.25

=> C_m = 28.8

Using the alligation rule:

=> (C1 - C_m) : (C_m - C2)

=> (31 - 28.8) : (28.8 - 27)

=> 2.2 : 1.8

=> 11 : 9

Therefore The correct answer is option 4 (11 : 9).

Q62. Answer: (b) Sodium

Calculation:

Export of Unit Li-ion = 20000 × 30%

=> 6000

Export of Unit Sodium = 20000 × 2%

=> 400

Export of Unit M-Air = 20000 × 20%

=> 4000

Export of Unit Lead Acid = 20000 × 35%

=> 7000

Export of Unit S - Capacitor = 20000 × 13%

=> 2600

Revenue of Li-ion = 2500000 × 35%

=> 875000

Revenue of Sodium = 2500000 × 5%

=> 125000

Revenue of M-Air = 2500000 × 20%

=> 500000

Revenue of Lead Acid = 2500000 × 25%

=> 625000

Revenue of S - Capacitor = 2500000 × 15%

=> 375000

According to the question,

Revenue of battery per unit export

Li-ion = 875000/6000 = 145.83

Sodium = 125000/400 = 312.5

M-Air = 500000/4000 = 125

Lead Acid = 625000/7000 = 89.28

S - Capacitor = 375000/2600 = 144.23

Therefore The highest revenue per unit of export is Sodium.

Q63. Answer: (c) 40000

Given:

10% of the voters did not cast their votes and 5% of the votes polled were found invalid. The successful candidate got 52.5% of the valid votes and won by a majority of 1710 votes.

Concept Used:

Calculate the total number of voters enrolled based on the given percentages and majority votes.

Calculation:

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Let the total number of voters enrolled be x.
10% of the voters did not vote:
=> Voters who did not vote = 0.10x
=> Voters who voted = x - 0.10x = 0.90x
5% of the votes polled were invalid:
=> Invalid votes = 0.05 × 0.90x = 0.045x
=> Valid votes = 0.90x - 0.045x = 0.855x
The successful candidate got 52.5% of the valid votes:
=> Votes received by successful candidate = 0.525 × 0.855x = 0.448875x
Let the votes received by the other candidate be y.
=> Total valid votes = Votes received by successful candidate + Votes received by the other candidate
=> 0.855x = 0.448875x + y
=> y = 0.855x - 0.448875x = 0.406125x
The majority is 1710 votes:
=> 0.448875x - 0.406125x = 1710
=> 0.04275x = 1710
=> x = 1710/0.04275
=> x = 40000
Therefore The number of voters enrolled on the voters list was 40000.

Q64. Answer: (c) 181 9/11 metres

Given:
In a 2 km linear race, if P completes the race in 200 second and Q in 220 seconds
Formula Used:
Speed = Distance/Time
Calculation:
Distance = 2000m or 2 km
Speed of P = 2000/200
=> 10 m/sec
Speed of Q = 2000/220
=> 100/11 m/sec
Distance cover by P in 10 Sec
D = 10/11 × 200 = 181 9/11 meters
Therefore The correct answer is 181 9/11 m.

Q65. Answer: (d) 12%

Given:
The marked price (MP) of an item is 1.4 times the cost price (CP).
To earn a 23.2% profit, we need to find the discount percentage.
Concept:
Profit percentage (Profit%) = (Selling Price (SP) - Cost Price (CP)) / CP × 100
Discount percentage (Discount%) = (Marked Price (MP) - Selling Price (SP)) / Marked Price (MP) × 100
Calculation:
Let the Cost Price (CP) be 100 units.
=> Marked Price (MP) = 1.4 × CP
=> MP = 1.4 × 100 = 140 units
Profit% is 23.2%:
=> Profit = (SP - CP) / CP × 100
=> 23.2 = (SP - 100) / 100 × 100
=> 23.2 = SP - 100
=> SP = 123.2 units
Now, we calculate the discount percentage:

=> Discount% = (MP - SP) / MP × 100

=> Discount% = (140 - 123.2) / 140 × 100

=> Discount% = 16.8 / 140 × 100

=> Discount% = 0.12 × 100

=> Discount% = 12%

Therefore The correct answer is option 4.

Q66. Answer: (c) Increased, 36.4%

Shortcut Trick

Let initial Income be 100, so Savings = 45 and Expenditure = 55.

New Income = 100 + 200 = 300.

New Savings = 5 × 45 = 225.

New Expenditure = 300 − 225 = 75.

% Increase in Expenditure = (75 − 55) / 55 × 100 = 20 / 55 × 100 ≈ 36.4%.

Therefore The correct answer is Increased, 36.4%.

Alternate Method

Given:

Initial Savings = 45% of Income

Income increase = 200%

Final Savings = 5 × Initial Savings

Formula Used:

Income = Expenditure + Savings

Percentage Change = (Final − Initial) / Initial × 100

Calculations:

=> Let Initial Income = 100

=> Initial Savings (S1) = 45% of 100 = 45

=> Initial Expenditure (E1) = 100 − 45 = 55

=> New Income (I2) = 100 + (200% of 100) = 100 + 200 = 300

=> New Savings (S2) = 5 × 45 = 225

=> New Expenditure (E2) = 300 − 225 = 75

=> Increase in Expenditure = 75 − 55 = 20

=> Percentage Increase = (20 / 55) × 100

=> Percentage Increase = 400 / 11 ≈ 36.36% ≈ 36.4%

Therefore The correct answer is Increased, 36.4%.

Additional Information

Income-Expenditure Relationship

The fundamental relation is Income = Expenditure + Savings. Any change in one variable must be balanced by the others.

Percentage Increase vs "Increase by X times"

An increase of 200% means the new value is 300% of the original (Multiplier = 3). "Increases by 5 times" can sometimes be interpreted as the new value being 5 times the old one or adding 5 times the old value to itself.

Successive Percentage Change

If a value changes by a% then by b%, the net change is [a + b + (ab/100)]%, though in Income-Expenditure problems, simple linear addition of components is used.

Q67. Answer: (c) 2

Shortcut Trick

When two circles with radii R and r touch each other externally, the length of their direct common tangent (LM) is given by the formula:

LM = √(4 × R × r)

Substituting the given values: 12 = √(4 × 18 × r)

=> 12 = √(72 × r)

Squaring both sides: 144 = 72 × r => r = 2 cm.

Therefore The correct answer is 2 cm.

Alternate Method

Given:

=> Radius of the bigger circle (R) = 18 cm

=> Length of the common tangent (LM) = 12 cm

=> The two circles touch each other externally.

Formula Used:

For two circles touching each other externally, the distance between their centres is d = R + r.

The length of their direct common tangent (LM) is:

LM = √(d2 − (R − r)2)

Calculations:

Substituting d = R + r into the tangent formula:

=> LM = √((R + r)2 − (R − r)2)

Since (a + b)2 − (a − b)2 = 4ab, the expression simplifies to:

=> LM = √(4 × R × r)

Now, substitute the known values LM = 12 cm and R = 18 cm:

=> 12 = √(4 × 18 × r)

=> 12 = √(72 × r)

Squaring both sides of the equation to eliminate the square root:

=> 122 = 72 × r

=> 144 = 72 × r

Solving for r (radius of the smaller circle):

=> r = 144 ÷ 72

=> r = 2 cm

Therefore The correct answer is 2 cm.

Additional Information

Direct Common Tangent (DCT)

The length of the direct common tangent for two circles with radii R and r separated by center distance d is given by √(d2 − (R − r)2).

Transverse Common Tangent (TCT)

The length of the transverse common tangent is given by √(d2 − (R + r)2), which only exists when the circles do not overlap (d > R + r).

Circles Touching Externally

When two circles touch externally, d = R + r. In this configuration, there are exactly three common tangents: two direct common tangents of equal length √(4Rr), and one transverse common tangent of length zero at the point of contact.

Q68. Answer: (b) 21

Given:

Chords AB and CD intersect at point L.

AL = 9 cm, LB = 7 cm, LD = 3 cm

Concept:

When two chords intersect inside a circle, the products of the lengths of the segments of each chord are equal.

Formula Used:

If two chords AB and CD intersect at L, then:

AL × LB = CL × LD

Calculation:

We have,

=> AL = 9 cm, LB = 7 cm, LD = 3 cm

=> AL × LB = CL × LD

=> 9 × 7 = CL × 3

=> 63 = 3 × CL

=> CL = 63 ÷ 3

=> CL = 21 cm

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Therefore The correct answer is option 2.

Q69. Answer: (b) 3

Given:

Principal (P) = Rs. 7,200

Amount (A) = Rs. 8,928

Rate of Interest (R) = 8% per annum

Concept:

Simple Interest (SI) is calculated using the formula:

SI = P × R × T / 100

Here, we need to find the time (T) in years.

Formula Used:

SI = A - P

SI = P × R × T / 100

By rearranging the formula to find T:

T = (SI × 100) / (P × R)

Calculation:

We have,

=> SI = A - P

=> SI = 8,928 - 7,200

=> SI = 1,728

Now, using the formula for T:

=> T = (SI × 100) / (P × R)

=> T = (1,728 × 100) / (7,200 × 8)

=> T = 172,800 / 57,600

=> T = 3

Therefore The correct answer is option 2, i.e., 3 years.

Q70. Answer: (c) 120

Given:

The hypotenuse of a right triangle is 6 m more than twice the shortest side. The third side is 2 m less than the hypotenuse.

Concept:

In a right triangle, the relationship between the sides is given by the Pythagorean theorem: $a^2 + b^2 = c^2$, where c is the hypotenuse.

Formula Used:

Pythagorean theorem: $a^2 + b^2 = c^2$

Area of the triangle: (1/2) × base × height

Calculation:

Let the shortest side be x m.

The hypotenuse = 2x + 6 m

The third side = (2x + 6) - 2 = 2x + 4 m

Using the Pythagorean theorem:

=> $x^2 + (2x + 4)^2 = (2x + 6)^2$

=> $x^2 + (4x^2 + 16x + 16) = (4x^2 + 24x + 36)$

=> $x^2 + 4x^2 + 16x + 16 = 4x^2 + 24x + 36$

=> $5x^2 + 16x + 16 = 4x^2 + 24x + 36$

=> $x^2 - 8x - 20 = 0$

Solving the quadratic equation $x^2 - 8x - 20 = 0$:

=> x = [8 ± sqrt((8)² - 4 × 1 × (-20))]/2 × 1

=> x = [8 ± sqrt(64 + 80)]/2

=> x = [8 ± sqrt(144)]/2

=> x = [8 ± 12]/2

=> x = 10 m (taking the positive value)

Hence, the shortest side is 10 m.
The hypotenuse = 2x + 6 = 2 × 10 + 6 = 26 m
The third side = 2x + 4 = 2 × 10 + 4 = 24 m
Area of the triangle:
=> (1/2) × base × height
=> (1/2) × 10 × 24
=> 120 m²
Therefore The area of the triangle is 120 m².

Q71. Answer: (d) 12 cm, 12√3 cm, 24 cm

Given:
The angles of the triangle are in the ratio 2 : 4 : 6 and its circumradius is 12 cm.
Concept:
For a triangle with circumradius R and angles A, B, C, the sides opposite to these angles a, b, c can be found using the formula:
Formula Used:
a = 2R sin A
b = 2R sin B
c = 2R sin C
Calculation:
First, find the angles of the triangle:
=> Let the angles be 2x, 4x, 6x
=> 2x + 4x + 6x = 180°
=> 12x = 180°
=> x = 15°
Thus, the angles are:
=> A = 2x = 30°
=> B = 4x = 60°
=> C = 6x = 90°
Now, use the circumradius R = 12 cm to find the sides:
=> a = 2 × 12 × sin 30°
=> a = 24 × 1/2
=> a = 12 cm
=> b = 2 × 12 × sin 60°
=> b = 24 × √3/2
=> b = 12√3 cm
=> c = 2 × 12 × sin 90°
=> c = 24 × 1
=> c = 24 cm
Therefore The lengths of the sides of the triangle are 12 cm, 12√3 cm, and 24 cm.

Q72. Answer: (a) 5000000

Given:
Illiterate female count in state C = 4,40,000
Illiterate ratio (M : F) in state C = 3 : 2
Concept:
Use the given ratio to find the total number of illiterate people, then use the literacy percentage to find the total population.
Formula Used:
Total illiterate population = Illiterate male + Illiterate female
Total population = Total illiterate population / (1 - Literacy percentage)
Calculation:
We have, illiterate female count = 4,40,000
Illiterate ratio (M : F) = 3 : 2

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=> Let the number of illiterate males be 3x and females be 2x
=> 2x = 4,40,000
=> x = 4,40,000 / 2
=> x = 2,20,000
=> Number of illiterate males = 3x = 3 × 2,20,000
=> Number of illiterate males = 6,60,000
=> Total illiterate population = 6,60,000 + 4,40,000
=> Total illiterate population = 11,00,000
Literacy percentage in state C = 78%
=> Illiteracy percentage = 100% - 78% = 22%
=> Total population = Total illiterate population / Illiteracy percentage
=> Total population = 11,00,000 / 0.22
=> Total population = 50,00,000
Therefore The total population in state C is 50,00,000.

Q73. Answer: (c) 94 cm2

Shortcut Trick
For a cuboid, the Total Surface Area (TSA) is equal to twice the sum of the areas of its three adjacent faces.
Adjacent face areas (x, y, z) = 5 cm², 15 cm², and 27 cm².
Total Surface Area = 2 × (x + y + z)
Total Surface Area = 2 × (5 + 15 + 27) = 2 × 47 = 94 cm².
Therefore The correct answer is 94 cm².
Alternate Method
Given:
Area of face 1 (length × width) = 5 cm²
Area of face 2 (width × height) = 15 cm²
Area of face 3 (length × height) = 27 cm²
Formula Used:
Total Surface Area of a cuboid = 2(lw + wh + lh)
Calculations:
=> Let the three adjacent face areas be A1, A2, and A3.
=> A1 = 5 cm², A2 = 15 cm², A3 = 27 cm²
=> Total Surface Area = 2 × (A1 + A2 + A3)
=> Total Surface Area = 2 × (5 + 15 + 27)
=> Total Surface Area = 2 × 47
=> Total Surface Area = 94 cm²
Therefore The correct answer is 94 cm².
Additional Information
Volume from Face Areas
The volume (V) of a cuboid with adjacent face areas x, y, and z is given by V = √(x × y × z).
Diagonal of a Cuboid
The length of the longest diagonal is calculated using the formula D = √(l² + w² + h²).
Lateral Surface Area
The Lateral Surface Area (LSA), which excludes the top and bottom faces, is given by 2h(l + w).

Q74. Answer: (c) 3

Shortcut Trick
Divide the first term by sin α to convert it into cot α.
(P cot α − Q) ÷ (P cot α + Q) = (P × (P/Q) − Q) ÷ (P × (P/Q) + Q) = (P² − Q²) ÷ (P² + Q²).
The total expression becomes [(P² − Q²) ÷ (P² + Q²)] − [(P² − Q²) ÷ (P² + Q²)] + 3.
The identical fraction terms cancel each other out, leaving only the constant.
Therefore The correct answer is 3.

Alternate Method

Given: cot α = P/Q

Formula Used: cot α = cos α ÷ sin α

=> Let the expression be E = [(P cos α − Q sin α) ÷ (P cos α + Q sin α)] − [(P² − Q²) ÷ (P² + Q²)] + 3

=> Divide the numerator and denominator of the first term by sin α:

=> Term 1 = [P(cos α ÷ sin α) − Q(sin α ÷ sin α)] ÷ [P(cos α ÷ sin α) + Q(sin α ÷ sin α)]

=> Term 1 = (P cot α − Q) ÷ (P cot α + Q)

=> Substitute cot α = P/Q into Term 1:

=> Term 1 = [P × (P/Q) − Q] ÷ [P × (P/Q) + Q]

=> Term 1 = [(P² − Q²) ÷ Q] ÷ [(P² + Q²) ÷ Q]

=> Term 1 = (P² − Q²) ÷ (P² + Q²)

=> Substitute Term 1 back into the original expression E:

=> E = [(P² − Q²) ÷ (P² + Q²)] − [(P² − Q²) ÷ (P² + Q²)] + 3

=> E = 0 + 3 = 3

Therefore The correct answer is 3.

Additional Information

Trigonometric Ratio Identities

Fundamental identities include tan α = sin α ÷ cos α and cot α = cos α ÷ sin α = 1 ÷ tan α.

Pythagorean Identity

For any angle α, sin²α + cos²α = 1, which implies cos α = P ÷ √(P²+Q²) and sin α = Q ÷ √(P²+Q²) based on the right triangle.

Componendo and Dividendo Rule

If a ÷ b = c ÷ d, then (a + b) ÷ (a − b) = (c + d) ÷ (c − d). This is often used to simplify ratio-based trigonometric equations.

Q75. Answer: (b) 35

Shortcut Trick

Sum of Length (L) and Breadth (B) = Perimeter ÷ 2 = 110 ÷ 2 = 55 m.

Difference between Length and Breadth (L − B) = 15 m.

To find the larger value (Length), use the formula: (Sum + Difference) ÷ 2.

=> Length = (55 + 15) ÷ 2 = 70 ÷ 2 = 35 m.

Therefore The correct answer is 35 m.

Alternate Method

Given:

Perimeter of the rectangular park = 110 m

Length (L) exceeds Breadth (B) by 15 m → L = B + 15

Formula used:

Perimeter of a rectangle = 2 × (Length + Breadth)

Calculations:

=> 2 × (L + B) = 110

=> L + B = 110 ÷ 2

=> L + B = 55

=> Substituting L = B + 15 in the equation:

=> (B + 15) + B = 55

=> 2B + 15 = 55

=> 2B = 55 − 15

=> 2B = 40

=> B = 20 m

=> Length (L) = B + 15 = 20 + 15 = 35 m

Therefore The correct answer is 35 m.

Additional Information

Area of Rectangle

The total space occupied by the rectangle is given by Area = Length × Breadth. For this park, Area = 35 × 20 = 700 m².

Diagonal of Rectangle

The distance between opposite corners is calculated using the Pythagoras theorem: Diagonal = $\sqrt{(L^2 + B^2)}$.

Semi-Perimeter

The sum of one length and one breadth (L + B) is known as the semi-perimeter, which is exactly half of the total perimeter.

Q76. Answer: (c) a secular state

The correct answer is a secular state

Key Points

• The Preamble of the Constitution of India describes the country as a sovereign, socialist, secular, and democratic republic.

• The term secular indicates that the state has no official religion and treats all religions equally.

• This reflects the commitment of the Indian Constitution to maintain religious neutrality and ensure freedom of religion for all citizens.

• The Preamble serves as an introduction to the Constitution and sets forth the guiding principles and philosophy of the document.

Additional Information

• The Constitution of India was adopted by the Constituent Assembly on 26th November 1949 and came into effect on 26th January 1950.

• It establishes the framework for the political principles, structures, procedures, powers, and duties of government institutions, and sets out fundamental rights, directive principles, and the duties of citizens.

• The Preamble reflects the aspirations and values of the people of India, including justice, liberty, equality, and fraternity.

• The inclusion of the word "secular" in the Preamble was made through the 42nd Amendment Act of 1976.

• The Preamble is considered a part of the Constitution and is used to interpret ambiguous areas of the law.

Q77. Answer: (a) Ministry of Petroleum and Natural Gas

The correct answer is Ministry of Petroleum and Natural Gas

Key Points

• Oil India Limited (OIL) is under the administrative structure of the Ministry of Petroleum and Natural Gas.

• The Ministry of Petroleum and Natural Gas is responsible for the exploration, production, refining, distribution, marketing, import, export, and conservation of petroleum, natural gas, and petroleum products.

• OIL is a government-owned company that plays a crucial role in the energy sector of India, focusing on the exploration, development, and production of crude oil and natural gas.

• The Ministry oversees various public sector undertakings (PSUs) related to petroleum and natural gas, ensuring the energy security of the country.

Additional Information

• The Ministry of Petroleum and Natural Gas was formed in 1947 and has since played a significant role in the development of the petroleum industry in India.

• The Ministry's responsibilities include policy formulation, coordination, and regulation of the petroleum and natural gas industries in India.

• It works towards ensuring the availability of petroleum products at reasonable prices and promotes the conservation of petroleum products.

• The Ministry is also involved in international cooperation and partnership in the energy sector to enhance India's energy security.

• OIL, under the Ministry's guidance, has expanded its operations both domestically and internationally, contributing significantly to India's energy needs.

Q78. Answer: (c) Supreme Court

The correct answer is Supreme Court

Key Points

• The Supreme Court of India emphasized that the country cannot have a parallel judicial system - one for the rich and the other for the poor.

• This statement underscores the importance of equality before the law and the need for a uniform judicial system that serves all citizens equally, regardless of their socio-economic status.

• The Supreme Court is the highest judicial forum and final court of appeal under the Constitution of India, and it has the power of judicial review.

• The Court's decision reflects its role in upholding the Constitution and ensuring justice is accessible to everyone.

Additional Information

• The Supreme Court of India was established on 28th January 1950, two days after the Constitution of India came into effect.

• It comprises the Chief Justice of India and a maximum of 33 other judges, appointed by the President of India.

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• The Supreme Court's primary function is to interpret the Constitution and adjudicate disputes between the central government and state governments or between two or more states.

• The Court also has the authority to hear appeals against the judgments of lower courts and tribunals.

• Through its judgments, the Supreme Court plays a crucial role in the development of constitutional law and the protection of fundamental rights in India.

Q79. Answer: (b) Uday Shankar

The correct answer is Uday Shankar

Key Points

• Uday Shankar is known as the Father of Modern Dance in India.

• He was a pioneer in adapting Western theatrical techniques to Indian classical dance forms, creating a new genre of modern Indian dance.

• Uday Shankar's innovative approach combined elements of Indian classical dance, folk traditions, and Western ballet, making dance accessible to a broader audience.

• His contributions significantly influenced the development of contemporary dance in India.

Additional Information

• Uday Shankar was born on 8th December 1900, in Udaipur, Rajasthan, India.

• He studied at the Royal College of Art in London, where he was introduced to Western art forms.

• In 1930, he established the Uday Shankar India Cultural Centre in Almora, which became a hub for training and innovation in Indian dance and music.

• He was awarded the Padma Vibhushan, India's second-highest civilian award, in 1971 for his contributions to the arts.

• Uday Shankar's legacy continues to inspire dancers and choreographers in India and around the world.

Q80. Answer: (c) Urbain-Jean-Joseph Le Verrier

The correct answer is Urbain-Jean-Joseph Le Verrier

Key Points

• Urbain-Jean-Joseph Le Verrier calculated the approximate location of the planet Neptune by studying gravity-induced disturbances in the motion of Uranus.

• Le Verrier's calculations were based on Newton's laws of gravitation, which predicted the presence of another planet affecting Uranus's orbit.

• His work led to the discovery of Neptune on September 23, 1846, by Johann Gottfried Galle and Heinrich d'Arrest at the Berlin Observatory.

• Le Verrier's prediction and the subsequent discovery of Neptune stand as a monumental achievement in the field of astronomy.

Additional Information

• John Couch Adams independently made similar calculations around the same time, but Le Verrier's work led to the actual observational discovery.

• Neptune is the eighth planet from the Sun and is known for its deep blue color caused by the absorption of red light by methane in its atmosphere.

• The discovery of Neptune was a major milestone in the validation of Newtonian mechanics.

• Le Verrier's methods of celestial mechanics continue to influence modern astronomy and space navigation.

Q81. Answer: (a) Sinho commission

The correct answer is Sinho commission

Key Points

• The Supreme Court upheld the 10% reservation for the Economically Weaker Sections (EWS) in November 2022.

• This EWS reservation was granted based on the recommendations from the Sinho Commission.

• The Sinho Commission was specifically constituted to identify and recommend measures for the upliftment of economically weaker sections.

Additional Information

• The reservation for EWS was introduced through the 103rd Constitutional Amendment Act, 2019.

• The amendment added Articles 15(6) and 16(6) to the Constitution, enabling the state to make special provisions for the advancement of economically weaker sections.

• The EWS quota is in addition to the existing reservations for Scheduled Castes (SC), Scheduled Tribes (ST), and Other Backward Classes (OBC).

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Q82. Answer: (d) Indus

The correct answer is Indus

Key Points

• The river Indus is known as 'Singi Khamban' in Tibet.

• 'Singi Khamban' translates to the "Lion's Mouth" in Tibetan language, referring to the river's origin in the Tibetan plateau.

• The Indus River is one of the longest rivers in the world, flowing through China (Tibet), India, and Pakistan.

• It plays a crucial role in the agricultural and economic activities of these regions.

Additional Information

• The Indus River originates in the Tibetan plateau near Lake Mansarovar.

• It flows through the Ladakh region of India and then into Pakistan, where it eventually drains into the Arabian Sea.

• The river is a key water source for the Indus Valley Civilization, one of the world's oldest civilizations.

• The Indus Basin is shared by India and Pakistan, making it a significant geopolitical feature in South Asia.

• The river supports diverse ecosystems and is home to various species of fish and other aquatic life.

Q83. Answer: (d) 17.64%

The correct answer is 17.64%

Key Points

• India's population growth rate during the period 2001-2011 was 17.64%.

• This growth rate is calculated based on the census data collected in 2001 and 2011, showing the percentage increase in the population over the decade.

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

• Population growth rates are crucial for planning and development policies, as they impact resources, infrastructure, and services.

• The growth rate reflects various factors including birth rates, death rates, and migration patterns during the decade.

Additional Information

• The census data provides comprehensive information on demographic, social, and economic parameters.

• The population growth rate is a key indicator of demographic trends and is used for various analytical purposes including economic forecasting and infrastructure development.

• India's total population as per the 2011 census was approximately 1.21 billion.

• The decadal growth rate witnessed a decline from the previous decade (1991-2001), indicating a slowdown in the population increase.

• Understanding population dynamics is essential for the effective implementation of government schemes and initiatives aimed at improving the quality of life for citizens.

Q84. Answer: (a) 943

The correct answer is 943

Key Points

• According to the Census of India-2011, the sex ratio of India is 943 females per 1000 males.

• The sex ratio is an important demographic indicator that shows the number of females per 1000 males in a population.

• A higher or balanced sex ratio is indicative of better gender equality in the society.

• Various government policies and programs aim to improve the sex ratio by addressing issues such as female infanticide, gender-based abortions, and discrimination against girls.

Additional Information

• The Census of India is conducted every ten years and is one of the most comprehensive sources of demographic data in the country.

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

• Key parameters measured in the Census include population size, sex ratio, literacy rate, and employment statistics, among others.

• The data collected from the Census helps in the formulation of policies and planning for socio-economic development.

Q85. Answer: (a) Press and Registration of Books Act, 1867

The correct answer is Press and Registration of Books Act, 1867

Key Points

• The Press and Periodicals Registration Bill, 2023 replaces the Press and Registration of Books Act, 1867 with a simplified law.

• This new legislation decriminalizes various provisions that were part of the earlier act.
• It also brings digital media under its ambit, recognizing the evolving media landscape.
• The bill aims to streamline the process of registration for newspapers and periodicals, making it more efficient.
• By decriminalizing certain provisions, the bill seeks to reduce the legal burden on publishers and editors.

Additional Information

• The Press and Registration of Books Act, 1867 was enacted during the British colonial period and had several provisions that are now considered outdated.
• The new bill is part of the government's efforts to modernize the regulatory framework governing the media sector.
• Digital media includes online news portals, blogs, and other forms of digital journalism.
• The bill ensures that digital media entities are subject to similar registration requirements as traditional print media, promoting accountability and transparency.

Q86. Answer: (a) The US

The correct answer is The US

Key Points

• Judicial Review in India has been borrowed from the United States Constitution.
• It is a process under which executive or legislative actions are subject to review by the judiciary.
• This feature helps in ensuring the constitutionality of laws and acts as a check on the powers of the legislature and executive.
• The concept of Judicial Review in India is enshrined in Article 13 of the Indian Constitution.
• It plays a crucial role in protecting the fundamental rights of citizens and maintaining the supremacy of the Constitution.

Additional Information

• The Constitution of India was adopted by the Constituent Assembly on 26th November 1949 and came into effect on 26th January 1950.
• It lays down the framework defining fundamental political principles, establishes the structure, procedures, powers, and duties of government institutions, and sets out fundamental rights, directive principles, and the duties of citizens.
• The Constitution of India is the longest written constitution of any country in the world.
• c
• The Seventh Schedule of the Constitution contains three lists which delineate the subjects under the Union, State, and Concurrent lists.
• Amendments to the Constitution can be made through a process outlined in Article 368.
• The Union List has been amended several times to meet the evolving needs of the nation.

Q87. Answer: (c) 1937

The correct answer is 1937

Key Points

• 1937 is the year when the All India Football Federation (AIFF) was formed.
• The AIFF is the governing body for football in India and is responsible for organizing and overseeing all aspects of the game in the country.
• It is affiliated with the global football governing body, FIFA, and the Asian Football Confederation (AFC).
• The AIFF organizes various national leagues and tournaments, including the Indian Super League (ISL) and the I-League.
• The federation also manages the Indian national football teams for both men and women.

Additional Information

• The AIFF was one of the founding members of the Asian Football Confederation in 1954.
• In 1974, the AIFF became affiliated with FIFA, the international governing body for football.
• The headquarters of the AIFF is located in Dwarka, New Delhi.
• Over the years, the AIFF has worked towards the development and promotion of football in India, including grassroots initiatives and youth development programs.
• The AIFF has faced various challenges, including the need for improved infrastructure and better training facilities for players.

Q88. Answer: (c) Rowlatt Act

The correct answer is Rowlatt Act

Key Points

• The Rowlatt Act was enacted in 1919 by the British government to curb the growing nationalist upsurge in India.
• This Act authorized the government to imprison any person suspected of terrorism without trial for up to two years.

• It also allowed the government to search any place and arrest any person without a warrant.

• The Act was seen as a direct attack on the civil liberties and democratic rights of the Indian people, leading to widespread protests.

Additional Information

• Mahatma Gandhi strongly opposed the Rowlatt Act and initiated a nationwide protest against it, which is known as the Rowlatt Satyagraha.

• The protests against the Rowlatt Act led to the tragic event of the Jallianwala Bagh Massacre in April 1919.

• The Act was officially known as the Anarchical and Revolutionary Crimes Act of 1919.

• The widespread opposition to the Rowlatt Act marked a significant moment in India's struggle for independence.

Q89. Answer: (d) Simhavishnu

The correct answer is Simhavishnu

Key Points

• Simhavishnu was the founder of the Pallava dynasty.

• The Pallava dynasty was a Tamil dynasty that ruled parts of South India from the 3rd century to the 9th century.

• Simhavishnu's reign marked the rise of the Pallavas to prominence in the region.

• The Pallavas are known for their patronage of architecture, particularly the rock-cut temples of Mahabalipuram.

• The dynasty played a crucial role in the cultural and political history of South India.

Additional Information

• The Pallavas were instrumental in the development of Dravidian architecture.

• Their rule saw the construction of several notable temples, including the Shore Temple and the Pancha Rathas at Mahabalipuram.

• Simhavishnu's successors, such as Mahendravarman I and Narasimhavarman I, continued to expand the dynasty's influence and patronage of the arts.

• The Pallavas had a significant impact on the cultural and religious landscape of South India, with contributions to both Hinduism and Buddhism.

Q90. Answer: (b) 8

The correct answer is 8

Key Points

• There are 8 white pawns in a standard game of chess.

• Each player starts with 8 pawns positioned on the second row (rank) of their side of the board.

• The primary role of pawns is to advance forward and capture opponent pieces diagonally.

• While pawns are the least valuable pieces in terms of points, they play a crucial role in controlling the center of the board and supporting other pieces.

Additional Information

• In chess, each player starts with a total of 16 pieces, including 8 pawns.

• The other pieces include 2 rooks, 2 knights, 2 bishops, 1 queen, and 1 king.

• Pawns have the unique ability to promote to any other piece (except a king) if they reach the opponent's back rank (eighth rank for white, first rank for black).

• The movement and strategy involving pawns are fundamental aspects of chess openings and endgames.

• Pawns can execute a special move called "en passant" under specific conditions.

Q91. Answer: (d) The ‘Date within’ field

The correct answer is The 'Date within' field

Key Points

• The 'Date within' field is the correct choice to select the date for sorting in Gmail.

• In Gmail, the 'Date within' field allows users to specify a date range to filter and sort emails.

• This feature helps users quickly find emails from a specific period, enhancing email management and search efficiency.

• Other options, such as the filter icon, '1 Day' dropdown menu, and calendar icon, do not provide the same functionality for date sorting in Gmail.

Additional Information

• Gmail offers various filtering and sorting options to help users organize their inbox efficiently.

• Using the 'Date within' field, users can specify a custom date range to sort emails, which is particularly useful for finding older

emails.

• Other filtering options include searching by sender, subject, and keywords, allowing for comprehensive email management.

• Understanding and utilizing these features can greatly enhance productivity and email navigation.

Q92. Answer: (c) Open market operations

The correct answer is Open market operations

Key Points

• Open market operations refer to the buying and selling of government securities in the open market by a central bank.

• The primary aim of these operations is to regulate the money supply in the economy and control inflation.

• When the central bank buys securities, it injects liquidity into the banking system, which can help lower interest rates and stimulate economic activity.

• Conversely, selling securities withdraws liquidity from the market, which can help raise interest rates and curb inflation.

• Open market operations are a key tool used by central banks, such as the Federal Reserve in the United States and the Reserve Bank of India, to implement monetary policy.

Additional Information

• High powered money refers to the total currency in circulation and reserves held by banks with the central bank.

• Reserve ratio is the fraction of total deposits that a bank must hold in reserve and not lend out.

• Bank rate is the rate at which a central bank lends money to domestic banks, often used as a tool to control liquidity and inflation.

• The central bank uses these various tools to influence the economy, control inflation, and ensure financial stability.

Q93. Answer: (b) Benzene – 2.42

The correct answer is Benzene – 2.42

Key Points

• Sapphire – 1.77 is a correct pair as the refractive index of Sapphire is indeed 1.77.

• Benzene – 2.42 is an incorrect pair since the refractive index of Benzene is approximately 1.50, not 2.42.

• Ruby – 1.71 is a correct pair as the refractive index of Ruby is indeed around 1.71.

• Kerosene – 1.44 is a correct pair as the refractive index of Kerosene is approximately 1.44.

Additional Information

• Refractive index is a measure of how much the speed of light is reduced inside a medium.

• It is calculated as the ratio of the speed of light in a vacuum to the speed of light in the medium.

• Different materials have different refractive indices, which can be used to identify them or to design optical devices.

• Materials with higher refractive indices bend light more than those with lower refractive indices.

Q94. Answer: (d) Abdel Fattah El-Sisi

The correct answer is Abdel Fattah El-Sisi

Key Points

• Abdel Fattah El-Sisi was the Chief Guest at the 74th Republic Day parade of India.

• He is the President of Egypt, a position he has held since 2014.

• His presence marked a significant moment in the diplomatic relations between India and Egypt.

• The Republic Day parade is a major event in India, showcasing the country's cultural diversity and military prowess.

Additional Information

• The Republic Day is celebrated on 26th January every year in India to commemorate the adoption of the Constitution of India in 1950.

• It is a national holiday in India and is marked by a grand parade held in the capital city, New Delhi, at Rajpath before the President of India.

• The parade showcases India's defense capability, cultural and social heritage.

• Every year, a foreign dignitary is invited as the Chief Guest for the Republic Day celebrations, symbolizing India's diplomatic outreach and relations with other countries.

• The invitation to Abdel Fattah El-Sisi underscores the strengthening ties between India and Egypt.

Q95. Answer: (b) 2009

The correct answer is 2009

Key Points

• 2009 is the year in which MS Dhoni was awarded the Padma Shri Award.

• The Padma Shri is the fourth highest civilian award in India, awarded for distinguished service in any field.

• MS Dhoni is a renowned Indian cricketer, known for his exceptional leadership and contributions to Indian cricket.

• Under his captaincy, India won the 2007 ICC T20 World Cup, the 2010 and 2016 Asia Cups, the 2011 ICC Cricket World Cup, and the 2013 ICC Champions Trophy.

Additional Information

• MS Dhoni has also been awarded the Rajiv Gandhi Khel Ratna award in 2007 and the Padma Bhushan, India's third-highest civilian award, in 2018.

• He is considered one of the best wicket-keeper batsmen and captains in the history of cricket.

• His calm demeanor and strategic acumen have earned him the nickname "Captain Cool."

• Dhoni's contributions have significantly shaped the landscape of Indian cricket, making him a celebrated sports personality.

Q96. Answer: (d) Tala

The correct answer is Tala

Key Points

• Tala is the term used for the cyclic arrangement of time units in Hindustani Classical music.

• It serves as the rhythmic framework for a musical composition, helping musicians maintain the tempo and structure of the piece.

• There are various types of Tala, each with its own specific number of beats and pattern, such as Teentaal, Ektaal, and Jhaptal.

• Tala is integral to both the performance and the composition of Hindustani Classical music, providing a foundation over which melodies are constructed.

Additional Information

• Jati refers to the classification of Ragas based on the number of notes used.

• Alap is the introductory section of a Raga performance, characterized by a slow and free-flowing exploration of the Raga's notes.

• Raga is a melodic framework used for improvisation and composition in Indian classical music.

• Understanding Tala is crucial for both performers and listeners to fully appreciate the complexity and beauty of Hindustani Classical music.

Q97. Answer: (c) males are haploid and females are diploid.

The correct answer is males are haploid and females are diploid

Key Points

• In honey bees, males are haploid and females are diploid.

• Males (drones) develop from unfertilized eggs and possess only one set of chromosomes.

• Females (workers and queens) develop from fertilized eggs and possess two sets of chromosomes.

• This is an example of a genetic system known as haplodiploidy.

• The haplodiploid system determines the sex of the offspring based on the number of chromosome sets they receive.

Additional Information

• Haplodiploidy is a common genetic system in several insect orders, including Hymenoptera (bees, ants, and wasps).

• In haplodiploid species, the sex determination mechanism can influence social structure and behavior, particularly in eusocial species like honey bees.

• Queens can control the sex of their offspring by choosing whether to fertilize an egg.

• This system allows for a high degree of relatedness among workers, which can promote cooperative behaviors.

Q98. Answer: (a) Svarajati

The correct answer is Svarajati

Key Points

• Svarajati is a form of musical composition in Carnatic music, which is a system of music commonly associated with South India.

• Carnatic music is known for its intricate rhythms and melismatic melodies, and it is one of the two main subgenres of Indian classical music, the other being Hindustani music.

• Other options like Chaturang, Dhamar, and Dhrupad are styles associated with Hindustani classical music.

Additional Information

• Chaturang is a form in Hindustani classical music that consists of four parts: bandish, tarana, sargam, and a rhythmic component.

• Dhamar is a type of composition in Hindustani classical music that is often performed during the festival of Holi.

• Dhrupad is one of the oldest forms of Hindustani classical music, known for its spiritual and meditative quality.

• Carnatic music compositions are typically in the form of kritis, varnams, and padams, among others, with Svarajati being a

foundational form taught to students early in their training.

Q99. Answer: (c) Slide Show tab

The correct answer is Slide Show tab

Key Points

• Options 'From Beginning' and 'From Current Slide' can be found in the Slide Show tab of MS PowerPoint.

• The Slide Show tab provides various options to start and customize your slide show presentation.

• It is specifically designed to help presenters control and manage their slide show settings effectively.

• You can also access other features such as setting up slide show timings and rehearsing the presentation under this tab.

Additional Information

• The Home tab contains basic formatting tools and is not related to slide show settings.

• The Slide Sorter tab does not exist in MS PowerPoint; slide sorting can be done in the View tab.

• The View tab allows you to switch between different views of your presentation but does not contain slide show options.

Q100. Answer: (d) Only ii and iii

The correct answer is Only ii and iii

Key Points

• GR technology had penetrated more in wheat crop than in the rice crop.

• During post GR period, the area under rice achieved a relatively slow growth when compared to the area under wheat.

• Option 4 is correct because statements ii and iii are true about the positive impact of the Green Revolution on yield levels in India.

• Statement i is incorrect as the yield of wheat grew at a much faster rate than that of rice during the post-Green Revolution period.

Additional Information

• The Green Revolution in India started in the 1960s and primarily focused on increasing agricultural productivity through the use of high-yielding variety (HYV) seeds, fertilizers, and irrigation.

• The revolution led to a significant increase in the production of wheat and rice, helping India achieve self-sufficiency in food grains.

• While the Green Revolution had a substantial positive impact on food security, it also led to environmental challenges such as soil degradation and water scarcity.

• The technology primarily benefited regions with better irrigation facilities, leading to regional disparities in agricultural growth.

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