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

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

Take this paper as a timed mock test

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

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

ENGLISH LANGUAGE

Q1. 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)

(3, 2, 162)

(6, 3, 3888)

(a) (5, 2, 1350)
(b) (9, 3, 19783)
(c) (4, 3, 786)
(d) (7, 2, 4802)

Q2. In a certain code language, ‘SCREEN’ is coded as ‘LCCPAQ’. What is the code for ‘SKILLS’ in that code language?

(a) QJJHIR
(b) QJJJGQ
(c) OJJGQ
(d) QJJGIQ

Q3. 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)

(18, 66, 48)

(52, 144, 92)

(a) (24, 56, 32)
(b) (46, 122, 66)
(c) (34, 106, 82)
(d) (82, 178, 94)

Q4. 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.

Ohm : Electric Resistance : : Newton : ?

(a) Force
(b) Pressure
(c) Temperature
(d) Area

Q5. In the following question, select the related letters from the given alternatives.

AMG : WIC :: NZT : ?

(a) JVP
(b) MOP
(c) JVS
(d) JKR

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

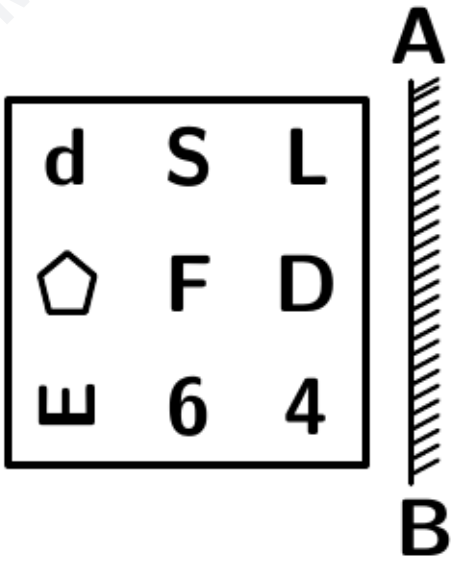
NTR, TVZ, ZXH, FZP, ?

(a) XRT
(b) LMQ
(c) LCY
(d) LBX

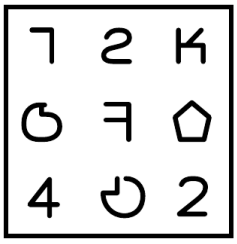
Q7. In the following question, select the odd letter/letters from the given alternatives.

(a) EAW
(b) WSM
(c) HDZ
(d) YUQ

Q8. 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?

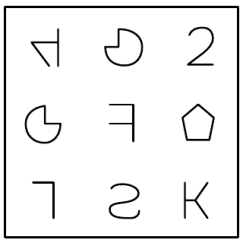


(a)

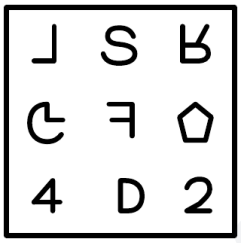


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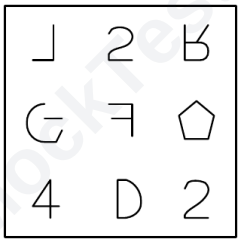
(b)



(c)



(d)



Q9. By interchanging the given two signs which of the following equation will be not correct?

× and +

I. 7 – 6 + 2 ÷ 1 × 9 = 2

II. 16 + 4 – 9 × 1 ÷ 3 = 60

(a) Both I and II

(b) Only I

(c) Only II

(d) Neither I nor II

Q10. Select the option that is related to the fifth number in the same way as the second number is related to the first number and fourth number is related to third number.

6 : 12 :: 15 : 75 :: 18 : ?

(a) 138

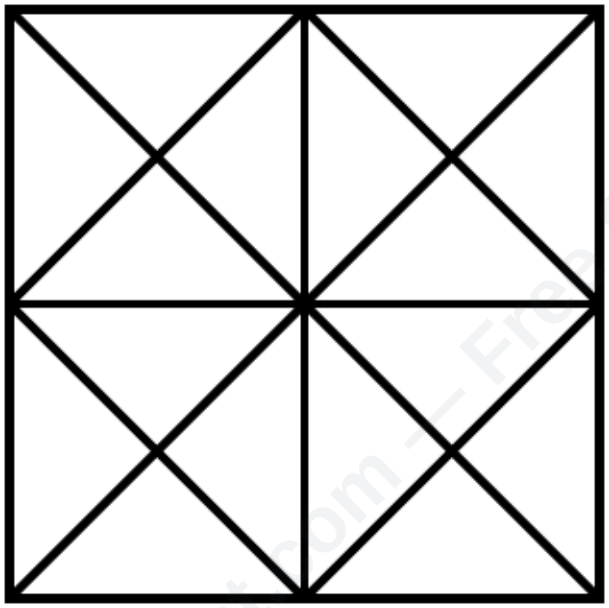
(b) 108

(c) 90

(d) 126

Q11. Find the total number of squares in the figure.

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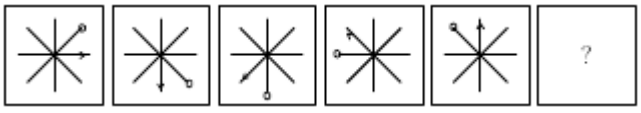
(a) 10
(b) 8
(c) 6
(d) 12

Q12. In the following question, select the odd word pair from the given alternatives.
(a) Karnataka – Bengaluru
(b) Patna – Bihar
(c) Gandhinagar – Gujarat
(d) Dispur – Assam

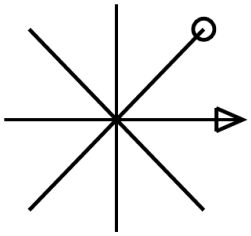
Q13. M is the brother of N. L is the father of M. N is the sister of O. O is the daughter of P. How is P related to N?
(a) Mother
(b) Paternal Grandmother
(c) Sister
(d) Maternal Aunt

Q14. In a certain code language, 'GARMENTS' is coded as '2019132214719', 'HYDROGEN' is coded as '192523181272214'. What is the code for 'INVASIVE' in that code language?
(a) 1418518954
(b) 1814518955
(c) 1814158955
(d) 1814519855

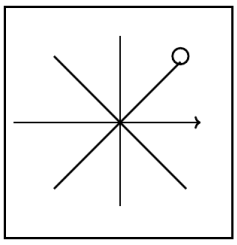
Q15. Select the figure from the given options that can replace the question mark (?) in the following series.



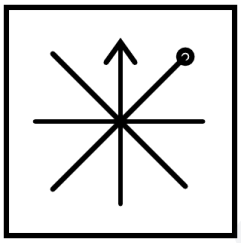
(a)



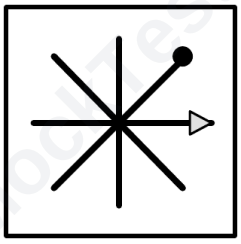
(b)



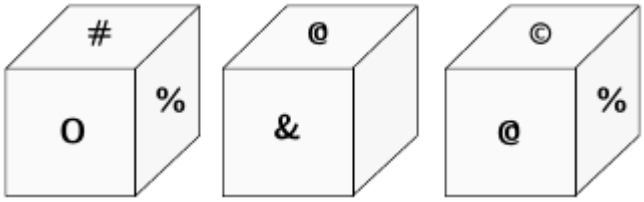
(c)



(d)



Q16. Three different positions of the same dice are shown. Select the symbol that will be on the face opposite to the one having '@'.



(a) O
(b) &
(c) %
(d) #

Q17. In the given word pairs, the first word is related to the second word following a certain logic. Study the given pairs carefully, and from the given options, select the pair that follows the same logic.

Colour : Black

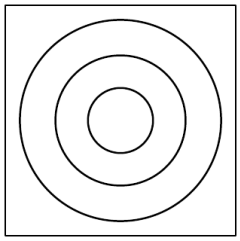
(a) Lily : Flower
(b) Eraser : Marker
(c) Furniture : Table
(d) Fruit : Onion

Q18. Select the Venn diagram that best represents the relationship between the following classes.

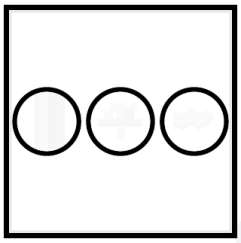
Pens, Pencils and Eraser

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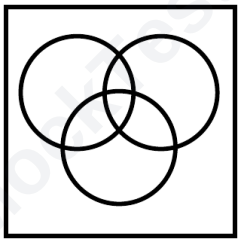
(a)



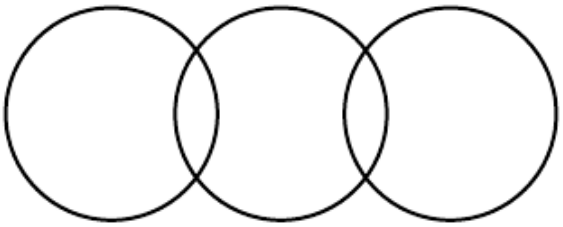
(b)



(c)



(d)



Q19. After arranging the given words according to dictionary order, which word will come at 'Second' position ?

1. Dietetic
2. Diestrus
3. Diestrum
4. Dieldrin
5. Diestock

(a) Diestrus
(b) Dietetic
(c) Diestock
(d) Dieldrin

Q20. 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)

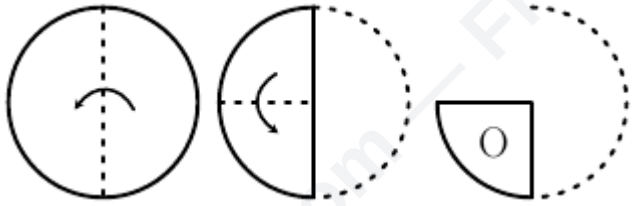
(a) 648 – 2592
(b) 378 – 1512
(c) 588 – 2352
(d) 278 – 1122

Q21. In the following question, select the missing number from the given series.

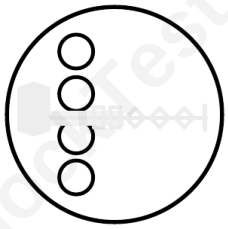
68, 82, 110, 124, 152,?, 194

(a) 168
(b) 170
(c) 166
(d) 162

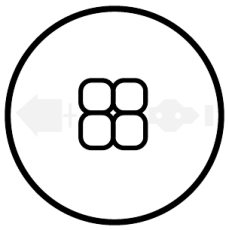
Q22. The sequence of folding a piece of paper and the manner in which the folded paper has been cut is shown in the following figures. How would this paper look when unfolded?



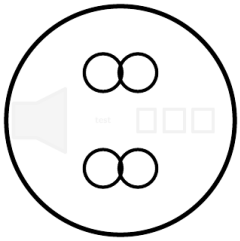
(a)



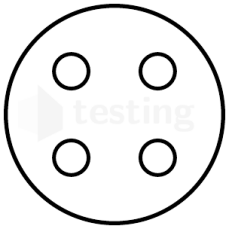
(b)



(c)



(d)



Q23. If 8 % 3 % 2 = 328 and 4 % 2 % 6 = 264, then 1 % 7 % 3 =?

(a) 173
(b) 317
(c) 371
(d) 731

Q24. 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. All truck are car.

II. Some car are bike.

Conclusion:

I. No bike is truck.

II. Some truck are car.

III. Some bike are car.

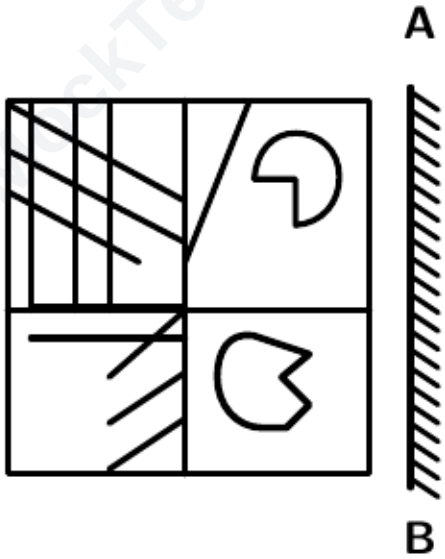
(a) Both conclusions I and II follows

(b) All conclusion follows

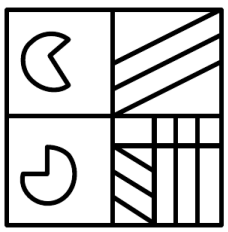
(c) Both conclusions I and III follows

(d) Both conclusions II and III follows

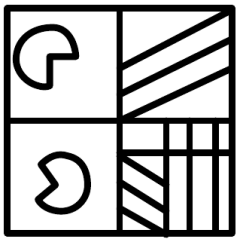
Q25. If a mirror is placed on the line AB, then out of the option figures which figure will be the right image of the question figure?



(a)

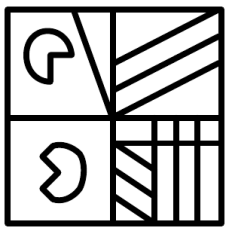


(b)

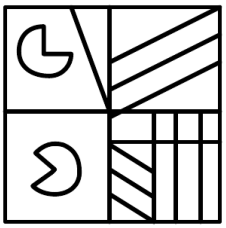


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(c)



(d)



GENERAL INTELLIGENCE

Q26. Where does the East Coast of India lie?

(a) Between Gulf of Cambay and Cape Comorin
(b) Between Eastern Ghats and the Bay of Bengal
(c) Between Maharashtra and Kerala
(d) Between Diu and Kerala

Q27. If ex ante aggregate demand and ex ante aggregate supply are plotted together in a graphical diagram, then at which point equilibrium will be reached?

(a) Where ex ante aggregate demand is less than ex ante aggregate supply
(b) Where ex ante aggregate demand is equal to ex ante aggregate supply
(c) Where ex ante aggregate demand is more than ex ante aggregate supply
(d) Where ex ante aggregate demand is zero

Q28. Who is the first athlete to represent India in fencing at Tokyo Olympics 2020 held in 2021?

(a) PT Usha
(b) P.V. Sindhu
(c) Aditi Ashok
(d) Bhavani Devi

Q29. Which village in Gujarat was declared as the first round-the-clock solar powered village in India in October 2022?

(a) Waghai
(b) Khavda
(c) Modhera
(d) Unai

Q30. In September 2022, which state bagged the international tourism award for “Best destination for culture”?

(a) Kerala
(b) West Bengal
(c) Uttar Pradesh
(d) Gujarat

Q31. Which law is also known as the law of inertia?

(a) Newton's First law of motion
(b) Newton's Second law of motion
(c) Archimedes principle

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(d) Kepler's law

Q32. Which of the following sports was NOT played at Tokyo Olympics 2020 held in 2021?

(a) Shooting
(b) Surfing
(c) Swimming
(d) Cricket

Q33. Sher Khan defeated Humayun at Kanauj in the year _____.

(a) 1535
(b) 1540
(c) 1530
(d) 1555

Q34. Which is the most important festival of Assam?

(a) Lumbini Festival
(b) Hornbill Festival
(c) Phool Dei
(d) Bihu

Q35. Which of the following pairs of 'disease – duration' is correct?

I. Acute – long duration
II. Chronic – short time

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

Q36. Which part of the Indian Constitution is related with the Fundamental rights?

(a) III
(b) I
(c) IV
(d) II

Q37. What is the theme of “Digital India Week 2022”?

(a) From Global to local
(b) India’s Digital Start ups
(c) Green India, Clean India
(d) Catalyzing New India’s Techade

Q38. Mita performs "Ghoomar" at her school's annual function. Which state does this dance form originate from?

(a) Punjab
(b) Gujarat
(c) Rajasthan
(d) Odisha

Q39. What is the total number of medals won by India in 2020 Tokyo Olympic Games?

(a) 7
(b) 8
(c) 6
(d) 10

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Q40. Who is the author of the book 'The 7 Sins of Being a Mother'?

(a) Tahira Kashyap Khurrana
(b) Alia Bhatt
(c) Twinkle Khanna
(d) Kareena Kapoor

Q41. Which of the following shortcut key is used add a new blank slide to an existing presentation of MS-PowerPoint 365?

(a) Ctrl + Alt + N
(b) Ctrl + M
(c) Ctrl + Alt + M
(d) Ctrl + N

Q42. The concept of "Procedure Established by Law" in the Indian constitution is borrowed from which of the following countries?

(a) Britain
(b) France
(c) United States of America
(d) Japan

Q43. _____ serves as the entry and exit point of a network, as all data coming in or going out of a network must first pass through it in order to use routing paths.

(a) Bridge
(b) Router
(c) Gateway
(d) Repeater

Q44. Which of the following factors of soil formation determines the accumulation of the soil?

(a) Fauna
(b) Flora
(c) Parent rock
(d) Relief

Q45. Majuli is a river island in the Brahmaputra River in which of the following states of India?

(a) Arunachal Pradesh
(b) Assam
(c) Manipur
(d) Sikkim

Q46. "Kavach" system introduced by Indian Railways is a/an _____.

(a) Insurance scheme for passengers
(b) Automatic crossing system
(c) Automatic Train Protection System
(d) System to increase the speed of the trains

Q47. Which of the following pair of country – name of grassland is correct?

I. Argentina – Pampas
II. Brazil – Steppe

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

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Q48. Who among the following started the Kuka Movement?

(a) Balak Singh
(b) Thakur Singh Sandhawalia
(c) Baba Dayal Das
(d) Satguru Ram Singh

Q49. By which of the following process can we separate two miscible liquids?

(a) Chromatography
(b) Distillation
(c) Crystallisation
(d) Sublimation

Q50. Law of Demand states that, there is a negative relationship between _____.

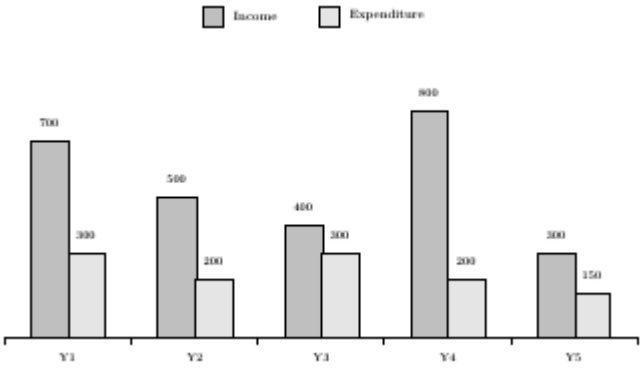
(a) tax on a commodity and its price
(b) demand for a commodity and its supply
(c) demand for a commodity and its price
(d) supply of a commodity and its price

QUANTITATIVE APTITUDE

Q51. If $\tan\theta + \cot\theta = 8$, then what is the value of $\tan^2\theta + \cot^2\theta$?

(a) 36
(b) 64
(c) 16
(d) 62

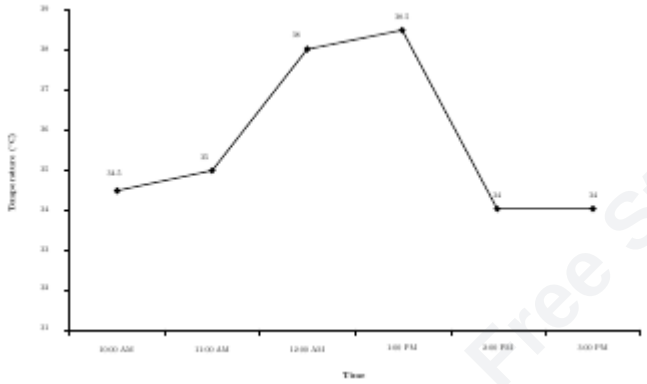
Q52. The bar graph given below shows the income and expenditure of a company in five years.



In which of the year savings are minimum?

(a) Y4
(b) Y3
(c) Y2
(d) Y5

Q53. The following line graph shows the body temperature of a patient every hour in a hospital. At what time the body temperature of the patient is the highest?



(a) 12 noon
(b) 10 am
(c) 11 am
(d) 1 pm

Q54. On selling of 18 pens at Rs.360, there is a loss equal to the cost of 3 pens. What is the cost price of a pen?
(a) Rs.10
(b) Rs.20
(c) Rs.24
(d) Rs.12

Q55. How many composite numbers are there between 23 and 43?
(a) 7
(b) 18
(c) 14
(d) 15

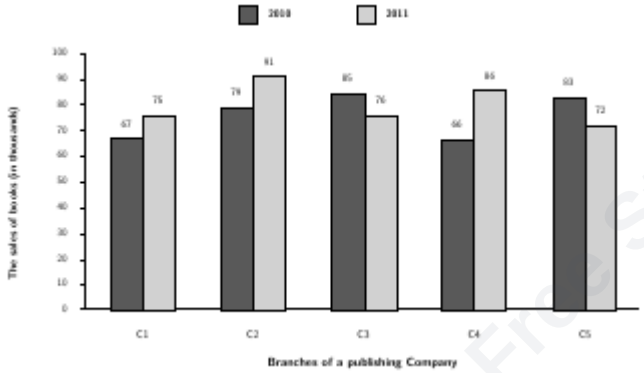
Q56. Angle subtended by a chord on the major arc of a circle is 65 degree. What is the angle subtended by the same chord on the centre of this circle?
(a) 130 degree
(b) 125 degree
(c) 90 degree
(d) 65 degree

Q57. ΔPQR is a right angled triangle. angle Q = 90 degree, PQ = 9 cm and QR = 11 cm. What is the value of cot P?
(a) √202/9
(b) 11/9
(c) 9/√202
(d) 9/11

Q58. The speed of a train is 30 percent more than the speed of a car. Both start from point P at the same time and reach point Q at the same time. P and Q are 130 km apart from each other. On the way, the train stops for 30 minutes at a station. What is the speed of the train?
(a) 70 km/hr
(b) 60 km/hr
(c) 78 km/hr
(d) 72 km/hr

Q59. The bar graph below shows the sale of books (in thousand) has been given in two consecutive years of 2010 and 2011 of five branches of a publishing company. Find the ratio of total sales in the two years of branch C2 to the total sales in both years of branch C4?

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(a) 76 : 85
(b) 169 : 153
(c) 153 : 169
(d) 85 : 76

Q60. If $a^3 = b^3 + 988$ and $a - b = 4$, then what is the value of $2a^2 + 2ab + 2b^2$?
(a) 500
(b) 516
(c) 247
(d) 494

Q61. The radius of the incircle of an equilateral triangle is $9\sqrt{3}$ cm. What will be the perimeter of this equilateral triangle?
(a) 54 cm
(b) 162 cm
(c) 108 cm
(d) 81 cm

Q62. What is the value of (sec A - tan A + 1)(sec A - tan A - 1) ?
(a) 2 tan A
(b) 2 tan A (tan A - sec A)
(c) 2 sec A
(d) (1 + tan A)

Q63. If $5x + y = 17$ and $xy = 6$, then what is the value of $125x^3 + y^3$?
(a) 4913
(b) 1530
(c) 3383
(d) 3183

Q64. 10 women do half of the total work in 20 days. How many more women will be required to complete the remaining work in 10 days?
(a) 40
(b) 20
(c) 30
(d) 10

Q65. PQ is the chord of a circle and O is the center of a circle. angle POQ = 130 degree. What is the angle subtended by the same chord in the major segment of the circle?
(a) 80 degree
(b) 65 degree
(c) 60 degree
(d) 55 degree

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Q66. What is the sum of the largest and the smallest of the given fractions?

6/5,11/15,4/7,5/13

(a) 61/65
(b) 97/65
(c) 103/65
(d) 94/65

Q67. Rajiv scored 20 percent marks in an exam and failed by 25 marks. If he scores 50 percent marks, then he gets 20 marks more than passing marks. What is the passing marks for the exam?

(a) 55
(b) 45
(c) 35
(d) 40

Q68. If the radius of a sphere is thrice the radius of a hemisphere, then what will be the respective ratio of their volumes?

(a) 54 : 1
(b) 27 : 1
(c) 16 : 1
(d) 18 : 1

Q69. P invested Rs. 4000 for one year. Q joined him with an investment of Rs. 6000 after few months. If at the end of one year the ratio of profits of P and Q is 4 : 3, then Q joined after how many months?

(a) 6 months
(b) 4 months
(c) 8 months
(d) 3 months

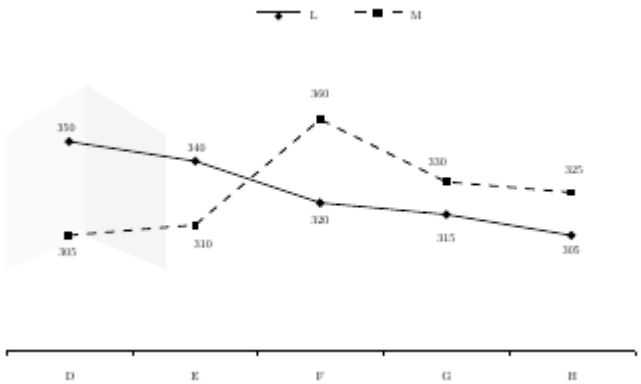
Q70. A person lent Rs. 12,000 to B for 3 years and Rs. 10,000 to C for 4 years on simple interest at the same rate of interest and received Rs. 6,080 in all from both of them as interest. What is the annual rate of interest?

(a) 5 percent
(b) 15 percent
(c) 8 percent
(d) 11 percent

Q71. What is the value of $a^2+ b^2 + c^2- 2ab - 2bc + 2ca$?

(a) $(a - b - c)^2$
(b) $(a + b - c)^2$
(c) $(a + b + c)^2$
(d) $(a - b + c)^2$

Q72. The line chart given below shows the number of calculators sold by two shopkeepers L and M in 5 months.



J1 = The value of the average number of calculators sold by L in all the months.

J2 = The difference between the total number of calculators sold by L and M.

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What is the value of (J2/J1) ?

(a) 326
(b) 125
(c) 0
(d) 1

Q73. A cycle listed at Rs.20,000 is sold to a retailer at Rs.14,000 after a discount. What is the percent discount given to retailer?

(a) 20 percent
(b) 10 percent
(c) 30 percent
(d) 40 percent

Q74. The average of mark of 132 students in a college is 50. If the average of the marks of the passed students is 55 and the average of the marks of the failed students is 35, then what will be the respective ratio of the total marks of passed students and the total marks of failed students?

(a) 11 : 7
(b) 21 : 8
(c) 1 : 3
(d) 33 : 7

Q75. Two circles of radius of 20 cm each intersect each other such that each passes through the centre of the other. What is the length of the common chord?

(a) 18√3 cm
(b) 20√3 cm
(c) 27 cm
(d) 42 cm

GENERAL AWARENESS

Q76. Select the most appropriate antonym of the given word.

FAMISH

(a) ABSTAIN
(b) REFRAIN
(c) EAT
(d) STARVE

Q77. Rearrange the parts of the sentence in correct order.

Forest planning rules

P. recognizes the growing risks to national

Q. forests from climate change as well as expands

R. opportunities for public input and engagement

S. were updated in 2012, and the new rule explicitly

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

Q78. Choose the incorrectly spelt word.

(a) Cateogry
(b) Heap
(c) Circle
(d) Greed

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Q79. Select the correct indirect form of the given sentence.

The professor said, “You must learn these words regularly.

(a) The professor said I should learn these words regularly.
(b) The professor said that I had to learn those words regularly.
(c) The professor said that I must learn these words regularly.
(d) The professor said that you had to learn these words regularly.

Q80. Select the correct passive form of the given sentence.

The president loved that lady.

(a) That lady was being loved by the president.
(b) That lady was loved by the president.
(c) That lady is love by the president.
(d) That lady is loved by the president.

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

Hostility

(a) Authorize
(b) Anchor
(c) Organize
(d) Enmity

Q82. Choose the word that means the same as the given word.

Saboteur

(a) Vandal
(b) Associate
(c) Mendicant
(d) Sage

Q83. Choose the sentence with no spelling error

(a) Motivational qoutes will not help you.
(b) Motivational quotes will not help you.
(c) Motivational quotes will not helpp you.
(d) Motivatinal quotes will not help you.

Q84. Choose the word that can substitute the given group of words.

Incapable of being read

(a) Illegible
(b) Comprehensive
(c) Decipherable
(d) Corrupt

Q85. Fill in the blank with an appropriate option.

I try to retrieve the note from my pocket while _____ the tray steady on my palm.

(a) noting
(b) scolding
(c) holding
(d) plotting

Q86. Select the word that is closest in meaning (SYNONYM) to the word given below.

Oblivious

(a) Suspecting
(b) Aware
(c) Ignorant
(d) Careful

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Q87. Find the part of the given sentence that has an error in it. If there is no error, choose 'No error'.

The five first girls will get the discount on our merchandise.

(a) No error
(b) on our merchandise.
(c) The five first girls
(d) will get the discount

Q88. In the following question, out of the given four alternatives, select the alternative which best expresses the meaning of the Idiom/Phrase.

To sleep like a dog

(a) To be insomniac
(b) To make noise while sleeping
(c) To sleep soundly
(d) To be less mindful

Q89. Select the most appropriate one-word substitution for the given group of words.

A person who has escaped from captivity or is in hiding.

(a) Farce
(b) Fugitive
(c) Fastidious
(d) Fanatic

Q90. In the following question, out of the given four alternatives, select the alternative which best expresses the meaning of the Idiom/Phrase.

Armed to the teeth

(a) Safeguard oneself in every possible way
(b) To have no weapon to fight
(c) Different attacking techniques
(d) Fully armed, having many weapons

Q91. Find the part of the given sentence that has an error in it. If there is no error, choose 'No error'.

Smart phone age has lead to substantial deterioration in both duration and quality of sleep.

(a) both duration and quality of sleep.
(b) Smart phone age has lead
(c) to substantial deterioration in
(d) No error

Q92. Choose the word that can substitute the given group of words.

One who looks at the dark side of life

(a) Libertine
(b) Pessimist
(c) Anarchist
(d) Extrovert

Q93. Rearrange the parts of the sentence in correct order.

P. contributed to the destruction of Sir Walter Raleigh's "Lost Colony"

Q. a severe three-year drought in the late 16th century probably

R. at Roanoke Island in what is now North Carolina, and a subsequent

S. seven-year drought led to high mortality at the Jamestown Colony in Virginia

(a) QRSP
(b) PSQR
(c) QPRS
(d) PRSQ

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Q94. Improve the underlined part of the sentence. Choose 'No improvement' as an answer if the sentence is grammatically correct.

The weather on the weekend are supposed to be sunny.

(a) No improvement
(b) were supposed
(c) is supposed
(d) are supposing

Q95. Fill in the blank with the most suitable word.

In addition, it is believed they possess crude electronic devices capable of triggering _____ bombs.

(a) insipid
(b) incendiary
(c) intelligible
(d) insensible

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. It is easy to think that the daily life of a plant is a simple (1) ____. They seem to just stand there and sunbathe. However, plants are very busy all the time doing (2) __ things. This activity is aimed at surviving the day and (3) __ for the future. They are continuously working for it. Plants need food to survive. Being (4) __ in the ground means that they cannot move around to find food so they must make their own. They do this by taking water from the soil in (5) ____ their roots and a molecule in the air carbon dioxide into their leaves.

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

(a) once
(b) one's
(c) one
(d) ones

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

(a) any
(b) very
(c) much
(d) many

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

(a) caressing
(b) planning
(c) sensing
(d) reviving

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

(a) rooted
(b) sullied
(c) smudged
(d) cluttered

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

(a) by
(b) through
(c) with
(d) of

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ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) (7, 2, 4802)

The logic followed here is:

Logic: (1st number)^4 × 2nd number = 3rd number.

Now,

(3, 2, 162)

→ 3^4 × 2

→ 81 × 2 = 162.

(6, 3, 3888)

→ 64 × 3

→ 1296 × 3 = 3888.

Similarly, (7, 2, 4802)

→ 74 × 2

→ 2401 × 2 = 4802.

Hence, the correct answer is "Option 4".

Q2. Answer: (d) QJJGIQ

The logic followed here is:

‘SCREEN’ is coded as ‘LCCPAQ’,

Similarly, for 'SKILLS'

So, 'SKILLS' is coded as 'QJJGIQ'.

Hence, the correct answer is "Option 4".

Q3. Answer: (a) (24, 56, 32)

The logic followed here is:

Logic: 1st number + 3rd number = 2nd number.

Now,

(18, 66, 48)

→ 18 + 48 = 66.

(52, 144, 92)

→ 52 + 92 = 144.

Similarly, (24, 56, 32)

→ 24 + 32 = 56.

Hence, the correct answer is "Option 1".

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Q4. Answer: (a) Force

The logic followed here is:

Logic: The first unit measures or indicates the physical quantity in the second term.

Here,

Ohm : Electric Resistance → An Ohm measures or indicates electric resistance.

Similarly,

Newton : Force → A Newton measures or indicates force.

Hence, the correct answer is "Force".

Additional Information

S.I Unit	Physical Quantity
Pascal	Pressure
Kelvin	Temperature
Square meter (m^2)	Area

Q5. Answer: (a) JVP

The logic followed here is:

AMG : WIC

Similarly,

NZT : ?

Hence, the correct answer is "Option 1".

Q6. Answer: (d) LBX

The logic followed here is:

So, 'LBX' will complete the series.

Hence, the correct answer is "Option 4".

Q7. Answer: (b) WSM

The logic followed here is:

Logic: 4 has been subtracted to each letter's positional value to get the next letter of the cluster.

Let's check each option as per the logic:

1) EAW:

2) WSM:

3) HDZ:

4) YUQ:

Here, we can see that only Option 2 doesn't follow the logic.

Hence, the correct answer is " WSM ".

Q8. Answer: (d) [figure]

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

Hence, the correct answer is " Option 4 ".

Q9. Answer: (a) Both I and II

BODMAS Table:

Given equation I. $7 – 6 + 2 ÷ 1 × 9 = 2$

Now, if '× and +' are interchanged, then:

$=> 7 – 6 × 2 ÷ 1 + 9 = 2$

$=> 7 – 6 × 2 + 9 = 2$

$=> 7 – 12 + 9 = 2$

$=> 16 - 12 = 2$

$=> 4 ≠ 2$

LHS ≠ RHS.

Given equation II: $16 + 4 – 9 × 1 ÷ 3 = 60$

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Now, if '× and +' are interchanged, then:
=> 16 × 4 – 9 + 1 ÷ 3 = 60
=> 16 × 4 – 9 + 0.33 = 60
=> 64 – 9 + 0.33 = 60
=> 64.33 - 9 = 60
=> 55.33 ≠ 60
LHS ≠ RHS.
Here, Both Equation I and II are the incorrect after interchanging the given symbol.
Hence, the correct answer is "Option 1".

Q10. Answer: (b) 108

The logic followed here is:
Logic: 1st number × (1st number ÷ 3) = 2nd number.
Now,
6 : 12
→ 6 × (6 ÷ 3)
→ 6 × 2 = 12.
15 : 75
→ 15 × (15 ÷ 3)
→ 15 × 5 = 75.
Similarly,
18 : ?
→ 18 × (18 ÷ 3)
→ 18 × 6 = 108.
Hence, the correct answer is "Option 2".

Q11. Answer: (a) 10

The squares are:
So, there is '10' squares in the given figure.
Hence, the correct answer is "10".

Q12. Answer: (a) Karnataka – Bengaluru

The logic followed here is:
Logic: The first word represents the capital city of the respective state.
Let's check each option,

Option	Capital City	State
1	Karnataka	Bengaluru
2	Patna	Bihar
3	Gandhinagar	Gujarat
4	Dispur	Assam

Here, we can see that only Option 1 doesn't follow the logic.
Hence, the correct answer is "Karnataka – Bengaluru".

Q13. Answer: (a) Mother

Family Chart:
Given:
M is the brother of N.
L is the father of M.
N is the sister of O.
O is the daughter of P.
So, P is mother of N.

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Hence, the correct answer is "Option 1".

Q14. Answer: (b) 1814518955

The logic followed here is:
'GARMENTS' is coded as '2019132214719',
'HYDROGEN' is coded as '192523181272214',
Similarly, for 'INVASIVE'
So, 'INVASIVE' is coded as '1814518955'.
Hence, the correct answer is "Option 2".

Q15. Answer: (b) [figure]

The logic followed here is:
Logic: The circle and the arrow moves in clockwise direction in +2, +1 alternatively.
Hence, the correct answer is "Option 2".

Q16. Answer: (a) O

For find the opposite surface of '@', we need to compare the common surface in the given dices,
Now, symbol '@' is given in Dice 2 and Dice 3,
So, From Dice 2 and Dice 3,
→ @ is the common surface and &, #, ©, % is the adjacent surface.
So, the remaining 'O' will be the opposite face of '@'.
Hence, the correct answer is "O".

Q17. Answer: (c) Furniture : Table

The logic followed here is:
Logic: The Second word is a type of First word.
Colour : Black
→ Black is a type of Colour.
Let's check each option:
1) Lily: Flower
→ Flower is not a type of Lily.
2) Eraser: Marker
→ Marker is not a type of Eraser.
3) Furniture: Table
→ Table is a type of Furniture. => Satisfies the logic.
4) Fruit: Onion
→ Onion is not a type of Fruit.
Here, we can see that only Option 3 follow the logic.
Hence, the correct answer is "Furniture: Table".

Q18. Answer: (b) [figure]

The Venn diagram representing the relationship between Pens, Pencils and Eraser is shown below:
Here, Pen, Pencil and Eraser all are different stationary item.
Hence, the correct answer is " Option 2 ".

Q19. Answer: (c) Diestock

The correct order as per the dictionary is shown below:
4) Dieldrin
5) Diestock
3) Diestrum
2) Diestrus
1) Dietetic
Here, we can see that the word at the Second position is Diestock.
Hence, the correct answer is " Diestock ".

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Q20. Answer: (d) 278 – 1122

The logic followed here:

Logic: Second Number = (1st Number) × 4 = 2nd number.

Let's check each option as per the logic:

1) 648 – 2592:

→ 2592 = 648 × 4

→ 2592 = 2592

→ LHS = RHS.

2) 378 – 1512:

→ 1512 = 378 × 4

→ 1512 = 1512

→ LHS = RHS.

3) 588 – 2352:

→ 2352 = 588 × 4

→ 2352 = 2352

→ LHS = RHS.

4) 278 – 1122:

→ 1122 = 278 × 4

→ 1122 ≠ 1112

→ LHS ≠ RHS.

Here, we can see that only Option 4 doesn't follow the logic.

Hence, the correct answer is "278 – 1122".

Q21. Answer: (c) 166

The logic followed here is:

So, '166' is the missing term in the given series.

Hence, the correct answer is "Option 3".

Q22. Answer: (d) [figure]

The paper when unfolded will appear as shown below:

Hence, the correct answer is "Option 4".

Q23. Answer: (d) 731

The logic followed here is:

8 % 3 % 2 = 328

4 % 2 % 6 = 264

Similarly,

1 % 7 % 3 =?

Hence, the correct answer is "Option 4".

Q24. Answer: (d) Both conclusions II and III follows

Given Statements:

I. All truck are car.

II. Some car are bike.

The least possible Venn diagram for the given statement is:

Conclusions:

I. No bike is truck - False (Because, no definite relation given between Bike and Truck, so it can be possible only).

II. Some truck are car - True (All truck are car, so some truck are also car).

III. Some bike are car - True (Some car are bike, so some bike is also car).

So, Both conclusions II and III follows.

Hence, the correct answer is "Option 4".

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Q25. Answer: (c) [figure]

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

Hence, the correct answer is " Option 3 ".

Q26. Answer: (b) Between Eastern Ghats and the Bay of Bengal

The correct answer is Option 2.

Key Points

• The East Coast of India lies between the Eastern Ghats mountain range and the Bay of Bengal.

• The Eastern Ghats, also known as the Mahendra Range, is a discontinuous mountain range that runs parallel to the East Coast of India.

• It stretches along the states of Odisha, Andhra Pradesh, Telangana, and Tamil Nadu.

• The East Coast plains, which lie between the Eastern Ghats and the Bay of Bengal, are relatively flat and fertile, making them suitable for agriculture.

• This region is home to several major cities and important ports along the coast.

Additional Information

• Between the Gulf of Cambay and Cape Comorin lies the western coast of India, also known as the West Coast of India.

• The West Coast of India is situated along the Arabian Sea and extends from the Gulf of Cambay (also known as the Gulf of Khambhat) in the north to Cape Comorin (also known as Kanyakumari) in the south.

• This coastal stretch includes the states of Gujarat, Maharashtra, Goa, Karnataka, and Kerala.

• The West Coast of India is known for its beautiful beaches, diverse culture, and important port cities such as Mumbai, Mangalore, Kochi, and Thiruvananthapuram.

• Between Maharashtra and Kerala lies the state of Karnataka.

• Karnataka is located on the southwestern part of India and shares its borders with Maharashtra to the north and Kerala to the south.

• The state capital of Karnataka is Bengaluru (Bangalore), which is known as the technology hub of India.

• Karnataka is known for its rich cultural heritage, historical sites, and natural beauty.

• It is also home to several important cities and tourist destinations, including Mysore, Hampi, Mangalore, and Coorg.

• Between Diu and Kerala lies the state of Gujarat and the Union Territory of Daman and Diu.

• Diu is a small island and town located off the southern coast of Gujarat, while Kerala is situated on the southwestern tip of India.

• To travel from Diu to Kerala, one would need to traverse the state of Gujarat, pass through Maharashtra, and then enter Kerala.

• The journey would involve traveling along the western coast of India.

Q27. Answer: (b) Where ex ante aggregate demand is equal to ex ante aggregate supply

The correct answer is Option 2.

Key Points

• In a graphical diagram where ex ante aggregate demand (AD) and ex ante aggregate supply (AS) are plotted together, equilibrium is reached at the point where the two curves intersect.

• This intersection represents the level of real output and price level where the quantity of goods and services demanded (AD) is equal to the quantity supplied (AS).

• At this equilibrium point, there is no tendency for the economy to move away from it, as the quantity demanded matches the quantity supplied.

• The equilibrium point can be thought of as the point of balance in the economy, where there is no excess demand or excess supply.

• It is where buyers' and sellers' plans align, resulting in a stable state in which the economy is in equilibrium.

Additional Information

• In an economy, demand and supply refer to the forces that determine the quantity of goods and services exchanged in the market.

• Demand: Demand represents the quantity of goods and services that buyers are willing and able to purchase at various price levels, during a specific period.

• Demand is influenced by factors such as price, consumer preferences, income levels, population, and the availability of substitutes.

• The relationship between price and quantity demanded is typically inverse, meaning that as the price increases, the quantity demanded tends to decrease, and vice versa.

• Demand is usually represented by a downward-sloping demand curve.

• Supply: Supply, on the other hand, represents the quantity of goods and services that sellers are willing and able to offer for sale

at different price levels.

• The supply is influenced by factors such as production costs, technology, resource availability, government regulations, and expectations of future prices.

• The relationship between price and quantity supplied is usually positive, meaning that as the price increases, the quantity supplied tends to increase, and vice versa.

• Supply is often represented by an upward-sloping supply curve.

• The interaction of demand and supply determines the equilibrium price and quantity in a market.

• When the quantity demanded equals the quantity supplied, the market is said to be in equilibrium.

• Changes in demand or supply will shift the respective curves, leading to changes in the equilibrium price and quantity.

• For example, an increase in demand will shift the demand curve to the right, leading to a higher equilibrium price and quantity.

• Understanding the dynamics of demand and supply is crucial in analyzing market behavior, price fluctuations, and the allocation of resources in an economy.

Q28. Answer: (d) Bhavani Devi

The correct answer is Option 4.

Key Points

• Bhavani Devi from Chennai became the first Indian athlete to represent India in the sport of fencing at the Olympics.

• Tokyo Olympics 2020 :Tokyo Olympics 2020 was an international multi-sport event held from 23 July to 8 August 2021 in Tokyo, Japan, with some preliminary events that began on 21 July.

• India finished 48th on the medal tally in Tokyo, its highest ranking in over four decades..

• India marched at the 21st number with the boxer Mary Kom and men’s hockey captain Manpreet Singh as flag-bearers.

• The teams entered the stadium in alphabetical order according to the language selected by the organizing committee, generally the dominant language in the host city.

• The 2024 Summer Olympics will be held in Paris. And all the way out in 2028, Los Angeles will play host.

Additional Information

• PT Usha:

• Pilavullakandi Thekkeparambil Usha, commonly known as PT Usha, is an Indian former track and field athlete.

• She is often referred to as the "Payyoli Express."

• P.V. Sindhu:

• Pusarla Venkata Sindhu, commonly known as PV Sindhu, is an Indian professional badminton player.

• She has achieved great success in badminton, including winning a silver medal at the 2016 Rio Olympics and a bronze medal at the 2020 Tokyo Olympics in women's singles badminton.

• Aditi Ashok:

• Aditi Ashok is an Indian professional golfer.

• She represents India in golf tournaments and has achieved notable success in the sport.

• Bhavani Devi:

• Bhavani Devi, whose full name is C. A. Bhavani Devi, is an Indian sabre fencer.

• She made history by becoming the first Indian fencer to qualify and represent India in fencing at the Tokyo Olympics 2020 (held in 2021).

Q29. Answer: (c) Modhera

The correct answer is Option 3.

Key Points

• Modhera in the state of Gujarat, India, has indeed become the first solar-powered village in the country.

• The solar project has provided renewable energy to the residents of Modhera, resulting in a surplus of power.

• The cost of the solar project was shared between the Indian government and the Government of Gujarat, amounting to $9.7 million.

• As a result of the solar power supply, residents of Modhera can save a significant portion of their power bills, ranging from 60 to 100 percent.

• This development aligns with the goal of promoting clean and sustainable energy sources, as highlighted by UN Secretary-General António Guterres.

Q30. Answer: (b) West Bengal

The correct answer is Option 2.

Key Points

• West Bengal has bagged the award for 'Best Destination For Culture' internationally.

• West Bengal receiving the International Travel Award 2023 for Best Destination for Culture is a significant achievement.

• The Pacific Area Travel Writers Association (PATWA) is an esteemed organization, and being accredited by them reflects the cultural richness and tourism potential of West Bengal.

• It's also noteworthy that the PATWA is an affiliate member of the United Nations World Tourism Organization (UNWTO), further enhancing the prestige of the award.

Q31. Answer: (a) Newton's First law of motion

The correct answer is Option 1.

Key Points

• The law that is also known as the law of inertia is Newton's First Law of Motion.

• It states that an object at rest tends to stay at rest, and an object in motion tends to stay in motion with the same speed and in the same direction unless acted upon by an external force.

• This fundamental law of physics was formulated by Sir Isaac Newton and is one of the three laws that form the basis of classical mechanics.

Additional Information

• Newton's Second Law of Motion, also known as the law of acceleration, describes the relationship between the force acting on an object, the mass of the object, and the resulting acceleration.

• It is one of the fundamental principles of classical mechanics formulated by Sir Isaac Newton.

• Archimedes' principle states that when an object is placed in a fluid (like water), it experiences an upward force called buoyant force.

• This force is equal to the weight of the fluid that the object displaces (pushes aside).

• Example - when you put something in water, it feels a push from the water that tries to lift it up. The more water the object pushes away, the stronger the push (buoyant force) it feels. If the object is lighter than the water it displaces, it will float because the buoyant force is greater than the weight of the object. If the object is heavier, it will sink because the weight is greater than the buoyant force.

• Kepler's laws are a set of three fundamental principles that describe the motion of planets and other celestial objects around the Sun. Here's a simplified explanation of each law:

• Law of Orbits: Each planet in our solar system moves around the Sun in an elliptical orbit, with the Sun at one of the two foci of the ellipse. In simpler terms, the path of a planet is not a perfect circle but more like a stretched-out circle with the Sun slightly off-center.

• Law of Areas: An imaginary line connecting a planet to the Sun sweeps out equal areas in equal time intervals. In other words, as a planet moves in its elliptical orbit, it covers an equal area in space over equal periods of time. This means that a planet moves faster when it is closer to the Sun and slower when it is farther away.

• Law of Periods: The square of the time period of a planet's orbit is proportional to the cube of its average distance from the Sun. In simpler terms, the time it takes for a planet to complete one orbit around the Sun (its period) is related to its average distance from the Sun. The farther a planet is from the Sun, the longer its orbital period.

Q32. Answer: (d) Cricket

The Correct answer is Option 4.

Key Points

• TOKYO OLYMPICS

• The 2020 Olympics was held in Tokyo from 23 July to 8 August 2021.

• The International Olympics Committee postponed the games due to Covid-19.

• This was the second time When Japan will host the Olympics. (First in 1964)

• Miraitowa is the official mascot of the 2020 Summer Olympics.

• The mascot is created by Japanese artist Ryo Taniguchi.

• The International Olympic Committee (IOC)

• IOC is a not-for-profit independent international organization.

• Created- 23 June 1894

• The first Olympic Games of the modern era were conducted in April 1896.

• The Olympic Charter is the codification of the Fundamental Principles of Olympism.

• President- Thomas Bach

• Olympic Motto- CITIUS – ALTIUS - FORTIUS meaning (FASTER - HIGHER - STRONGER -COMMUNITER)

• The 138th session of the International Olympic Committee met between 20-21 July 2021.

• At this meeting, the International Olympic Committee decided to change the Olympic motto 'Citius, Altius, Fortius' to 'Citius, Altius, Fortius, Communiter'.

Additional Information

• Tokyo Olympics 2020

• India won 7 medals at Tokyo Olympics 2020, which includes 1 Gold, 2 Silver, and 4 Bronze medals.

• Neeraj Chopra won a Gold medal in the Javelin Throw event.

• Ravi Kumar Dahiya won a Silver medal in Men's Wrestling 57KG category.

• Mirabai Chanu created history winning India’s first medal of the Tokyo Olympics when she clinched silver in women’s 49kg weightlifting event.

• P.V. Sindhu won a Bronze medal in Women's Singles Badminton.

• Lovlina Borgohain won a Bronze medal in the Women's Welterweight Boxing category.

• Indian Men's Hockey team won the Bronze medal.

• Bajrang Punia won a Bronze medal in Men's Wrestling 65 KG category.

Q33. Answer: (b) 1540

The correct answer is Option 2.

Key Points

• Sher Shah Suri defeated Humayun at the Battle of Kanauj in the year 1540.

• The battle took place near the city of Kanauj, located in present-day Uttar Pradesh, India.

• Sher Shah Suri's forces, under his leadership, emerged victorious in this battle, resulting in Humayun's temporary expulsion from the Indian subcontinent.

• Humayun was able to regain his empire later and reclaim Delhi in 1555.

Additional Information

• Sher Shah Suri was born in 1486 in Sasaram, present-day Bihar, India.

• He belonged to the Pashtun Sur tribe, hence the name "Suri."

• Sher Shah Suri initially served under the Delhi Sultanate and later joined the service of the Mughal emperor Humayun.

• Humayun, also known as Nasir-ud-Din Muhammad Humayun, was the second Mughal emperor who ruled over a significant portion of the Indian subcontinent.

• He was born on March 6, 1508, in Kabul, Afghanistan, and he ascended to the throne in 1530.

• Humayun was the eldest son of the first Mughal emperor, Babur.

• During his reign, he faced several challenges, including conflicts with regional rulers and internal power struggles.

• Humayun's reign was marked by ups and downs, as he lost and regained his empire multiple times.

Q34. Answer: (d) Bihu

The correct answer is Option 4.

Key Points

• The most important festival of Assam is Bihu. Bihu is a series of three agricultural festivals celebrated with great enthusiasm and fervor throughout the state. These three Bihus are:

• Rongali Bihu (Bohag Bihu): It is the most popular and widely celebrated Bihu, which marks the arrival of the Assamese New Year in mid-April. It celebrates the onset of the spring season and the agricultural cycle. People indulge in traditional music, dance (Bihu dance), feasting, and various cultural activities.

• Kongali Bihu (Kati Bihu): Celebrated in mid-October, Kongali Bihu is dedicated to the worship of the household deities. This Bihu is more somber in nature and focuses on prayers and rituals for a bountiful harvest. People light oil lamps, offer prayers, and participate in community activities.

• Bhogali Bihu (Magh Bihu): Celebrated in mid-January, Bhogali Bihu is associated with the harvest and feasting. It is also known as the festival of food, where people enjoy various traditional delicacies, especially made from rice and sesame seeds. Bonfires are lit, and community feasts are organized during this Bihu.

Additional Information

• The Lumbini Festival is an important cultural festival celebrated in the state of Andhra Pradesh, India.

• It is organized annually to promote tourism and showcase the rich cultural heritage of the region.

• The festival takes place in Nagarjunasagar, a town located near the Nagarjuna Sagar Dam, which is a significant historical and tourist attraction.

• The Lumbini Festival is named after Lumbini, the birthplace of Gautama Buddha in Nepal.

• The festival aims to highlight the Buddhist connection and the influence of Buddhism in the region.

• It usually occurs in December and spans three days, featuring a variety of cultural events, exhibitions, performances, and competitions.

• The Hornbill Festival is one of the most important cultural festivals of Nagaland, a state located in Northeast India.

• It is named after the Indian Hornbill bird, which is deeply revered in Naga folklore.

• The festival takes place annually from December 1st to 10th in the Kisama Heritage Village, located near Kohima, the capital city of Nagaland.

• The Hornbill Festival aims to showcase and celebrate the rich cultural heritage and traditions of the Naga tribes.

• It provides a platform for the different tribes of Nagaland to come together, display their distinct customs, arts, crafts, music, dance, and culinary delights.

• The festival also promotes inter-tribal harmony and unity among the Naga people.

• Phool Dei is a traditional festival celebrated in the Kumaon region of Uttarakhand, a state in northern India.

• The festival marks the arrival of spring and is usually observed in the month of March.

• "Phool" means flowers, and "Dei" refers to an offering or gift. Therefore, Phool Dei can be translated as "the festival of flowers."

Q35. Answer: (a) Neither I nor II

The correct answer is Option 1.

Key Points

• The correct pairing of 'disease - duration' is:

• Acute - short time

• Chronic - long duration

• Acute diseases are characterized by a sudden onset and a relatively short duration. They typically resolve within a short period, ranging from a few days to a few weeks. Examples of acute diseases include the common cold, acute bronchitis, and acute appendicitis.

• On the other hand, chronic diseases are characterized by a long duration, typically lasting for months or years. They often develop slowly and persist over an extended period, sometimes for a person's lifetime. Examples of chronic diseases include diabetes, hypertension (high blood pressure), and rheumatoid arthritis.

• Therefore, the correct pairing would be "Acute - short time" and "Chronic - long duration."

Q36. Answer: (a) III

The correct answer is Part III of the Constitution.

Key Points

• Fundamental Rights (FRs) are known as the base of the Indian constitution & mentioned in Part III of the constitution.

• They prohibit unreasonable interference of the state & prevent its executive & legislature to become authoritarian, hence put due limitations of state power.

• Observance of fundamental duties is required for having one’s FRs redressed in case of their violation.

Important Points

• FRs are not absolute but qualified rights.

• It is Subject to certain restrictions imposed by the state on the question of national security, interest & general welfare of the society.

• But restrictions are checked by SC & HCs, whether restrictions are reasonable or not.

• SC verdict in the Golaknath V/S state of Punjab (1967) - FRs have been given a transcendental position by constitution hence no authority functioning under the constitution including parliament has the power to amend FRs.

• In Keshavananda Bharati V/S state of Kerala, 1973, SC held that parliament has the power to amend any provision of the constitution including part III, however, parliament’s amending power subjects to the “Basic structure of the constitution".

Additional Information

There are six Fundamental Rights-

Article 14 – 18	**Right to Equality**
Article 19-22	Right to Freedom
Article 23-24	Right against Exploitation

Article 25-28	Right to Freedom of Religion
Article 29-30	Cultural & Education Rights
Article 32	Right to Constitutional Remedies

Q37. Answer: (d) Catalyzing New India's Techade

The correct answer is Catalyzing New India's Techade.

Key Points

• Prime Minister Narendra Modi inaugurated Digital India Week 2022 in Gandhinagar in Gujarat on 4 July 2022.

• During the programme, he launched multiple digital initiatives aimed at enhancing the accessibility of technology, streamlining service delivery to ensure ease of living and giving a boost to startups.

• The theme for Digital India Week is Catalyzing New India's Techade.

Additional Information

• Mr Modi launched digital India Bhashini' which enables easy access to the internet and digital services in Indian languages, including voice-based access and helps the creation of content in Indian languages.

• Prime Minister also launched 'Digital India GENESIS' - a National Deep-tech Startup Platform, to discover, support, grow and make successful startups in Tier-II and Tier-III cities of India.

• A total outlay of 750 crore rupees has been envisaged for the scheme.

• He launched 'Indiastack.global' - a global repository of key projects implemented under India Stack like Aadhaar, UPI, Digilocker, Cowin Vaccination Platform, Government e MarketPlace, DIKSHA Platform and Ayushman Bharat Digital Health Mission.

• Prime Minister dedicated to the citizens 'MyScheme' - a service discovery platform facilitating access to Government Schemes.

• It aims to offer a one-stop search and discovery portal where users can find schemes that they are eligible for.

• He also dedicates to the citizens 'Meri Pehchaan'- National Single Sign On for One Citizen Login.

• National Single Sign-On is a user authentication service in which a single set of credentials provide access to multiple online applications or services.

• Mr Modi announced the first cohort of 30 Institutions to be supported under the Chips to Startup Programme.

• The C2S Programme aims to train specialized manpower in the area of design of semiconductor chips at the Bachelor, Masters and Research levels.

Q38. Answer: (c) Rajasthan

The correct answer is Rajasthan.

Key Points

• Ghoomar is a traditional folk dance of the Bhil tribe performed to worship Goddess Sarasvati which was later embraced by other Rajasthani communities.

• Ghoomar became popular in the Indian state of Rajasthan during the reigns of Rajput kings and is typically performed by women during gatherings.

• Other Folk Dance from Rajasthan are:

• Chakri, Ganagor, Jhulan Leela, Jhuma, Suisini, Ghapal, and Kalbeliya.

Additional Information

• List of the Folks Dances from the Different States:-

State	Folk Dance
Andhra Pradesh	Kuchipudi, Vilasini Natyam, Andhra Natyam, Bhamakalpam, Veeranatyam, Dappu, Tappeta Gullu, Lambadi, Dhimsa, Kolattam, Butta Bommalu.
Assam	Bihu, Bichhua, Natpuja, Maharas, Kaligopal, Bagurumba, Naga dance, Khel Gopal, Tabal Chongli, Canoe, Jhumura Hobjanai
Bihar	Jata-Jatin, Bakho-Bakhain, Panwariya, Sama Chakwa, Bidesia.
Gujarat	Garba, Dandiya Ras, Tippani Juriun.
Himachal Pradesh	Jhora, Jhali, Chharhi, Dhaman, Chhapeli, Mahasu, Nati, Dangi.
Chhattisgarh	Gaur Maria, Panthi, Raut Nacha, Pandwani, Vedamati, Kapalik, Bharthari Charit, Chandaini.

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Jharkhand	Alkap, Karma Munda, Agni, Jhumar, Janani Jhumar, Mardana Jhumar, Paika, Phagua,Hunta Dance, Mundari Dance, Sarhul, Barao, Jhitka, Danga, Domkach, Ghora Naach.
Manipur	Dol Cholam, Thang-Ta, Lai Haraoba, Pung Cholom, Khamba Thaibi, Nupa Dance, Raslila, Khubak Ishii, Lou Sha.
Madhya Pradesh	Jawara, Matki, Aada, Khada Nach, Phulpati, Grida Dance, Selalarki, Selabhadoni, Maanch.

Q39. Answer: (a) 7

The correct answer is 7.

Key Points

• India Medal Tally Tokyo Olympics - 1 Gold, 2 Silver, 4 Bronze Medal. (Total- 7 Medal)

• India made a big comeback to beat Germany 5-4 and claim the bronze medal. It is their third Olympic bronze medal - after the 1968 and 1972 Games - and their 12th Olympic medal overall. It is India's fifth medal at Tokyo 2020.

• At Tokyo Olympics, India surpassed its previous best haul of six medals achieved in the 2012 London Games. Apart from Chopra's gold, India has won two silver and four bronze medals.

Additional Information

Tokyo Olympics 2020 India Medals List

Athlete	Achievements
Neeraj Chopra	Gold medal in Men’s Javelin throw
Mirabai Chanu	Silver medal in women’s 49kg weightlifting
Ravi Kumar Dahiya	Silver medal in men’s 57kg freestyle wrestling
PV Sindhu	Bronze medal in women’s singles badminton
Lovlina Borgohain	Bronze medal in women’s welterweight boxing
Bajrang Punia	Bronze medal in men’s 65kg freestyle wrestling
Men’s Hockey team	Bronze medal

Q40. Answer: (a) Tahira Kashyap Khurrana

The correct answer is Tahira Kashyap Khurrana.

Key Points

• The 7 Sins of Being a Mother is a book by Tahira Kashyap Khurrana, an Indian writer, filmmaker, and wife of actor Ayushmann Khurrana.

• The book was published in October 2021 by Juggernaut Books.

• The book is a collection of essays in which Khurrana shares her experiences of motherhood, both the good and the bad.

• She writes about the joys of raising children, as well as the challenges and frustrations. She also talks about the guilt that many mothers feel, and how she has learned to overcome it.

• The book has been praised for its honesty and humor. Khurrana's writing is relatable and insightful, and she does not shy away from discussing the more difficult aspects of motherhood.

Additional Information

Actress	Book
Priyanka Chopra	Unfinished
Deepika Padukone	A Suitable Girl
Alia Bhatt	Dear Zindagi
Kareena Kapoor Khan	The Pregnancy Bible
Sonam Kapoor	I Don't Belong Here: An Outsider's Guide to Becoming Indian
Freida Pinto	Sway
Kalki Koechlin	Goa Gone

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Vidya Balan	The Lost and Found Diaries
Twinkle Khanna	Mrs. Funnybones

Q41. Answer: (b) Ctrl + M

The correct answer is CTRL + M.

Key Points

• PowerPoint is a Microsoft software used to create presentations.

• CTRL + N is used to create a new presentation.

• CTRL + M is used to insert a new slide.

• CTRL + D is used to duplicate the slide.

• CTRL + K is used to insert a link.

Additional Information

• Other important MS PowerPoint shortcuts:

CTRL + G	**To group items**
Ctrl + Q	To save and close a presentation
Ctrl + E	To centre align the text
CTRL + SHIFT + <	To decrease the text size
Ctrl + Up	To move a slide up
SHIFT + F5	To start presentation mode from the current slide

Q42. Answer: (d) Japan

The correct answer is Japan.

Key Points

• It means that a law has been duly enacted by the competent body following the correct procedure. For example, the procedure mentioned in the constitution.

• The Doctrine of Procedure established by law has been taken from the Japanese Constitution.

Additional Information

• The Indian constitution came into force on 26th January 1950.

• It was adopted by the Constituent Assembly on 26th November 1949.

• Some provisions of the Constitution pertaining to citizenship, elections, provisional parliament, and temporary and transitional provisions.

• And short title contained in Articles 5, 6, 7, 8, 9, 60, 324, 366, 367, 379, 380, 388, 391, 392 and 393 came into force on November 26, 1949,.

• The remaining provisions (the major part) of the Constitution came into force on January 26, 1950.

• This day is referred to in the Constitution as the date of its commencement and is celebrated as Republic Day.

• January 26 was specifically chosen as the date of commencement of the Constitution because of its historical importance.

• It was on this day in 1930 that Purna Swaraj day was celebrated, following the resolution of the Lahore Session (December 1929) of the INC.

Important Points

The other borrowed provisions from different countries and details of those are given in below:

Countries	**Borrowed Provisions**
Australia	• Concurrent list - Freedom of trade, commerce - Joint-sitting of the two Houses of Parliament
Canada	• Federation with a strong Centre - Vesting of residuary powers in the Centre - Appointment of state governors by the Centre - Advisory jurisdiction of the Supreme Court
Ireland	• Directive Principles of State Policy - The nomination of members to the Rajya Sabha - Method of election of the President
Japan	• Procedure Established by law

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Russia	• Fundamental duties - Ideals of justice (social, economic, and political) in the Preamble
United Kingdom	• Parliamentary government - Rule of Law - Legislative procedure - Single Citizenship - Cabinet system - Prerogative writs - Parliamentary privileges - Bicameralism
The United States of America	• Fundamental rights - Independence of judiciary - Judicial review - Impeachment of the president - Removal of Supreme Court and High Court judges - Post of vice-president
Germany	• Suspension of Fundamental Rights during emergency
South Africa	• Procedure for amendment in the Indian Constitution - Election of members of Rajya Sabha
France	• Republic - Ideals of liberty, equality, and fraternity in the Preamble

Q43. Answer: (c) Gateway

The correct answer is Gateway.

Key Points

• A gateway serves as the entry and exit point of a network. It acts as a communication point or interface between different networks, allowing data to pass through it in order to use routing paths.

• Gateways are responsible for protocol translation, security enforcement, and network traffic management.

• They can connect networks that use different protocols, such as connecting a local area network (LAN) to the internet.

Additional Information

• Network Interface: A gateway is equipped with multiple network interfaces to connect different networks. It can have connections to the internet, local area networks (LANs), wide area networks (WANs), or other networks.

• Protocol Translation: Gateways are responsible for translating protocols between different networks. They can convert data packets from one protocol to another, allowing communication between networks that use different standards or languages.

• Traffic Routing: When data enters a network, it must pass through the gateway. The gateway examines the packet's destination address and determines the best routing path for the data to reach its intended destination. It helps direct traffic efficiently within the network or between different networks.

• Network Address Translation (NAT): Gateways often perform Network Address Translation, which allows multiple devices on a LAN to share a single public IP address. It masks the private IP addresses of devices behind the gateway's public IP address, enhancing security and conserving IP addresses.

Q44. Answer: (c) Parent rock

The Correct answer is: Parent rock

Key Points

• Parent Rock:

• This is the correct factor that determines the accumulation of soil.

• The parent rock provides the basic mineral composition of the soil.

• Its nature (hard, soft, coarse-grained, or fine-grained) influences the rate of weathering and the type of soil formed.

• Soils derived from granite are sandy, while basalt produces black cotton soil rich in clay.

• Fauna:

• Animals, insects, and microorganisms help in mixing organic matter and improving soil aeration.

• They aid in soil fertility but do not determine the accumulation of the soil itself.

• Flora:

• Plants add humus and organic matter to the soil.

• They enrich the soil but do not decide the fundamental accumulation of soil material.

• Relief:

• Relief (slope and altitude) influences drainage and erosion.

• It affects soil depth and moisture but is not the primary determinant of accumulation.

Additional Information

• Factors of Soil Formation:

• Parent rock – source of mineral matter.

• Climate – temperature and rainfall affect weathering and humus content.
• Organisms – flora and fauna add organic matter.
• Relief – slope and drainage determine soil depth and erosion.
• Time – longer duration allows mature soil profiles to develop.
• Example:
• Alluvial soils in India are deposited by rivers and depend on the parent rock material carried from the Himalayas.
• Black soil of the Deccan Plateau is derived from basaltic parent rock.

Q45. Answer: (b) Assam

The correct answer is Assam.

Key Points

• Majuli is a large river island situated in the middle of the Brahmaputra River in Assam.
• Majuli is depicted as the largest river island in the world.
• This island has been formed over a period of time due to the change of direction and area of the Brahmaputra river and its tributaries especially the Lohit river.
• Majuli can also be called the 'cultural capital of Assam'.
• Majuli is located in the northern part of the Jorhat district and is separated from the mainland by the Brahmaputra river.

Additional Information

• Brahmaputra River flows through Tibet, India and Bangladesh.
• The Brahmaputra rises in the north of the Himalayas near Lake Mansarovar in the Purang district of Tibet, where it is known as the Yarlung Tsangpo.
• Flowing in Tibet, this river enters the Indian state of Arunachal Pradesh.
• Flowing in the valley of Assam, it is called the Brahmaputra, and then it is called Jamuna as soon as it enters Bangladesh.

Q46. Answer: (c) Automatic Train Protection System

The correct answer is Automatic Train Protection System.

Key Points

• Railway Minister Ashwini Vaishnaw has announced that the ‘Kavach’ System, the anti-collision test conducted by the Indian Railways to check the indigenous developed system to avoid rail accidents is successful.
• He held an on-site inspection near Secunderabad on 4 March 2022.

Additional Information

• The test involved two trains - one with the railway minister on board and the other with the Chairman of the Railway Board - hurtle towards each other at full speed.
• 'Kavach' automatically stopped the train before 380 metres of other Locomotive at the front.
• The indigenously developed Automatic Train Protection (ATP) system, Kavach, was designed to help the Railways achieve - zero accidents.
• The Kavach will be the world's cheapest automatic train collision protection system.
• The railway authorities informed that once implemented, it will cost 50 lakh rupees per kilometer to operate compared to about 2 crore rupees worldwide.

Q47. Answer: (c) Only I

The correct answer is Only I.

Key Points

• Pampas
• Pampas grasslands are situated in Argentina.
• Found mostly in the interior of the continent.
• Temperature varies greatly in winter and summer.
• Rainfall can vary from 25-75cm
• It doesn't have much diversity in vegetation or animals.
• Mostly, horses are found here.
• steppes
• Grasslands (steppes) are temperate environments, with warm to hot summers and cool to very cold winters; temperatures are often extreme in these midcontinental areas.
• They are often located between temperate forests and deserts, and annual precipitation falls between the amounts characteristic

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of those zones.

Additional Information

• Temperate grasslands around the world-

• Pustaz - Hungary

• Prairies - North America

• Pampas - Argentina and Uruguay

• Veld - South Africa

• Downs - Australia

• Canterbury - New Zealand

• Steppe - Russia

Q48. Answer: (d) Satguru Ram Singh

The correct answer is Satguru Ram Singh.

Key Points

• After the fall of the kingdom of Maharaja Ranjit Singh, there were several attempts to raise the old glory of the Khalsa.

• Several movements to reform the Sikhism were started.

• First, one being the Namdhari movement, which was started by Baba Ram Singh Namdhari after Anglo Sikh wars.

• He was a soldier in the Khalsa army.

• Like the Nirankari, this second reform movement known as the Namdhari, or Kuka, movement also had its origin in the north-west corner of the Sikh kingdom, away from the places of royal pomp and grandeur.

• It harked back to a way of life more in keeping with the spiritual tradition of the community.

• Its principal object was to spread the true spirit of Sikhism shorn of tawdry customs and mannerism, which had been growing on it since the beginning of the Sikh monarchy.

Additional Information

• In the midst of national pride born of military glory and political power, this movement extolled the religious obligation for pious and simple living.

• They were called "Kukas" because of their particular style to recite the Gurbani (Sayings of the Gurus).

• This style was in a high pitched voice, called Kook in Punjabi, and thus Namdhari Khalsa's were named Kukas.

• In the post-1857 phase of the freedom struggle, the Namdhari movement occupies a very significant place in the annals of history.

• It was founded at a time when the socio-religious teachings of the great Gurus were slowly being shadowed by other considerations and the political life was at its lowest ebb.

• Namdhari movement was an offshoot of Sikhism.

• The Kuka Movement was launched on the Baisakhi day in April 1857 at Bhaini (sahib), in Ludhiana District of Punjab.

• The leader of the Namdhari movement Baba Ram Singh was inspired by Maharaj Singh's struggle against aliens and worked for social reforms and gave a call for the political battle against the Britishers.

Q49. Answer: (b) Distillation

The correct answer is Distillation.

Key Points

• Distillation

• It Separates a mixture of two miscible liquids (Miscible liquids are one that together when mixed, form a homogenous mixture whose composition is the same throughout.)

• A liquid mixture's components are vaporized, condensed, and then separated here.

• As the mixture is heated, the volatile component vaporizes first.

• The vapour is deposited in a liquid state after passing through a condenser.

• EXAMPLE - separation of gasoline from crude oil, formation of freshwater from salt-water.

Additional Information

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Sublimation	**Separating components of a mixture containing a non-sublimable impurity and a sublimable volatile solid.**	**• Sublimation is the mechanism of a material transitioning from a solid state to a gaseous state without going through a liquid state. - The material, that is solid, which is sublime, undergoes subtilization and hence the separation. - EXAMPLE - When heated, ammonium chloride transforms from a solid to a gas, it is sublime. Hence getting separated.**
Chromatography	Separation of solutes from the solvent or mixture.	• This separation approach is founded on the fact that two substances can be dissolved in the same solvent but have different solubilities. - The portion that is more soluble in the mixture rises faster and separates from the rest. - EXAMPLE -Separating different components of the ink.
Crystallization	It involves the separation of solid-liquid separation technique, which involves the transfer of solute to the pure solid crystalline phase from the liquid solution.	• Crystallization is an example of physical change. And it's related to physical change as it doesn't involve the formation of any new substance.

Q50. Answer: (c) demand for a commodity and its price

The correct answer is demand for a commodity and its price.

Key Points

• According to the law of demand

• when the price of a commodity increase, its the quantity demanded decreases

• when the price of a commodity decreases, it's the quantity demanded increases

• keeping other factors remains the same.

• The consumer's demand for good must be inversely related to the price of the good.

• There is an inverse relationship between price and demand and due to this the demand curve always has a downward slope.

• Demand Curve is the relation between the quantity of the good chosen by a consumer and the price of the good.

• Assumptions for the Law of Demand

• No change in the income of consumers

• No change is the taste and preference of the consumers

• No change in price related to other goods.

Q51. Answer: (d) 62

Given:

$\tan\theta + \cot\theta = 8$

Concept used:

$\cot\theta = 1/\tan\theta$

$x^2 + 1/x^2 = (x + 1/x)^2 - 2$

Calculation:

$\tan\theta + \cot\theta = 8$

$\tan\theta + 1/\tan\theta = 8$

$\tan2\theta + \cot2\theta$

We can write this as $\tan2\theta + 1/\tan^2\theta$ using $(\cot\theta = 1/\tan\theta)$

By using the formula: $x2 + 1/x2 = (x + 1/x)2 - 2$

$\tan2\theta + 1/\tan2\theta = (\tan\theta + 1/\tan\theta)^2 - 2$

$\tan2\theta + 1/\tan2\theta = (8)2 - 2$

$\tan2\theta + 1/\tan2\theta = 64 - 2$

$\tan2\theta + 1/\tan2\theta = 62$

$\tan2\theta + \cot2\theta = 62$

Therefore Option 4 is the correct answer.

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Q52. Answer: (b) Y3

Calculation:

Saving = Income - Expenditure.

Y1 Savings = 700 - 300 = 400

Y2 Savings = 500 -200 = 300

Y3 Savings = 400 - 300 = 100

Y4 Savings = 800 - 200 = 600

Y5 Savings = 300 - 150 = 150

Please note that the saving of Y3 is minimum.

Therefore Option 2 is the correct answer.

Q53. Answer: (d) 1 pm

Calculation:

Please note that at 1 pm the graph is at its highest point.

Therefore Option 4 is the correct answer.

Q54. Answer: (c) Rs.24

Given:

Loss on selling 18 pens = CP of 3 pens.

Concept used:

Loss = CP - SP

Calculation:

(C.P. of 18 pens) - (S.P. of 18 pens) = (C.P. of 3 pens)

=> CP of 15 pens = SP of 18 pens

=> CP (1 pen)/SP (1 pen) = 18/15 = 6/5

According to the question,

SP (1 pen) = 360/18 = 20

Therefore CP of 1 pen = 6/5 × 20 = 24

Therefore Option 3 is the correct answer.

Q55. Answer: (d) 15

Given:

Range of numbers: 23 to 43

Formula used:

A composite number is a number that has more than two factors

Solution:

The prime numbers between 23 and 43 are 23, 29, 31, 37, 41, and 43. Therefore, the composite numbers between 23 and 43 are 24, 25, 26, 27, 28, 30, 32, 33, 34, 35, 36, 38, 39, 40, and 42

There are a total of 15 composite numbers between 23 and 43.

Q56. Answer: (a) 130 degree

Given:

The angle subtended by a chord on the major arc of a circle is 65 degrees.

Concept used:

The angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.

Calculation:

Let O, R, and PQ be the centre, a point on the major arc, and the aforementioned chord respectively.

So, the major arc for the PQ chord is PRQ.

Hence, angle PRQ = 65°

Here, angle POQ is the angle subtended by the same chord, PQ on the centre of the circle.

According to the concept,

angle POQ = 2 × angle PRQ

=> angle POQ = 2 × 65°

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=> angle POQ = 130°

Therefore The angle subtended by the same chord on the centre of the circle is 130°.

Q57. Answer: (d) 9/11

Shortcut Trick

In a right-angled triangle, the cotangent of an angle is the ratio of the adjacent side to the opposite side.

For angle P, the side adjacent is PQ and the side opposite is QR.

Directly substitute the given values: cot P = PQ ÷ QR.

=> cot P = 9/11.

Therefore The correct answer is (9)/(11).

Alternate Method

Given:

ΔPQR is a right-angled triangle where angle Q = 90°.

The length of side PQ = 9 cm and the length of side QR = 11 cm.

Formula Used:

In a right triangle, for any acute angle θ:

cot θ = Adjacent Side / Opposite Side

Calculations:

=> For the angle at vertex P:

=> Adjacent side (Base for angle P) = PQ = 9 cm

=> Opposite side (Perpendicular for angle P) = QR = 11 cm

=> cot P = PQ / QR

=> cot P = 9/11

Therefore The correct answer is (9)/(11).

Additional Information

Reciprocal Trigonometric Identities

The cotangent function is the reciprocal of the tangent function: cot θ = 1 / tan θ.

Complementary Angle Property

In a right-angled triangle, if angle P + angle R = 90°, then cot P = tan R and tan P = cot R.

Pythagoras Theorem

To find the hypotenuse PR, use PR = √(PQ² + QR²). Here, PR = √(9² + 11²) = √(81 + 121) = √202 cm.

Basic Ratios for angle P

sin P = QR/PR, cos P = PQ/PR, and tan P = QR/PQ.

Q58. Answer: (c) 78 km/hr

Given:

Distance between points P and Q: 130 km

Train stops for 30 minutes

Formula:

Speed = Distance/Time

Calculation:

Let's denote the speed of the car as '10x'.

The speed of the train is 30% more than the speed of the car, which can be expressed as 13x

Now, let's calculate the time taken by the car and the train to travel from point P to Q.

Time is taken by the car: Distance/Speed of the car

Time taken by the train: Distance / Speed of the train + Time spent at the station

The time taken by the car and the train is the same, as mentioned in the question.

Therefore, we can write the equation:

130/10x = 130/(13x) + (30 minutes/60 minutes) [Converting 30 minutes to hours]

To simplify the equation, let's solve it step by step.

130/10x = 130/(13x) + 1/2

13/x - 10/x = 1/2

x = 6

Speed of the train = 13 × 6 km/h = 78 km/h.

Hence, the speed of the train is 78 km/h.

Q59. Answer: (d) 85 : 76

Calculation:

Total sales of C2 for two years:

79 + 91 = 170

Total sales of C4 for two years:

66 + 86 = 152

The ratio will be:

170 : 152

85 : 76

Therefore Option 4 is the correct answer.

Q60. Answer: (d) 494

Given:

a3 = b3 + 988

a - b = 4

Formula used:

a^3 - b^3 = (a - b)(a2 + ab + b2)

Solution:

From the equation a3 = b3 + 988, we can write

a3 - b3 = 988

(a - b)(a² + ab + b²) = 988

4(a2 + ab + b2) = 988

a2 + ab + b2 = 247

We can now substitute the value of a2 + ab + b2 into the equation 2a2 + 2ab + 2b2.

2(a2 + ab + b2) = 2(247)

2a2 + 2ab + 2b2 = 494

Therefore, the value of 2a2 + 2ab + 2b2 is 494.

Q61. Answer: (b) 162 cm

Given:

The radius of the incircle of an equilateral triangle = 9√3 cm

Concept Used:

In an equilateral triangle, the radius of the incircle is related to the side length (s) by the formula:

The radius of incircle = side / 2√3

Calculation:

Radius of incircle = side / 2√3

=> 9√3 = side / 2√3

=> side = 9√3 × 2√3 = 18 × 3 = 54 cm

So, Perimeter of an equilateral triangle = 3 × side = 3 × 54 = 162 cm

Therefore The correct answer is option (2).

Q62. Answer: (b) 2 tan A (tan A - sec A)

Shortcut Trick

Put A = 45° in the expression (sec A − tan A + 1)(sec A − tan A − 1).

=> (√2 − 1 + 1)(√2 − 1 − 1) = √2(√2 − 2) = 2 − 2√2

Checking Option 2 by substituting A = 45°:

=> 2 tan 45° (tan 45° − sec 45°) = 2 × 1 × (1 − √2) = 2 − 2√2

Therefore The correct answer is 2 tan A (tan A − sec A).

Alternate Method

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Given:
Expression: (sec A − tan A + 1)(sec A − tan A − 1)
Formula Used:
=> (a + b)(a − b) = a² − b²
=> sec² θ − 1 = tan² θ
Calculations:
=> Let a = (sec A − tan A)
=> The given expression is of the form (a + 1)(a − 1).
=> (a + 1)(a − 1) = a² − 1
=> Substituting the value of a: (sec A − tan A)² − 1
=> Expanding the square: sec² A + tan² A − 2 sec A tan A − 1
=> Rearranging terms: (sec² A − 1) + tan² A − 2 sec A tan A
=> Substituting (sec² A − 1) = tan² A
=> tan² A + tan² A − 2 sec A tan A
=> 2 tan² A − 2 sec A tan A
=> Taking 2 tan A common: 2 tan A (tan A − sec A)
Therefore The correct answer is 2 tan A (tan A − sec A).
Additional Information
Trigonometric Identities
1. sin² θ + cos² θ = 1
2. 1 + tan² θ = sec² θ
3. 1 + cot² θ = cosec² θ
Difference of Squares
The algebraic identity (x + y)(x − y) = x² − y² helps in expanding product expressions quickly and efficiently.

Q63. Answer: (c) 3383

Given :
5x + y = 17 and xy = 6
Formula used :
a3 + b3 = (a+b) (a2 + b2 - ab)
Calculation :
According to the question:
=> 5x + y = 17
Cubing both sides of the equation:
=> (5x + y)3 = (17)3
=> 125x3 + y3 + 3 × 5x × y × (5x + y) = 4913
=> 125x3 + y3 + 15xy × (17) = 4913
=> 125x3 + y3 + 90 × (17) = 4913
=> 125x3 + y3 = 4913 - 1530
=> 125x3 + y3 = 3383
Therefore The answer is 3383.

Q64. Answer: (d) 10

Shortcut Trick
Apply MDH rule: Since the work is equal (half each), M1D1 = M2D2.
10 women × 20 days = M2 women × 10 days
M2 = 200 ÷ 10 = 20 women
Additional women = 20 − 10 = 10 women.
Therefore The correct answer is 10 women.
Alternate Method
Given: Initial women (M1) = 10, Days (D1) = 20, Work (W1) = 1/2. Remaining Work (W2) = 1/2, Target Days (D2) = 10.
Formula Used: (M1 × D1) / W1 = (M2 × D2) / W2

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=> (10 × 20) / (1/2) = (M2 × 10) / (1/2)

=> 200 = 10 × M2

=> M2 = 200 ÷ 10 = 20 women

=> Additional women required = Total women required − Initial women

=> Additional women = 20 − 10 = 10

Therefore The correct answer is 10 women.

Additional Information

General MDH Formula

The relation between Men (M), Days (D), Hours (H) and Work (W) is given by (M1 × D1 × H1) / W1 = (M2 × D2 × H2) / W2.

Inverse Proportionality

For a constant amount of work, the number of people is inversely proportional to the time taken (M prop. to 1/D). If days are halved, the number of people must be doubled.

Work Efficiency

Total Work = Number of People × Time × Efficiency. If efficiency changes, it is multiplied in the numerator of the MDH formula.

Q65. Answer: (b) 65 degree

Given:

angle POQ = 130 degree

Concept used:

The angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.

Calculation:

Let O, R, and PQ be the centre, a point on the major arc, and the aforementioned chord respectively.

So, the major arc for the PQ chord is PRQ.

Hence, angle POQ = 130 degree

Here, angle POQ is the angle subtended by the same chord, PQ on the centre of the circle.

According to the concept,

angle POQ = 2 × angle PRQ

=> 130° = 2 ×angle PRQ

=> angle POQ = 65°

Therefore The angle subtended by the same chord in the major segment of the circle is 65°.

Q66. Answer: (c) 103/65

Formula used:

Average = Sum of all the term/Number of term

Calculation:

6/5 = 1.2 (largest fraction)

11/15 = 0.73

4/7 = 0.57

5/13, the Denominator is more than twice the Numerator and is equal to 0.38, therefore this is the smallest fraction

So, The Largest and the Smallest Fraction is 6/5 + 5/13 = 103/65

Therefore Option 3 is the correct answer

Q67. Answer: (a) 55

Shortcut Trick

Difference in percentage = 50% − 20% = 30%

Difference in marks = 25 (failed) + 20 (extra) = 45 marks

Since 30% corresponds to 45 marks, 1% = 45 ÷ 30 = 1.5 marks

Passing marks = 20% of total marks + 25 = (20 × 1.5) + 25 = 30 + 25 = 55

Therefore The correct answer is 55.

Alternate Method

Given:

Rajiv's score 1 = 20%, Failure margin = 25 marks

Rajiv's score 2 = 50%, Surplus margin = 20 marks

Formula Used:

Passing Marks = (Percentage × Total Marks) ± Margin

Calculations:

=> Let the Total Marks be x.

=> 20% of x + 25 = 50% of x − 20

=> 50% of x − 20% of x = 25 + 20

=> 30% of x = 45

=> 0.30x = 45

=> x = 45 ÷ 0.30 = 150

=> Passing Marks = (20% of 150) + 25

=> Passing Marks = 30 + 25 = 55

Therefore The correct answer is 55.

Additional Information

Maximum Marks

The 100% value represent the total marks of the examination, calculated as Total = (Mark Difference ÷ Percentage Difference) × 100.

Passing Percentage

It is the minimum percentage required to pass: Pass % = (Passing Marks ÷ Total Marks) × 100.

Percentage Base Change

When comparing two states of the same base (Total Marks), the numerical difference in marks is directly proportional to the difference in their percentage values.

Q68. Answer: (a) 54 : 1

Given:

The radius of the hemisphere: r

Radius of the sphere: 3r

Formula:

Volume of a hemisphere = $(2/3)\pi r^3$

Volume of a sphere = $(4/3)\pi(\text{radius})^3$

Calculation:

Let's calculate the respective volumes of the hemisphere and the sphere.

Volume of the hemisphere = $(2/3)\pi r3$

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

Simplifying the expressions:

Volume of the hemisphere = $(2/3)\pi r3$

Volume of the sphere = $(4/3)\pi 27r^3$

Now, let's calculate the ratio of the volumes.

The ratio of volumes = (Volume of the sphere) / (Volume of the hemisphere)

= $[(4/3)\pi 27r3]/[(2/3)\pi r3]$

= 54

Therefore, the respective ratio of the volumes of the sphere and the hemisphere is 54:1.

Q69. Answer: (a) 6 months

Given:

P invested Rs. 4000 for one year.

Q joined him with an investment of Rs. 6000 after a few months.

At the end of one year, the ratio of profits of P and Q is 4 : 3.

Formula used:

Profit = (Investment × Time)

Solution:

Let x be the number of months after which Q joined.

The profit of P is 4x.

The profit of Q is 3x

(12*4000)/(12-x)*6000 = (4/3)
6 = 12 - x
x = 6
Therefore, Q joined after 6 months.

Q70. Answer: (c) 8 percent

Given:
Principal amount lent to B = Rs. 12,000
Time period for B = 3 years
Principal amount lent to C = Rs. 10,000
Time period for C = 4 years
Total interest received = Rs. 6,080
Formula used:
Simple interest = (Principal amount × Time period × Rate of interest)/100
Solution:
The total interest received is the sum of the interest received from B and the interest received from C.
Interest received from B = (12,000 × 3 × R)/100
Interest received from C = (10,000 × 4 × R)/100
6,080 = (12,000 × 3 × R)/100 + (10,000 × 4 × R)/100
6,080 = 360R + 400R
6,080 = 760R
R = 6,080 / 760
R = 8%
Therefore, the annual rate of interest is 8%.

Q71. Answer: (d) (a - b + c)²

Formula used:
(a + b + c)2 = a2 + b2 + c2 + 2ab + 2bc + 2ca
Calculation
By using the formula (a + b + c)2 = a2 + b2 + c2 + 2ab + 2bc + 2ca
(a - b + c)² = a2 + b2 + c2 - 2ab - 2bc + 2ca
Therefore Option 4 is the correct answer.

Q72. Answer: (c) 0

Calculation:
J1 = The value of the average number of calculators sold by L in all the months.
(350 + 340 + 320 + 315 + 305)/5 = 326
J2 = The difference between the total number of calculators sold by L and M.
Total number of calculators sold by L = 350 + 340 + 320 + 315 + 305 = 1630
Total number of calculators sold by M = 305 + 310 + 360 + 330 + 325 = 1630
J2 = 1630 - 1630 = 0
so, J2/J1 = 0/326 = 0
Therefore Option 3 is the correct answer.

Q73. Answer: (c) 30 percent

Given:
The listed price of the cycle = Rs. 20,000
Selling price to the retailer = Rs. 14,000
Formula:
Percent discount = (Discount / Listed price) * 100
Calculation:
To calculate the percent discount, we need to find the discount first.
Discount = Listed price - Selling price

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Substituting the given values:

Discount = Rs. 20,000 - Rs. 14,000

= Rs. 6,000

Now, we can calculate the percent discount:

Percent discount = (Discount / Listed price) * 100

= (6000 / 20000) * 100

= 30

Therefore, the percent discount given to the retailer is 30%.

Q74. Answer: (d) 33 : 7

Given:

Number of students = 132

Average marks of all students = 50

Average marks of passed students = 55

Average marks of failed students = 35

Formula:

Average marks = Total marks / Number of students

Solution:

By using the allegation method.

Passed		Failed
55		35
	50	
15		5

So the ratio is 15 : 5 or 3 : 1

The total marks of passed students = 3 × 55

The total marks of failed students = 35 × 1

The ratio is

3 × 55 : 35 × 1

33 : 7

Therefore, the respective ratio of the total marks of passed students and the total marks of failed students is 33 : 7

Q75. Answer: (b) 20√3 cm

Shortcut Trick

When two circles of equal radius (r) intersect such that each passes through the centre of the other, the distance between their centres is equal to the radius (d = r).

Length of the Common Chord = √3 × r

Given r = 20 cm

Length of common chord = 20 × √3 = 20√3 cm.

Therefore The correct answer is 20√3 cm.

Alternate Method

Given:

Radius of both circles (r) = 20 cm

Distance between centres (O1O2) = 20 cm

Let O1 and O2 be the centres and AB be the common chord. Let M be the intersection of O1O2 and AB.

=> O1O2 = 20 cm

=> O1M = M O2 = 20 ÷ 2 = 10 cm (Line joining centres bisects the common chord at right angles)

=> In right-angled triangle ΔAMO1:

=> $AM^2 + O1M^2 = O1A^2$

=> $AM^2 + 10^2 = 20^2$

=> $AM^2 = 400 - 100 = 300$

=> $AM = \sqrt{300} = 10\sqrt{3}$ cm

=> Length of common chord AB = 2 × AM

=> AB = 2 × 10√3 = 20√3 cm

Therefore The correct answer is 20√3 cm.

Additional Information

Common Chord Formula

Length of common chord $L = 2\sqrt{(r^2 - (d/2)^2)}$, where r is the radius and d is the distance between centres.

Angle in Semicircle

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

Perpendicular from Centre

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

Q76. Answer: (c) EAT

The solution is in Hindi. Read it online.

Q77. Answer: (d) SPQR

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

Key Points

• S. were updated in 2012, and the new rule explicitly

• P. recognizes the growing risks to national

• Q. forests from climate change as well as expands

• R. opportunities for public input and engagement

• The rearranged sentence would be: Forest planning rules were updated in 2012, and the new rule explicitly recognizes the growing risks to national forests from climate change as well as expands opportunities for public input and engagement.

Therefore, the correct answer is: 'SPQR'

Q78. Answer: (a) Cateogry

The solution is in Hindi. Read it online.

Q79. Answer: (b) The professor said that I had to learn those words regularly.

The correct answer is 'Option 2'.

Key Points

• To convert it into indirect speech, we need to make the necessary changes:

• Change the pronoun "you" to the appropriate pronoun based on the context.

• Since the professor said the statement, we can assume that the person being addressed is the person reporting the statement.

• Therefore, "you" changes to "I" in the indirect form.

• Change the verb form from "must" to a verb form that reflects indirect speech. In this case, "must" changes to "had to" in the indirect form.

• Add the conjunction "that" to introduce the reported statement.

Therefore, the correct sentence is: The professor said that I had to learn those words regularly.

Q80. Answer: (b) That lady was loved by the president.

The correct answer is 'Option 2'.

Key Points

• To transform an active sentence into the passive voice, the object of the active sentence becomes the subject in the passive form, and the verb is changed accordingly.

• In the given sentence, the object is "that lady," and the verb is "loved."

• To convert it into the passive voice, we change the verb to its past participle form ("loved") and introduce the subject ("that lady") as the receiver of the action.

• "That lady was loved by the president" accurately transforms the sentence into the passive voice.

• It maintains the past tense and correctly places the lady as the subject.

Therefore, the correct sentence is: 'That lady was loved by the president'.

Q81. Answer: (d) Enmity

The solution is in Hindi. Read it online.

Q82. Answer: (a) Vandal

The solution is in Hindi. Read it online.

Q83. Answer: (b) Motivational quotes will not help you.

The correct answer is 'Motivational quotes will not help you.'

Key Points

• Motivational qoutes will not help you.

• The error in this option is the misspelling of the word "quotes" as "qoutes."

• Motivational quotes will not helpp you.

• The error in this option is the repetition of the letter "p" in the word "helpp." It should be spelled as "help."

• Motivatinal quotes will not help you.

• The error in this option is the misspelling of the word "Motivational" as "Motivatinal." The correct spelling should have an "i" after the "t."

Therefore, option 2) "Motivational quotes will not help you" is the correct sentence as it does not contain any spelling errors.

Q84. Answer: (a) Illegible

The solution is in Hindi. Read it online.

Q85. Answer: (c) holding

The solution is in Hindi. Read it online.

Q86. Answer: (c) Ignorant

The solution is in Hindi. Read it online.

Q87. Answer: (c) The five first girls

The correct answer is 'Option 3' i.e. 'The five first girls'.

Key Points

• The error is in option 3) "The five first girls."

• The correct phrase should be "The first five girls."

• In English, when describing a specific group of people or objects in a particular order, the ordinal numbers (such as "first," "second," "third") typically come before the cardinal numbers (such as "five," "ten," "twenty").

• Therefore, the correct order is "first five" instead of "five first."

Therefore, the correct sentence is: "The first five girls will get the discount on our merchandise."

Q88. Answer: (c) To sleep soundly

The solution is in Hindi. Read it online.

Q89. Answer: (b) Fugitive

The solution is in Hindi. Read it online.

Q90. Answer: (d) Fully armed, having many weapons

The solution is in Hindi. Read it online.

Q91. Answer: (b) Smart phone age has lead

The correct answer is 'Option 2' i.e. 'Smart phone age has lead'.

Key Points

• The part of the given sentence that has an error is: 2) Smart phone age has lead

• The correct form of the verb in this sentence should be "has led" instead of "has lead."

• The verb "lead" is an irregular verb, and its past participle form is "led" (pronounced like "leed").

• Therefore, in the present perfect tense, we use "has led" as the correct form.

Therefore, the correct sentence is: 'Smart phone age has led'.

Q92. Answer: (b) Pessimist

The solution is in Hindi. Read it online.

Q93. Answer: (c) QPRS

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

Key Points The correct arrangement of the parts of the sentence is: 'QPRS'.

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• Q. A severe three-year drought in the late 16th century probably

• P. contributed to the destruction of Sir Walter Raleigh's "Lost Colony"

• R. at Roanoke Island in what is now North Carolina, and a subsequent

• S. seven-year drought led to high mortality at the Jamestown Colony in Virginia

• This arrangement presents the information in a logical order. First, it introduces the severe three-year drought in the late 16th century. Then, it explains how this drought probably contributed to the destruction of Sir Walter Raleigh's "Lost Colony" at Roanoke Island. Following that, it mentions the subsequent seven-year drought. Finally, it concludes by stating that this seven-year drought led to high mortality at the Jamestown Colony in Virginia.

Therefore, the correct answer is: 'QPRS'

Q94. Answer: (c) is supposed

The correct answer is 'Option 3' i.e. 'Is supposed'.

Key Points

• The given answer (option 3) is correct because it uses the correct subject-verb agreement in the present tense to match the singular subject "weather."

• The subject "weather" is singular, so it should be paired with the singular form of the verb "to be," which is "is."

Therefore, the correct sentence should be: "The weather on the weekend is supposed to be sunny."

Additional Information

• Were supposed: The use of "were" suggests past tense, which does not match with "on the weekend" indicating a future time frame. The correct verb form should be in the present tense.

• Are supposing: This option uses the continuous tense ("are supposing"), which is not appropriate for the intended meaning of stating a general fact about the weather.

Q95. Answer: (b) incendiary

The solution is in Hindi. Read it online.

Q96. Answer: (c) one

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

Key Points

• In the context of the passage, the phrase "a simple (1) _____" suggests that the blank requires a singular noun to describe the daily life of a plant.

• Among the given options, "one" is the correct choice.

• "One" is a singular pronoun that can be used to refer to an individual or a singular entity, in this case, the daily life of a plant.

• It implies that the daily life of a plant may appear simple, but it is more complex than it seems.

Therefore, the correct sentence is: It is easy to think that the daily life of a plant is a simple one.

Additional Information

• Explanation of other options:

• Once: "Once" is an adverb that indicates a specific point in time and does not fit the context of describing the daily life of a plant.

• One's: "One's" is a possessive pronoun that indicates possession by an individual. It is not suitable in this context as it does not describe the simplicity of the daily life of a plant.

• Ones: "Ones" is a plural pronoun that does not fit the context of describing the daily life of a single plant. The sentence is discussing the daily life of a plant in general, not multiple plants.

Q97. Answer: (d) many

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

Key Points

• In the context of the passage, the phrase "plants are very busy all the time doing (2) _____ things" suggests that the blank requires an adjective that describes the number or quantity of activities performed by plants.

• Among the given options, "many" is the correct choice.

• "Many" is an adjective that indicates a large number or a significant quantity of things.

• In this case, it implies that plants are engaged in numerous activities, emphasizing the variety and extent of their daily tasks.

Therefore, the correct sentence is: However, plants are very busy all the time doing many things.

Additional Information

• Explanation of other options:

• Any: "Any" is not suitable in this context as it does not convey the idea of a large number or quantity of activities.

• Very: "Very" is an adverb that intensifies or emphasizes the degree or quality of something, but it does not convey the notion of a large number of activities.

• Much: "Much" is an adverb that indicates a large degree or quantity of something, but it does not convey the idea of a large number of activities.

Q98. Answer: (b) planning

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

Key Points

• In the context of the passage, the phrase "This activity is aimed at surviving the day and (3) _____ for the future" suggests that the blank requires a word that conveys the idea of preparing or making arrangements for the future.

• Among the given options, "planning" is the correct choice.

• "Planning" is a noun that refers to the act of making plans or organizing actions in advance.

• In this context, it implies that the busy activities of plants are directed towards surviving the present day while also making preparations for future growth and survival.

Therefore, the correct sentence is: This activity is aimed at surviving the day and planning for the future.

Additional Information

• Explanation of other options:

• Caressing: "Caressing" is a verb that means to gently touch or stroke someone or something with affection. It does not fit the context of plants' busy activities and preparations.

• Sensing: "Sensing" is a verb that refers to the act of perceiving or becoming aware of something through the senses. While plants do have sensory mechanisms, it does not directly convey the idea of making arrangements for the future.

• Reviving: "Reviving" is a verb that means to bring something back to life or restore its vigor. It does not align with the context of plants' activities and preparations for the future.

Q99. Answer: (a) rooted

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

Key Points

• In the context of the passage, the phrase "Being (4) _____ in the ground" suggests that the blank requires an adjective or past participle that describes the state or condition of plants being fixed in the ground.

• Among the given options, "rooted" is the correct choice.

• "Rooted" is an adjective that describes the state of being firmly established or anchored in a particular place.

• In this context, it conveys that plants are firmly fixed in the ground and cannot move around to find food.

Therefore, the correct sentence is: Being rooted in the ground means that they cannot move around to find food so they must make their own.

Additional Information

• Explanation of other options:

• Sullied: "Sullied" is a past participle that means to make something dirty or tarnished. It does not fit the context of plants being fixed in the ground.

• Smudged: "Smudged" is a past participle that means to make something dirty or untidy by smearing or smudging. It does not relate to the concept of plants being fixed in the ground.

• Cluttered: "Cluttered" is an adjective that means messy or disorganized. It does not convey the idea of plants being fixed in the ground.

Q100. Answer: (b) through

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

Key Points

• In the context of the passage, the phrase "taking water from the soil in (5) _____ their roots and a molecule in the air carbon dioxide into their leaves" suggests that the blank requires a preposition to describe the method or pathway of how plants take in water and carbon dioxide.

• Among the given options, "through" is the correct choice.

• "Through" is a preposition that indicates movement or passage within or across a medium.

• In this context, it accurately conveys that plants absorb water from the soil by passing it through their roots and also take in carbon dioxide by passing it through their leaves from the surrounding air.

Therefore, the correct sentence is: They do this by taking water from the soil in through their roots and a molecule in the air carbon dioxide into their leaves.

Additional Information

• Explanation of other options:

• By: "By" is a preposition that indicates the method or means by which something is done, but it does not specifically convey the idea of passage or movement through a medium.

• With: "With" is a preposition that indicates association or accompaniment, but it does not convey the idea of movement or passage through a medium.

• Of: "Of" is a preposition that indicates possession or relationship, and it does not fit the context of describing the pathway of water and carbon dioxide into the plant.

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