SSC CHSL Tier-1 2022: Official Paper (Held On: 14 March, 2023 Shift 3) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2022 • 100 questions • 60 minutes • Answer key and solutions

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ENGLISH LANGUAGE

Q1. In a certain code language, 'ANMGRS' is coded as 'PODJKX'. What is the code for 'CHAIRS' in that code language?

(a) POFYEZ
(b) POFXEZ
(c) POFXEY
(d) POFXDZ

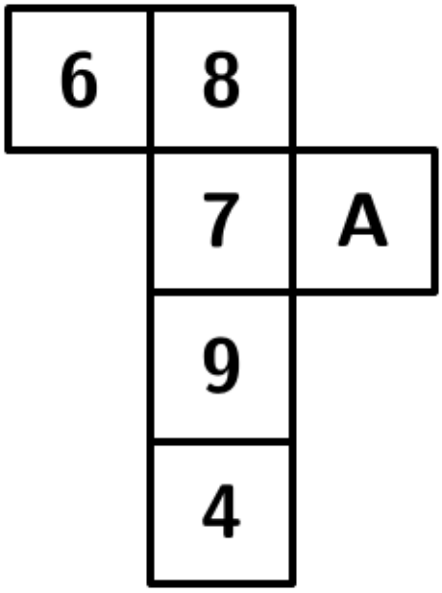
Q2. In the following question, select the odd letter/letters from the given alternatives.

(a) RPM
(b) BZW
(c) IGE
(d) AYV

Q3. J is the brother of L. H is the wife of J. N is the sister of P. L is the father of N. How is H related to N?

(a) Sister
(b) Mother in law
(c) Father's Brother's wife
(d) Mother

Q4. A cube is made by folding the given sheet. In the cube so formed, which number / letter will be on the face opposite to the face showing '7'?



(a) A
(b) 4

(c) 6
(d) 8

Q5. Select the correct alternative to indicate the arrangement of the following terms in a logical and meaningful order.

1. Post-Graduation
2. Graduation
3. Nursery
4. Matriculation
5. Higher Secondary

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

Q6. A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

ABC, WHP, SNC, OTP, ?

(a) KQR
(b) KAC
(c) KZC
(d) KYB

Q7. Select the option that is related to the fifth number in the same way as the first number is related to the second number and third number is related to fourth number.

434 : 567 :: 617 : 750 :: 839 : ?

(a) 972
(b) 1334
(c) 984
(d) 1012

Q8. After interchanging the given two numbers (not digits), what will be the value of the given equation?

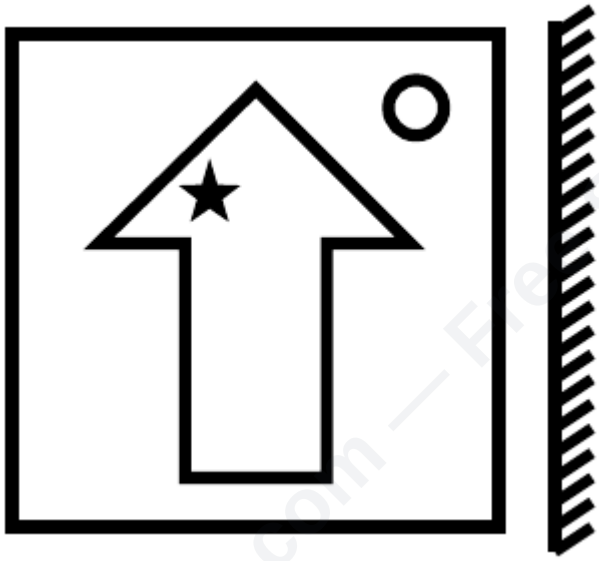
14 and 21

21 ÷ 14 × 3 + 48 - 37

(a) 13
(b) 21
(c) 19
(d) 32

Q9. Select the correct mirror image of the given figure when the mirror is placed to its right side.

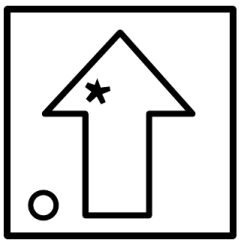
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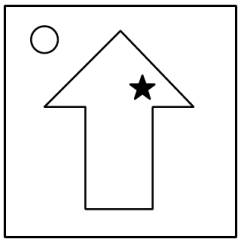
(a)



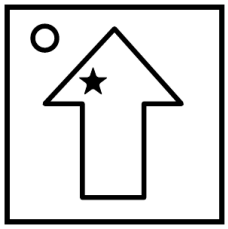
(b)



(c)



(d)



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Q10. Words given on the left side of (::) are related with each other by some Logic/Rule /Relation. Select the missing word/word pair on the right side of (::) from the given alternatives based on the same Logic/Rule/Relation.

Cockpit : Aeroplane :: ?

(a) Student : Class
(b) House : Room
(c) Pencil : Lead
(d) Bicycle : Pedal

Q11. If 617 @ 342 = 572 and 483 @ 342 = 141, then 280 @ 82 = ?

(a) 632
(b) 891
(c) 188
(d) 721

Q12. Select the option that is related to the third word in the same way as the second word is related to the first word.

Thermometer : Temperature :: Seismograph : ?

(a) Mass
(b) Earthquake
(c) Current
(d) Distance

Q13. Out of the given words, three are similar in a certain manner. However, one word is NOT like the other three. Select the word which is different from the rest.

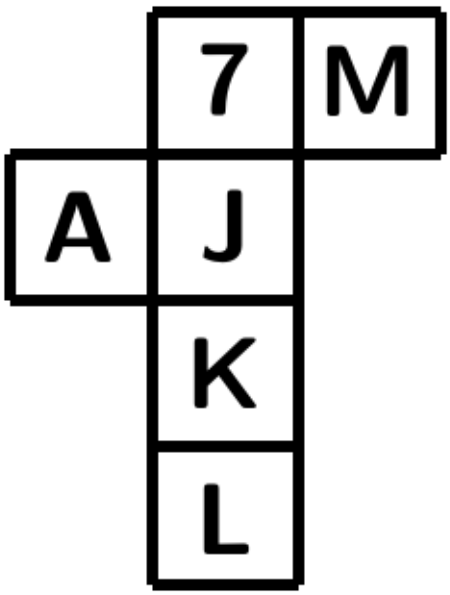
(a) Rupee
(b) Dhaka
(c) Dollar
(d) Euro

Q14. In the following question, select the missing number from the given series.

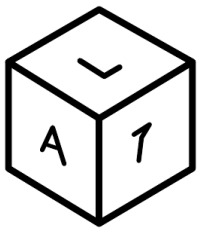
51, 55, 64, 80, 105, ?

(a) 151
(b) 141
(c) 153
(d) 131

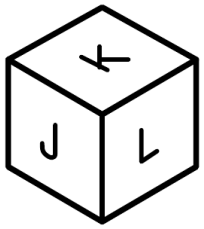
Q15. By folding the given paper, which of the following box cannot be made?



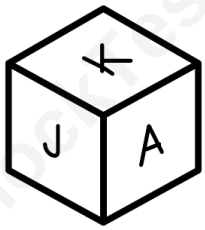
(a)



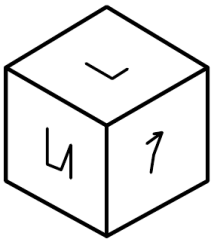
(b)



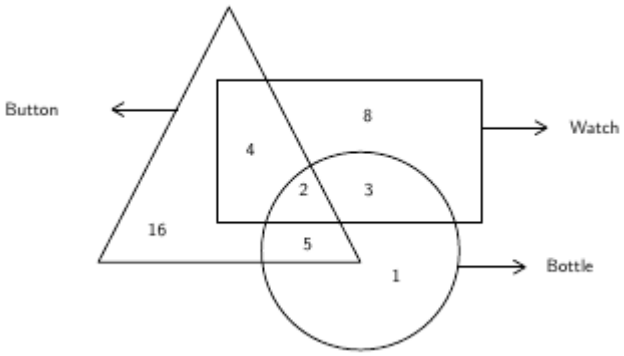
(c)



(d)



Q16. How many are both buttons and bottle?



(a) 3
(b) 7
(c) 5
(d) 2

Q17. In a certain code language, 'JAIL' is coded as '304', 'LAWN' is coded as '232'. What is the code for 'NAVY' in that code language?

(a) 312
(b) 184
(c) 288

(d) 172

Q18. In the following question below are given some statements followed by some conclusions based on those statements. Taking the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusion logically follows the given statements.

Statements:

I. Some R are C.

II. All R are K.

Conclusion:

I. All K are R.

II. All C are R.

III. All C are K.

(a) Both conclusions II and III follows
(b) Both conclusions I and III follows
(c) Neither conclusion follows
(d) All conclusion follows

Q19. Select the option in which the numbers shares the same relationship in set as that shared by the numbers in the given set.

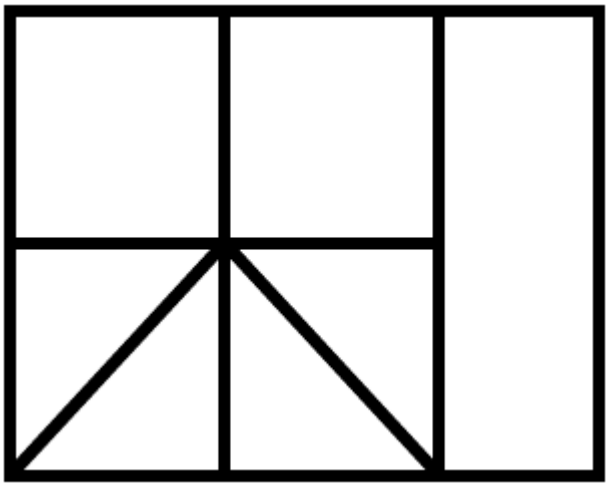
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g.13 - Operations on 13 such as adding / subtracting / multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and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

(13, 7, 546)

(14, 15, 1260)

(a) (28, 21, 3528)
(b) (27, 14, 2288)
(c) (16, 9, 874)
(d) (13, 15, 1190)

Q20. How many quadrilaterals are there in the given figure?



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

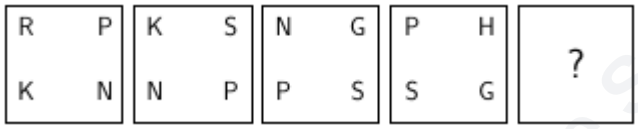
Q21. In the following question, select the related letters from the given alternatives.

QTY : YTQ :: ENR : ?

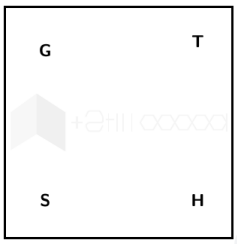
(a) ERN
(b) NOP

(c) RNE
(d) JMN

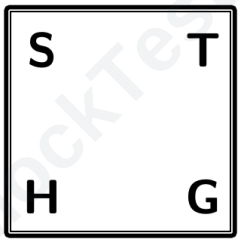
Q22. Select the figure from the given options that can replace the question mark (?) in the following series.



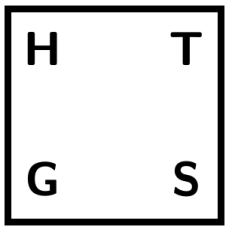
(a)



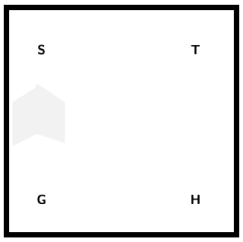
(b)



(c)



(d)



Q23. Select the option in which the numbers shares the same relationship in set as that shared by the numbers in the given set.

(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)

(10, 22, 42)

(15, 14, 44)

(a) (9, 22, 38)
(b) (12, 12, 24)
(c) (13, 12, 38)
(d) (6, 3, 17)

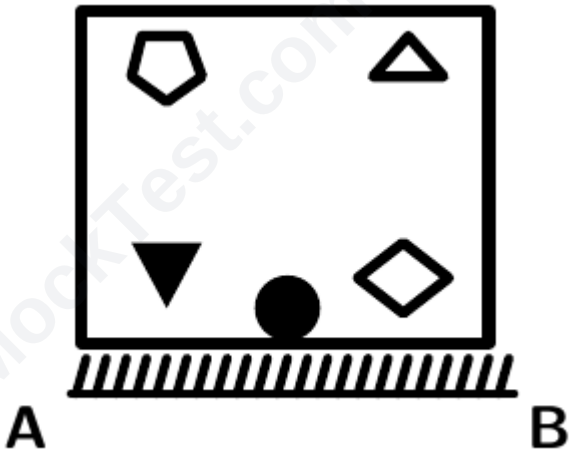
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Q24. In the following question, four number pairs are given. In each pair the number on left side of (-) is related to the number of the right side of (-) with some Logic/Rule/Relation. Three pairs are similar on basis of same Logic/Rule/Relation. Select the odd one out from the given alternatives.

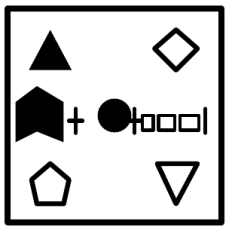
(NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g.13 - Operations on 13 such as adding /subtracting /multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and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

(a) 14 - 2844
(b) 12 - 1728
(c) 20 - 8000
(d) 10 - 1000

Q25. If a mirror is placed on the line AB, then out of the option figures which figure will be the right image of the question figure?



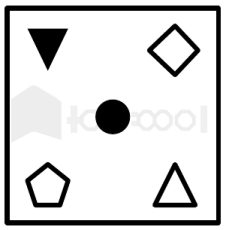
(a)



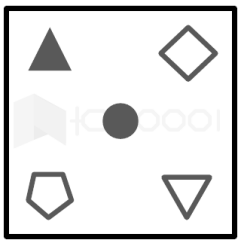
(b)



(c)



(d)



GENERAL INTELLIGENCE

Q26. When are the kharif crops harvested?

(a) July - August
(b) September - October
(c) March - April
(d) January - February

Q27. The Reserve Bank of India raised the minimum capital requirement for setting up an asset reconstruction company (ARC) to Rs _____ crore in October 2022.

(a) 350
(b) 300
(c) 200
(d) 250

Q28. What type of the rock is Granite?

(a) Extrusive igneous rocks
(b) Sedimentary rocks
(c) Metamorphic rocks
(d) Intrusive igneous rocks

Q29. The Fifth Assembly of International Solar Alliance took place in _____ in October 2022.

(a) New Delhi
(b) Kolkata
(c) Gurugram
(d) Pune

Q30. Which of the following statements is correct?

(a) Metals react with acids and produce metal salts and hydrogen gas.
(b) Non-metals react with oxygen to produce non- metallic oxides which are basic in nature.
(c) On burning, metals react with oxygen to produce metal oxides which are acidic in nature.
(d) Less reactive metals displace more reactive metals from their compounds in aqueous solutions.

Q31. The World Bank extended an unconditional loan of $ _____ million for the SALT project in Andhra Pradesh in October 2022.

(a) 250
(b) 200
(c) 350
(d) 300

Q32. State public services; State Public Service Commission comes under which list of seventh schedule of the Indian constitution?

(a) State list
(b) Transferred list
(c) Concurrent list
(d) Union list

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Q33. Who won the Best Actor in a Leading Role award in the 94th Academy Awards 2022?

(a) Leonardo DiCaprio
(b) Will Smith
(c) Hugh Jackman
(d) Troy Kotsur

Q34. Kadana Dam of Gujarat is built over which of the following rivers?

(a) Mahi
(b) Manjira
(c) Tapti
(d) Sabarmati

Q35. In which year was a law passed in India to make conversion to Christianity easier?

(a) 1845
(b) 1850
(c) 1830
(d) 1840

Q36. _____ won the International Cricket Council (ICC) Men's Player for the month of September 2022.

(a) Axar Patel
(b) Mohammad Rizwan
(c) Cameron Green
(d) Sikandar Raza

Q37. "Narendra Modi: A Political Biography" is written by _____.

(a) Poonam Surie
(b) Andy Marino
(c) Daman Singh
(d) Raghav Bahal

Q38. The potential difference, V, across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it, provided its temperature remains the same. This is called _____ law.

(a) Pascal's
(b) Charles's
(c) Ohm's
(d) Boyle's

Q39. Who is a well known tabla maestro of the Punjab Gharana?

(a) Moti Lal Kemmu
(b) Pt. Ravi Shankar
(c) Alla Rakha
(d) Bismillah khan

Q40. Which country won the 2022 FIH Junior Women's Hockey World Cup?

(a) Belgium
(b) Germany
(c) Netherlands
(d) Spain

Q41. Which of the following is NOT a classical dance of India?

(a) Bhangra
(b) Bharatnatyam
(c) Manipuri
(d) Kathak

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Q42. In _____, the British government enacted a legislation banning the use of printed cotton textiles - chintz - in England. Interestingly, this Act was known as the Calico Act.

(a) 1720
(b) 1700
(c) 1740
(d) 1730

Q43. In which of the following modes of data transmission, can the data flow in both directions simultaneously?

(a) Simplex
(b) Quarter-duplex
(c) Half-duplex
(d) Full-duplex

Q44. Which of the following shortcut key is used to copy the selected data in MS-Word 365?

(a) Ctrl + X
(b) Alt + C
(c) Ctrl + C
(d) Alt + X

Q45. Which of the following states has Maharshi Valmiki Scheduled Tribes Development Corporation Limited?

(a) Punjab
(b) Karnataka
(c) Delhi
(d) Haryana

Q46. As per area, India is the _____ largest country in the world.

(a) 2nd
(b) 7th
(c) 10th
(d) 4th

Q47. An image formed by the convex mirror is always _____.

(a) virtual and inverted
(b) real and erect
(c) virtual and erect
(d) real and inverted

Q48. Who among the following chess grandmasters won the ninth edition of the Sinquefield Cup in September 2022?

(a) Magnus Carlsen
(b) Alireza Firouzja
(c) Ian Nepomniachtchi
(d) Wesley So

Q49. The production function can be expressed as _____. (where L is labour and C is capital and Q is the maximum output that can be produced)

(a) Q = f(C)
(b) L = f(Q, C)
(c) Q = f(L)
(d) Q = f(L, C)

Q50. Central Bureau of Intelligence and Investigation comes under which list of the seventh schedule of the Indian constitution?

(a) Union list
(b) Concurrent list
(c) State list

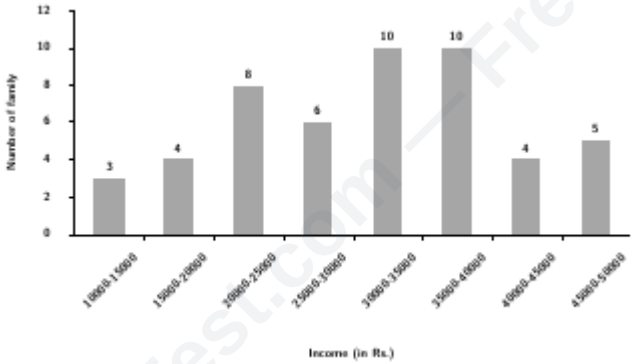
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(d) Transferred list

QUANTITATIVE APTITUDE

Q51. The following histogram shows the monthly income range of families staying in an apartment.

What is the difference between the total number of families whose income is more than or equal to 10000 but less than or equal to 25000 and the total number of families whose income is more than 35000 but less than or equal to 50000?



(a) 4
(b) 3
(c) 0
(d) 11

Q52. A man travelled a certain distance by train at the speed of 50 km/hr and walked back the same distance at the speed of 10 km/hr. If the whole journey took 12 hours, then what was the distance travelled by train?

(a) 100 km
(b) 180 km
(c) 150 km
(d) 120 km

Q53. A shopkeeper sells a table at a discount of 20 percent and earns a profit of 30 percent. If he sells the same table at 10 percent discount, then what will be his new profit or loss percent?

(a) 32.5 percent profit
(b) 40.5 percent loss
(c) 46.25 percent profit
(d) 50.5 percent loss

Q54. If $(k+1/k)^2=9$, then what is the value of $k^3+1/(k^3)$?

(a) 27
(b) 18
(c) 15
(d) 21

Q55. A chord of length 40 cm is at a distance of 15 cm from the centre. What is the length of the chord of the same circle which is at a distance of 20 cm from the centre of circle?

(a) 15 cm
(b) 25 cm
(c) 45 cm
(d) 30 cm

Q56. What is the value of 3126 ÷ 4 of 521 + 5 × 3?

(a) 15.5
(b) 14.5
(c) 13.5

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(d) 16.5

Q57. A trader buys two articles for Rs. 3,000 each. While selling, he earns a 10 percent profit on one and loses 20 percent on the other. What will be his overall loss percentage?

(a) 10 percent
(b) 20 percent
(c) 15 percent
(d) 5 percent

Q58. In ΔPQR, angle bisector of angle P intersects QR at M. If PQ = PR, then what is the value of angle PMQ?

(a) 75 degree
(b) 80 degree
(c) 70 degree
(d) 90 degree

Q59. The table given below shows the number of sharpener sold by two shopkeepers A and B in 5 months.

	Shopkeepers	
Months	A	B
R	200	155
S	190	160
T	170	210
U	165	180
V	155	175

P1 = The total number of sharpener sold by A.

P2 = The total number of sharpener sold by B.

What is the value of (P1/P2)?

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

Q60. The radius of a sphere is 3.5 cm. What is the total surface area of the sphere?

(a) 154 cm2
(b) 77 cm2
(c) 231 cm2
(d) 188 cm2

Q61. Student A got 25 marks more than the student B and the marks of A were equal to the 60 percent of the sum of their marks. What are the marks obtained by A and B respectively?

(a) 75, 100
(b) 75, 50
(c) 45, 120
(d) 55, 80

Q62. If $x^2+1/(x^2)=4$, then what is the value of x^4+1/(x^4)

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

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Q63. In an equilateral triangle STU, the inradius is 5√3 cm. What is the length of the side of this equilateral triangle?

(a) 20√3 cm
(b) 18√3 cm
(c) 30 cm
(d) 24 cm

Q64. The table given below shows the sales of two companies in 5 years.

	Companies	
Years	P	Q
A	100	500
B	200	350
C	300	400
D	250	100
E	150	50

Which of the following statement is correct?

I. The ratio of combined sales of P in years A and B to that of combined sales of Q in years D and E is 1 : 2.

II. The sales of P in year C is 300% of the sales of Q in year D.

(a) Only I
(b) Both I and II
(c) Only II
(d) Neither I nor II

Q65. If $\sqrt{2}\sec^2\theta - 4\sec\theta + 2\sqrt{2} = 0$, then what is the value $\sin^2\theta + \tan^2\theta$?

(a) 1/2
(b) 2/3
(c) 5/2
(d) 3/2

Q66. M is the incentre of the ΔXYZ. If angle YXZ + angle YMZ = 150 degree, then what is the value of angle YXZ?

(a) 40 degree
(b) 55 degree
(c) 60 degree
(d) 45 degree

Q67. 10 Consecutive numbers are given. If the average of the two numbers given in the middle is 13.5, then what is the sum of the first 6 numbers?

(a) 58
(b) 55
(c) 67
(d) 69

Q68. If $a + b + c = 6$ and $a^2 + b^2 + c^2 = 40$, then what is the value of $a^3 + b^3 + c^3 - 3abc$?

(a) 212
(b) 252
(c) 232
(d) 206

Q69. At what rate of compound interest (Compounding annually) per annum will a sum of Rs. 1,000 become Rs. 1,060.90 in 2 years?

(a) 2% per annum
(b) 4% per annum

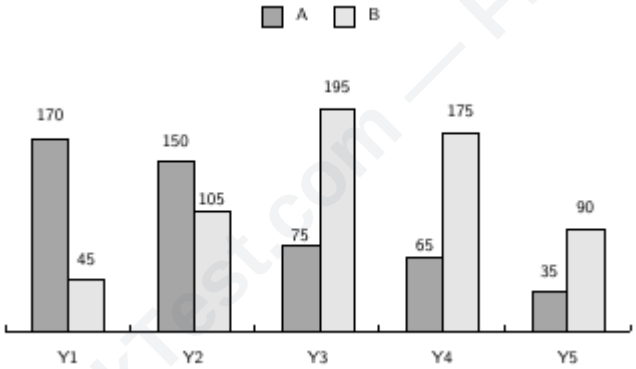
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(c) 3% per annum
(d) 5% per annum

Q70. If cosec B = 3/2, then what is the value of cot B sin B?

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

Q71. The bar graph given below shows the foreign trade by two countries A and B in 5 different years.



J1 = The total foreign trade by country A in all the 5 years.
J2 = The total foreign trade by country B in all the 5 years.
What is the value of (J2 - J1)?

(a) 125
(b) 115
(c) 95
(d) 75

Q72. What is the value of (5 cos 62°)/(sin 28°)-(2 tan 34°)/(cot 56°) ?

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

Q73. If the sum of three consecutive composite numbers is 36, then what is the product of the three numbers?

(a) 1460
(b) 1750
(c) 1680
(d) 1820

Q74. A, B and C together can finish a piece of work in 20 days. A alone can finish the work in 40 days. What part of the work B and C together can finish in a day?

(a) 1/5
(b) 1/20
(c) 1/10
(d) 1/40

Q75. The incomes of A and B are in the ratio 4 : 5 and their expenditure are in the ratio 5 : 4. If A saves Rs. 6000 and B saves Rs. 12000, then what will be the income of A?

(a) Rs. 18000
(b) Rs. 20000
(c) Rs. 12000
(d) Rs. 16000

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GENERAL AWARENESS

Q76. Choose the word that can substitute the given group of words.

One that cannot be harmed/wounded

(a) Mortal
(b) Mystic
(c) Invulnerable
(d) Bigot

Q77. Choose the sentence with no spelling error.

(a) Your employes also have acess to this data.
(b) Your employes also have access to this data.
(c) Your employees also have acces to this datas.
(d) Your employees also have access to this data.

Q78. The given sentence is in active voice. Change the voice of the sentence. Select the correct option from the sentences given in options.

She persuaded him for over a year.

(a) He was being persuaded by her for a year.
(b) He kept being persuaded by her for a year.
(c) He was persuaded by her for over a year.
(d) She was being persuaded by him for over a year.

Q79. Rearrange the parts of the sentence in correct order.

P. requires knowledge of the complex interplay among ocean

Q. chemistry and circulation, ecology of marine and terrestrial

R. organisms, ice sheet dynamics, and atmospheric chemistry and circulation

S. a full understanding of glacial-interglacial carbon dynamics

(a) PQRS
(b) QPRS
(c) SPQR
(d) SRPQ

Q80. Improve the underlined part of the sentence. Choose 'No improvement' as an answer if the sentence is grammatically correct.

They hired a maid to have cleaner the house.

(a) to cleans
(b) No improvement
(c) to clean
(d) for cleaner

Q81. Choose the word that means the same as the given word.

Vacillate

(a) Advance
(b) Stir
(c) Plunge
(d) Hesitate

Q82. Fill in the blank with an appropriate option.

Google on Saturday celebrated the onset of spring in the northern hemisphere with a/an _____ graphic.

(a) rooting
(b) animated
(c) freezing

(d) implanting

Q83. Choose the word that is opposite in meaning to the given word.

Reprove

(a) Rap
(b) Eulogize
(c) Pummel
(d) Keelhaul

Q84. Choose the word that is opposite in meaning to the given word.

Abeyance

(a) Latency
(b) Moratorium
(c) Layoff
(d) Continuation

Q85. Parts of the following sentence are given as options. Identify the part that contains a grammatical error. If there is no error, select 'No error'.

You never know when/you are going to stumble to a / jewel in the most unexpected corner.

(a) You never know when
(b) you are going to stumble to a
(c) jewel in the most unexpected corner.
(d) No error

Q86. Find the part of the given sentence that has an error in it. If there is no error, choose 'No error'.

Every of the two girls will get the reward.

(a) No error
(b) girls will get
(c) the reward.
(d) Every of the two

Q87. Select the correct indirect form of the given sentence.

He said, "I had gone to Shimla."

(a) He said that he had gone to Shimla.
(b) He said that he went to Shimla.
(c) He says that he had gone to Shimla.
(d) He said that he has gone to Shimla.

Q88. Fill in the blank with the most suitable word.

At first the water _____ blue, then grey.

(a) glanced
(b) seemed
(c) heeded
(d) lest

Q89. Fill in the blank with an appropriate option.

Ram placed her in one of the _____ leather chairs opposite his desk.

(a) marinated
(b) brewed
(c) quilted
(d) stewed

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Q90. Select the most appropriate option to fill in the blank.

Sir, can you reflect on the usefulness or _____ of blocking all the highways?

(a) impotence
(b) futility
(c) scorch
(d) incompatibility

Q91. Select the word that is opposite in meaning (ANTONYM) to the word given below.

Sinister

(a) Propitious
(b) Ominous
(c) Baleful
(d) Foreboding

Q92. Choose the incorrectly spelt word.

(a) Healthy
(b) Sugest
(c) Quantum
(d) Mechanics

Q93. Choose the word that can substitute the given group of words.

Killing one's father

(a) Insecticide
(b) Suicide
(c) Tyrannicide
(d) Patricide

Q94. In the following question, out of the given four alternatives, select the alternative which best expresses the meaning of the Idiom/Phrase.

Lion's mouth

(a) A dangerous situation
(b) Very talkative
(c) Having no sense
(d) A large share

Q95. Select the most appropriate meaning of the given idiom.

A bolt from the blue

(a) An unexpected event
(b) A sudden run
(c) An electric shock
(d) To get hold of someone

Directions

In the following passage some of the words have been deleted. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.

There are so many myths about the (1)_____ impacts of milk on health. Changing how much milk you drink because of (2) _ myths may mean you are unnecessarily restricting this (3)__ nutritious drink. Australians often restrict dairy foods when they try to (4)___ weight believing them to be fattening. While dairy products naturally contain fat there are many reduced fat products (5) _____.

Q96. Select the most appropriate option to fill in blank number 1.

(a) kind
(b) welcoming
(c) impolite

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(d) negative

Q97. Select the most appropriate option to fill in blank number 2.

(a) those
(b) thus
(c) these
(d) this

Q98. Select the most appropriate option to fill in blank number 3.

(a) suddenly
(b) nominally
(c) highly
(d) invisibly

Q99. Select the most appropriate option to fill in blank number 4.

(a) lose
(b) meditate
(c) subjugate
(d) leverage

Q100. Select the most appropriate option to fill in blank number 5.

(a) inoperable
(b) deficient
(c) durable
(d) available

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (b) POFXEZ

The logic followed here is:
'ANMGRS' is coded as 'PODJKX',
Similarly, for 'CHAIRS'
So, 'CHAIRS' is coded as 'POFXEZ'.
Hence, the correct answer is "Option 2".

Q2. Answer: (c) IGE

The logic followed here is:
Second Letter = First Number - 2

Third Letter = Second Letter - 3

Let's check each option,

1) RPM

2) BZW

3) IGE

4) AYV

Here, we can see that only Option 3 doesn't follow the logic.

Hence, the correct answer is " IGE ".

Q3. Answer: (c) Father's Brother's wife

Family Chart:

Given:

J is the brother of L.

H is the wife of J.

N is the sister of P.

L is the father of N.

So, H is Father's Brother's wife of N.

Hence, the correct answer is "Option 3".

Q4. Answer: (b) 4

From the given open Dice:

6 and A is the opposite sides.

8 and 9 is the opposite sides.

7 and 4 is the opposite sides.

So, the face of '4' is opposite to the face showing '7'

Hence, the correct answer is "Option 2".

Q5. Answer: (c) 3, 4, 5, 2, 1

The logic followed here is:

→ Nursery is the initial stage of education.

→ Matriculation refers to the completion of secondary education or high school.

→ Higher Secondary follows matriculation and is typically the next level of education.

→ Graduation refers to the completion of an undergraduate degree.

→ Post-Graduation comes after graduation and refers to further education at a higher level, such as a master's or doctoral degree.

The correct logical order is:

3. Nursery

4. Matriculation

5. Higher Secondary

2. Graduation

1. post-Graduation

Hence, the correct answer is " 3, 4, 5, 2, 1 ".

Q6. Answer: (c) KZC

The logic followed here is:

Hence, the correct answer is "Option 3".

Q7. Answer: (a) 972

The logic followed here is:

Logic: 1st number + 133 = 2nd number.

For, 434 : 567

→ 434 + 133 = 567.

For, 617 : 750

→ 617 + 133 = 750.

Similarly, for 839 : ?

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→ 839 + 133 = 972.

Hence, the correct answer is "972".

Q8. Answer: (a) 13

Given Equation: 21 ÷ 14 × 3 + 48 - 37.

After interchanging 14 and 21, the equation, we get:

→ 14 ÷ 21 × 3 + 48 - 37 =?

→ 2/3 × 3 + 48 - 37 =?

→ 2 + 48 - 37 =?

→ 50 - 37 = 13

Hence, the correct answer is "13".

Q9. Answer: (c) [figure]

The correct mirror image of the given figure is shown below:

Hence, the correct answer is " Option 3 ".

Q10. Answer: (a) Student : Class

The logic followed here is:

=> The relationship between the words "Cockpit" and "Aeroplane" is that the cockpit is a part of an aeroplane.

Let's check each option,

1) Student : Class

→ Student is a part of Class.

2) House : Room

→ House is not a part of Room. Infact, Room is a part of House. Here, the order is incorrect.

3) Pencil : Lead

→ Pencil is not a part of Lead. Infact, Lead is a part of Pencil. Here, the order is incorrect.

4) Bicycle : Pedal

→ Bicycle is not a part of Pedal. Infact, Pedal is a part of Bicycle. Here, the order is incorrect.

Here, we can see that only Option 1 follow the logic.

Hence, the correct answer is " Student: Class ".

Q11. Answer: (b) 891

The logic followed here is:

=> @ denotes Subtraction.

=> The final result is obtained by reversing the digits of the number obtained by subtraction.

Let's check as per the logic,

617 @ 342 = 572:

→ 617 - 342 = 275.

→ Reversing the digits of 275, we get 572.

483 @ 342 = 141:

→ 483 - 342 = 141.

→ Reversing the digits of 141, we get 141.

Similarly,

280 @ 82 =?

→ 280 - 82 = 198.

→ Reversing the digits of 198, we get 891.

Hence, the correct answer is " 891 ".

Q12. Answer: (b) Earthquake

The logic followed here is:

=> The First word denotes the device used to measure the Second word.

Let's check as per the logic:

Thermometer : Temperature

→ Thermometer is a device which is used to measure the temperature.

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Similarly,
Seismograph :?
→ Seismograph is used to measure Earthquake.
Hence, the correct answer is " Earthquake ".
Additional Information → Ammeter is used to measure Current.
→ Odometer is used to measure distance in vehicles.

Q13. Answer: (b) Dhaka

The logic followed here is:
=> Rupee, Dollar and Euro are currencies of different countries.
=> Dhaka is the Capital of Bangladesh.
Here, we can see that Dhaka is the odd one.
Hence, the correct answer is " Dhaka ".

Q14. Answer: (b) 141

The logic followed here is:
=> The squares of the consecutive numbers starting with 2 has been added to get the next term of the series.
Hence, the correct answer is " 141 ".

Q15. Answer: (b) [figure]

From the given open Dice:
M and A is the opposite sides.
K and 7 is the opposite sides.
J and L is the opposite sides.
And, two opposite sides can not be the adjacent surfaces, so it can't be shows in a dice.
Now,
Option 1)
→ Can be made, because no opposite sides in the given Dice.
Option 2)
→ Can not be made, because J and L are the opposite sides.
Option 3)
→ Can be made, because no opposite sides in the given Dice.
Option 4)
→ Can be made, because no opposite sides in the given Dice.
Hence, the correct answer is "Option 2".

Q16. Answer: (b) 7

According to the given Venn diagram:
The shaded area shows the "total number of buttons and bottle".
So, the total number of buttons and bottle = 2 + 5 = 7.
Hence, the correct answer is "7".

Q17. Answer: (b) 184

The logic followed here is:
Logic: (Sum of the opposite place value of all letters) × 4 = Code of the word.
'JAIL' is coded as '304'.
'LAWN' is coded as '232'.
Similarly, for 'NAVY'
So, 'NAVY' will be coded as '184'.
Hence, the correct answer is "184".

Q18. Answer: (c) Neither conclusion follows

Given Statements:
I. Some R are C.

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II. All R are K.

The least possible Venn diagram for the given statement is:

Conclusions:

I. All K are R - False (Because, All R are K, means some K are R and All K are R is possible only).

II. All C are R - False (Because, Some R are C given and All C are R is possible only).

III. All C are K - False (Because, Some R are C and All R are K gives Some C are K, and All C are K are possible only).

So, Neither conclusion follows.

Hence, the correct answer is "Option 3".

Q19. Answer: (a) (28, 21, 3528)

The logic followed here is:

Logic: (1st number × 2) × (2nd number × 3) = 3rd number.

Now,

(13, 7, 546)

→ (13 × 2) × (7 × 3)

→ 26 × 21 = 546.

(14, 15, 1260)

→ (14 × 2) × (15 × 3)

→ 28 × 45 = 1260.

Similarly, (28, 21, 3528)

→ (28 × 2) × (21 × 3)

→ 56 × 63 = 3528.

Hence, the correct answer is "Option 1".

Q20. Answer: (a) 11

The quadrilaterals are:

So, there is '11' quadrilaterals in the given figure.

Hence, the correct answer is "11".

Q21. Answer: (c) RNE

The logic followed here is:

=> The first and third letter is interchanged.

=> The second letter remains same.

Let's check using the logic,

QTY : YTQ

Similarly,

ENR :?

Hence, the correct answer is " RNE ".

Q22. Answer: (d) [figure]

The logic followed here is:

Step I: Letter 'N' has shifting a place in clockwise direction in next images, and replaced with H.

Step II: Letter 'K' has shifting a place in clockwise direction in next images, and replaced with G.

Step III: Letter 'R' has shifting a place in clockwise direction in next images, and replaced with S.

Step IV: Letter 'P' has shifting a place in clockwise direction in next images, and replaced with T.

So, the complete series will be:

So, 'Option 4' will replace the question mark.

Hence, the correct answer is "Option 4".

Q23. Answer: (c) (13, 12, 38)

The logic followed here:

=> (Third Number - Second Number) ÷ 2 = First Number.

(10, 22, 42):

→ (42 - 22) ÷ 2 = 10

→ (20) ÷ 2 = 10
→ 10 = 10
→ LHS = RHS.
(15, 14, 44):
→ (44 - 14) ÷ 2 = 15
→ (30) ÷ 2 = 15
→ 15 = 15
→ LHS = RHS.
Now, Let's check each option as per the logic:
1) (9, 22, 38):
→ (38 - 22) ÷ 2 = 9
→ (16) ÷ 2 = 9
→ 8 ≠ 9
→ LHS ≠ RHS.
2) (12, 12, 24):
→ (24 - 12) ÷ 2 = 12
→ (12) ÷ 2 = 12
→ 6 ≠ 12
→ LHS ≠ RHS.
3) (13, 12, 38):
→ (38 - 12) ÷ 2 = 13
→ (26) ÷ 2 = 13
→ 13 = 13
→ LHS = RHS.
4) (6, 3, 17):
→ (17 - 3) ÷ 2 = 6
→ (14) ÷ 2 = 6
→ 7 ≠ 6
→ LHS ≠ RHS.
Here, we can see that only Option 3 follow the logic.
Hence, the correct answer is " (13, 12, 38) ".

Q24. Answer: (a) 14 - 2844

The logic followed here is:
=> First Number × (First Number)² = Second Number.
Let's check each option as per the logic:
1) 14 - 2844:
→ 14 × (14)² = 2844
→ 14 × 196 = 2844
→ 2744 ≠ 2844.
→ LHS ≠ RHS.
2) 12 - 1728:
→ 12 × (12)² = 1728
→ 12 × 144 = 1728
→ 1728 = 1728
→ LHS = RHS.
3) 20 - 8000:
→ 20 × (20)² = 8000
→ 20 × 400 = 8000
→ 8000 = 8000
→ LHS = RHS.
4) 10 - 1000:

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→ 10 × $(10)^2$ = 1000

→ 10 × 100 = 1000

→ 1000 = 1000

→ LHS = RHS.

Here, we can see that only Option 1 doesn't follow the logic.

Hence, the correct answer is "14 - 2844".

Q25. Answer: (a) [figure]

The correct mirror image of the given figure is shown below:

Hence, the correct answer is " Option 1 ".

Q26. Answer: (b) September - October

The correct answer is September - October.

Key Points

• The crops which are sown in the rainy season are called Kharif crops.

• Kharif crops are the crops that are sown at the beginning of the rainy season, e.g. between April and May.

• The Kharif crops are harvested in the month of September-October

• Important crops grown during this season are paddy, maize, jowar, bajra, tur (arhar), moong, urad, cotton, jute, groundnut and soybean.

• Kharif crop requires high temperature and high humidity.

Additional Information

• There are three cropping seasons in India.

• Rabi.

• Kharif.

• Zaid.

• Rabi crops are sown in the winter season from October to December and harvested in the summer season from April to June.

• Wheat, Barley, Peas, Gram, and Mustard-produced during Rabi.

• Zaid season is a short season In between the Rabi and the Kharif seasons.

• Cucumber and watermelon are produced during Zaid.

Q27. Answer: (b) 300

The correct answer is Option 2.

Key Points

• On October 11, 2022, the Reserve Bank of India (RBI) raised the minimum capital requirement for setting up an asset reconstruction company (ARC) to Rs 300 crore from the existing Rs 100 crore.

• The Reserve Bank of India (RBI) is the central bank of India, responsible for the formulation and implementation of monetary policy in the country.

• The RBI performs various functions and roles, including:

• Monetary Policy

• Currency Issuance

• Banking Regulation and Supervision

• Foreign Exchange Managemen

• Developmental Function

• Financial Stability

Q28. Answer: (d) Intrusive igneous rocks

The correct answer is Intrusive igneous rocks.

Key Points

Concept:

• A rock is any naturally occurring solid mass or aggregate of one or more minerals or mineraloid matter.

• The earth's crust is composed of rocks.

• It is categorized by the minerals included its chemical composition and the way in which it is formed.

• The rock cycle is a basic concept of transitions through geologic time among the three main rock types: sedimentary, metamorphic, and igneous.

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• Each rock type is altered when it is forced out of its equilibrium conditions.

Additional Information

Types of rocks	Characteristics
Igneous rock	• It is formed when molten rock (magma or lava) cools and solidifies. - Igneous rock may form with or without crystallization. - It may be intrusive (plutonic) rocks or extrusive (volcanic) rocks. - For example, Granite, Basalt, etc.
Sedimentary rock	• They originate when particles settle out of water or air, or by precipitation of minerals from water. - They accumulate in layers. - For example, Sandstone, Limestone, etc.
Metamorphic rock	• They are formed when existing rocks are changed by heat, pressure, or reactive fluids, such as hot, mineral-laden water. - For example, Marble, Quartzite, Schist, etc.

Q29. Answer: (a) New Delhi

The correct answer is Option 1.

Key Points

• International Solar Alliance's Fifth Assembly to be held in New Delhi from 17th to 20th October, 2022.

• India holds the office of the President of the ISA Assembly.

• Ministers, missions and delegates from 109 Member and Signatory Countries are set to participate in this meeting.

• The Assembly will be presided over by Shri R.K. Singh, Union Minister for Power, New and Renewable Energy.

• Shri R.K Singh emphasized that India is leading the global energy transition with unmatched speed.

• He highlighted the indispensable role of the International Solar Alliance in achieving our planet's energy transition objectives.

• The minister emphasized the significance of solar power as the most affordable energy source, stating that solar and mini grids hold the key to ensuring universal access to energy worldwide.

Q30. Answer: (a) Metals react with acids and produce metal salts and hydrogen gas.

The correct answer is Metals react with acids and produce metal salts and hydrogen gas.

Key Points

• When an acid reacts with metal, salt and hydrogen are produced:

• Acid + Metal → Salt + Hydrogen

• An example: Nitric acid + Calcium → Nitrate + Hydrogen.

• The salt that is produced depends upon which acid and which metal react.

Additional Information

• Metals readily react with acid and produce hydrogen gas which burns with a pop sound.

• Metals are placed above hydrogen in reactivity series and displace during a reaction with an acid.

• As acids have a property of giving H+ ions.

• A resultant is formed with the release of hydrogen gas.

• It doesn't matter which metal or which acid is used if there is a reaction we always get hydrogen gas as well as salt.

• However, how quickly the reaction goes depends on the metal used and how high up in the reactivity series it is.

Q31. Answer: (a) 250

Correct answer is: 250

Key Points:

• In recognition of the state government's groundbreaking reforms, the World Bank has extended an unconditional loan of $250 million to Supporting Andhra's Learning Transformation (SALT) project.

• The SALT project's reforms have resulted in a paradigm shift in the way education is delivered, and the results have been encouraging.

• The SALT Project is the World Bank's first project in the school education sector to be funded without any conditions.

• In the last three years, approximately 53,000 crores have been spent on school education.

• More than 40,31,239 children attended government schools during the academic year 2022-2023.

• The lack of facilities or the adoption of English as a medium of instruction in government schools is not the cause of the decrease in the number of children.

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Q32. Answer: (a) State list

The correct answer is State list

Key Points:

Some important subjects under all three lists are:

Union list	State list	Concurrent list
1. Defence 2. Foreign affairs 3. Election Commission 4. Finance Commission 5. Security 6. Railways 7. Banking 8. Central Forces	1. Police 2. Public order 3. Panchayat 4. State Election commission 5. Agriculture 6. Irrigation 7. Toll tax 8. Health	1. Education 2. Marriage 3. Newspaper 4. Protection of wildlife. 5. Employment

• There are 100 subjects that come under the Union list.

• There are 61 subjects that come under the State list.

• There are 52 subjects that come under the Concurrent List.

• Division of Powers comes under Seventh Schedule.

• Residuary list: The subject which does not come under union, state, a concurrent list that will come under residuary list.

Important Points

• The power to control the residuary list comes in the hand of parliament.

• Earlier there were 97, 66, and 47 subjects in Union, State, Concurrent list respectively.

Q33. Answer: (b) Will Smith

The correct answer is Will Smith.

Key Points:

• The winners of the 94th Academy Awards or Oscar awards were announced on 28 March 2022.

• Will Smith was declared best actor for 'King Richard.

• While Jessica Chastain won the best actress Oscar for “The Eyes of Tammy Faye."

• Jane Campion became just the third woman in the 94-year history of the Oscars to win the best director, for her “Power of the Dog.

Important Points:

• "CODA" won all three awards it was nominated for, including Best Picture in Oscar 2022 ceremony.

• Troy Kotsur, who won for best supporting actor, became the first Deaf man to win an Academy Award for acting.

• Jessica Chastain won her first Oscar for her performance in "The Eyes of Tammy Faye."

Q34. Answer: (a) Mahi

The correct answer is Mahi

Key Points

• Kadana Dam is an earthen and masonry dam on the Mahi river in the Mahisagar district of Gujarat, India.

• The dam was constructed between 1979 and 1989.

• The dam supports a pumped-storage hydroelectric power station.

• The first two generators commissioned, stage I, are reversible Kaplan turbines that allow the power station to generate electricity during peak hours and then pump it back into the reservoir during low-demand hours such as night.

• Kadana Eddy Marking Sedimentary Structures nearby has been declared the National Geological Monuments of India by the Geological Survey Of India, for their protection, maintenance, promotion, and enhancement of geo-tourism.

Additional InformationSabarmati River:

• The Sabarmati basin extends over the states of Rajasthan and Gujarat having an area of 21,674 Sq.km with a maximum length and width of 300 km and 150 km.

• It lies between 70°58’ to 73°51’ east longitudes and 22°15’ to 24°47’ north latitudes.

• Sabarmati river originates from the Aravalli hills in Kotdi tehsil of Udaipur district of Rajasthan.

• The basin is bounded by Aravalli hills on the north and north-east, by Rann of Kutch on the west and by the Gulf of Khambhat on the south.

• The basin is roughly triangular in shape with the Sabarmati River as the base and the source of the Vatrak River as the apex point.

• Sabarmati originates from Aravalli hills at an elevation of 762 m near village Tepur, in the Udaipur district of Rajasthan.

• Right Bank Tributaries: Sei, Siri and Dhamni

• Left Bank Tributaries: Wakal, Harnav, Hathmati, Khari, Watrak.

Tapti:

• The Tapti (also known as the Tapi) is the second-largest west-flowing river in Peninsular India and is known as ‘the twin’ or ‘the handmaid’ of the Narmada.

• It flows for about 724 km before outfalling into the Arabian Sea through the Gulf of Cambay (Gulf of Khambhat).

• The Tapti River along with its tributaries flows over the plains of Vidharbha, Khandesh, and Gujarat and over large areas in the state of Maharashtra and a small area in Madhya Pradesh and Gujarat.

• Situated in the Deccan plateau, the basin is bounded by the

• Satpura range on the north,

• Mahadev hills on the east,

• Ajanta Range and the Satmala hills on the south, and

• by the Arabian Sea on the west.

Q35. Answer: (b) 1850

The correct answer is 1850

Key Points:

• The British believed that Indian society had to be reformed.

• Laws were passed to stop the practice of Sati and to encourage the remarriage of widows.

• English-language education was actively promoted.

• After 1830, the Company allowed Christian missionaries to function freely in its domain and even own land and property.

• The Caste Disabilities Removal Act, 1850, was a law passed in British India under East India Company rule, that abolished all laws affecting the rights of people converting to another religion or caste.

• The new Act allowed Hindus who converted from the Hindu religion to another religion equal rights under the new law, especially in the case of inheritance.

• The Caste Disabilities Removal Act, of 1850 was passed to make the conversion to Christianity easier.

• This law allowed an Indian who had converted to Christianity to inherit the property of his ancestors.

• Many Indians began to feel that the British were destroying their religion, their social customs, and their traditional way of life.

• There were of course other Indians who wanted to change existing social practices.

Q36. Answer: (b) Mohammad Rizwan

The correct answer is Mohammad Rizwan

Key Points:

• The International Cricket Council (ICC) has announced the winners of the ICC Player of the Month awards for September 2022.

• India’s inspirational captain Harmanpreet Kaur is named the recipient of the ICC Women’s Player of the Month award, While Pakistan ace Mohammad Rizwan claims the ICC Men’s Player of the Month award.

• Harmanpreet Kaur becomes India’s first winner of the ICC Women’s Player of the Month.

• The India skipper was at her brilliant best during the ODI series, scoring 221 runs across the three matches, maintaining a strike rate of 103.47, and only being dismissed once.

• She displayed control and poise in the first match of the series at Hove, and her 74 not out helped her side chase down England’s total of 228 at a canter to win by seven wickets.

• Kaur claims her inaugural win by overcoming compatriot Smriti Mandhana and Bangladesh skipper Nigar Sultana in the global vote conducted among media representatives, ICC Hall of Famers, former international players, and fans registered.

• The ICC is the global governing body for cricket. Representing 108 members, the ICC governs and administrates the game and works with our members to grow the sport. The ICC is also responsible for the staging of all ICC Events.

• ICC Founded: 15 June 1909;

• ICC Chairman: Greg Barclay;

• ICC CEO: Geoff Allardice;

• ICC Headquarters: Dubai, United Arab Emirates.

Q37. Answer: (b) Andy Marino

Correct Answer Andy Marino

Key Points:

• "Narendra Modi: A Political Biography" is a detailed book written by British author Andy Marino.

• It was published in 2014.

• The biography provides an in-depth look at Narendra Modi's life and his political journey, beginning with his early days in

Vadnagar, Gujarat to his rise to the position of Prime Minister of India.

Q38. Answer: (c) Ohm's

Correct Answer Ohm's

Key Points:

• The relationship between current, voltage, and resistance is described by Ohm's law. This law is given by George Simon Ohm in 1828

Ohm’s law:

• Ohm’s law states that at a constant temperature, the current through a conductor between two points is directly proportional to the voltage across the two points.

• Voltage = Current × Resistance

• V = I × R

• V = voltage, I = current and R = resistance

• The SI unit of resistance is ohms and is denoted by Ω.

• It helps to calculate the power, efficiency, current, voltage, and resistance of an element of an electrical circuit.

• If an element follows ohm’s law, then the element is known as a linear element.

• Ex: Resistor

Limitation of ohm's Law:

• Ohm’s law is applicable for conductors only.

• Ohm’s law does not apply to unilateral networks. Unilateral networks allow the current to flow in one direction. Such types of networks consist of elements like a diode, transistor, etc.

• Ohm’s law is also not applicable to non - linear elements.

• Non-linear elements are those which do not have current exactly proportional to the applied voltage that means the resistance value of those elements changes for different values of voltage and current. An example of a non-linear element is a thyristor.

• Ohm’s law is also not applicable to vacuum tubes.

Additional InformationBoyle’s Law

• Boyle's law is a gas law that states that a gas's pressure and volume are inversely proportional.

• It states that at a constant temperature, the pressure exerted by a gas is inversely proportional to the volume occupied by it.

• According to the Boyle's Law:

• P1V1 = P2V2

• Where P1 = Initial Pressure

P2 = Final Pressure

V1 = Initial Volume

V2 = Final Volume

The five main gas laws in chemistry are Boyle's Law, Charle's Law, Gay Lussac's Law, Avogadro's Law, and Ideal Gas Law.

• Charle's law states that the volume of an ideal gas is directly proportional to the absolute temperature at constant pressure.

• Gay-Lussac's law states that the pressure of a given mass of gas varies directly with the absolute temperature of the gas when the volume is kept constant.

• Avogadro's law or Avogadro-Ampère's hypothesis is an experimental gas law relating the volume of a gas to the amount of substance of gas present.

• The ideal gas law states that the product of the pressure and the volume of one gram molecule of an ideal gas is equal to the product of the absolute temperature of the gas and the universal gas constant.

Q39. Answer: (c) Alla Rakha

Correct Answer Alla Rakha.

Key Points

• Ustad Allah Rakha was a renowned tabla player.

• Ustad Allah Rakha studied voice and Raag Vidya under Ashiq Ali Khan of the Patiala Gharana.

• He was awarded the Padma Shri in 1977 and the Sangeet Natak Akademi Award in 1982.

• He was also featured in a Google doodle on 29 April 2014 on the occasion of his 95th birthday.

• Zakir Hussain is the eldest son of Ustad Allah Rakha.

Additional Information

Instrument	Musicians

Tabla	Zakir Hussain, Anindo Chatterjee, Alla Rakha, Bikram Ghosh, Kishan Maharaj, Shankar Ghosh, etc.
Flute	Hariprasad Chaurasia, Pravin Godkhindi, Pannalal Ghosh, Shashank Subramanyam, etc.
Shehnai	Bismillah Khan, Krishna Ram Choudhary, Ali Ahmad Hussain, etc.
Sitar	Pt Ravi Shankar, Shahid Parvez Khan, Budhaditya Mukherjee, Anushka Shankar, Hara Shankar Bhattacharya, Nikhil Banerjee, Vilayat Khan, Mushtaq Ali Khan
Sarod	Allauddin Khan, Ali Akbar Khan, Amjad Ali Khan, Buddhadev Dasgupta, Bahadur Khan, Sharan Rani, etc.

Q40. Answer: (c) Netherlands

The correct answer is Netherlands.

Key Points

• The Netherlands clinched their ninth FIH Women's Hockey World Cup by beating Argentina 3-1 in the final on 17 July 2022.

• Australia won the third place match by defeating Germany to claim their first World Cup medal as well.

• It was the 15th edition of the Women's FIH Hockey World Cup.

• It was held from 1 to 17 July 2022 in Spain and the Netherlands.

Additional Information:Sports:

• Youth World Boxing champions Alfiya Pathan & Gitika won gold medals at the first edition of the Elorda Boxing Cup in Nur-Sultan, Kazakhstan on 4 July 2022.

• Archers Jyothi Surekha Vennam and Abhishek Verma won the gold medal in the compound mixed team event at the Archery World Cup 2022 Stage- 3 in Paris on 25 June 2022.

• Cyclist Ronaldo Singh made history by winning a silver medal in the senior category sprint event at the Asian Track Cycling Championship 2022 (41st edition) held in New Delhi.

• Neeraj Chopra won the gold medal at the Kuortane Games in Finland on 18 June 2022.

• On 14 June 2022, Chopra also broke his own national record with a throw of 89.30m at the Paavo Nurmi Games 2022.

• Indian para-powerlifters Manpreet Kaur and Parmjeet Kumar have won bronze medals in World Para-powerlifting 2022 Asia Oceania Open Championships.

• Indian weightlifter Saanapathi Gurunaidu won the gold medal in the men's 55-kilogram event at the IWF Youth World Championships in Leon, Mexico on 12 Jun'22.

Q41. Answer: (a) Bhangra

The correct answer is Bhangra.

Key Points

• Bhangra is a lively form of folk music and dance that originates from Punjab.

• It is not considered a classical dance form in India.

• It is traditionally associated with the harvest festival of Baisakhi and is characterized by the beat of the dhol, a double-sided drum.

• The dance is known for its high energy levels, vibrant movements, and rhythmic beats.

• While Bhangra has its roots in traditional Indian culture, it has also evolved significantly in the modern age, influenced by other music genres and cultures.

Additional Information

• The Sangeet Natak Akademi recognizes 8 classical dances in India.

• 8 Classical Dances of India and States:

Dance	State
Bharatanatyam	Tamil Nadu
Kathak	Uttar Pradesh
Kathakali	Kerala.
Kuchipudi	Andhra Pradesh.
Odissi	Odisha

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Sattriya	Assam
Manipuri	Manipur
Mohiniyattam	Kerala

Important Points

• The Cultural Ministry of India has included Chhau in the list of classical dances making a total of 9 classical dance forms.

Q42. Answer: (a) 1720

The correct answer is 1720.

Key Points

• In 1720, the British government enacted legislation known as the Calico Act, banning the use of printed cotton textiles - chintz - in England.

• This Act was brought into effect due to the fear that the import of cheap, colourful, and washable Indian textiles was harming the British wool and silk industries, which were unable to compete with the more attractive Indian products.

• The Calico Act prohibited the use of Indian textiles in Britain, but they were still allowed for re-export to other places, which ensured the continued operation of the East India Company.

• The Act illustrates the early impact of global trade and market forces and the measures that governments took to protect their domestic industries.

• Over time, as Britain's own cotton industry developed, the restrictions imposed by the Calico Act were gradually lifted.

Additional Information

• Calico Act:

• The Calico Act of 1720 was a piece of protectionist legislation by the British government.

• Calico refers to unbleached, plain-woven cotton textiles, initially imported from India.

• The use of calico from India had become widespread in England since it was inexpensive, brightly coloured, and considered exotic.

• The British textile industry felt threatened by the importation of Indian calico.

• To protect its wool and silk industries, the government passed the Calico Act, banning the use of cotton textiles in England.

• The Act is a significant indicator of how the British used legislation to control markets and trade in the interests of their home industries.

Q43. Answer: (d) Full-duplex

The correct answer is Full-duplex.

Key Points

• Full-duplex mode refers to the method of data transmission in which data can flow in both directions simultaneously.

• In this mode, both the sender and receiver can transmit data at the same time.

• This is akin to a telephone conversation where both parties can talk and listen simultaneously.

• Full-duplex communication requires two independent channels, one for sending data and the other for receiving.

• This mode is more efficient than half-duplex and simplex modes as it allows communication in both directions at the same time, making it faster for large amounts of data.

• Full-duplex systems are used in situations where there is a large volume of data to be transmitted and there is a need for real-time communication, such as in video conferencing, telephony, and server-client communication.

Additional Information

Option	Description
Simplex	In the simplex mode of communication, the data flows in only one direction, from the sender to the receiver. A good example of this mode is a keyboard or a mouse where input devices send data to the computer and there is no data sent back from the computer to these devices.
Quarter-duplex	Quarter-duplex is not a standard mode of data transmission. The standard modes are simplex, half-duplex, and full-duplex.
Half-duplex	In half-duplex mode, data can be sent in both directions, but not at the same time. When one device is sending, the other can only receive, and vice versa. Walkie-talkies are a good example of devices operating in half-duplex mode.

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Q44. Answer: (c) Ctrl + C

The correct answer is Ctrl + C.

Key Points

• Ctrl + C is a universal keyboard shortcut on Microsoft systems that copies the selected text or item to the clipboard.

• This shortcut is used across many applications, not just MS Word.

• This includes other Microsoft Office applications, browsers, and file explorer.

• The copied data can then be pasted elsewhere using the keyboard shortcut Ctrl + V.

• This is a quicker and more efficient way of copying data than using the mouse to select 'Copy' from the right-click context menu or from the 'Edit' menu in the toolbar.

• It's also worth noting that the original data remains in place after the copy operation, allowing it to be copied to multiple locations if desired.

Additional Information

Shortcut Key	Function
Ctrl + X	This shortcut key is used to cut the selected text or item. The cut item can then be pasted elsewhere using Ctrl + V. Unlike copy, the cut operation removes the original data from its initial location.
Alt + C	This is not a standard shortcut in MS Word 365 or most other applications. It could potentially be set as a custom shortcut, but by default, it does not perform any function.
Alt + X	This is also not a standard shortcut in MS Word 365. As with Alt + C, it could potentially be assigned a function in a custom setup, but by default, it does not perform any function.

Q45. Answer: (b) Karnataka

The correct answer is Karnataka.

Key Points

• Maharshi Valmiki Scheduled Tribes Development Corporation Limited is situated in Karnataka, a state in the southwestern region of India.

• This Corporation was established for the upliftment of the Scheduled Tribes in the state of Karnataka.

• It aims to provide financial assistance for income-generating activities to Scheduled Tribes in the state, contributing to their economic development.

• The Corporation also organizes awareness and training programs to help Scheduled Tribes members become self-sufficient.

• Besides providing financial aid, the Corporation's functions also include offering educational assistance, conducting surveys for need-based programs, and facilitating employment-oriented training programs.

Additional Information

• Maharshi Valmiki:

• Maharshi Valmiki is revered as the first poet of Sanskrit literature.

• He is the author of the epic Ramayana, which narrates the life of Lord Rama.

• Valmiki's contributions to Indian literature are highly esteemed, and he holds a significant place in the cultural and religious history of India.

• His name is often associated with social justice initiatives in India, symbolizing upliftment and empowerment, especially in the context of organizations like Maharshi Valmiki Scheduled Tribes Development Corporation Limited.

• Apart from the Ramayana, there are other works attributed to Valmiki in traditional Indian literature.

• However, it's worth noting that the authorship of these works is often disputed due to the time elapsed since they were written.

• These works include:

• Yoga Vasistha:

• Sometimes attributed to Valmiki, this is a discourse by sage Vasistha to Prince Rama, during a period when Rama is in a dejected state.

• It contains teachings of Advaita Vedanta and is structured as a conversation between Vasistha, a learned sage, and Rama.

• Valmiki Ramayana in Prakrit:

• This is said to be a version of the Ramayana written by Valmiki in Prakrit language, but its authenticity and authorship are debated among scholars.

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Q46. Answer: (b) 7th

The correct answer is seventh.

Key Points

• India:

• It is the seventh-largest country in the world.

• Russia, Canada, China, the United States, Brazil, Australia are the top six largest countries respectively.

• It occupies 2.4 per cent of the total land area of the world.

• Indian population is 17.7% of the total world population.

• The name 'India' is derived from the Indus river.

Additional Information

• India is the world's oldest, largest civilization.

• It has the largest postal system.

• India is the second-largest English speaking country in the world.

• India has the world's largest Hindu population.

Q47. Answer: (c) virtual and erect

The correct answer is virtual and erect.

Key Points

• Convex Mirror

• A Convex Mirror curves outward like the back of a spoon.

• In a convex mirror, light originating from the same point will reflect off the mirror surface and diverge.

• Hence convex mirror is sometimes referred to as a diverging mirror.

• The type of image formed by these mirrors is always imaginary or virtual.

• Uses of Convex Mirror

1. It is used as a rearview mirror in the vehicle because it provides the maximum near field of view.

2. In Sodium reflector lamp.

• Concave Mirror

• A Concave mirror is a mirror that has a slightly inward curve like the inside of a spoon.

• The Curved surfaces focus parallel rays from a great distance into a single point for enhanced intensity.

• Uses of Concave Mirror

1. As a shaving glass

2. As a reflector for headlights of vehicles, and searchlights.

3. An ophthalmoscope examines the eye, ear, and nose doctors.

4. In Solar cookers.

Confusion Points

• Do not confuse between Concave/Convex Lens and Mirror

• Convex lens

• The convex lens is also called a converging lens.

• Concave lens

• The concave lens is also called a diverging lens.

Q48. Answer: (b) Alireza Firouzja

The correct answer is Alireza Firouzja.

Key Points

• The ninth edition of the Sinquefield Cup was held in September 2022.

• The event concluded with a play-off after nine eventful rounds.

• The play-off consisted of two rapid games.

• The play-off was between Grandmasters Ian Nepomniachtchi and Alireza Firouzja.

• The winner of the Sinquefield Cup in 2022 was Alireza Firouzja.

Additional Information

• The Sinquefield Cup is an annual, invitation-only chess tournament held in St. Louis, Missouri.

• Named after Rex Sinquefield, an American businessman and chess patron, the Cup is part of the Grand Chess Tour, a series of

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international chess tournaments.

• It has been hosting some of the world's top players since its inception in 2013.

• The format of the tournament is a 10-player round-robin, meaning each participant plays against every other participant.

Q49. Answer: (d) Q = f(L, C)

The correct answer is Q = f(L, C).

Key Points

• The production function is a mathematical representation of the relationship between inputs (like labour and capital) and the output of a firm or industry.

• The production function typically takes the form

• Q = f(L, C)

• Where Q represents the maximum output that can be produced given the inputs.

• In this equation, L is the quantity of labor used in the production process and C is the quantity of capital used.

• The function f(.) describes the specific relationship between the inputs and output.

• This relationship is usually determined empirically, based on observations of real-world production processes.

• The equation Q = f(L, C) is a representation of the concept of production technology, which describes how firms transform inputs into outputs.

• It's a fundamental concept in the study of production and cost in microeconomics.

Q50. Answer: (a) Union list

The correct answer is Union list.

Key Points

• The Central Bureau of Intelligence and Investigation (CBI) comes under the Union List of the Seventh Schedule of the Indian Constitution.

• The Seventh Schedule of the Indian Constitution is about the allocation of powers and functions between the Union and the States.

• It contains three lists:

• Union List

• State List, and

• Concurrent List.

• The Union List is where the Union has exclusive powers to deal with certain subjects.

• The Central Bureau of Intelligence and Investigation is one of the subjects in the Union List.

• This means that the central government has exclusive jurisdiction over the CBI, which is a key agency for national intelligence and investigations1.

Additional Information

• State List:

• This list contains subjects on which only the state government can make laws.

• The subjects under this list pertain to matters of regional and local importance.

• Examples include police, agriculture, and public health.

• Concurrent List:

• This list contains subjects on which both the Union and the State Governments are competent to legislate.

• However, in case of a conflict between Union and State law on the same subject, the Union law prevails.

• Examples of subjects in this list include bankruptcy and insolvency, marriage and divorce, bankruptcy and insolvency, and education.

• Transferred List:

• This option is not a part of the Seventh Schedule.

• It might be a reference to the subjects that were transferred from the State List to the Concurrent List by constitutional amendments, but it's not an official term used in the Indian Constitution.

Q51. Answer: (a) 4

Calculation:

Families whose income is more than or equal to 10000 but less than or equal to 25000 = 3 + 4 + 8 = 15

The total number of families whose income is more than 35000 but less than or equal to 50000 = 10 + 4 + 5 = 19

Difference = 19 -15 = 4.

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Therefore Option 1 is the correct answer.

Q52. Answer: (a) 100 km

Given:

Speed of train = 50 km/hr

Speed of walking = 10 km/hr

Total time for journey = 12 hours

Concept:

We'll use the concept of average speed which is Total Distance / Total Time

Solution:

Let the distance to be covered be 'd' km.

Time taken by train = d / 50, Time taken by walking = d / 10

d/50 + d/10 = 12

d = 500/5

=> d = 100 km

Hence, the distance traveled by train is 100 km.

Q53. Answer: (c) 46.25 percent profit

Shortcut Trick

Use the ratio formula: CP / MP = (100 − Discount%) / (100 + Profit%)

CP / MP = (100 − 20) / (100 + 30) = 80 / 130 = 8 / 13

Let MP = 13 and CP = 8. New SP = 90% of MP = 13 × 0.9 = 11.7

New Profit% = [(11.7 − 8) / 8] × 100 = (3.7 / 8) × 100 = 46.25%

Therefore The correct answer is 46.25 percent profit.

Alternate Method

Given: First discount = 20%, Initial profit = 30%, Second discount = 10%.

Formula: SP = MP × (100 − D)% | Profit% = [(SP − CP) / CP] × 100

=> Let Cost Price (CP) = 100

=> Initial Selling Price (SP1) = 100 + 30% of 100 = 130

=> Since SP1 is obtained after 20% discount on Marked Price (MP):

=> 130 = MP × (100 − 20) / 100 => 130 = MP × 0.8

=> MP = 130 / 0.8 = 162.5

=> New discount = 10%, so New Selling Price (SP2) = 162.5 × (100 − 10) / 100

=> SP2 = 162.5 × 0.9 = 146.25

=> New Profit = SP2 − CP = 146.25 − 100 = 46.25

=> New Profit% = (46.25 / 100) × 100 = 46.25%

Therefore The correct answer is 46.25 percent profit.

Additional Information

Relation between CP and MP

The direct relationship is given by CP / MP = (100 − D%) / (100 ± P/L%), where D is discount and P/L is profit or loss percentage.

Mark-up Percentage

Mark-up % = [(MP − CP) / CP] × 100. It represents how much the price is increased above the cost price before offering a discount.

Successive Discounts

If two discounts d1 and d2 are given, the effective discount is [d1 + d2 − (d1 × d2) / 100]%.

Q54. Answer: (b) 18

Given:

$(k + 1/k)^2 = 9$

Formula used:

$(k^3 + 1/k^3) = (k + 1/k)^3 - 3(k + 1/k)$

Calculation:

(k + 1/k)2 = 9

k + 1/k = 3

(k3 + 1/k3) = (k + 1/k)3 - 3(k + 1/k)

(k3 + 1/k3) = (3)3 - 3(3)

(k3 + 1/k3) = 27 - 9

(k3 + 1/k3) = 18

Therefore Option 2 is the correct answer.

Q55. Answer: (d) 30 cm

Given:

A circle with a chord of length 40 cm which is 15 cm away from the centre of the circle.

We are to find the length of another chord in the same circle which is 20 cm away from the centre.

Concept Used:

The Perpendicular from the centre of a circle to a chord bisects the chord.

Pythagorean theorem: Hypotenuse² = Base² + Perpendicular²

Calculation:

MP = PN = MN/2 = 40/2 = 20 cm, and

The distance from the centre as d1 = 15 cm.

From the Pythagorean theorem, the radius r of the circle is:

=> r = √(a² + d1²)

=> √((20 cm)² + (15 cm)²)

=> √(400 cm² + 225 cm²)

=> √(625 cm²)

=> 25 cm.

For the unknown chord, let's denote half of its length as x/2, and the known distance from the centre as d2 = 20 cm.

Again using the Pythagorean theorem, we find b as:

x/2 = √(r² - d2²)

=> √((25 cm)² - (20 cm)²)

=> √(625 cm² - 400 cm²)

=> √(225 cm²)

=> 15 cm.

So, the full length of the unknown chord is x = 2 × 15 cm = 30 cm.

Therefore, the length of the chord of the same circle which is at a distance of 20 cm from the center of the circle is 30 cm.

Therefore Option 4 is the correct answer.

Q56. Answer: (d) 16.5

Given:

3126 ÷ 4 of 521 + 5 x 3

Concept Used:

Calculation:

3126 ÷ 4 x 521 + 5 x 3

3126/2084 + 15

1.5 + 15

16.5

Therefore Option 4 is the correct answer.

Q57. Answer: (d) 5 percent

Shortcut Trick

When the Cost Price (CP) of two articles is the same, the overall profit or loss percentage is the simple average of the individual profit and loss percentages.

Overall % = (Profit % − Loss %) ÷ 2

Overall % = (10 − 20) ÷ 2 = −10 ÷ 2 = −5%

The negative sign indicates an overall loss of 5%.

Therefore The correct answer is 5 percent.

Alternate Method
Article 1
CP = Rs. 3000
+10% (+Rs. 300)
Article 2
CP = Rs. 3000
−20% (−Rs. 600)
Total CP = Rs. 6000 | Net Loss = Rs. 300
Given:
Cost Price (CP) of first article = Rs. 3000
Cost Price (CP) of second article = Rs. 3000
Profit on first article = 10%
Loss on second article = 20%
Formula Used:
Profit or Loss Amount = CP × (Profit or Loss %) ÷ 100
Overall Loss % = (Net Loss ÷ Total CP) × 100
Calculations:
=> Total Cost Price = Rs. 3000 + Rs. 3000 = Rs. 6000
=> Profit on first article = 10% of 3000 = (10 ÷ 100) × 3000 = Rs. 300
=> Loss on second article = 20% of 3000 = (20 ÷ 100) × 3000 = Rs. 600
=> Net Loss = Total Loss − Total Profit = Rs. 600 − Rs. 300 = Rs. 300
=> Overall Loss % = (300 ÷ 6000) × 100
=> Overall Loss % = 5%
Therefore The correct answer is 5 percent.
Additional Information
When Cost Prices are Equal
If articles are bought at the same price and sold at x% profit and y% loss, the overall percentage is simply their average: (x − y) ÷ 2 %.
When Selling Prices are Equal
If two articles are sold at the exact same price, one at a profit of x% and the other at a loss of x%, the net result is always a loss given by the direct formula: (x^2 ÷ 100) %.
Successive Percentage Change
If a single value undergoes successive percentage changes of a% and b%, the effective overall percentage change is: a + b + (a × b) ÷ 100.

Q58. Answer: (d) 90 degree

Given:
In ΔPQR, angle bisector of angle P intersects QR at M.
PQ = PR
Concept Used:
When two sides of a triangle are equal then the triangle is isosceles and and angles opposite to equal sides are equal in measure.
Calculation:
In ΔPQR, PQ = PR
=> angle Q = angle R = b
PM is the angle bisector of angle P.
angle QPM = angle RPM = a
In ΔPQR, apply Angle Sum Property
angle P + angle Q + angle R = 180°
angle P + b + b = 180°
angle P = 180° - 2b
angle QPM = (180° - 2b)/2 = 90° - b
In ΔPQM

Let angle PMQ = θ

angle QPM + angle Q + angle M = 180°

90 - b + b + θ = 180°

θ = 180° - 90°

θ = 90°

angle PMQ = 90°

Q59. Answer: (a) 1

Solution:

Total sharpeners sold by A (P1) = 200 + 190 + 170 + 165 + 155 = 880

Total sharpeners sold by B (P2) = 155 + 160 + 210 + 180 + 175 = 880

Ratio P1/P2 = 880/880 = 1

Hence, the value of (P1/P2) is 1.

Q60. Answer: (a) 154 cm2

Given

Radius of a sphere = 3.5 cm

Concept:

We'll use the formula for the total surface area of a sphere which is 4πr^2.

Solution:

Total surface area = 4π(3.5 cm)^2 = 154 cm2

Therefore, the total surface area of the sphere is 154 cm2.

Q61. Answer: (b) 75, 50

Given

Student A got 25 marks more than Student B.

Marks of A = 60% of the sum of A and B's marks.

Concept: We'll use the given conditions to set up equations and solve them.

Solution:

Let marks of B = x. Then, marks of A = x + 25.

From the second condition, x + 25 = 0.6 × (x + x + 25) => x + 25 = 0.6 × (2x + 25)

Solving the equation, we get x = 50. Therefore, marks of B = 50.

Marks of A = 50 + 25 = 75.

Therefore, the marks obtained by A and B are 75 and 50 respectively.

Q62. Answer: (b) 14

Given:

x2 + 1/x2 = 4

Formula used:

(x2 + 1/x2)² = x^4 + 1/x^4 + 2

Calculation:

(x2 + 1/x2)2 = x4 + 1/x4 + 2

(4)2 = x4 + 1/x4 + 2

16 = x4 + 1/x4 + 2

x4 + 1/x4 = 14

Therefore Option 2 is the correct answer.

Q63. Answer: (c) 30 cm

Given:

Inradius of an equilateral triangle = 5√3 cm.

Concept: We'll use the formula of the inradius of an equilateral triangle which is a = 2√3r, where 'a' is the side length and 'r' is the inradius.

Solution:

Side of the triangle = 2√3 × 5√3 = 30

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Therefore, the length of the side of the equilateral triangle is 30 cm.

Q64. Answer: (c) Only II

Given

Sales of P in years A and B: 100, 200

Sales of Q in years D and E: 100, 50

Sales of P in year C = 300

Sales of Q in year D = 100

Concept: We'll calculate the required ratios and percentages and compare with the given statements.

Solution:

Combined sales of P in years A and B = 100 + 200 = 300

Combined sales of Q in years D and E = 100 + 50 = 150

Ratio of combined sales of P in years A and B to that of combined sales of Q in years D and E = 300/150 = 2 : 1

Sales of P in year C is 300% of the sales of Q in year D = 3 × 100 = 300.

Therefore, Statement II is correct, but Statement I is not correct.

Q65. Answer: (d) 3/2

Calculation:

$\sqrt{2}\sec^2 - 4\sec\theta + 2\sqrt{2} = 0$

$\Rightarrow \sqrt{2}\sec 2 - 2\sec\theta - 2\sec\theta + 2\sqrt{2} = 0$

$\Rightarrow \sqrt{2}\sec\theta(\sec\theta - \sqrt{2}) - 2(\sec\theta - \sqrt{2}) = 0$

$\Rightarrow (\sec\theta - \sqrt{2})(\sqrt{2}\sec\theta - 2) = 0$

$\Rightarrow \sec\theta = \sqrt{2}$

$\Rightarrow \theta = 45°$

$\Rightarrow \sin 2\theta + \tan 2\theta = \sin^2 45° + \tan^2 45°$

$\Rightarrow 1/2 + 1 = 3/2$

Therefore Option 4 is the correct answer.

Q66. Answer: (a) 40 degree

Given:

M is the incentre of ΔXYZ.

angle YXZ + angle YMZ = 150°

Concept Used:

If M is the incentre.

angle YMZ = 90° + angle YXZ/2

Calculation:

angle YXZ + angle YMZ = 150°

angle YMZ = 150 - angle YXZ

M is the incentre.

angle YMZ = 90° + angle YXZ/2

150 - angle YXZ = 90° + angle YXZ/2

60 = 3angle YXZ/2

angle YXZ = 40°

Therefore Option 1 is the correct answer.

Q67. Answer: (d) 69

Given

10 consecutive numbers.

Average of the middle two numbers = 13.5.

Concept:

We'll use the property that the average of two middle numbers in a series of consecutive numbers is the average of the whole series.

Solution:

The average of the whole series of 10 numbers is also 13.5.

Hence, the first number = 13.5 - 4.5 = 9 (since the average is the middle of the series of 10 numbers).

Sum of first 6 numbers = 6 × average of first and sixth number = 6 × (9+14)/2 = 69.

Therefore, the sum of the first 6 numbers is 69.

Q68. Answer: (b) 252

Given

$a + b + c = 6$

$a^2 + b^2 + c^2 = 40$

Formula used:

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

Solution:

$a + b + c = 6$

$\Rightarrow (a + b + c)^2 = 6^2$

$\Rightarrow a^2 + b^2 + c^2 + 2ab + 2bc + 2ac = 36$

$\Rightarrow 40 + 2(ab + bc + ca) = 36$

$\Rightarrow 2(ab + bc + ca) = - 4$

$\Rightarrow ab + bc + ca = - 2$

and

a3 + b3 + c3 - 3abc = (a + b + c)(a2 + b2 + c2 - ab - bc - ac)

$\Rightarrow$ a3 + b3 + c3 - 3abc = (6)[40 - (-2)]

$\Rightarrow$ a3 + b3 + c3 - 3abc = 6 × 42

$\Rightarrow$ a3 + b3 + c3 - 3abc = 252

Therefore, the value of $a^3 + b^3 + c^3 - 3abc$ is 252.

Q69. Answer: (c) 3% per annum

Given:

Principal = Rs. 1000

Amount after 2 years = Rs. 1060.90

Concept:

We'll use the formula for compound interest, A = P(1 + r/n)^((not)), where A is the amount, P is the principal, r is the annual interest rate, n is the number of times interest is compounded per year, and t is the time in years.

Solution:

Given that interest is compounded annually, n = 1.

So the equation becomes A = P(1 + r)^t

Rearranging for r, we get r = (A/P)^((1/t)) - 1 = (1060.90/1000)^((1/2)) - 1 = 0.03 or 3%.

Therefore, the rate of compound interest per annum is 3%.

Q70. Answer: (a) √5/3

Given:

cosec B = 3/2

Concept:

We'll use the trigonometric identities $\sin^2 B + \cos^2 B = 1$ and cot B = cos B/sin B to solve this problem.

Solution:

sin B = 1/cosec B = 2/3.

Using the identity $\sin^2 B + \cos^2 B = 1$, we can solve for cos B to get $\cos B = \sqrt{(1 - \sin^2 B)} = \sqrt{(1 - (2/3)^2)} = \sqrt{5}/3$.

cot B = cos B/sin B = $(\sqrt{5}/3)/(2/3) = \sqrt{5}/2$.

cot B sin B = $(\sqrt{5}/2) \times (2/3) = \sqrt{5}/3$.

Therefore, the value of cot B sin B is √5/3.

Q71. Answer: (b) 115

Calculation:

J1 = The total foreign trade by country A in all the 5 years. = 170 + 150 + 75 + 65 + 35 = 495

J2 = The total foreign trade by country B in all the 5 years. = 45 + 105 + 195 + 175 + 90 = 610

J2 - J1 = 610 - 495 = 115

Therefore Option 2 is the correct answer.

Q72. Answer: (a) 3

Shortcut Trick

By complementary angles rule: cos A = sin B and tan A = cot B when A + B = 90°.

Since 62° + 28° = 90° => cos 62° ÷ sin 28° = 1

Since 34° + 56° = 90° => tan 34° ÷ cot 56° = 1

Therefore, the expression becomes: 5 × 1 − 2 × 1 = 3

Therefore The correct answer is 3.

Alternate Method

Given:

Expression: (5 cos 62° ÷ sin 28°) − (2 tan 34° ÷ cot 56°)

Formula Used:

cos θ = sin(90° − θ)

tan θ = cot(90° − θ)

Calculations:

=> cos 62° = sin(90° − 62°)

=> cos 62° = sin 28°

=> tan 34° = cot(90° − 34°)

=> tan 34° = cot 56°

Substituting these values into the given expression:

=> [5 × sin 28° ÷ sin 28°] − [2 × cot 56° ÷ cot 56°]

=> 5(1) − 2(1)

=> 5 − 2

=> 3

Therefore The correct answer is 3.

Additional Information

Complementary Angle Relations

Trigonometric functions of complementary angles satisfy: sin(90° − θ) = cos θ, cos(90° − θ) = sin θ, tan(90° − θ) = cot θ, and cot(90° − θ) = tan θ.

Reciprocal Relations

The reciprocal relationships are given by: cosec θ = 1 ÷ sin θ, sec θ = 1 ÷ cos θ, and cot θ = 1 ÷ tan θ.

Pythagorean Identities

Important trigonometric identities include: $\sin^2\theta + \cos^2\theta = 1$, $\sec^2\theta - \tan^2\theta = 1$, and $\text{cosec}^2\theta - \cot^2\theta = 1$.

Q73. Answer: (c) 1680

Shortcut Trick

The average of the three numbers ≈ 36 ÷ 3 = 12.

Check consecutive composite numbers around 12: 10, 12, and 14.

Sum = 10 + 12 + 14 = 36 (Condition satisfied).

Product = 10 × 12 × 14 = 1680.

Therefore The correct answer is 1680.

Alternate Method

Given:

Sum of three consecutive composite numbers = 36

Concept Used:

Composite numbers are integers strictly greater than 1 that have more than two positive divisors. The sequence of composite numbers starts as: 4, 6, 8, 9, 10, 12, 14, 15, 16...

Calculation:

=> Let us test consecutive triplets of composite numbers to find a sum of 36.

=> 8 + 9 + 10 = 27 (Too small)

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=> 9 + 10 + 12 = 31 (Too small)

=> 10 + 12 + 14 = 36 (Matches exactly)

=> The three consecutive composite numbers are 10, 12, and 14.

=> Product = 10 × 12 × 14

=> Product = 120 × 14 = 1680

Therefore The correct answer is 1680.

Additional Information

Composite Numbers

Numbers that have more than two distinct positive divisors. For example, 4, 6, 8, 9, 10, 12 etc.

Prime Numbers

Numbers greater than 1 that have exactly two divisors: 1 and the number itself. For example, 2, 3, 5, 7, 11 etc.

Number 1

The number 1 is a unique integer that is neither prime nor composite.

Consecutive Numbers

Numbers that follow each other in order without gaps. When specifying composite numbers, they represent adjacent values in that specific mathematical subset.

Q74. Answer: (d) 1/40

Shortcut Trick

Let total work = LCM(20, 40) = 40 units.

Combined efficiency of A, B, and C = 40 ÷ 20 = 2 units/day.

Efficiency of A alone = 40 ÷ 40 = 1 unit/day.

Efficiency of B and C together = 2 − 1 = 1 unit/day.

Part of the work completed by B and C in 1 day = 1 / 40.

Therefore The correct answer is 1/40.

Alternate Method

Given:

Time taken by A, B, and C together to finish the work = 20 days

Time taken by A alone to finish the work = 40 days

Formula Used:

Total Work = LCM of given days

Efficiency = Total Work ÷ Time Taken

Person	Days	Total Work	Efficiency
A + B + C	20	40	40 ÷ 20 = 2
A	40	40 ÷ 40 = 1	

Calculations:

=> Efficiency of (B + C) = Efficiency of (A + B + C) − Efficiency of A

=> Efficiency of (B + C) = 2 − 1 = 1 unit/day

=> Part of the work B and C together finish in a day = Efficiency of (B + C) ÷ Total Work

=> Part of work = 1 ÷ 40 = 1/40

Therefore The correct answer is 1/40.

Additional Information

Time & Work Relation

Total Work = Efficiency × Time taken. Time taken and efficiency are inversely proportional to each other for a given amount of work.

Pipes & Cisterns

Works on the same concept as Time & Work, but filling pipes have positive efficiency while emptying pipes have negative efficiency.

Work & Wages

Total wages are always distributed in the ratio of the actual total work done by the individuals, not just their efficiency or time.

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Q75. Answer: (d) Rs. 16000

Shortcut Trick

Apply the Cross-Multiplication Method on the Income and Expenditure ratios.

Product difference of ratios: |(4 × 4) − (5 × 5)| = |16 − 25| = 9 units

Product difference of ratio and savings: |(5 × 12000) − (4 × 6000)| = |60000 − 24000| = Rs. 36000

=> 9 units = Rs. 36000 → 1 unit = Rs. 4000

=> A's Income = 4 units = 4 × 4000 = Rs. 16000

Therefore The correct answer is Rs. 16000.

Alternate Method

Given:

Ratio of Incomes of A and B = 4 : 5

Ratio of Expenditure of A and B = 5 : 4

Savings of A = Rs. 6000 | Savings of B = Rs. 12000

Formula Used:

Income − Expenditure = Savings

Let the Income of A be 4x and B be 5x.

Let the Expenditure of A be 5y and B be 4y.

=> 4x − 5y = 6000 → (Eq. 1)

=> 5x − 4y = 12000 → (Eq. 2)

To find x, eliminate y by multiplying (Eq. 1) by 4 and (Eq. 2) by 5:

=> 16x − 20y = 24000

=> 25x − 20y = 60000

Subtracting the equations:

=> (25x − 16x) = 60000 − 24000

=> 9x = 36000

=> x = 4000

=> Income of A = 4x = 4 × 4000 = 16000

Therefore The correct answer is Rs. 16000.

Additional Information

Income, Expenditure and Savings

The fundamental relation is Income = Expenditure + Savings. When ratios are given, using a constant like 'x' for income and 'y' for expenditure is standard for setting up simultaneous equations.

Cross-Multiplication Technique

This is a shortcut for problems where two ratios are given along with an absolute change (like savings). Difference of cross products of ratios = Difference of cross products of ratio and constants.

Ratio and Proportion Properties

If A : B = c : d, then A = ck and B = dk. This property allows us to convert relative values into absolute algebraic terms for easier calculation.

Q76. Answer: (c) Invulnerable

The solution is in Hindi. Read it online.

Q77. Answer: (d) Your employees also have access to this data.

The correct answer is 'Option 4'.

Key Points

• The sentence with no spelling error is: "Your employees also have access to this data."

• The explanation of the correct sentence is as follows:

• "Your" is the correct spelling for the second person possessive adjective.

• "Employees" is the correct spelling for the plural form of "employee", which means someone who works for a person or business for wage or salary.

• "Also" is correctly spelled. It's an adverb that means 'in addition' or 'too'.

• "Have" is the correct form of the verb to have in this context.

• "Access" is correctly spelled and means the means or opportunity to approach or enter a place.

• "To" is a preposition, and it is correctly spelled.

• "This" is a demonstrative adjective that points forward to a following noun or noun phrase. It's correctly spelled.

• "Data" is the plural of "datum" and refers to facts and statistics collected together for reference or analysis. It is also correctly spelled.

Therefore, the correct sentence is: "Your employees also have access to this data."

Additional Information

• The other sentences have spelling mistakes:

• "Employes" should be "employees" and "acess" should be "access".

• "datas" should be "data".

Q78. Answer: (c) He was persuaded by her for over a year.

The correct answer is 'Option 3'.

Key Points

• When converting a sentence from active to passive voice, the object of the active sentence becomes the subject of the passive sentence, and the subject of the active sentence becomes the 'agent' in the passive sentence.

• The verb takes the form of "be + past participle."

• In the given active sentence, "She" is the subject, "persuaded" is the verb, and "him" is the object.

• When it's turned into a passive voice, "He" (formerly the object) becomes the subject, "was persuaded" is the verb in its "be + past participle" form, and "by her" (formerly the subject) is now the agent.

• The phrase "for over a year" remains the same as it is a prepositional phrase showing duration and does not impact the structure of the sentence in terms of active or passive voice.

Therefore, the correct sentence is: 'He was persuaded by her for over a year'.

Q79. Answer: (c) SPQR

The correct answer is 'Option 3'.

Key Points

• S, "A full understanding of glacial-interglacial carbon dynamics", introduces the topic of the sentence, making it the logical starting point.

• P, "requires knowledge of the complex interplay among ocean", expands on what is needed for a full understanding of the topic introduced in S. It also ends in a way that suggests more information is about to follow, making it a bridge to the next part.

• Q, "chemistry and circulation, ecology of marine and terrestrial", gives more detail on the complex interplay mentioned in P. It lists aspects related to ocean and ends in a way that suggests further detailing is about to follow, making it a link to the next part.

• R, "organisms, ice sheet dynamics, and atmospheric chemistry and circulation", completes the detail on the complex interplay. It includes elements that link to both marine (organisms, ice sheet dynamics) and terrestrial (atmospheric chemistry and circulation) aspects, thus finishing the sentence in a coherent manner.

Therefore, the correct order is: 'SPQR'.

Q80. Answer: (c) to clean

The correct answer is 'Option 3' i.e. 'To clean'.

Key Points

• The correct improvement for the sentence "They hired a maid 'to have cleaner' the house." is: "to clean"

• The phrase "to clean" is the correct infinitive verb form that should be used in this sentence.

• The infinitive form "to clean" indicates the purpose for which the maid was hired.

Therefore, the correct sentence is: "They hired a maid to clean the house."

Additional Information

• "To cleans" is incorrect because the infinitive form of the verb "clean" is "to clean", not "to cleans". The "s" is added to the base form of the verb when the subject is third-person singular (he, she, it), but in the infinitive form, we do not add "s".

• "For cleaner" is incorrect because "cleaner" is a comparative adjective and doesn't fit properly in the context of the sentence. Also, "for" does not properly indicate the purpose in this case.

Q81. Answer: (d) Hesitate

The solution is in Hindi. Read it online.

Q82. Answer: (b) animated

The correct answer is 'Option 2' i.e. 'Animated'.

Key Points

• "Animated" means to give an appearance of life, liveliness, or activity.

• In the context of graphics or digital media, it refers to something that is made to appear to move.

• Google often celebrates events and holidays with animated graphics or doodles on their homepage, making "animated" the most fitting option in this context.

Therefore, the correct sentence is: 'Google on Saturday celebrated the onset of spring in the northern hemisphere with an animated graphic.

Additional InformationNow let's look at the other options:

• "Rooting" generally means to establish deeply and firmly or to encourage a team or person. However, it does not make sense in the context of describing a graphic.

• "Freezing" means turning into ice or another solid as a result of extreme cold. It's contradictory to use this word while talking about the onset of spring, a season associated with warming temperatures.

• "Implanting" generally means to insert or fix something in a place. It doesn't fit in this context as it doesn't describe the nature of a graphic appropriately.

Q83. Answer: (b) Eulogize

The solution is in Hindi. Read it online.

Q84. Answer: (d) Continuation

The solution is in Hindi. Read it online.

Q85. Answer: (b) you are going to stumble to a

The correct answer is 'Option 2'.

Key Points

• The part of the sentence that contains a grammatical error is*: "you are going to stumble to a"*

• The error in this part of the sentence is the preposition "to" used after "stumble".

• The correct phrase is "stumble upon" or "stumble across", both of which mean to find or discover something by chance.

Therefore, the corrected sentence would be: "You never know when you are going to stumble upon a jewel in the most unexpected corner.

Q86. Answer: (d) Every of the two

The correct sentence is 'Every of the two'.

Key Points

• The part of the sentence that contains an error is: "Every of the two"

• In English, the correct phrase is "Each of the two," not "Every of the two."

• "Each" is used when referring to individual members of a group, especially when the group is small, like two girls in this case.

• "Every" is used when referring to all the members of a group of three or more.

Therefore, the corrected sentence would be: "Each of the two girls will get the reward."

Q87. Answer: (a) He said that he had gone to Shimla.

The correct answer is 'Option 1'.

Key Points

• The correct indirect form of the given sentence "He said, 'I had gone to Shimla.'" is: "He said that he had gone to Shimla."

• When converting direct speech into indirect speech, the tense of the verb usually moves back into the past. This is known as 'backshifting'.

• However, if the verb is already in the past perfect tense ("had gone"), it remains in the past perfect tense in indirect speech.

• This is because the past perfect tense already represents an action that was completed before some point in the past, so there is no further 'past' tense to shift back to.

Therefore, the correct answer is: 'He said that he had gone to Shimla.'

Additional Information

• Here's why the other options are not correct:

• "He said that he went to Shimla." - The verb tense changes from past perfect ("had gone") to simple past ("went"), which is not consistent with the original sentence.

• "He says that he had gone to Shimla." - The verb in the reporting clause ("says") is in the present tense, whereas in the original sentence, it is in the past tense ("said").

• "He said that he has gone to Shimla." - The verb tense changes from past perfect ("had gone") to present perfect ("has gone"), which is not consistent with the original sentence.

Q88. Answer: (b) seemed

The correct answer is 'Option 2' i.e. 'Seemed'.

Key Points

• "Seemed" is used here to describe the appearance or perceived color of the water at different times or under different conditions.

• The verb "seem" is often used when something appears a certain way to the senses but may not actually be that way.

Therefore, the correct sentence is: 'At first the water seemed blue, then grey.'

Additional Information

• Now, let's look at the other options:

• "Glanced" generally means to look quickly or briefly. It doesn't fit in this context as it's not the water doing the action of glancing, but rather it's about how the water appears.

• "Heeded" means to pay attention to. Again, it doesn't make sense in this context because water cannot heed anything - it's an inanimate object.

• "Lest" is a conjunction that means 'for fear that' or 'to avoid the risk of.' It is used before a clause showing something that is feared or to be avoided. It doesn't fit in this context grammatically or semantically.

Q89. Answer: (c) quilted

The correct answer is 'Option 3' i.e. 'Quilted'.

Key Points

• The adjective "quilted" is used to describe something that is made of two layers of fabric with padding in between, stitched together in lines or patterns.

• This provides a sense of texture and comfort, and it's a term often used to describe furniture, particularly chairs or sofas.

Therefore, the correct sentence is: 'Ram placed her in one of the quilted leather chairs opposite his desk.'

Additional Information

• Now let's look at the other options:

• "Marinated" refers to the process of soaking foods in a seasoned, often acidic, liquid before cooking. This term is not applicable to describe a chair.

• "Brewed" is typically used in the context of making beer, tea, or other drinks by soaking, boiling, and fermentation. This term is also not applicable to describe a chair.

• "Stewed" refers to the process of cooking slowly in liquid in a closed dish or pan. This term is not applicable to describe a chair.

Q90. Answer: (b) futility

The correct answer is 'Option 2' i.e. 'Futility'.

Key Points

• In this context, "futility" is the most appropriate word to fill in the blank.

• "Futility" means the pointlessness or uselessness of an action.

• This word is used when an action doesn't produce any useful results, which complements the word "usefulness" in the sentence.

• The speaker is asking for reflection on whether blocking all the highways is useful or pointless.

Therefore, the correct sentence is: 'Sir, can you reflect on the usefulness or futility of blocking all the highways?

Additional Information

• Let's look at the other options:

• "Impotence" generally refers to a lack of power or ability, which doesn't fit the context here.

• "Scorch" means to burn slightly or to cause discoloration due to heat. It's not appropriate in this context.

• "Incompatibility" refers to the state of two things being so different in nature that they cannot coexist. It does not fit the context here.

Q91. Answer: (a) Propitious

The solution is in Hindi. Read it online.

Q92. Answer: (b) Sugest

The solution is in Hindi. Read it online.

Q93. Answer: (d) Patricide

The solution is in Hindi. Read it online.

Q94. Answer: (a) A dangerous situation

The solution is in Hindi. Read it online.

Q95. Answer: (a) An unexpected event

The solution is in Hindi. Read it online.

Q96. Answer: (d) negative

The correct answer is 'Option 4' i.e. 'Negative'.

Key Points

• The most appropriate word to fill in the blank number 1 would be "negative".

• The context of the sentence is about myths surrounding the health impacts of milk.

• So, we are discussing potential adverse or "negative" effects that these myths suggest, which is why "negative" is the most fitting choice.

Therefore, the correct sentence is: There are so many myths about the negative impacts of milk on health. Changing how much milk you drink because of (2) ___ myths may mean you are unnecessarily restricting this (3)__ nutritious drink. Australians often restrict dairy foods when they try to (4) weight believing them to be fattening. While dairy products naturally contain fat there are many reduced fat products (5) _____.

Additional Information

• Here's why the other options are less appropriate:

• "Kind" - This word is typically used to describe someone's character or behavior as considerate or benevolent. Here, it doesn't fit well because we're talking about potential health effects, not characteristics or behaviors.

• "Welcoming" - This adjective describes an inviting or friendly environment or attitude. It does not fit in this context because we're discussing perceived health impacts, not attitudes or environments.

• "Impolite" - This word describes behavior that's not respectful or courteous. It is not suitable here because we're discussing health impacts, not manners or politeness.

Q97. Answer: (c) these

The correct answer is 'Option 3' i.e. 'These'.

Key Points

• The most appropriate word to fill in the blank number 2 would be "these".

• The word "these" is a demonstrative pronoun and is used to point forward to something that is about to be mentioned.

• Since the sentence is referring to the myths about the negative impacts of milk that were just mentioned in the previous sentence, "these" is the appropriate choice to refer to those specific myths.

Therefore, the correct sentence is: There are so many myths about the negative impacts of milk on health. Changing how much milk you drink because of these myths may mean you are unnecessarily restricting this (3)____ nutritious drink. Australians often restrict dairy foods when they try to (4) weight believing them to be fattening. While dairy products naturally contain fat there are many reduced fat products (5) _____.

Additional Information

• Here's why the other options are less appropriate:

• "Those" - This is a plural form of 'that' and is used to refer to things or people that are further away or are not as directly connected to the speaker. In this context, we're referring to the myths that have been directly mentioned, making "these" a better choice.

• "Thus" - This is an adverb that means 'therefore' or 'as a result'. It doesn't fit in this context as we're not describing a consequence or result, but rather we're referring to a specific set of myths.

• "This" - This is a singular form of 'these' and refers to a singular noun that is close to the speaker. But since we're referring to multiple myths, the plural form "these" is a more fitting choice.

Q98. Answer: (c) highly

The correct answer is 'Option 3' i.e. 'Highly'.

Key Points

• The most appropriate word to fill in the blank number 3 would be "highly".

• The context of the sentence is emphasizing the high nutritional value of milk.

• So, using "highly" before "nutritious" amplifies this value and appropriately conveys the intended meaning.

Therefore, the correct sentence is: There are so many myths about the negative impacts of milk on health. Changing how much milk you drink because of these myths may mean you are unnecessarily restricting this highly nutritious drink. Australians often restrict dairy foods when they try to (4) weight believing them to be fattening. While dairy products naturally contain fat there are many reduced fat products (5) _____.

Additional Information

• Here's why the other options are less appropriate:

• "Suddenly" - This adverb describes something happening quickly and unexpectedly. It doesn't fit in this context because the nutritional value of milk is not sudden or unexpected.

• "Nominally" - This adverb means 'in name only' or 'very little'. It's not suitable in this context because it doesn't effectively emphasize the high nutritional value of milk.

• "Invisibly" - This adverb means 'in a way that cannot be seen'. It doesn't fit in this context because we're not discussing anything that's unseen or invisible.

Q99. Answer: (a) lose

The correct answer is 'Option 1' i.e. 'Lose'.

Key Points

• The most appropriate word to fill in the blank number 4 would be "lose".

• The context of the sentence is discussing the misconception that dairy products, including milk, may contribute to weight gain.

• Hence, the word "lose" is the most fitting choice as it relates to weight loss, a common goal for those who might restrict dairy foods.

Therefore, the correct sentence is: There are so many myths about the negative impacts of milk on health. Changing how much milk you drink because of these myths may mean you are unnecessarily restricting this highly nutritious drink. Australians often restrict dairy foods when they try to lose weight believing them to be fattening. While dairy products naturally contain fat there are many reduced fat products (5) _____.

Additional Information

• Here's why the other options are less appropriate:

• "Meditate" - This refers to the practice of focusing one's mind for a period of time, in silence or with the aid of chanting, for religious or spiritual purposes, or as a method of relaxation. It does not fit here because the context is about managing weight, not meditating.

• "Subjugate" - This verb means to bring under domination or control, especially by conquest. In this context, it does not make sense to 'subjugate' weight.

• "Leverage" - This term generally refers to the use of borrowed capital for an investment, expecting the profits made to be greater than the interest payable. In another context, it can mean to use something to maximum advantage. Neither of these meanings fits within the context of weight management.

Q100. Answer: (d) available

The correct answer is 'Option 4' i.e. 'Available'.

Key Points

• The most appropriate word to fill in the blank number 5 would be "available".

• The context of the sentence is talking about reduced fat dairy products as alternatives to regular dairy products for those concerned about weight gain.

• Hence, the word "available" is the most fitting choice because it indicates that these reduced fat products exist and can be accessed.

Therefore, the correct sentence is: There are so many myths about the negative impacts of milk on health. Changing how much milk you drink because of these myths may mean you are unnecessarily restricting this highly nutritious drink. Australians often restrict dairy foods when they try to lose weight believing them to be fattening. While dairy products naturally contain fat there are many reduced fat products available.

Additional Information

• Here's why the other options are less appropriate:

• "Inoperable" - This is typically used to describe something that cannot be operated or something that cannot be treated by surgery. In this context, it doesn't make sense because we're talking about dairy products, not machinery or medical conditions.

• "Deficient" - This means lacking in some necessary quality or element. It's not suitable in this context because the sentence seems to emphasize the availability of reduced fat dairy products, not their deficiency.

• "Durable" - This refers to the ability to withstand wear, pressure, or damage. It's not the best fit for this context because we're discussing food products, not items that need to be resistant to wear and tear.

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