SSC CHSL 2020 Official Paper 15 (Held On: 19 April 2021 Shift 3) (Previous Year Paper)

SSC Combined Higher Secondary Level (CHSL) • 2020 • 100 questions • 60 minutes • Answer key and solutions

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ENGLISH LANGUAGE

Q1. Select the most appropriate word to fill in the blank.

During her vacation, Shanta _____ her mother when she went to work in the mall

(a) associated
(b) abandoned
(c) accompanied
(d) isolated

Q2. Select the INCORRECTLY spelt word.

(a) approval
(b) commitment
(c) development
(d) failier

Q3. Given below are four jumbled sentences. Out of the given options, select the one that gives their correct order.

A. I saw a middle-aged man sitting beneath the tree with his knees drawn up to his chest.
B. When I was a street away from my house, I saw a huge banyan tree to my right.
C. My heart went out to him as he was crying bitterly.
D. His head was bowed and his body was shivering continuously.

(a) ADBC
(b) BADC
(c) BDCA
(d) ACDB

Q4. Select the word which means the same as the group of words given.

the scientific study of the universe and planets

(a) astrology
(b) gemology
(c) astronomy
(d) physiology

Q5. Direction: Select the most appropriate word to fill in the blank.

For each question, four _____ are given as options.

(a) alternatives
(b) altercations
(c) alternates
(d) alterations

Q6. Select the most appropriate synonym of the given word.

Severity

(a) Anguish
(b) Pain
(c) Support
(d) Seriousness

Q7. Select the correct indirect form of the given sentence.

The yoga instructor said to us, “Doing yoga daily will help you to develop a healthy mind and body."

(a) The yoga instructor was told them that daily yoga would help them to develop a healthy mind and body
(b) The yoga instructor said to us that doing daily yoga will be helping us to develop a healthy mind and body
(c) The yoga instructor told us that doing yoga daily would help us to develop a healthy mind and body.
(d) The yoga instructor said to us that daily yoga will help us to develop a healthy mind and body.

Q8. Select the option that expresses the given sentence in the active or passive voice.

Teachers should cover all the topics in the syllabus.

(a) Teachers should be covered the syllabus in all the topics.
(b) All the topics in the syllabus should be covered by teachers.
(c) Teachers should be covered all the topics in the syllabus.
(d) All the topics in the syllabus should cover teachers.

Q9. Select the most appropriate synonym of the given word.

Emerge

(a) appear
(b) mingle
(c) withhold
(d) leave

Q10. Select the INCORRECTLY spelt word.

(a) Science
(b) Physics
(c) Seenary
(d) Technology

Q11. Select the most appropriate meaning of the given idiom.

A grey area

(a) An unusual spot
(b) A special part of the brain
(c) An unclear situation
(d) An unspoken truth

Q12. Select the most appropriate option to substitute the underlined segment in the given sentence. If there is no need to substitute it, select ‘No substitution’.

My daughter could not find the words to say why she has been crying on a day when she should have been happy.

(a) was crying
(b) can be crying
(c) is been crying
(d) No substitution

Q13. Select the option that can be used as a one-word substitute for the given group of words.

Eat or drink food quickly and in large amounts

(a) Sip
(b) Choke
(c) Gulp

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(d) Swish

Q14. Select the most appropriate ANTONYM of the given word.

Constant

(a) Competent
(b) Static
(c) Unchanging
(d) Fluctuating

Q15. Select the most appropriate antonym of the given word.

GRACEFUL

(a) attractive
(b) dangerous
(c) pretty
(d) awkward

Q16. Select the most appropriate meaning of the given idiom.

To be in the dark

(a) to not know something others are aware of
(b) to be afraid of darkness and refuse to go out at night
(c) to learn to face dark places without fear
(d) to always be in a bad mood about darkness

Q17. Select the most appropriate option to substitute the underlined segment in the given sentence. If there is no need to substitute it, select 'No substitution required'.

The green shirt is too lose for me to wear.

(a) lost for me
(b) No substitution required
(c) loose for me
(d) loss for me

Q18. In the given sentence, identify the segment which contains the grammatical error.

The children were warning not to try to climb the cliffs as they were very steep.

(a) not to try
(b) were warning
(c) to climb
(d) as they were

Q19. Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the right order to form a meaningful and coherent paragraph.

A. He often spread rumors that his neighbours were thieves.

B. After being released, one of them sued him for wrongly accusing them.

C. One evening, some of them were arrested by the police.

D. After the investigation, they were proven innocent.

(a) DCAB
(b) ABCD
(c) ACDB
(d) ADBC

Q20. The following sentence has been split into four segments. Identify the segment that contains a grammatical error.

I'm sorry, sir. / How many is / the fine for / returning the books late?

(a) the fine for
(b) returning the books late
(c) How many is

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(d) I'm sorry, sir

Directions

Direction: In the following passage, some words have been deleted. Select the most appropriate option to fill in each blank.

These are the various symbols used on garbage bins. The wheeled-bin (1) ____ which is crossed out indicates that the item (2) __ be disposed of separately from household waste. The item should be handed in for recycling (3) __ to local environmental regulations for waste disposal. By (4) __ a marked item from household waste, you will help reduce the volume of waste sent to landfills. It will also (5) ____ any potential negative impact on human health and the environment. For more information, please contact your nearest civic official.

Q21. Select the most appropriate option to fill in blank number 1.

(a) symbol
(b) photo
(c) disposal
(d) item

Q22. Select the most appropriate option to fill in blank number 2.

(a) shouldn't
(b) have
(c) can't
(d) won't

Q23. Select the most appropriate option to fill in blank number 3.

(a) accordance
(b) proposed
(c) subject
(d) according

Q24. Select the most appropriate option to fill in blank number 4.

(a) separating
(b) discarding
(c) throwing
(d) spoiling

Q25. Select the most appropriate option to fill in blank number 5.

(a) increase
(b) maximise
(c) minimise
(d) encourage

GENERAL INTELLIGENCE

Q26. Which of the following four letter-clusters is different from the other letter-clusters?

(a) ILORUZ
(b) ASOJIB
(c) ABEGIJ
(d) EGIKOT

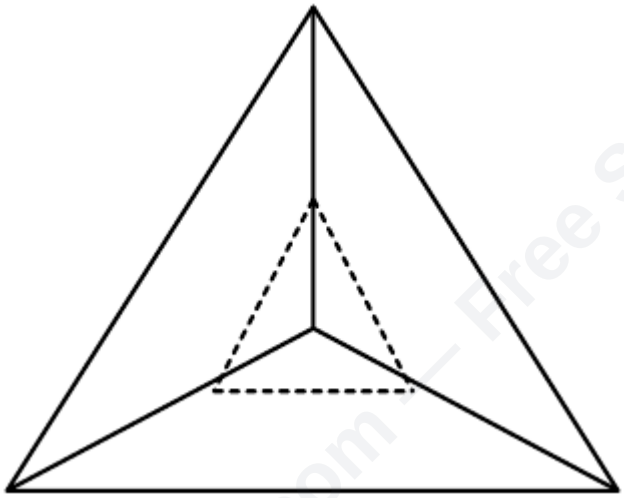
Q27. Select the number from among the given options that can replace the question mark (?) in the following series.

34, 39, 50, 67, 90, ?, 162

(a) 155
(b) 98
(c) 102
(d) 121

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Q28. How many triangles are there in the given figure?



(a) 10
(b) 11
(c) 6
(d) 8

Q29. In a certain code language, PAINT is written as QZHOU and BASK is written as CZTL. How will MOVIE be written in that language?

(a) LNWHF
(b) NPWJD
(c) NNUHF
(d) NNWHD

Q30. If in a code language, ROHAN is coded as 3136 and SHYAM is coded as 4356, then how will you code RAM?

(a) 2315
(b) 1024
(c) 1234
(d) 3412

Q31. Select the combination of letters that when sequentially placed in the blanks of the given series will complete the series.

p r _ b n _ r q _ n p _ q b _ p _ q _ n

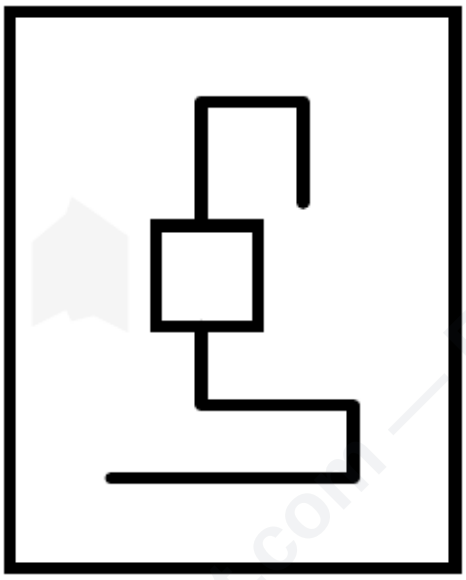
(a) q, p, b, r, n, r, b
(b) q, b, p, n, r, n, r
(c) q, p, b, r, r, n, n
(d) q, r, n, p, b, r, n

Q32. In the following question, select the related letters from the given alternatives.

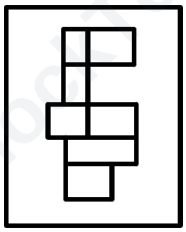
JOKERS : NKOAVO :: ROMING : ?

(a) WKQDRB
(b) VKQERC
(c) VKQGRB
(d) VKRESC

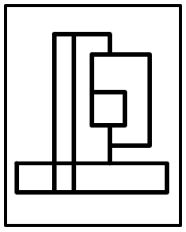
Q33. Select the option in which the given figure is embedded (rotation is NOT allowed).



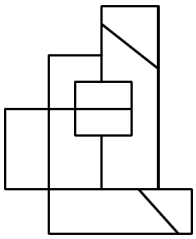
(a)



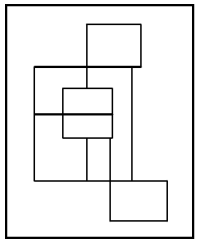
(b)



(c)

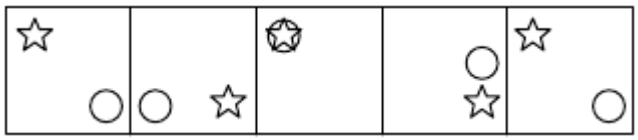


(d)

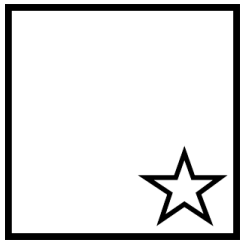


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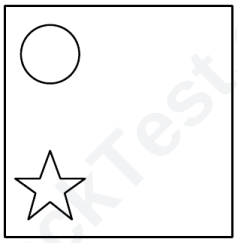
Q34. Select the figure that will come next in the following figure series.



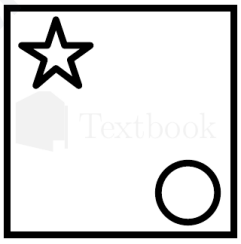
(a)



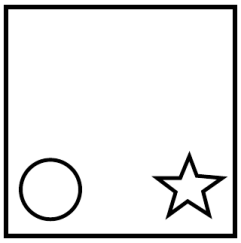
(b)



(c)



(d)



Q35. Select the option that is related to the third word in the same way as the second word is related to the first word.

Spoon : Feeding : : Microscope : ?

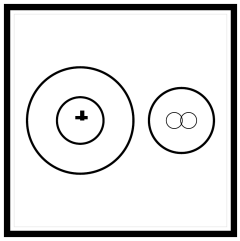
(a) Radiating
(b) Magnifying
(c) Grinding
(d) Heating

Q36. Select the Venn diagram that best illustrates the relationship between the following classes.

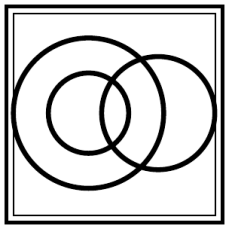
Women, Gynaecologists, Doctors

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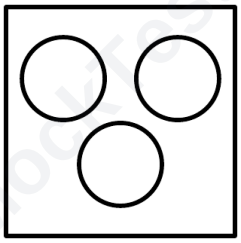
(a)



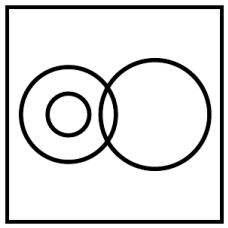
(b)



(c)



(d)



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



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(a)



(b)



(c)



(d)



Q38. Select the option that is related to the third number in the same way as the second number is related to the first number.

54 : 81 : : 6 : ?

(a) 9
(b) 15
(c) 11
(d) 21

Q39. There are three books coded as A, B and C. The price of book A is twice the price of book B and one-third the price of book C. If book C costs Rs. 84, then what are the costs of book A and book B, respectively?

(a) Rs. 28 and Rs. 14
(b) Rs. 14 and Rs. 7
(c) Rs. 24 and Rs. 42
(d) Rs. 14 and Rs. 42

Q40. Arrange the following words in a logical and meaningful order.

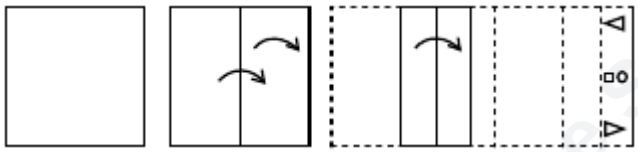
1. Eat
2. Rinse
3. Buy
4. Cut
5. Cook

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

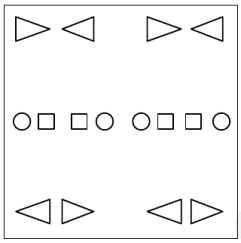
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(d) 2, 4, 3, 5, 1

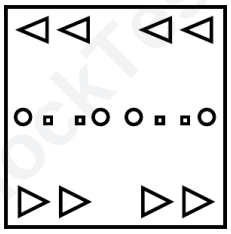
Q41. The sequence of folding a piece of paper and the manner in which the folded paper has been cut is shown in the following figures. How would this paper look when unfolded?



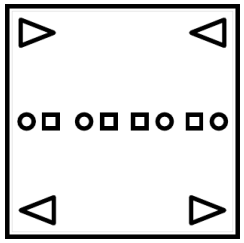
(a)



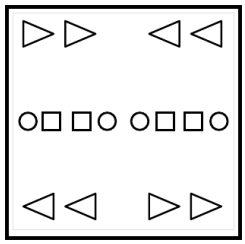
(b)



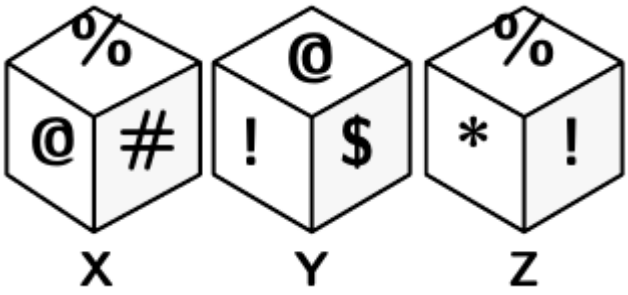
(c)



(d)



Q42. Three different positions (X, Y and Z) of the same dice are shown. Which symbol is on the face opposite to the face having the symbol '!'?



(a) #

(b) $
(c) %
(d) @

Q43. Select the option that is related to the third term in the same way as the second term is related to the first term.

Circle : Arc :: Flower : ?

(a) Colour
(b) Perfume
(c) Petal
(d) Smell

Q44. Four options have been given, out of which three are alike in some manner and one is different. Select the option that is different.

(a) Scurvy
(b) Psoriasis
(c) Vitiligo
(d) Eczema

Q45. What will be the value of the given expression if 'A' means '+', 'B' means '-', 'C' means '×' and 'D' means '÷'

15 C 7 B (24 D 8) A 16 C 4 B 21 D 3

(a) 179
(b) 165
(c) 159
(d) 151

Q46. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

Some lights are wires.

All appliances are lights.

All bulbs are appliances.

Conclusions:

I. Some lights are appliances.

II. Some wires are bulbs.

III. All bulbs are lights.

(a) Both conclusions I and III follow
(b) Only conclusion III follows.
(c) Both conclusions II and III follow.
(d) Both conclusions I and II follow

Q47. Three of the following four numbers are alike in a certain way and one is different. Select the number that is different from the rest.

(a) 1055
(b) 3124
(c) 6457
(d) 4328

Q48. U is the father of M. V is the wife of K. D is the mother of K's only brother M. How is U related to D?

(a) Father
(b) Husband
(c) Paternal uncle
(d) Brother

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Q49. Select the option in which the numbers are related in the same way as are the numbers of the following set.

(11, 20, 81)

(a) (36, 28, 25)
(b) (25, 36, 121)
(c) (12, 30, 224)
(d) (14, 29, 64)

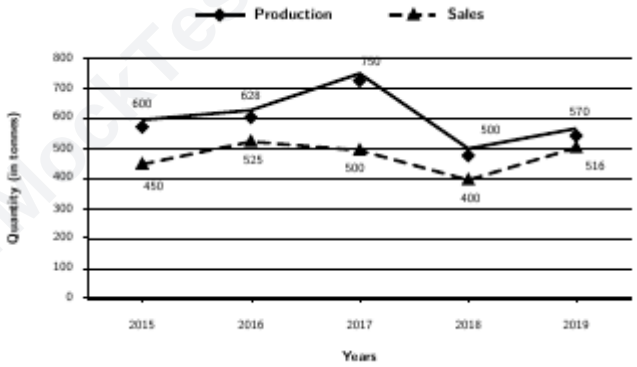
Q50. Select the set in which the numbers are related in the same way as are the numbers of the following set.

(1, 2, 6)

(a) (10, 20, 40)
(b) (7, 14, 49)
(c) (1, 2, 16)
(d) (5, 30, 930)

QUANTITATIVE APTITUDE

Q51. The given line graph shows the production (in tonnes) and the sales (in tonnes) of a company.



What is the difference (in tonnes) in the production in 2015 and 2017 taken together and the sales in 2018 and 2019 taken together?

(a) 309
(b) 462
(c) 334
(d) 434

Q52. Solve the following equation.

θ : $2\sqrt{3}\sin^2\theta + \cos\theta - \sqrt{3} = 0$ where θ is an acute angle.

(a) 60°
(b) 15°
(c) 30°
(d) 45°

Q53. If a + b + c = 4, ab + bc + ca = -14 and abc = -18, then the value of $\sqrt{(4a^3+4b^3+4c^3-36)}$ will be:

(a) 25
(b) 24
(c) 18
(d) 26

Q54. A shopkeeper charges Rs. 1.50 to photocopy a sheet of paper and a discount of 5.5% is given on all photocopies done after 400 sheets. How much will it cost to photocopy 800 sheets of paper?

(a) Rs. 1,167
(b) Rs. 1,160
(c) Rs. 1,176
(d) Rs. 1,276

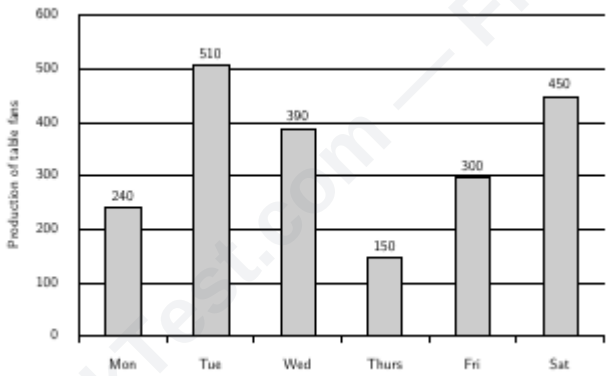
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Q55. if the diameter of the base of a cone is 18 cm and its curved surface area is 4242/7 cm², then its height will be: (Take π = 22/7)

(a) 14 cm
(b) 12 cm
(c) 15 cm
(d) 10 cm

Q56. Study the given bar graph and answer the question that follows.

The bar graph shows the production of table fans in a factory for one week.



The ratio of the total production of table fans on Tuesday and Wednesday together to that on Thursday and Friday together is:

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

Q57. The ratio of boys and girls in a school is 6 : 7. If the total number of students in the school is 3289, then what is the number of girls?

(a) 1876
(b) 1984
(c) 1569
(d) 1771

Q58. The average of 5 numbers is 26.4. The first number is one-fifth of the sum of the remaining 4 numbers. What is the first number?

(a) 22
(b) 23
(c) 20
(d) 21

Q59. In a right angled triangle ABC, if angle ABC = 90°, AB = 6 cm, BC = 8 cm, and BD is perpendicular to AC, then AD : DC is:

(a) 9 : 16
(b) 8 : 15
(c) 7 : 16
(d) 9 : 14

Q60. If the perimeter of a circle is 88 cm, then what is the area of the circle? (Take π = 22/7)

(a) 446 cm²
(b) 886 cm²
(c) 566 cm²
(d) 616 cm²

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Q61. From a point P that is at a distance of 15 cm from centre O of a circle of radius 9 cm, in the same plane, a pair of tangents PQ and PR is drawn to the circle. The area of quadrilateral PQOR is:

(a) 118 cm²
(b) 108 cm²
(c) 114 cm²
(d) 106 cm²

Q62. If $a^2 + 49b^2 + c^2 + 18 = 2(28b - c - a)$ then the value of $(a + 7b – c)$ is:

(a) 2
(b) 6
(c) -1
(d) 4

Q63. P and Q can complete a work in 9 days and 15 days, respectively. If they work together for three days, then in how many days will the remaining work be completed by Q alone?

(a) 12
(b) 8
(c) 7
(d) 9

Q64. The difference between a number and its three-fifth is 274. What is 20% of the number?

(a) 144
(b) 137
(c) 150
(d) 165

Q65. When a number M is divided by 7, the remainder is 6. What is the remainder if the square of M is divided by 7?

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

Q66. If x^8 – 2599x^4 + 1 = 0, then the positive value of x-1/x will be:

(a) 6
(b) 12
(c) 7
(d) 8

Q67. If $\sec(90°-3\theta/2)=\sqrt{2}$, $0° < \theta < 90°$, then the value of $2\sin\theta + 4\cos2\theta$ will be:

(a) 3
(b) 4
(c) 2
(d) 6

Q68. In how many years, the compound interest, if compounded annually on a sum of RS. 60,000 at rate of 8% per annum is Rs. 9,984?

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

Q69. The value of (86÷20)-13/8 of (1/3-2/13)+(1/8÷3/7)+(2-3/10) is:

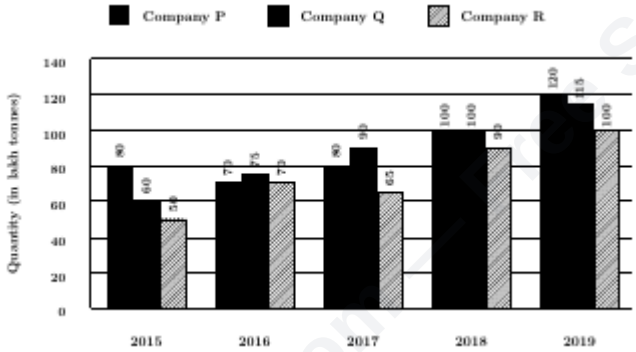
(a) 1
(b) 6
(c) 10

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(d) 5

Q70. The given bar graph indicates the production of sugar (in lakh tonnes) by three different sugar companies P, Q and R from the year 2015 to 2019. Study the bar graph and answer the question that follows.

Production of sugar by companies P, Q and R from 2015 to 2019



The ratio of the average production of sugar by company P from the year 2015 to 2019 to the average production of sugar by company R from the year 2015 to 2019 is:

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

Q71. If (sin θ+cos θ)/(sin θ-cos θ)=3, then the value of sin^4 θ - cos^4 θ is equal to:

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

Q72. A shopkeeper bought 840 kg of rice. A part of it was sold at 25% profit and the remaining at 10% loss and on the whole, the profit was 15%. What was the quantity of rice which was sold at 10% loss?

(a) 240 kg
(b) 340 kg
(c) 260 kg
(d) 220 kg

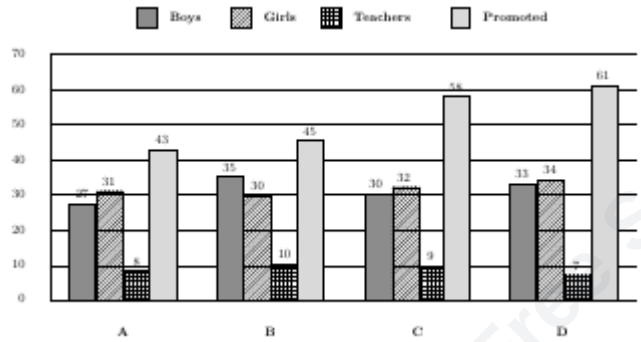
Q73. A man walking at a rate of 4 km/h crossed a tunnel in 18 minutes. What is the length of the tunnel in meters?

(a) 1800
(b) 1600
(c) 1400
(d) 1200

Q74. The length of the base of a triangle is 3 cm smaller than the length of its altitude. Its area is 104 cm^2. What is the length of the base?

(a) 11 cm
(b) 12 cm
(c) 14 cm
(d) 13 cm

Q75. The given bar graph shows the number of boys and girls in classes A, B, C, and D in a school, the number of teachers allotted to each class, and the number of students promoted to the next class.



Which class has the highest percentage of failed students?

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

GENERAL AWARENESS

Q76. Which of the following movies won the ‘Best Tamil Film’ award at the 66^(th) National Film Awards?

(a) Bhonga
(b) Kaappaan
(c) Baaram
(d) Asuran

Q77. A topology for a Local Area Network in which all nodes are individually connected to a central connection point like a hub or switch is called:

(a) star topology
(b) tree topology
(c) bus topology
(d) ring topology

Q78. Which of the following is an input device?

(a) Projector
(b) Scanner
(c) Monitor
(d) Speaker

Q79. Which of the following musical instruments is an example of the stringed instruments played by the Manganiars of west Rajasthan?

(a) Jhanj
(b) Toomba
(c) Kamaicha
(d) Manjira

Q80. Which of the following organizations launched the 'United for Biodiversity' coalition made up of zoos, aquariums, botanical gardens, national parks, natural history, and science museums from around the world, on World Wildlife Day 2020?

(a) Commonwealth of Nations
(b) World Health Organization
(c) World Wide Fund for Nature
(d) European Commission

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Q81. The International Conference on Nano Science and Nano Technology (ICONSAT) was held in March 2020 at:

(a) Leh
(b) Kozhikode
(c) Shimla
(d) Kolkata

Q82. As of January 2021, how many Olympic medals did India win in the sport of badminton?

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

Q83. The 2018 edition of Commonwealth Games was hosted by:

(a) Australia
(b) South Africa
(c) Canada
(d) England

Q84. What is the importance of the ozone layer for life on Earth?

(a) It protects us from ultraviolet radiation.
(b) It protects us from acidic rainfall.
(c) It protects us from snowfall.
(d) It protects us from rainfall.

Q85. Which Indian president used the pocket veto for the Indian Post Office (Amendment) Bill, 1986?

(a) Dr Rajendra Prasad
(b) Giani Zail Singh
(c) KR Narayanan
(d) APJ Abdul Kalam

Q86. Who is the founder of the Grameen Bank of Bangladesh?

(a) Professor Muhammad Gawas
(b) Professor Muhammad Shah
(c) Professor Muhammad Zaheer
(d) Professor Muhammad Yunus

Q87. Which filmmaker won the Best Screenplay award at the Venice film festival for ‘The Disciple’, a Marathi drama, in 2020?

(a) Sachin Kundalkar
(b) Chaitanya Tamhane
(c) Arvind Deshpande
(d) Hrishikesh Joshi

Q88. Rafael Nadal won the Men's 2020 French Open title after beating:

(a) Roger Federer
(b) Stefanos Tsitsipas
(c) Daniil Medvedev
(d) Novak Djokovic

Q89. Primarily, an ant’s sting has which of the following?

(a) Magnesium hydroxide
(b) Tartaric acid
(c) Citric acid
(d) Formic acid

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Q90. As of the financial year 2018-19, which of the following is the largest raw jute producing state in India?

(a) West Bengal
(b) Nagaland
(c) Rajasthan
(d) Bihar

Q91. What was the meaning of 'Ryot' in British records in the 18th century?

(a) Jobbers
(b) Weavers
(c) Peasants
(d) Traders

Q92. Which country hosted the Shanghai Cooperation Organisation (SCO) Ministers meeting in October 2020?

(a) China
(b) Japan
(c) India
(d) Pakistan

Q93. Amarkantak plateau in Chhattisgarh contains an abundant deposit of which of the following minerals?

(a) Bauxite
(b) Mica
(c) Iron ore
(d) Coal

Q94. Which of the following combinations of measures of quantity and unit is NOT a correct match?

(a) Weight - Cubic metre
(b) Temperature - Kelvin
(c) Pressure - Pascal
(d) Mass - Kilogram

Q95. In which of the following states is the famous Chitradurga Fort located?

(a) Tamil Nadu
(b) Kerala
(c) Rajasthan
(d) Karnataka

Q96. Which of the following is NOT a plateau situated in India?

(a) Bundelkhand
(b) Maikal
(c) Malwa
(d) Chota Nagpur

Q97. Which of the following government schemes was launched with the objective of delivering government services to citizens electronically by improving online infrastructure and by increasing internet connectivity?

(a) Digital India
(b) AMRUT Plan
(c) Pradhan Mantri SVANidhi Scheme
(d) Stand Up India

Q98. Which of the following is NOT an effect of an earthquake?

(a) Avalanche
(b) Heavy rainfall
(c) Tsunami
(d) Soil liquefaction

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Q99. Who among the following kings founded the Maurya empire in ancient India?

(a) Bindusara
(b) Ashoka
(c) Chandragupta
(d) Dasaratha

Q100. Who among the following is the ex-officio Chairman of Rajya Sabha?

(a) President of India
(b) Vice-President of India
(c) Speaker of the Parliament
(d) Prime Minister

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (c) accompanied

The correct answer is 'Accompanied'.

Key Points

• The given sentence is in the past tense that can be identified by the usage of the second form 'went'.
• During the vacation, normally children wish to spend time with their parents. The same situation has been stated in the sentence.
• Accompany (verb) means 'to go somewhere with someone as a companion'
• Hence, the correct answer is Option 3.

Additional Information Let's understand the meaning of other options.

• Associate (verb) - to connect someone or something in your mind with someone or something else - He is glad to be associated with this project.
• Abandon (verb) - to leave something or someone usually forever - The king abandoned his kingdom and spent the rest of his life as a saint.
• Isolate (Verb) - to separate something from other things with which it is connected - He isolated himself from the company of narrow-minded people.

Q2. Answer: (d) failier

The incorrect spelling is 'Failier'.

Key Points

• The accurate spelling of 'failier' is 'failure'.
• Failure (noun) means a lack of success in doing something.
• The meeting was a complete failure because no one was prepared.
• Hence, the correct answer is option 4.

Additional Information Let's understand the meaning of other options.

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• Approval (noun) - official permission - They have received the approval to construct a building on this land.

• Commitment (noun) - a firm decision to do something - The students fulfilled their commitment to complete the project on time.

• Development (noun) - the process in which someone or something grows or changes and becomes more advanced - Nutritious diet is essential for the development of a healthy mind.

Q3. Answer: (b) BADC

The correct answer is 'BADC'.

Key Points

• Whenever we try to arrange the sequence of the jumbled sentences, it's important to find out the first sentence.

• The sentence 'B' is the first one as it explains the situation perfectly. (When I was a street away from my house, I saw a huge banyan tree to my right.)

• The second in the sequence would be the sentence 'A' that states what I saw beneath the tree. (I saw a middle-aged man sitting beneath the tree with his knees drawn up to his chest.)

• The third in the sequence would be the sentence 'D' that tells about the condition of that middle-aged man. (His head was bowed and his body was shivering continuously.)

• The sentence 'C' is the last one as it talks about how I felt at the end. (My heart went out to him as he was crying bitterly.)

**Hence, the correct answer is option 2.

Additional Information

• Let's understand some important words given in the sentences.

• Shiver (verb) - to shake slightly or quickly because of feeling cold, ill, or frightened - She was shivering with the cold that's why she covered herself with the blanket.

• Bitterly (adverb) - in a way that shows deep anger and pain - He was bitterly disappointed when he couldn't get through the exam.

Q4. Answer: (c) astronomy

The correct answer is 'Astronomy.

Key Points

• 'Astronomy' is the study of objects and matter outside the earth's atmosphere and of their physical and chemical properties.

• For e.g.- Because Tim was fascinated with astronomy, he asked his parents to buy him a telescope.

• Hence, the correct answer is option 3.

Additional Information Let's understand the meaning of other words.

• Astrology - the study of the movements and positions of the sun, moon, planets, and stars in the belief that they affect the character and lives of people.

• Gemology - It is the science of studying, cutting, and valuing precious stones, but the essence lies in identifying the gemstones.

• Physiology - It is the scientific study of functions and mechanisms in a living system.

Q5. Answer: (a) alternatives

The correct answer is 'Alternatives',

Key Points

• The given sentence is about making choice out of four options. (For each question, four _____ are given as options.)

• Alternative means something that is different, especially from what is usual; a choice.

• I am left with no alternative but to leave the organization.

• Hence, the correct answer is option 1.

Additional Information

Let's understand the meaning of other words.

• Altercation (noun) - a loud argument or disagreement - There should be no space for an altercation between the experienced employees.

• Alternate (noun) - a person or a thing that can take the place of another - Brad served as the alternate of Tom as he was too sick to come.

• Alteration (noun) - the action or process of changing or being changed - There should be some alterations required in the plan.

Q6. Answer: (d) Seriousness

The correct answer is 'Seriousness'.

Key Points

• Severity (noun) means Seriousness or quality of being very unkind or unpleasant.

• In order to understand the severity of our financial problems, one has to undergo the same situation. (Seriousness)

• The severity of his comments surprised everyone. (Not kind)

• Hence, the correct answer is option 4.

Additional Information Let's understand the meaning of other words.

• Anguish (noun) - extreme sadness caused by physical and mental suffering - In his anguish, he ignored to answer the call of the customer.

• Pain (noun) - a feeling of physical or mental suffering - People normally take heavy medicines to get instant relief from pain.

• Support (noun) - emotional or practical help - Dale gave me a lot of support when I faced financial crises.

Q7. Answer: (c) The yoga instructor told us that doing yoga daily would help us to develop a healthy mind and body.

The correct answer is 'The yoga instructor told us that doing yoga daily would help us to develop a healthy mind and body.'

Key PointsFollow some basic rules, whenever you have to convert the speech from direct to indirect.

• In the first part of the sentence (reporting speech), remember to change the verb according to the tense.

• Remove inverted commas using 'that'.

• In the second part of the sentence (reported speech), remember to change the verb according to the tense of the first part of the sentence (reporting speech)

On the basis of the above rules, change 'said to' into 'told' and 'will' into would' as the sentence is in the past tense.

The indirect speech would be 'the yoga instructor told us that doing yoga daily would help us to develop a healthy mind and body.'

Hence, the correct answer is option 3.

Additional Information Let's understand the concept with some more examples

• Patrick said to Sara, "I will meet you in the restaurant."

• Patrick told Sara that he would meet her in the restaurant.

• She said to me, "I will help you in English."

• She told me that she would help me in English.

Q8. Answer: (b) All the topics in the syllabus should be covered by teachers.

The correct answer is 'All the topics in the syllabus should be covered by teachers.'

Key Points In order to convert from active to passive voice, we need to understand some basic rules.

• Start the sentence with the object. (All the topics in the syllabus - 'object')

• If a modal is used in the sentence, use 'be + verb 3rd form' with the given model. (should be covered - 'be + verb 3rd form')

• In the end, use 'by + subject (doer)' in order to show the relation between the action and subject. (by teachers - 'by + subject or doer')

Now if we follow the above rules, the sentence will be:

• All the topics in the syllabus should be covered by teachers

**Hence, the correct answer is option 2.

Additional Information Let's understand the concept with some more examples.

• The government should open more schools.

• More schools should be opened by the government.

• Smith can solve this sum.

• This sum can be solved by Smith.

Q9. Answer: (a) appear

The solution is in Hindi. Read it online.

Q10. Answer: (c) Seenary

The incorrect spelling is 'Seenary'.

Key Points

• The accurate spelling of 'seenary' is 'scenery'.

• It means the general appearance of the natural environment.

• No one can ignore the spectacular view of mountain scenery.

• Hence, the correct answer is option 3.

Additional Information

Let's understand a bit more about the word 'scenery'.

• The word 'scenery' is an uncountable noun.

• sceneries - wrong
• a scenery - wrong

Q11. Answer: (c) An unclear situation

The solution is in Hindi. Read it online.

Q12. Answer: (a) was crying

The correct answer is 'was crying'.

Key Points The sentence is related to the past tense as it can be identified with the usage of 'could' & 'other combined sentence'.

• Has been crying - present perfect continuous tense - to use this tense it's essential to mention period or point of time in the sentence.
• Can be crying - the accurate way to use this format is 'model + be + verb 3rd form', so it's incorrect.
• Is been crying - again it's an inaccurate format.

Hence, the correct answer is option 1.

Additional Information Let's understand the concept with some more examples.

• He has been studying since morning. (present perfect continuous tense with a point of time)
• Food can be cooked in 10 minutes. (passive voice - model + be + verb 3rd form)

Q13. Answer: (c) Gulp

The correct answer is 'Gulp'.

Key Points

• Sip - to drink, taking only a very small amount at a time.
• Choke - to have severe difficulty in breathing due to the obstructed throat or a lack of air.
• Swish - to move quickly through the air making a soft sound.
• Gulp - to eat or drink liquid quickly by swallowing it in a large amount.

Hence, the correct answer is option 3.

Additional Information Let's understand the words with some examples.

• I always enjoy having sips of coffee early morning.
• Children can choke on peanuts.
• I heard the sword swish through the air.
• She swallowed her drink in one gulp.

Q14. Answer: (d) Fluctuating

The correct answer is 'Fluctuating'.

Key Points

• Constant (adjective) means:
• Happening a lot or all the time.
• John was in constant trouble with his neighbor.
• Staying the same, not getting less or more.
• The demand for homemade food will always remain constant.
• The opposite of this term is Fluctuate which means to change or vary frequently between one level or thing and another.

Hence, the correct answer is option 4.

Additional Information Let's understand the meaning of other words.

• Competent (adjective) - able to do something well - John is competent at his work.
• Static - staying in one place without moving - Fuel prices have remained static for the last few weeks.
• Unchanging - not changing, not being different - Some people always say that the habit of drunkards is unchanging.

Q15. Answer: (d) awkward

The correct answer is 'awkward'.

Key Points

• Graceful means moving in a smooth, relaxed, attractive way, or having a smooth, attractive shape.
• She presented herself in a graceful manner.
• The opposite of this term is awkward which means embarrassed or nervous; moving in a way that is not natural or attractive.
• No one was expecting such an awkward performance of the singer.

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• Hence, the correct answer is option 4.

Additional Information

Let's understand the meaning of other words.

• Attractive - very pleasing in appearance and sound - I still remember one of my classmates who was very attractive.

• Dangerous - able or likely to cause harm - It is really dangerous to be here at night.

• Pretty - quite, but not extremely; pleasant to look at - I have got such a pretty daughter.

Q16. Answer: (a) to not know something others are aware of

The solution is in Hindi. Read it online.

Q17. Answer: (c) loose for me

The correct answer is 'loose for me'.

Key Points

• The sentence is about the clothe i.e. shirt.

• Either it can be tight or loose.

• Hence, the correct answer is option 3.

Additional InformationLet's understand the meaning of other words.

• Lost - not knowing one's whereabouts - I lost my younger brother in a big 'Kumbh' fair.

• Loss - the process of losing something - He faced financial loss at an early age and gained experience to tackle such issues.

Q18. Answer: (b) were warning

The correct answer is 'were warning'.

Key Points

• It can be easily understood that the sentence is in the past tense (passive voice).

• In passive voice, verb 3rd form is always used with the helping verb.

• That's why the format 'were warning' is incorrect.

• The accurate format should be 'were being warned' or 'were warned'.

• Hence, the correct answer is 'option 2'.

Additional Information Let's understand the concept with some more examples.

• The children were instructed not to play here as the floor was very slippery.

• Tourists were being informed not to go for tracking as the weather condition was not favorable.

Q19. Answer: (c) ACDB

The correct answer is ACDB

Key Points

• On reading the sentence, we can comprehend that the passage is all about the misinformation spread by the person.

• The first sentence will be sentence A as it tells us that the person is spreading rumors.

• The second sentence will be sentence C as it tells us that one evening the neighbors got arrested by the police.

• The third sentence will be sentence D as it tells us that after the investigation they were found innocent.

• The fourth sentence will be sentence B as it is the only sentence left.

So the correct passage is- He often spread rumors that his neighbors were thieves. One evening, some of them were arrested by the police. After the investigation, they were proven innocent. After being released, one of them sued him for wrongly accusing them.

Q20. Answer: (c) How many is

The correct answer is 'How many is'.

Key Points

• The sentence is related to the present tense where someone wants to know something.

• Here, the word 'fine' is a singular noun, it can't come with the determiner 'many'.

• Much is accurate with the word 'fine'.

• The sentence should be 'I'm sorry, sir. How much is the fine for returning the books late?'

• Hence, the correct answer is option 3.

Additional InformationLet's understand the concept of how much or how many.

• How much - can be used with an uncountable noun - sugar, time, money, milk, etc. - How much time will you take to get ready?

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• How much - can be used with a countable noun to know the price - dress, jacket, etc. - How much is this jacket?

• How many - can be used with a countable plural noun - dresses, jackets, books, etc. - How many dresses have you bought?

Q21. Answer: (a) symbol

The correct answer is 'Symbol'.

Key Points

• The passage talks about the various symbols used on garbage bins and the right ways to dispose of the waste.

• In the sentence, a kind of sign indicates the way to dispose of a particular type of item. (The wheeled-bin ____ which is crossed out indicates that the item____ be disposed of separately from household waste.)

• A kind of sign must be a symbol that can give an indication. Other options are not relevant as per the context.

• Hence, the correct answer is option 1.

Additional Information

• Crossed out wheeled bins symbol reminds us that all electrical and electronic products and batteries must be taken to separate collection at the end of their working life.

Q22. Answer: (a) shouldn't

The solution is in Hindi. Read it online.

Q23. Answer: (d) according

The correct answer is 'according'.

Key Points

• Whenever "based on" some rules and regulations, we try to explain something, always use 'as per rules and regulations or according to the rules and regulations.

• In the sentence, as per local environmental regulations, it is mentioned that "what should be done" with the waste (The item should be handed in for recycling _____ to local environmental regulations for waste disposal.)

• Other options are not relevant as per the context.

• Hence, the correct answer is option 4.

Additional Information

• Let's try to understand the concept of 'according to' with some more examples.

• According to (preposition) used for saying which person or group provides a particular fact.

• According to a company spokesman, the firm is expected to make the highest profit this month.

• According to the world health organization, there have been 42,536,137 confirmed cases of COVID-19.

Q24. Answer: (a) separating

The correct answer is 'separating'.

Key Points

• The sentence talks about the segregation of marked items that will somewhere be beneficial. (By _____ a marked item from household waste, you will help reduce the volume of waste sent to landfills.)

• Apart from the word 'separating' none of the above-given options expresses segregation.

• Hence, the correct answer is option 1.

Additional Information

• Segregate (verb) means to keep one thing separate from another.

• By separating or segregating negative attitudes, one will be able to climb the ladder of success in a short period.

• Separate or segregate the odd one out from the given question.

Q25. Answer: (c) minimise

The correct answer is 'minimise'.

Key Points

• All in all, for the benefits of human health and the environment, the passage talks about the various symbols used on garbage bins and the right ways to dispose of the waste.

• It's obvious that the awareness of symbols and waste disposal methods will reduce or minimise the negative impact. (It will also _____ any potential negative impact on human health and the environment.)

• Apart from the word 'minimise', the rest of the options aren't relevant as per the context.

• Hence, the correct answer is option 3.

Additional Information

• Many aspirants have confusion related to the spelling of Minimise or Minimize.
• Both the spellings are correct.
• 'Z' is used in American English.
• 'S' is used in British English.

Q26. Answer: (b) ASOJIB

Table show alphabet serial number –
The pattern followed is,
All follow the same pattern, except 'ASOJIB'.
Hence, “ASOJIB” is the odd one.

Q27. Answer: (d) 121

The pattern followed here is:
Hence, '121' is the correct answer.
Important Points:Prime number series is 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41.
Here the next term of the series is obtained by adding the alternative prime numbers and skipping the adjacent one. Here prime number series started from 5.
For example: 5 added to 34 but 11 added to 39, skipped to add 7 and so on.
Note: Here 7 is not difference of 11 and 5.

Q28. Answer: (d) 8

The number of triangles in the given figure is:
So, there are a total of 8 triangles in the figure.
Hence, ‘8’ is the correct answer.

Q29. Answer: (d) NNWHD

The table is alphabets place value:
The pattern followed here is:
Step1: All consonants are coded as the next alphabet.
• Consonants + 1
Step2: All vowels are coded as the previous alphabet.
• Vowel - 1
PAINT is written as QZHOU.
And,
BASK is written as CZTL.
Similarly,
Hence, 'MOVIE' is coded as "NNWHD".

Q30. Answer: (b) 1024

The table is alphabets place value:
The pattern followed here is:
(Sum of the positional values of the letters)² = number.
ROHAN →.
R(18) + O(15) + H(8) + A(1) + N(14) = 18 + 15 + 8 + 1 + 14 = 56
(Sum of the positional values of the letters)² = number
=> $(56)^2 = 3136$
And,
SHYAM →
S(19) + H(8) + Y(25) + A(1) + M(13) = 19 + 8 + 25 + 1 + 13 = 66
(Sum of the positional values of the letters)² = number
=> $(66)^2 = 4356$
Similarly,
RAM →
R(18) + A(1) + M(13) = 18 + 1 + 13 = 32

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(Sum of the positional values of the letters)² = number

=> (32)² = 1024

Hence, RAM will be written as “1024”.

Q31. Answer: (a) q, p, b, r, n, r, b

Given :- p r _ b n _ r q _ n p _ q b _ p _ q _ n

By checking options and substituting accordingly.

Option (1) q, p, b, r, n, r, b → p r q b n - p r q b n - p r q b n - p r q b n

♦ Here p r q b n is repeated itself.

Option (2) q, b, p, n, r, n, r → p r q b n - b r q p n - p n q b r - p n q r n

Option (3) q, p, b, r, r, n, n → p r q b n - p r q b n - p r q b r - p n q n n

Option (4) q, r, n, p, b, r, n → p r q b n - r r q n n - p p q b b - p r q n n

♦ Option (1) gives a pattern of p r q b n - p r q b n - p r q b n - p r q b n.

Hence, ‘q, p, b, r, n, r, b’ is the correct answer.

Q32. Answer: (b) VKQERC

The logic here is,

JOKERS : NKOAVO

Similarly,

ROMING : ?

Hence, "VKQERC" is correct answer.

Q33. Answer: (c) [figure]

The embedded part of this image is:

Hence, option (3) is the correct answer.

Q34. Answer: (d) [figure]

The pattern follows here is:

1) Star figure rotate upper left to lower right and vice-versa.

2) circle rotate an anti-clockwise direction of the square each corner.

The figure that will replace the question mark (?) in the following figure series is shown below:

Hence, ‘option 4’ is the correct answer.

Q35. Answer: (b) Magnifying

The logic followed here is:

Spoon : Feeding → The spoon is used to feeding food.

Similarly,

Microscope : Magnifying → The microscope is used to magnify small objects.

Hence, 'Magnifying' is the correct answer.

Additional Information

• Radiating → linear accelerators or cobalt machines is used in radiation therapy.

• Grinding → Grinding machine used to grind any object.

• Heating → Heating devices like the heater is used to heat any object.

Q36. Answer: (b) [figure]

The Venn diagrams best represent the relationship between - Women, Gynaecologists, Doctors figures are shown below:

All Gynaecologists are doctors, some women are doctors and some women are Gynaecologists.

Hence, ‘option 2’ is the correct answer.

Q37. Answer: (a) [figure]

The correct mirror image of the given figure when the mirror is held at the right side is:

Hence, "option (1)" is the correct answer.

Additional Information

In Mirror image left side and right side changed vice-versa where top and bottom remain same.

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Reflection of an object into the water is its water image. It appears by inverting an object vertically i.e. upside down.

The water image of the figure looks like the mirror image of the figure in case the mirror is horizontally at the bottom of the figure.

Water image is just a reflection where top and bottom part of the images changed where left and right side of the image remain same.

Q38. Answer: (a) 9

The pattern followed here is:

(1^(st) number ÷ 6) × 9 = 2^(nd) number

Now follow the steps:

54 : 81

(1^(st) number ÷ 6) × 9

= (54 ÷ 6) × 9

= 9 × 9

= 81 = 2^(nd) number

Similarly,

6 : ?

(1^(st) number ÷ 6) × 9

= (6 ÷ 6) × 9

= 1 × 9

= 9 = 2^(nd) number

Hence, "9" is correct answer.

Q39. Answer: (a) Rs. 28 and Rs. 14

Given:

Three books coded as A, B and C.

1) The price of book A is twice the price of book B

=> A = 2B → eq. 1

2) The price of book A is one-third the price of book C

=> A = 1/3 C → eq. 2

3) Book C costs Rs. 84

Put the value in eq. 2

=> A = 1/3 × 84

=> A = 28

Put the value of A in eq 1;

=> A = 2B

=> 28 = 2B

=> B = 28 ÷ 2

=> B = 14

Hence, the costs of book A and book B, respectively “Rs. 28 and Rs. 14”.

Q40. Answer: (c) 3, 2, 4, 5, 1

The logical and meaningful order of the given words is as follows:

LOGIC: The words have been arranged according to the stage of vegetable cook.

3. Buy → Firstly we buy vegetables.

2. Rinse → Then we rinse vegetables.

4. Cut → After the rinse vegetables we cuts the vegetables.

5. Cook → Then after cutting we cook the vegetables.

1. Eat → After cooked vegetable we can eat.

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

Q41. Answer: (a) [figure]

The image obtained when the paper is unfolded is,

Hence, "option 1" is the correct answer.

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Q42. Answer: (a) #

Logic: If two dice have the same face value in the given image then their clockwise or anticlockwise wise number are known as opposite numbers in dice.

Given:

From the dice X and Y: @ is common in both so we can rotate clockwise or anticlockwise of the given dice.

Symbol	Opposite
%	$
#	!
@	Not shown

Here, Opposite of ! is %.

From dice Y and Z → '!' is the common face

So,

1) '@' is the opposite face of '*'.

2) '$' is the opposite face of '%'

From the cube 'X' only '#' is remaining

So the opposite face of '!' is '#'.

From dice X and Z: % is common, so we can rotate clockwise or anticlockwise of the given dice.

Symbol	Opposite
#	!
@	•
%	Not shown

Here, Opposite of ! is #.

So, comparing with all dices, opposite face of '!' is '#'.

Hence, "#" is the correct answer.

Q43. Answer: (c) Petal

The logic followed here is:

Given:

Circle : Arc → Arc is the part of Circle.

Similarly,

Flower : Petal → Petal is the part of Flower.

Hence, 'Petal' is the correct answer.

Q44. Answer: (a) Scurvy

The logic followed here is:

Option (1) Scurvy → Scurvy is a disease resulting from a lack of vitamin C.

Option (2) Psoriasis → Psoriasis is the disease of skin problems.

Option (3) Vitiligo→ Vitiligo is the disease of skin problems.

Option (4) Eczema→ Eczema is the disease of skin problems.

All diseases are skin problems except Scurvy.

Hence, "Scurvy" is an odd one.

Q45. Answer: (c) 159

Decoding the information,

Sign	A	B	C	D
Means	•	•	×	÷

Given:

15 C 7 B (24 D 8) A 16 C 4 B 21 D 3

After replacing the signs from left to right and using the BODMAS rule,
15 × 7 - (24 ÷ 8) + 16 × 4 - 21 ÷ 3
= 15 × 7 - 3 + 16 × 4 - 7
= 105 - 3 + 64 - 7
= 169 - 10
= 159
Hence, “159” is the correct answer.

Q46. Answer: (a) Both conclusions I and III follow

Statements:
Some lights are wires.
All appliances are lights.
All bulbs are appliances.
The least possible diagram for the given statements is as follows
Conclusions:
I. Some lights are appliances → True (because all appliances are lights so some lights are also appliances)
II. Some wires are bulbs → False (It is possible but not definite)
III. All bulbs are lights → True (because all bulbs are appliances and all appliances are light so all bulbs are also lights)
Hence, “Both conclusions I and III follow”.

Q47. Answer: (c) 6457

The pattern is following here,
First digit × last digit = middle digits
Option 1) 1055 → 1 - 05 - 5 → 1 × 5 = 5 = middle number
Option 2) 3124 → 3 - 12 - 4 → 3 × 4 = 12 = middle number
Option 3) 6457 → 6 - 45 - 7 → 6 × 7 = 42 ≠ middle number
Option 4) 4328 → 4 - 32 - 8 → 4 × 8 = 32 = middle number
All options follow the same pattern, except ‘Option 3’
Hence, "6457" is the correct answer.

Q48. Answer: (b) Husband

Preparing the family tree using the following symbols,
Given:
1) U is the father of M.
2) V is the wife of K.
3) D is the mother of K's only brother M.
Hence, U is the "Husband" of D.

Q49. Answer: (b) (25, 36, 121)

The Logic here is as follows:
(2^(nd) number - 1^(st) Number)² = 3^(rd) Number
In (11, 20, 81)
(2^(nd) number - 1^(st) Number)²
= (20 - 11)²
= 9²
= 81 = 3^(rd) Number
Now check the all options,
Option (1) (36, 28, 25)
(2^(nd) number - 1^(st) Number)²
= (28 - 36)²
= (- 8)²
= 64 ≠ 3^(rd) Number
Option (2) (25, 36, 121)

(2^(nd) number - 1^(st) Number)²
= (36 - 25)²
= 11²
= 121 = 3^(rd) Number
Option (3) (12, 30, 224)
(2^(nd) number - 1^(st) Number)²
= (30 - 12)²
= 18²
= 324 ≠ 3^(rd) Number
Option (4) (14, 29, 64)
(2^(nd) number - 1^(st) Number)²
= (29 - 14)²
= 15²
= 225 ≠ 3^(rd) Number
Hence, the correct answer is "(25, 36, 121)".

Q50. Answer: (d) (5, 30, 930)

The Logic here is as follows:
(1^(st) number)² + 1^(st) number = 2^(nd) number
(2^(nd) number)² + 2^(nd) number = 3^(rd) number
In (1, 2, 6)
(1^(st) number)² + 1^(st) number
=> 1² + 1 = 1 + 1 = 2 = 2^(nd) number
(2^(nd) number)² + 2^(nd) number
=> 2² + 2 = 4 + 2 = 6 = 3^(rd) number
Now check the all options,
Option (1) (10, 20, 40)
(1^(st) number)² + 1^(st) number
=> 10² + 10 = 100 + 10 = 110 ≠ 2^(nd) number
(2^(nd) number)² + 2^(nd) number
=> 20² + 20 = 400 + 20 = 420 ≠ 3^(rd) number
Option 2) (7, 14, 49)
(1^(st) number)² + 1^(st) number
=> 7² + 7 = 49 + 7 = 56 ≠ 2^(nd) number
(2^(nd) number)² + 2^(nd) number
=> 14² + 14 = 196 + 14 = 210 ≠ 3^(rd) number
Option 3) (1, 2, 16)
(1^(st) number)² + 1^(st) number
=> 1² + 1 = 1 + 1 = 2 = 2^(nd) number
(2^(nd) number)²+ 2^(nd) number
=> 2² + 2 = 4 + 2 = 6 ≠ 3^(rd) number
Option (4) (5, 30, 930)
(1^(st) number)² + 1^(st) number
=> 5² + 5 = 25 + 5 = 30 = 2^(nd) number
(2^(nd) number)²+ 2^(nd) number
=> 30² + 30 = 900 + 30 = 930 = 3^(rd) number
Hence, the correct answer is "(5, 30, 930)".

Q51. Answer: (d) 434

Calculation:
Total number of production in 2015 and 2017 together = (600 + 750)
=> 1350

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Total number of sales in 2018 and 2019 together = (400 + 516)

=> 916

The difference in the production in 2015 and 2017 taken together and the sales in 2018 and 2019 taken together = (1350 – 916)

=> 434

Therefore The required difference is 434

Q52. Answer: (c) 30°

Given:

θ : $2\sqrt{3}\sin 2\theta + \cos\theta - \sqrt{3} = 0$

Formula used:

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

$\Rightarrow \sin^2\theta = 1 - \cos^2\theta$

Calculation:

$2\sqrt{3}\sin 2\theta + \cos\theta - \sqrt{3} = 0$

$\Rightarrow 2\sqrt{3}(1 - \cos^2\theta) + \cos\theta - \sqrt{3} = 0$

$\Rightarrow 2\sqrt{3} - 2\sqrt{3}\cos^2\theta + \cos\theta - \sqrt{3} = 0$

$\Rightarrow 2\sqrt{3}\cos 2\theta - \cos\theta - \sqrt{3} = 0$

Let $\cos\theta = x$

Now,

$\Rightarrow 2\sqrt{3}x^2 - x - \sqrt{3} = 0$

$\Rightarrow 2\sqrt{3}x^2 - 3x + 2x - \sqrt{3} = 0$

$\Rightarrow \sqrt{3}x(2x - \sqrt{3}) + 1(2x - \sqrt{3}) = 0$

$\Rightarrow (\sqrt{3}x + 1)(2x - \sqrt{3}) = 0$

$\Rightarrow x = -1/\sqrt{3}, \sqrt{3}/2$

So, $\cos \sqrt{3}/2 = \cos 30°$

$\Rightarrow \theta = 30°$

Therefore The required value of θ is 30°

Alternate MethodExam approach -

Hit and trial -

Put $\theta = 30°$

$2\sqrt{3}\cos 2\theta - \cos\theta - \sqrt{3} = 0$

$\Rightarrow 2\sqrt{3}\cos 230° - \cos 30° - \sqrt{3} = 0$

$\Rightarrow 2\sqrt{3}(3/4) - \sqrt{3}/2 - \sqrt{3} = 0$

$\Rightarrow 3\sqrt{3}/2 - 3\sqrt{3}/2 = 0$

$\Rightarrow 0 = 0$

Therefore The value of θ is 30°.

This method is useful if you have good command on value putting.

Q53. Answer: (d) 26

Given:

$a + b + c = 4$

$ab + bc + ca = -14$

$abc = -18$

Formula used:

$(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

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

Calculation:

According to the question

(a + b + c)2 = a2 + b2 + c2 + 2(ab + bc + ca)

$\Rightarrow a^2 + b^2 + c^2 = (4)^2 - 2 \times (-14)$

$\Rightarrow$ a2 + b2 + $c^2 = 16 - (-28)$

$\Rightarrow a^2 + b^2 + c^2 = (16 + 28) = 44$

Now,
The value of $\sqrt{4a^3+4b^3+4c^3-36}$
$\Rightarrow \sqrt{4(a^3 + b^3 + c^3) – 36}$
$\Rightarrow \sqrt{4(a + b + c) (a2 + b2 + c2 – ab – bc – ca) + 3abc – 36}$
$\Rightarrow \sqrt{4 \times [4 \times \{44 – (-14) + 3 \times (-18)\}] – 36}$
$\Rightarrow \sqrt{4 \times [(4 \times 58) – 54] – 36}$
$\Rightarrow \sqrt{4 \times (232 – 54) – 36}$
$\Rightarrow \sqrt{(4 \times 178) – 36}$
$\Rightarrow \sqrt{712 – 36}$
$\Rightarrow \sqrt{676}$
$\Rightarrow 26$
Therefore The required value is 26
Alternate Method $\sqrt{4a^3+4b^3+4c^3-36}$
$\Rightarrow \sqrt{4(a^3+b^3+c^3)-36}$
$\Rightarrow \sqrt{4(a + b + c)((a + b + c)2 - 3(ab + bc + ca)) + 3abc – 36}$
$\Rightarrow \sqrt{4 \times [4\{4 \times 4 - 3 \times (-14)\} + 3 \times (-18)] - 36}$
$\Rightarrow \sqrt{16(16 + 42) - 4 \times 54 - 36}$
$\Rightarrow \sqrt{928 - 216 - 36}$
$\Rightarrow \sqrt{676}$
$\Rightarrow 26$
Therefore The required value is 26

Q54. Answer: (a) Rs. 1,167

Given:
Total number of sheets = 800
A shopkeeper charges Rs. 1.50 to photocopy a sheet of paper
A discount of 5.5% is given on all photocopies done after 400 sheets
Calculation:
According to the question
Cost to photocopy next 400 sheets = Rs. (400×1.50)
$\Rightarrow$ Rs. 600
Now,
Cost to photocopy after 400 sheets = $[(400 \times 1.50) \times 94.5/100]$
$\Rightarrow (600 \times 94.5/100)$
$\Rightarrow (6 \times 94.5)$
$\Rightarrow$ Rs. 567
Cost to photocopy 800 sheets of paper = Rs. (600 + 567)
$\Rightarrow$ Rs. 1,167
Therefore The required cost is Rs. 1,167

Q55. Answer: (b) 12 cm

Shortcut Trick
Radius (r) = 18 ÷ 2 = 9 cm.
Slant height (l) = CSA ÷ (π × r) = (2970 / 7) ÷ (22 / 7 × 9) = 15 cm.
In a cone, height (h), radius (r), and slant height (l) form a right-angled triangle.
Using the Pythagorean triplet (9, 12, 15), where r = 9 and l = 15, the height must be 12.
Therefore The correct answer is 12 cm.
Alternate Method
Given:
Diameter of the base = 18 cm
Curved Surface Area (CSA) = 424 2/7 cm^2
Formula Used:

1. Radius (r) = Diameter ÷ 2
2. Curved Surface Area of a cone = πrl
3. Slant height $(l)^2 = r^2 + h^2$

Calculations:

=> Radius (r) = 18 ÷ 2 = 9 cm

=> CSA = 424 2/7 = (424 × 7 + 2) ÷ 7 = 2970 / 7 cm^2

=> π × r × l = 2970 / 7

=> (22 / 7) × 9 × l = 2970 / 7

=> 198 × l = 2970

=> l = 2970 ÷ 198 = 15 cm

=> Height (h) = $\sqrt{(l^2 - r^2)}$

=> h = $\sqrt{(15^2 - 9^2)}$

=> h = $\sqrt{(225 - 81)}$

=> h = $\sqrt{144}$

=> h = 12 cm

Therefore The correct answer is 12 cm.

Additional Information

Total Surface Area (TSA)

The Total Surface Area of a cone is the sum of the curved area and the base area: TSA = πr(l + r).

Volume of a Cone

The Volume represents the capacity of the cone: V = 1/3 × $\pi r^2 h$.

Pythagorean Relationship

In any right circular cone, the relationship between slant height, vertical height, and radius is $l^2 = h^2 + r^2$.

Therefore The correct answer is 12 cm.

Q56. Answer: (a) 2 : 1

Calculation:

The total production of table fans on Tuesday and Wednesday together = (510 + 390)

=> 900

The total production of table fans on Thursday and Friday together = (150 + 300)

=> 450

The ratio of the total production of table fans on Tuesday and Wednesday together to that on Thursday and Friday together = (900 : 450)

=> 2 : 1

Therefore The required ratio is 2 : 1

Q57. Answer: (d) 1771

Given:

The ratio of boys and girls in a school = 6 : 7

The total number of students in the school = 3289

Calculation:

Let the ratio of boys and girls be 6x and 7x respectively.

According to the question

=> (6x + 7x) = 3289

=> 13x = 3289

=> x = (3289/13)

=> x = 253

Now,

The number of girls = 7x = (7 × 253)

=> 1771

Therefore The required number of girls is 1771

Alternate Method(6 + 7) units = 3289

=> 13 units = 3289
=> 1 unit = 3289/13
=> 1 unit = 253
The number of girls = 7 units = 7 × 253 = 1771
Therefore The required number of girls is 1771

Q58. Answer: (a) 22

Given:
The average of 5 numbers = 26.4
The first number is one-fifth of the sum of the remaining 4 numbers
Formula used:
Average = sum of observations/Number of observations
Calculation:
Let the 5 numbers be a, b, c, d and e respectively.
According to the question
The first number is one-fifth of the sum of the remaining 4 numbers
=> a = (b + c + d + e)/5
=> 5a = b + c + d + e
Now,
The average of 5 numbers = (a + b + c + d + e)/5 = 26.4
=> (a + b + c + d + e) = (26.4 × 5)
=> (a + b + c + d + e) = 132
=> b + c + d + e = 132 – a
Now,
=> 5a = 132 – a
=> 6a = 132
=> a = (132/6)
=> a = 22
Therefore The first number is 22
Alternate MethodThe sum of all numbers = 26.4 × 5 = 132
First number : Remaining 4 number = 1 : 5
(1 + 5) units = 132
=> 6 units = 132
=> 1 unit = The first number = 22
Therefore The first number is 22

Q59. Answer: (a) 9 : 16

Given:
angle ABC = 90°
AB = 6 cm
BC = 8 cm
Formula used:
$AC^2 = AB^2 + BC^2$
Calculation:
In ΔABC
$AC^2 = AB^2 + BC^2$
=> $AC^2 = (6)^2 + (8)^2$
=> $AC^2 = 36 + 64$
=> $AC^2 = 100$
=> AC = 10 cm
Now,
In ΔABC and ΔBDC, angle B = angle D = 90°

BC = BC [common]
angle C = angle C [common]
Therefore angle ABC ~ angle BDC [By ASA criteria]
=> AC/BC = BC/DC
=> DC = BC^2/AC
=> DC = $(8)^2/10$
=> DC = 64/10
=> DC = 6.4 cm
And, AD = (AC – DC)
=> AD = (10 – 6.4) cm = 3.6 cm
Now,
The ratio of AD and DC = (3.6 : 6.4)
=> 9 : 16
Therefore The required ratio is 9 : 16

Q60. Answer: (d) 616 cm^2

Given:
The perimeter of a circle = 88 cm
Formula used:
Perimeter of circle = $2\pi r$
Area of the circle = πr^2
Calculation:
According to the question
Perimeter of circle = $2\pi r$
=> $2\pi r = 88$
=> $(2 \times 22/7 \times r) = 88$
=> $44r/7 = 88$
=> $r = (7 \times 2)$ cm
=> r = 14 cm
Now,
Area of circle = πr^2
=> $(22/7 \times 14 \times 14)$ cm^2
=> (22×28) cm^2
=> 616 cm^2
Therefore The required area of the circle is 616 cm^2

Q61. Answer: (b) 108 cm^2

Given:
From a point P that is at a distance of 15 cm from centre O of a circle of radius 9 cm
A pair of tangents PQ and PR is drawn to the circle
Concept used:
The tangent at any point of circle is perpendicular to the radius through the point of contact.
Tangents through an external point to a circle are equal.
(Base)2 + (Perpendicular)2 = (Hypotenuse)2
Calculation:
Let P be a point at a distance of 15 cm from O.
Draw a pair of tangents, PQ and PR.
OQ = OR = radius = 9cm
And OP = 15 cm
We know that, tangent to at any point on the circle is perpendicular to the radius through point of contact.
Hence, we get
OQ ? PQ and OR ? PR

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ΔPOQ and ΔPOR are right-angled triangles
Now,
Using Pythagoras theorem in ΔPQO
(Base)² + (Perpendicular)² = (Hypotenuse)²
=> (PQ)² + (OQ)² = (OP)²
=> (PQ)² + (9)² = (15)²
=> (PQ)² + 81 = 225
=> (PQ)² = (225 – 81)
=> (PQ)² = 144
=> PQ = 12 cm
Tangents through an external point to a circle are equal.
So,
PQ = PR = 12 cm
Now,
The area of quadrilateral PQOR = Area of ΔPQO + Area of ΔPRO
=> (1/2 × OQ × PQ) + (1/2 × OR × PR)
=> (1/2 × 9 × 12) + (1/2 × 9 × 12)
=> (54 + 54) cm²
=> 108 cm²
Therefore The required value is 108 cm²

Q62. Answer: (d) 4

Given:
a2 + 49b2 + c2 + 18 = 2(28b – c – a)
Formula used:
(a – b)² = a² + b² – 2ab
Calculation:
a2 + 49b2 + c2 + 18 = 2(28b – c – a)
=> a² + 49b² + c² + 18 = 56b – 2c – 2a
=> a² + 2a + 49b² – 56b + c² + 2c + 18 = 0
=> a² + 2a + 1 + 49b² – 56b + 16 + c² + 2c + 1 = 0
=> (a + 1)² + (7b – 4)² + (c + 1)² = 0
Now,
(a + 1) = 0
=> a = -1
(7b – 4) = 0
=> b = 4/7
(c + 1) = 0
=> c = -1
Now, The value of (a + 7b – c) = [-1 + 7 × 4/7 – (-1)]
=> (-1 + 4 + 1)
=> (3 + 1)
=> 4
Therefore The required value is 4
Alternate MethodDivide the coefficient of a, b and c in the right side by 2. and equal it with the left side respective expression.
a = -2/2 = -1
49b = 56/2 = 28
=> b = 4/7
c = -2/2 = -1
Now, The value of (a + 7b – c) = [-1 + 7 × 4/7 – (-1)]
=> (-1 + 4 + 1)
=> (3 + 1)

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=> 4

Therefore The required value is 4

Q63. Answer: (c) 7

Given:

Time taken to complete a work by P = 9 days

Time taken to complete a work by Q = 15 days

Formula used:

Work = Efficiency × Time

Calculation:

LCM of 9 and 15 is 45

Efficiency of P = (45/9) = 5 units/day

Efficiency of Q = (45/15) = 3 units/day

P and Q worked together for 3 days = [3 × (5 + 3)]

=> (3 × 8) = 24 units

Remaining work = (45 – 24) = 21 units

Now,

The remaining work completed by Q alone = (21/3)

=> 7 days

Therefore The required days is 7

Q64. Answer: (b) 137

Given:

The difference between a number and its three-fifth = 274

Calculation:

Let the number be x

According to the question

=> (x – 3x/5) = 274

=> (5x – 3x)/5 = 274

=> 2x/5 = 274

=> 2x = 1370

=> x = (1370/2)

=> x = 685

Now,

20% of the number = (20/100 × 685)

=> 137

Therefore The required number is 137

Alternate MethodLet the number be 5 units.

(5 - 3) units = 274

=> 2 units = 274

=> 1 unit = 137

=> The number = 5 units

20 % of the number = 20% of 5 units = 1 unit = 137

Therefore The required number is 137

Q65. Answer: (b) 1

Given:

A number M is divided by 7, the remainder is 6

Formula used:

$(a + b)^2 = a^2 + b^2 + 2ab$

Calculation:

Let the number be K

Then,

Let M = 7k + 6
According to the question
=> $(M)^2 = (7k + 6)^2$
=> $(49k^2 + 36 + 84k)$
Now,
After dividing it by 7, we get
=> $(49k^2 + 36 + 84k)/7$
=> $[7k^2 + (7 \times 5) + 1 + 12k]$
Now, we can say that when M^2 is divided by 7, the remainder will be 1.
Therefore The required remainder is 1
Alternate MethodLet M = 7 + 6 = 13
Now, $M^2 = 169$
=> 169/7 = 24 and Remainder = 1
Therefore The required remainder is 1

Q66. Answer: (c) 7

Given:
x8 – 2599x4 + 1 = 0
Formula used:
$(a + b)^2 = a^2 + b^2 + 2ab$
$(a – b)^2 = a^2 + b^2 – 2ab$
Calculation:
x8 – 2599x4 + 1 = 0
Dividing the equation by x^4 we get,
=> x^4 – 2599 + 1/x^4 = 0
=> x^4 + 1/x^4 = 2599
As we know,
$(x^2 + 1/x^2)^2 = x^4 + 1/x^4 + 2 \times x^2 \times 1/x^2$
=> (x2 + 1/x2)2 = x4 + 1/x4 + 2
=> $(x2 + 1/x2)^2 = 2599 + 2$
=> $(x2 + 1/x2)^2 = 2601$
=> $x^2 + 1/x^2 = \sqrt{2601}$
=> $x^2 + 1/x^2 = 51$
Again as we know,
$(x – 1/x)^2 = x^2 + 1/x^2 – 2 \times x \times 1/x$
=> (x – 1/x)2 = x2 + 1/x2 – 2
=> $(x – 1/x)^2 = 51 – 2$
=> $(x – 1/x)^2 = 49$
=> $(x – 1/x) = \sqrt{49}$
=> x – 1/x = 7
Therefore The required value is 7

Q67. Answer: (a) 3

Given:
sec (90°-3θ/2)=√2
Formula used:
sec(90 – θ) = cosecθ
cosec 45° = √2
Calculation:
According to the question
sec (90°-3θ/2)=√2
=> cosec 3θ/2 = cosec 45°

=> 3θ/2 = 45°
=> 3θ = 90°
=> θ = 30°
Now,
2sin θ + 4cos2θ = (2 × sin30° + 4 × cos60°)
=> (2 × 1/2 + 4 × 1/2)
=> (1 + 2)
=> 3
Therefore The required value is 3

Q68. Answer: (b) 2

Shortcut Trick
Interest for the 1st year = 8% of 60,000 = Rs. 4,800.
Interest for the 2nd year = 4,800 + (8% of 4,800) = 4,800 + 384 = Rs. 5,184.
Total Compound Interest for 2 years = 4,800 + 5,184 = Rs. 9,984.
Since the sum matches the given interest exactly, the time period is 2 years.
Therefore The correct answer is 2 years.
Alternate Method
Given: Principal (P) = Rs. 60,000, Rate (R) = 8% per annum, Compound Interest (CI) = Rs. 9,984.
Formula Used: Amount (A) = P + CI and $A = P(1 + R/100)^n$
=> Amount (A) = 60,000 + 9,984 = Rs. 69,984
=> $69,984 = 60,000 \times (1 + 8/100)^n$
=> $69,984 / 60,000 = (108/100)^n$
=> $11,664 / 10,000 = (1.08)^n$
=> $1.1664 = (1.08)^n$
=> $(1.08)^2 = (1.08)^n$
=> n = 2 years
Therefore The correct answer is 2 years.
Additional Information
Effective Interest Rate
For a rate R, the effective rate for 2 years in CI is given by (R + R + R×R/100)%. For 8%, it is 8 + 8 + 0.64 = 16.64%.
Difference between CI and SI
The difference between Compound Interest and Simple Interest for 2 years is $P(R/100)^2$.
Rule of 72
A quick way to estimate how long it takes for an investment to double: Time ≈ 72 ÷ Interest Rate.

Q69. Answer: (b) 6

Concept Used:
Follow the BODMAS rule according to the table given below:
Calculation:
(86÷20)-13/8 of (1/3-2/13)+(1/8÷3/7)+(2-3/10)
=> (43/10) – 13/8 of (13 – 6)/39 + (1/8 ÷ 3/7) + (2 – 3/10)
=> 43/10 – 13/8 of 7/39 + (1/8 ÷ 3/7) + (2 – 3/10)
=> 43/10 – 7/24 + (1/8 ÷ 3/7) + (2 – 3/10)
=> 43/10 – 7/24 + (1/8 × 7/3) + (2 – 3/10)
=> 43/10 – 7/24 + 7/24 + (2 – 3/10)
=> 43/10 – 7/24 + 7/24 + (20 – 3)/10
=> 43/10 – 7/24 + 7/24 + 17/10
=> 43/10 + 17/10
=> (43 + 17)/10
=> 60/10
=> 6

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Therefore The required value is 6

Q70. Answer: (c) 6 : 5

Calculation:

Total number of production of sugar by company P from the year 2015 to 2019 = (80 + 70 + 80 + 100 + 120)

=> 450

The average production of sugar by company P from the year 2015 to 2019 = (450/5)

=> 90

Total number of production of sugar by company R from the year 2015 to 2019 = (50 + 70 + 65 + 90 + 100)

=> 375

The average production of sugar by company R from the year 2015 to 2019 = (375/5)

=> 75

The ratio of the average production of sugar by company P from the year 2015 to 2019 to the average production of sugar by company R from the year 2015 to 2019 = (90 : 75)

=> 6 : 5

Therefore The required difference is 6 : 5

Q71. Answer: (b) 3/5

Shortcut Trick

Apply Componendo and Dividendo: (sin θ + cos θ + sin θ − cos θ) ÷ (sin θ + cos θ − (sin θ − cos θ)) = (3 + 1) ÷ (3 − 1).

=> 2 sin θ ÷ 2 cos θ = 4 ÷ 2 => tan θ = 2.

Using Right Triangle: perpendicular = 2, base = 1, hypotenuse = √(2² + 1²) = √5.

sin^4 θ − cos^4 θ = (sin² θ − cos² θ)(sin² θ + cos² θ) = sin² θ − cos² θ = (2/√5)² − (1/√5)² = 4/5 − 1/5 = 3/5.

Therefore The correct answer is 3/5.

Alternate Method

Given: (sin θ + cos θ) / (sin θ − cos θ) = 3

Formula Used: sin^4 θ − cos^4 θ = (sin² θ + cos² θ)(sin² θ − cos² θ); sin² θ + cos² θ = 1

=> sin θ + cos θ = 3(sin θ − cos θ)

=> sin θ + cos θ = 3 sin θ − 3 cos θ

=> 4 cos θ = 2 sin θ

=> tan θ = 2

=> sin θ = 2/√5 and cos θ = 1/√5

=> sin^4 θ − cos^4 θ = (sin² θ − cos² θ)(1)

=> (2/√5)² − (1/√5)² = 4/5 − 1/5 = 3/5

Therefore The correct answer is 3/5.

Additional Information

Trigonometric Identities

Fundamental identities include sin² θ + cos² θ = 1, 1 + tan² θ = sec² θ, and 1 + cot² θ = cosec² θ.

Algebraic Difference of Powers

For even powers, a^4 − b^4 can be factored into (a² − b²)(a² + b²), which is very useful in trigonometric simplifications.

Componendo and Dividendo Rule

If a/b = c/d, then (a+b)/(a-b) = (c+d)/(c-d). This rule simplifies ratio-based trigonometric equations quickly.

Q72. Answer: (a) 240 kg

Given:

Amount of rice bought = 840 kg

Profit in which a part is sold = 25%

Loss in which other part is sold = 10%

Total profit = 15%

Calculation:

Let the price of 1 kg rice be Rs. 1

Cost price of 840 kg rice = Rs. 840

Let x kg sold for 10% loss

Then,
(840 – x) kg sold for 25% profit
Now,
Net selling price = (840 × 115/100) = Rs. 966
Net amount on selling x kg rice at 10% loss = (x × 90%)
=> (x × 90/100) = 0.9x
Net amount on selling (840 – x) kg rice at 25% profit = [(840 – x) × 125/100]
=> [1.25 × (840 – x)]
Now,
=> 1.25 × (840 – x) + 0.9x = 966
=> 1050 – 1.25x + 0.9x = 966
=> 1050 – 0.35x = 966
=> 0.35x = 84
=> x = (84 × 100)/35
=> x = 8400/35
=> x = 240
Therefore The required value is 240 kg
Alternate MethodLet the quantity sold at 10% loss be x kg.
According to the question
=> [(840 – x) × 125/100] + (x × 90/100) = (840 × 115/100)
=> [(840 – x) × 1.25] + 9x/10 = 966
=> 1050 – 1.25x + 0.9x = 966
=> 1050 – 0.35x = 966
=> 0.35x = 84
=> x = (84 × 100)/35
=> x = 240 kg
Therefore The required value is 240 kg.
Alternate MethodBy mixture and allegation:
+25 -10
+15
25 : 10
=> Ratio = 5 : 2
(5 + 2) units = 840
=> 1 unit = 120
Quantity of rice sold at 10% loss = 2 units = 240 kg
Therefore The required value is 240 kg.

Q73. Answer: (d) 1200

Given:
Speed of man = 4 km/h
Time taken by man = 18 min
Formula used:
Speed = Distance/Time
1 km/hr = 5/18 m/s
1 min = 60 sec
Calculation:
Let the distance be x
Speed = Distance/Time
=> (4 × 5/18) = x/(18 × 60)
=> 20/18 = x/1080
=> 18x = 1080 × 20
=> 18x = 21,600

=> x = (21,600/18)

=> 1200 m

Therefore The length of the tunnel is 1200 m

Q74. Answer: (d) 13 cm

Given:

The length of the base of a triangle = 3 cm smaller than the length of its altitude

Area of triangle = 104 cm²

Formula used:

Area of triangle = 1/2 × base × height

Calculation:

Let the length of the base of the triangle be x cm.

The length of the base of a triangle is 3 cm smaller than the length of its altitude = (x + 3)

Now,

Area of triangle = [1/2 × x × (x + 3)] = 104

=> (1/2 × x² + 3x) = 104

=> x² + 3x = 208

=> x² + 3x – 208 = 0

=> x² + 16x – 13x – 208 = 0

=> x(x + 16) – 13(x + 16) = 0

=> (x – 13) (x + 16) = 0

=> x = 13, -16

Now,

The length of base of the triangle = x = 13 cm

Therefore The required value is 13 cm

Alternate MethodArea of triangle = [1/2 × x × (x + 3)] = 104

=> x × (x + 3) = 208

=> x × (x + 3) = 13 × 16

=> x × (x + 3) = 13 × (13 +3)

On comparing x = 13

The length of base of the triangle = x = 13 cm

Therefore The required value is 13 cm

Q75. Answer: (b) B

Calculation:

Total number of boys and girls in class A = (27 + 31) = 58

Number of students promoted in class A = 43

Number of failed students in class A = [(58 – 43)/58 × 100]

=> (15/58 × 100)

=> (1500/58)

=> 25.86%

Now,

Total number of boys and girls in class B = (35 + 30) = 65

Number of students promoted in class B = 45

Number of failed students in class B = [(65 – 45)/65 × 100]

=> (20/65 × 100)

=> (2000/65)

=> 30.77%

Now,

Total number of boys and girls in class C = (30 + 32) = 62

Number of students promoted in class C = 58

Number of failed students in class C = [(62 – 58)/62 × 100]

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=> (4/62 × 100)

=> (400/62)

=> 6.45%

Now,

Total number of boys and girls in class D = (33 + 34) = 67

Number of students promoted in class D = 61

Number of failed students in class D = [(67 – 61)/67 × 100]

=> (6/67 × 100)

=> (600/67)

=> 8.96%

Therefore The highest percentage of failed students in class B

Q76. Answer: (c) Baaram

The correct answer is Baaram.

Key Points

• Baaram movie won the 'Best Tamil Film' award at the 66th National Film Awards.

• The 66th National Film awards were announced by Rahul Rawail, head of the Jury for feature films, almost Four hundred and nineteen films

competed for the awards this year.

Additional Information

• The national film awards are given in 31 categories.

• Best non-feature film: Son-Rise by Vibha Bakshi and The Secret Life of Frogs by Ajay and Vijay Bedi.

• Best Educational Film: Sarala Virala.

• Best Director: Uri: The Surgical Strike- Aditya Dhar.

• Best Feature Film: Hellaro is a Gujarati film directed by Abhishek Shah.

• Best Actor: Ayushmann Khuranna for Andhadhun and Vicky Kaushal for Uri: The Surgical Strike.

• Best Music Direction (Songs): Sanjay Leela Bhansali for Padmaavat.

• Best Female Playback Singer: Bindhu Malini for Mayavi Manave from Nathichirami (Kannada).

• Best Male Playback Singer: Arijit Singh for Bhinte Dhil.

Q77. Answer: (a) star topology

The correct answer is Star topology.

Key Points

• A topology for a Local Area Network in which all nodes are individually connected to a central connection point like a hub or switch is called Star Topology.

• In a star topology, each device needs only one link and one I/O port to connect it to any number of other devices.

• Each device has a dedicated point-to-point link to a central controller known as a hub or switch.

Additional Information

• A multipoint connection is one in which more than two specific devices share a single link.

• A point-to-point connection provides a dedicated link between two devices. In mesh, star and ring topologies are point-to-point connection

• Mesh topology:

• In a mesh topology, every device has a dedicated point-to-point link to every other device.

• Bus Topology:

• In Bus Topology, one long cable acts as a backbone to link all the devices in a network.

• Ring topology:

• In a ring topology, each device has a dedicated point-to-point connection with only the two devices on either side of it; Each device is connected to its corresponding repeater.

Q78. Answer: (b) Scanner

The correct answer is Scanner.

Key Points

• The scanner is an input device, which works more like a photocopy machine.

• It is a device that captures images from photographic prints, posters, magazine pages.

• The scanner captures images from the source which are then converted into a digital form that can be stored on the disk.

• These images can be edited before they are printed.

Additional Information

• A monitor:

• It is an output device that is used to display images, text, video, and graphics information generated by a connected computer.

• It is an output device that displays information in pictorial form.

• It is also known as a video display terminal (VDT) or a video display unit (VDU).

• The first computer monitor was introduced on 1 March 1973, which was part of the Xerox Alto computer system.

• Projector:

• A projector or image projector is an optical device that projects an image onto a surface, commonly a projection screen.

Q79. Answer: (c) Kamaicha

The correct answer is Kamaicha.

Key Points

• The Kamaicha:

• It is a bowed lute played by the Manganiars of west Rajasthan.

• The whole instrument is one piece of wood, the spherical bowl extending into a neck and fingerboard; the resonator is covered with leather and the upper portion with wood.

• There are four main strings and a number of subsidiary ones passing over a thin bridge.

• It links the sub-continent to Western Asia and Africa and is considered by some scholars to be the oldest instrument, with the exception of the Ravana Hatta or Ravana Hasta Veena.

Additional Information

• The picture of Kamaicha is shown below:

Q80. Answer: (d) European Commission

The correct answer is European Commission.

Key Points

• European Commission has launched the 'United for Biodiversity' coalition made up of zoos, aquariums, botanical gardens, national parks, natural history and science museums from around the world, on World Wildlife Day 2020.

• The European Commission has put forward plans for the world's first "carbon border tax" on imports of carbon-intensive goods, including steel, cement, fertilizers, and aluminium, as part of a program to meet its new climate target.

• The border levy should be phased in from 2026.

• The measure is designed to protect European industries from competitors abroad.

Additional Information

• World Health Organization:

• World Health Organization (WHO) is a specialized agency of the United Nations (UN) established in 1948 to further international cooperation for improved public health conditions.

• Although it inherited specific tasks relating to epidemic control, quarantine measures, and drug standardization from the Health Organization of the League of Nations (set up in 1923) and the International Office of Public Health at Paris (established in 1907), WHO was given a broad mandate under its constitution to promote the attainment of "the highest possible level of health" by all peoples.

• WHO defines health positively as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

• Each year WHO celebrates its date of establishment, April 7, 1948, as World Health Day.

• With administrative headquarters in Geneva, governance of WHO operates through the World Health Assembly, which meets annually as the general policy-making body, and through an Executive Board of health specialists elected for three-year terms by the assembly.

• The WHO Secretariat, which carries out routine operations and helps implement strategies, consists of experts, staff, and field workers who have appointments at the central headquarters or at one of the six regional WHO offices or other offices located in countries around the world.

Q81. Answer: (d) Kolkata

The correct answer is Kolkata.

Key Points

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• The International Conference on Nano Science and Technology 2020 (ICONSAT) was held at Biswa Bangla Conventional Centre, Kolkata.

• The event was supported by the Department of Science and Technology (DST) and organized by S. N. Bose National Centre for Basic Sciences, Kolkata.

• The conference was held from March 5 to 7, 2020.

Q82. Answer: (b) Two

The correct answer is Two.

Key Points

• As of January 2021, India has won Two Olympic medals in badminton, all in women's singles.

• Saina Nehwal became the first Indian to win an Olympic medal in badminton in 2012.

• PV Sindhu won silver in Rio 2016.

• PV Sindhu also won a bronze medal in the women's singles event at the Tokyo Olympics on August 01, 2021.

Additional Information

• India has won 7 medals in Tokyo Olympics 2021 - 1 Gold Medal, 2 Silver medals, and 4 Bronze medals.

• The 23-year old Neeraj Chopra won India's first-ever Gold in Athletics after finishing on top of the podium in the Javelin Throw.

• He also became only the second individual Gold medalist for the country at the Summer Olympics.

• Abhinav Bindra had won the country's first individual Gold after winning the 10m Air Rifle event at the 2008 Beijing Olympics.

• PV Sindhu wins bronze medal in women's singles shuttler PV Sindhu becomes first Indian woman to win two individual medals at Olympic Games.

• She had won the Silver at the 2016 Games held at Rio. She also became the first Indian player to win the World Badminton Championship and two Olympic medals across genders.

• She had won the World Championship in 2019.

• Ravi Kumar Dahiya gets India a Silver medal in the Tokyo Olympics.

• Lovlina Borogohain fetched a Bronze medal for India in Tokyo Olympics.

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

Q83. Answer: (a) Australia

The correct answer is Australia.

Key Points

• Commonwealth Games 2018 was held on the Gold Coast, Australia.

• Officially known as 'XXI Commonwealth Games.

• Mascot: Borobi.

• Motto: Share the Dream.

Additional Information

• 71 Commonwealth Games Associations participated in this event.

• Open ceremony was inaugurated by Charles, Prince of Wales.

• Australia topped the medal table for the fourth time in the commonwealth games with 80 Gold medals.

• India made its 18th appearance at the Commonwealth Games.

• India finished third for the tournament with 26 Golds.

• First medal for India in Commonwealth Games 2018: Gururaja Poojary (Silver).

• First Gold medal for India in Commonwealth Games 2018: Mirabai Chanu.

• PV Sindhu was named flag-bearer of India for the opening ceremony in Gold Coast.

• Mary Kom carries India's flag at the closing ceremony in Gold Coast.

• The 2022 Commonwealth Games is scheduled to be held in Birmingham, England.

Q84. Answer: (a) It protects us from ultraviolet radiation.

The correct answer is It protects us from ultraviolet radiation.

Key Points

• The ozone layer is one of the layers in the earth's atmosphere inside the stratosphere layer. It absorbs ultraviolet radiation and protects people, animals, plants, and marine life from the sun's harmful rays.

• It was discovered by Charles Fabry and Henri Buisson in 1913.

• It can absorb 98% of the sun's ultraviolet rays and almost 90% of ozone is located in the stratosphere layer at a distance of 15 to 30 km from the surface of Earth.

• In 1989, the Montreal protocol came to protect the ozone layer by cutting the substances that deplete the ozone layer.

Additional Information

• Ozone:

• It is important to mankind because it creates a protective coverage against ultraviolet rays.

• Formula Ozone is O3.

• The ozone layer is found in the stratosphere. The stratosphere is the mass of protective gases clinging to our planet. The ozone layer acts as a shield for life on Earth.

• The ozone layer only makes up 0.00006 per cent of Earth's atmosphere.

• The ozone layer is getting thinner because of chemicals called chlorofluorocarbons (CFCs). Due to this reason nowadays hydrochlorofluorocarbons (HCFCs) are used in place of CFCs.

• CFCs are non-toxic, nonflammable chemicals containing atoms of carbon, chlorine, and fluorine.

• "Ozone holes" are popular names for areas of damage to the ozone layer.

• The ozone layer is thinnest near the poles due to very low temperatures.

Q85. Answer: (b) Giani Zail Singh

The correct answer is Giani Zail Singh.

Key Points

• Giani Zail Singh, the President of India from 1982 till 1987, exercised a pocket veto to prevent the Indian Post Office (Amendment) Bill from becoming law.

• A pocket veto allows a president to exercise veto power over a bill by taking no action.

• Article 111 of the Indian constitution states that the President shall declare his assent to a bill passed by both houses of Parliament or withhold his assent, provided that may he return the bill to Parliament for reconsideration.

Additional Information

• Indian Post Office (Amendment) Bill 1986 which among other things gave the executive extensive powers to intercept personal communication. The provisions of the Bill, he felt, violated the right to privacy. He sat on it. On two occasions, he informally suggested certain changes to it. When nothing came of those efforts, he simply sat on the matter indefinitely. The President killed the Bill by sheer inaction.

• Pocket Veto means to take no action on the bill that comes to him for his assent.

• The President neither ratifies nor rejects nor returns the bill, but simply keeps the bill pending for an indefinite period.

Q86. Answer: (d) Professor Muhammad Yunus

The correct answer is Professor Muhammad Yunus.

Key Points

• Muhammad Yunus, a Bangladeshi social entrepreneur, the Nobel Peace Prize awardee is the founder of the Grameen Bank of Bangladesh.

• Grameen Banks have been created with the purpose of serving rural areas with basic banking and financial services.

• Grameen Banks provide small loans without the burden of high interest to those living in abject poverty to reduce the widespread rural poverty.

Additional Information

• In 2006 Grameen and Yunus were awarded the Nobel Prize for Peace.

• The Grameen model, devised by Yunus in 1976, is based on groups of five prospective borrowers who meet regularly with Grameen Bank field managers. Typically, two of the five prospective borrowers are granted loans. If, after a probationary time period, the first two borrowers meet the terms of repayment, then loans are granted to the remaining group members.

• Preer pressure acts as a replacement for traditional loan collateral. Grameen became an independent bank in 1983; headquartered in Dhaka, Bangladesh, it has more than 2,200 branches in the country.

• The Grameen model has come to symbolize an efficient means of helping the poor by providing them with opportunities to help themselves.

• More than 97 per cent of Grameen's loan recipients have been women.

Q87. Answer: (b) Chaitanya Tamhane

The correct answer is Chaitanya Tamhane.

Key Points

• Filmmaker Chaitanya Tamhane's The Disciple won the best Best Screenplay award at Venice International Film Festival during the closing ceremony held on 12 September 2020.

• This is the second award the film got at the festival. Earlier, it was honoured with the International Critics' Prize awarded by

FIPRESCI.

• Chloe Zhao's Nomadland won the prestigious Golden Lion award at the festival.

Additional Information

• The Disciple is a Marathi movie directed by Chaitanya Tamhane. Its plot is based on Indian Classical Music.

• The Disciple was also selected as the only Indian film this year among the official selection of the 2020 Toronto International Film Festival.

• The film unfolds with the story of a young musician Sharad, the disciple who has been initiated into the rites of Hindustani classical music complete with reverence and idealism.

• Director: Chaitanya Tamhane.

• Writer: Chaitanya Tamhane.

• Stars: Aditya Modak, Arun Dravid, Sumitra Bhave

Q88. Answer: (d) Novak Djokovic

The correct answer is Novak Djokovic.

Key Points

• Rafael Nadal is a professional tennis player from Spain.

• Rafael Nadal won the men's 2020 French open title by defeating Novak Djokovic in the final.

• It was his fourth French Open title in a row.

• He won men's 2020 French open singles continuously in 2017, 2018, 2019, and 2020.

• Rafael Nadal has won the most french open titles with 13 titles.

• He also won the US Open men's singles in 2019.

Q89. Answer: (d) Formic acid

The correct answer is Formic Acid.

Key Points

• Methanoic acid is found in ant stings.

• It is also called Formic acid (HCOOH).

• It is commonly used in processing textiles and leather.

• Formic acid was first isolated from certain ants and was named after the Latin Formica, meaning "ant."

• It is made by the action of sulphuric acid upon sodium formate, which is produced from carbon monoxide and sodium hydroxide.

Additional Information

• Tartaric acid is a white, crystalline organic acid.

• It occurs naturally in many fruits, most notably in grapes, but also in bananas, tamarinds, and citrus.

• It is commonly known as the cream of tartar.

• Oxalic acid is also called ethanedioic acid.

• It is a colourless, crystalline, toxic organic compound belonging to the family of carboxylic acids.

• Oxalic acid is widely used as an acid rinse in laundries.

Q90. Answer: (a) West Bengal

The correct answer is West Bengal.

Key Points

• West Bengal is the largest jute-producing state in India.

• West Bengal followed by Assam and Bihar is the major jute growing state in the country.

• These states account for about 98 per cent of the country's jute area and production (State of Indian Agriculture, 2016-2017).

• West Bengal yields 2605 kgs per Hectare.

Additional Information

• Largest Rice producing state - West Bengal.

• Largest Sugarcane-producing state - Uttar Pradesh.

• Largest Wheat producing state - Uttar Pradesh.

• Largest Cotton producing state-Gujarat.

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Q91. Answer: (c) Peasants

The correct answer is Peasants.

Key Points

• Ryotwari system is one of the three principal methods of revenue collection in British India.

• It was prevalent in most of southern India, being the standard system of the Madras Presidency.

• The system was devised by Capt. Alexander Read and Thomas Munro at the end of the 19th century and introduced by the latter when he was governor (1820-27) of Madras (now Chennai).

• This was practised in the Madras and Bombay areas, as well as Assam and Coorg provinces.

• In this system, the peasants or cultivators were regarded as the owners of the land. They had ownership rights, could sell, mortgage, or gift the land.

• The rates were 50% in dryland and 60% in wetland.

Additional Information

• The advantages of this system were the elimination of middlemen, who often oppressed villagers, and an assessment of the tax on land actually cultivated and not merely occupied.

• This system also gave much power to subordinate revenue officials, whose activities were inadequately supervised.

• The name of the system comes from the word ryot, an Anglicization by the British in India of the Arabic word raīyah, meaning a peasant or cultivator.

• The Arabic word passed into Persian (rakyat) was carried by the Mughals, who used it throughout India in their revenue administration.

Q92. Answer: (c) India

The correct answer is India.

Key Points

• India hosted the 19th Meeting of the Shanghai Cooperation Organisation (SCO) Ministers of Foreign Economy and Foreign Trade on 28 October 2020.

• In the meeting, four documents were adopted. They include a statement on the response to COVID-19.

• Besides, a statement on SCO Cooperation on Intellectual Property Rights (IPR) was also adopted.

Additional Information

• The Shanghai Cooperation Organization (SCO) was established as a multilateral association to ensure security and maintain stability across the vast Eurasian region.

• It envisages joining forces to counteract emerging challenges and threats among other nations.

• It also promotes enhancing trade, as well as cultural and humanitarian cooperation among the members.

• The current Secretary-General is Vladimir Norov of Uzbekistan, who assumed his office on 1 January 2019.

Q93. Answer: (a) Bauxite

The correct answer is Bauxite.

Key Points

• The Amarkantak plateau, Maikal hills, and the plateau region of Bilaspur- Katni have the Bauxite deposits.

• Odisha is the largest producer of Bauxite in India.

• Kalahandi, Sambalpur, Bolangir, and Koraput are the leading producers of bauxite in Odisha.

• Amarkantak plateau has rich deposits of bauxite in Chhattisgarh.

• Katni-Jabalpur area and Balaghat are the major regions of bauxite in Madhya Pradesh.

• Kolaba, Thane, Ratnagiri, Satara, Pune, and Kolhapur in Maharashtra are important bauxite producers.

Q94. Answer: (a) Weight - Cubic metre

The correct answer is Weight - Cubic metre.

Key Points

• Weight is the measurement of the pull of gravity on an object.

• Weight is measured on a scale.

• Weight changes with location.

• Mass can never be zero. Weight can be zero. An example of this is an astronaut floating in space - there's no gravity acting on his body and, therefore, he has no weight.

• Weight is commonly measured in Newtons.

Q95. Answer: (d) Karnataka

The correct answer is Karnataka.

Key Points

• The Chitradurga Fort is located in Karnataka.

• The fort was built in stages between the 11th and 13th centuries by the dynastic rulers of the region, including the Chalukyas and Hoysalas, later the Nayakas of Chitradurga of the Vijayanagar Empire.

• The Nayakas of Chitradurga, or Palegar Nayakas, were most responsible for the expansion of the fort between the 15th and 18th centuries.

Additional Information

• Karnataka:

• Number of Districts - 31.

• Lok Sabha seats - 28.

• Rajya Sabha seats - 12.

• National Parks - Anshi National Park, Bandipur National Park, Bannerghatta National Park, Kudremukh National Park, Rajiv Gandhi (Nagarahole) National Park.

• Dams - Alamatti Dam (Krishna River), Krishna Raja Sagara Dam (Kaveri River), Tungabhadra Dam (Tungabhadra River), Vani Vilasa Sagara Dam (Vedavathi River), Supa Dam (Kali river).

• Registered GI: Channapatna Toys & Dolls, Mysore Sandal Soap, Mysore Jasmine.

Q96. Answer: (b) Maikal

The correct answer is Maikal.

Key Points

• The Maikal range is not a plateau situated in India.

• The Maikal range:

• They are located in the eastern part of the Satpuras range in Kawardha District of Chhattisgarh and Anuppur district of Madhya Pradesh.

• Narmada, Mahanadi, and Son River originate through this range.

• The highest peak of this range is Mount Amarkantak.

• It is the broad topographical division located in Chhattisgarh.

• Kanha National Park is located in the Maikal Hills of the Satpuras region.

• The Baigas and the Gonds are two hilly tribes located here.

Additional Information

• The Chota Nagpur Plateau:

• It covers parts of Jharkhand, Odisha, West Bengal, and Chattisgarh.

• It has an elevation of 4430 feet.

• The Mahanadi River lies to the south and the Indo-Gangetic plain to the north.

• The total area is approximately 65000 square kilometers.

• The region is rich in resources like bauxite, iron ore, etc.

• Given below are the divisions of the Chota Nagpur Plateau:

• Pat region.

• Ranchi Plateau.

• Hazaribagh plateau.

• Koderma plateau.

• Damodar trough.

• Palamu.

• Manbhum-Singhbhum.

• Malwa Range:

• The Malwa Plateau is bounded by the Madhya Bharat Plateau and Bundelkhand Upland to the north, the Vindhya Range to the east and

south, and the Gujarat Plains to the west.

• The plateau is located in western Madhya Pradesh and south-eastern Rajasthan with Gujarat in the west.

• Agar, Dewas, Dhar, Indore, Jhabua, Mandsaur, Neemuch, Rajgarh, Ratlam, Shajapur and Ujjain, Guna and Sehore districts of Madhya Pradesh, and the districts of Jhalawar and parts of Kota, Banswara, and Pratapgarh of Rajasthan are covered by the

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plateau.

• It was formed between 60 and 68 million years ago.

• Major rivers like Betwa, Mahi, Chambal, etc. are located here.

• The Simhasta Mela, which is held every 12 years is conducted on the banks of the Shipra river. The river is also located here.

Q97. Answer: (a) Digital India

The correct answer is Digital India.

Key Points

• The Digital India campaign was initiated by the Indian Government to make government services accessible to people electronically by improving online infrastructure and improving internet connectivity.

• It was launched by Prime Minister Narendra Modi on 1st July 2015.

• Other government programs, including Make in India, Bharatmala, Sagarmala, Startup India, BharatNet, and Standup India, are beneficiaries of this scheme.

• With a vision of inclusive growth in the areas of electronic services, goods, manufacturing, and job opportunities, Digital India was established.

• There is a total of nine pillars of the Digital India Campaign.

• The objectives of the Digital India scheme are:

• Making cyberspace safe and secure.

• To improve the ease of doing business through transformed digital service.

• Universalization of digital literacy. To boost cashless digital transactions.

• Manufacture in India and selling the products worldwide is the objective of the Make in India program.

• The development of poor people by providing skill training is the objective of Deen Dayal Upadhyaya Anthyodaya yojana.

Additional Information

• AMRUT:

• Atal Mission for Rejuvenation and Urban Transformation.

• Launch: June 2015.

• Concerned Ministry: Housing and Urban Affairs.

• To ensure that every household has access to a tap with the assured supply of water and a sewerage connection.

• The Priority zone of the Mission is water supply followed by sewerage.

• Stand-Up India:

• The Stand Up India Scheme is aimed at promoting entrepreneurship among SC/ST and Women entrepreneurs and facilitates at least two such projects per bank branch.

• It provides for refinancing through the Small Industries Development Bank of India (SIDBI) with an initial amount of Rs. 10,000 crore.

• It facilitates bank loans between 10 lakh and 1 Crore to at least one Scheduled Caste (SC) or Scheduled Tribe (ST) borrower and at least one woman borrower per bank branch for setting up a greenfield enterprise, an enterprise may be in manufacturing, services or the trading sector.

Q98. Answer: (b) Heavy rainfall

The correct answer is Heavy rainfall.

Key Points

• Heavy rainfall is not an effect of an earthquake.

• Impacts of Earthquake:

• Earthquake Damage, Danger & Destruction. The destructive effects of earthquakes are Fissures, Collapse, landslides, tsunamis, fires, and fault rupture. The violent shaking of the ground produces the greatest property losses and personal injuries.

Additional Information

• Liquefaction:

• This transfer of load increases pressure in the pore water, either causing drainage to occur or if drainage is restricted, a sudden the buildup of pore-water pressure.

• Disruptions to the soil generated by these collapses cause transfer of the ground-shaking load from grain-to-grain contacts in the soil layer to the pore water.

• Liquefaction takes place when seismic shear waves pass through a saturated granular soil layer, distort its granular structure, and cause some of the void spaces to collapse.

• Tsunamis:

• Water waves are caused by the sudden vertical movement of a large area of the seafloor during an undersea earthquake.

• Tsunamis are often called tidal waves, but this term is a misnomer.

• Unlike regular ocean tides, tsunamis are not caused by the tidal action of the Moon and Sun.

• The height of a tsunami in the deep ocean is typically about 1 foot, but the distance between wave crests can be very long more than 60 miles.

• The speed at which the tsunami travels decreases as water depth decreases. In the mid-Pacific, where the water depths reach 3 miles, tsunami speeds can be more than 430 miles per hour.

Q99. Answer: (c) Chandragupta

The correct answer is Chandragupta.

Key Points

• Chandragupta Maurya was the founder of the Mauryan Empire.

• He at the young age of 25, captured Pataliputra from the last ruler of the Nanda dynasty, Dhanananda. In this task, he was assisted by Kautilya, who was also known as Chanakya or Vishnugupta.

• Located on the hills of Kaimur, the city of Pavapuri, also known as Paava, is located near Rajgir and Bodh Gaya in the Nalanda district of Bihar.

• This holy city for the followers of Jainism. Along with being the birthplace of Lord Mahavira, Vaishali is a city built out of Muzaffarpur Bihar. The main language here is Vajjika.

• Kushinagar, a city known as the Parinirvana Sthal of Mahatma Buddha, is located in the eastern frontier of Uttar Pradesh, whose former name is Kasia Bazaar.

• The dialect of common people is Bhojpuri.

Additional Information

• With the help of Chanakya (Vishnugupta/ Kautilya), Chandragupta Maurya defeated Dhana Nanda (322 BCE) and founded the Mauryan Dynasty.

• Chanakya encouraged Chandragupta Maurya and his army to take over the throne of Magadha.

• His vast empire included Bihar, Bengal, Deccan (except modern Kerala, Tamilnadu, and parts of Northeast India), Eastern Afghanistan, Baluchistan, and the area west of the Indus river.

Q100. Answer: (b) Vice-President of India

The correct answer is Vice-President of India.

Key Points

• Vice President of India is the ex-officio chairman of Rajya Sabha.

• The Chairman presides over the sessions of Rajya Sabha while the Deputy Chairman takes care of the day-to-day matters of the house in the absence of the Chairman.

• The present chairman of Rajya Sabha is C. P. Radhakrishnan.

• Rajya Sabha is the upper house of parliament that represents the states and union territories.

Additional Information

• Rajya Sabha is a permanent body and not subject to dissolution.

• Rajya Sabha currently has a maximum membership of 245. The maximum strength of the Rajyasabha is fixed at 250 (if the question asked 'Maximum Strength', the answer would be 250).

• Among its 245 members, 233 are elected by the legislatures of the states and union territories using single transferable votes through Open Ballot while the remaining 12 members are appointed by the President for their contributions to art, literature, science, and social services.

• One-third of the members of the Rajya Sabha retire every two years. Rajya Sabha represents the federal character of the constitution.

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