RRB NTPC CBT-I Official Paper (Held On: 7 Jan 2021 Shift 2) (Previous Year Paper)

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

Take this paper as a timed mock test

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

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

Q1. Who of the following is one of the nine gems of Chandragupta II?

(a) Vishakhadatta
(b) Brahmagupta
(c) Moggallana
(d) Varahamihira

Q2. A statement is given followed by an immediate conclusion. Choose the correct option regarding the conclusion.

Statement: All farmers are very hardworking.

Conclusion: Some very hardworking persons are farmers.

(a) Probably false but not sure
(b) True
(c) False
(d) Information irrelevant

Q3. Who is considered as the father of geography?

(a) Aristotle
(b) Thales
(c) Eratosthenes
(d) Ptolemy

Q4. The quartzite is a _____ type of rock.

(a) igneous
(b) basalt
(c) sedimentary
(d) metamorphic

Q5. Read the following information carefully and answer the question that follow:

A word-number arrangement machine, when given input as set of words and numbers, rearranges them following a particular rule and generates a stepwise output until the rearrangement is complete following that rule.

Following is an illustration of the input and steps of rearrangement until the last step.

Input: Tokyo 7 Rio @ 5 Salva We

Step 1: Tokyo 7 Rio @ We 5 Salva

Step 2: Tokyo 7 Rio We @ 5 Salva

Step 3: 7 Rio We @ 5 Salva Tokyo

Step 4: Rio 7 We @ 5 Salva Tokyo

In addition, step 4 is the last step.

For the input, "When % SSR 2 meet shall you", What is Step 2?

(a) When % SSR 2 you meet shall
(b) SSR When % you 2 meet shall
(c) When % SSR you 2 meet shall

(d) SSR 2 When % you meet shall

Q6. Select the number from among the given options that can replace the question mark (?) in the following series.

1, 5, 29, ?

(a) 324
(b) 259
(c) 196
(d) 256

Q7. Moving along a circular path, Ansh takes 18 minutes to complete one round and Siddhi takes 12 minutes for the same. If they start from the same point and at the same time, then after what time they will meet again at the starting point?

(a) 36 minutes
(b) 1.5 minutes
(c) 6 minutes
(d) 216 minutes

Q8. Which of the following projects is being implemented by C-DAC, Pune?

(a) Project SATH-E
(b) Project Zojila
(c) Project BHARATMALA
(d) Project JATAN

Q9. There are six toys arranged one above the other in form of a stack, the lowermost is numbered 1 and the toy above it as 2 and so on. Each toy is of a different colour Purple, Pink, White, Yellow, Red and Grey. Purple toy is at the even position but not at the top. Red toy is not adjacent to white or yellow toy. Grey toy is at 5^(th) position. There are two toys between pink and white toy where pink toy is above the white one. White toy is not at the bottommost position. At which position is the pink toy?

(a) 3^(rd)
(b) 6^(th)
(c) 4^(th)
(d) 2^(nd)

Q10. The _____ were the first to discover a sea-route to India.

(a) English
(b) French
(c) Dutch
(d) Portuguese

Q11. As of October 2020, who is the President of Nepal?

(a) Madhav Kumar
(b) Nanda Kishor Pun
(c) Bidya Devi Bhandari
(d) K. P. Oli

Q12. How many ministers can be included in the council of Ministers of the Union?

(a) Ten to fifteen percent of the total number of members of the House of People
(b) Fifty percent of the total number of members of the House of People
(c) As many as wished by the Prime Minister of India
(d) Fifteen percent of the total number of members of the House of People

Q13. $3 + 2\sqrt{5}$ is:

(a) a complex number
(b) a natural number
(c) a rational number
(d) a irrational number

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Q14. The Bharatmala Pariyojana is associated with:

(a) Highways
(b) Railways
(c) Telecom
(d) Ports

Q15. Assuming that the given statement is ture; find out which of the four alternative(s) is definitely true.

Statement: No newspaper is read by an illiterate.

A. All newspapers that are read, are read by post graduates.

B. Some newspapers that are read, are read by post graduates.

C. Some newspapers are not read by illiterates.

D. No illiterate ever reads a newspapers

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

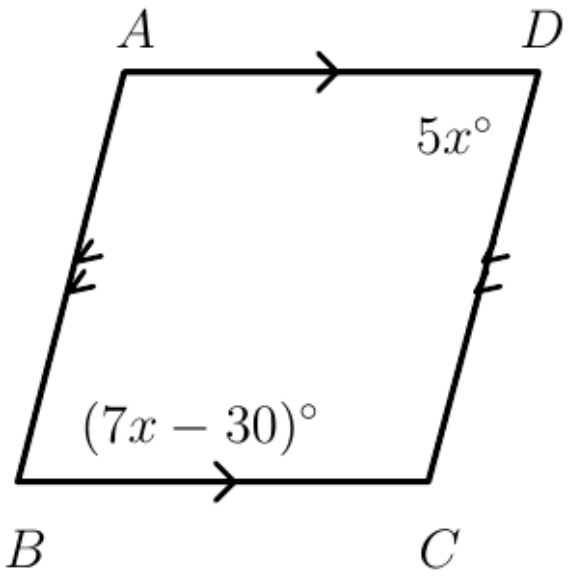
Q16. Amit alone can complete a piece of work in 15 days and Balbir alone can do the same work in 10 days. If Amit alone works for 3 days after which Balbir joins him, then the whole work is finished in how many days?

(a) 44/5 days
(b) 1/6 days
(c) 4/5 days
(d) 74/5 days

Q17. The ranking of India in the Global Innovation Index 2020 is:

(a) 66
(b) 58
(c) 84
(d) 48

Q18. Looking at the given parallelogram, where angle B and D are (7x - 30)° and 5x° respectively, we can say that the value of x is:



(a) 105°
(b) 65°
(c) 15°
(d) 75°

Q19. The National Rural Health Mission was launched in the year:

(a) 2007
(b) 2005
(c) 2002
(d) 2012

Q20. Select the option that is related to the third term in the same way as the second term is related to the first term.
China : Beijing :: Brazil : _____

(a) Buenos Aires
(b) Shanghai
(c) Brasilia
(d) Rio De Janeiro

Q21. Select the number from among the given options that can replace the question mark (?) in the following series.
A2B, C12D, E30F, ?, I90J.

(a) G48H
(b) G64H
(c) G56H
(d) G49H

Q22. India's first railway university is located at:

(a) Thane, Mumbai
(b) Varanasi, Uttar Pradesh
(c) Vadodara, Gujarat
(d) Raurkela, Orissa

Q23. The inter-governmental-tready-based organisation having its headquarters in India is:

(a) NATO
(b) ATS
(c) ISA
(d) OECD

Q24. What is URL?

(a) A computer software
(b) Searching engine
(c) Address of the web page displayed on the internet
(d) A web browser

Q25. The sides of a triangle are in the ratio 3 : 4 : 5 the triangle is:

(a) acute angled
(b) either acute angled or right angled
(c) right angled
(d) obtuse angled

Q26. Which of the following devices is used to measure relatively high temperatures, such as encountered in furnaces?

(a) Barometer
(b) Pyrometer
(c) Ammeter
(d) Fluxmeter

Q27. The population of a town increased by 10% every year. If the present population is 20,000, in the next year it will be:

(a) 22,000
(b) 2,200
(c) 1,800
(d) 18,000

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Q28. Which of the following numbers has a terminating decimal?

15/600, 29/343, 7/(2²×7²),77/210

(a) 7/(2²×7²)
(b) 29/343
(c) 77/210
(d) 15/600

Q29. The Indian space programme is said to have begun in _____ with the setting up of INCOSPAR by the Indian governnent.

(a) 1968
(b) 1970
(c) 1962
(d) 1960

Q30. Who coined the word "Artificial Intelligence"?

(a) John Berger
(b) Charles Bachman
(c) John McCarthy
(d) David Bradley

Q31. Ali can complete a piece of work in 8 days. Balvinder can complete the same work in 10 days. In order to complete the work in 4 days, they asked Chander to join them and were able to finish the work in time. In how many days can Chander alone finish the work?

(a) 20 days
(b) 12 days
(c) 40 days
(d) 14 days

Q32. Simplify the following equation:

(43/4-31/3)÷(3/4-3/5)+3/5×5/7× 7/9

(a) 97/9
(b) 452/135
(c) 85/29
(d) 131/240

Q33. Who is the Attorney General of India as of October 2020?

(a) Rajnish Kumar
(b) V. K. Sharma
(c) K. K. Venugopal
(d) K. V. Chowdhary

Q34. A train is travelling 50% faster than a bus. Both start from Karnal at the same time and reach Panipat, which is 75 km from Karnal at the same time. On the way however, the train stopped at a station for about 12.5 minutes. The speed of the bus is:

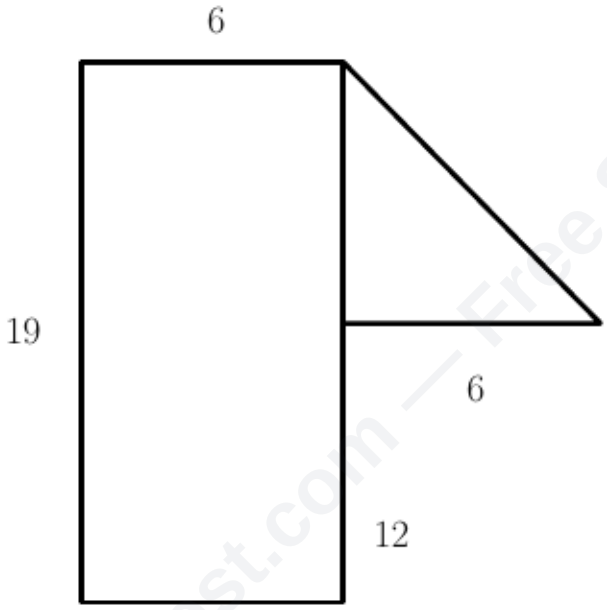
(a) 110 km/h
(b) 100 km/h
(c) 120 km/h
(d) 130 km/h

Q35. Who won gold medal in the 25 m Pistol Category at Asian Games 2018?

(a) Satyajit Prasad
(b) Bobby Aloysius
(c) Tessa Vertue
(d) Rahi Sarnobat

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Q36. What is the area of the compound shape?



(a) 114 square units
(b) 114 units
(c) 21 units
(d) 135 square units

Q37. Which of the following is a Maharatna PSU?

(a) BHEL
(b) BCCL
(c) CSL
(d) BSNL

Q38. Anuj plants 5,625 plants in his garden in such a way that the number of rows and the number of plants in each row remains the same. The number of plants in each row will be:

(a) 11250
(b) 2813
(c) 75
(d) 2812

Q39. If a pie chart is drawn based on the data given below, what will be the central angle for food?

No. of families	Item of expenditure
150	Education
400	Food
40	Rent
250	Electricity
160	Miscellaneous

(a) 150°
(b) 90°
(c) 208°
(d) 144°

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Q40. In which year was the Setu Bharatam Programme launched?

(a) 2018
(b) 2013
(c) 2016
(d) 2017

Q41. The smallest unit of the life capable of independent existence is:

(a) Protoplasm
(b) Cytoplasm
(c) Cell
(d) Vacuoles

Q42. The earliest deciphered epigraphy of Ashoka's inscription in India was written in which script?

(a) Kharoshthi
(b) Devnagri
(c) Harappan
(d) Brahmi

Q43. Which of the numbers given below would come next in the following series of numbers?

1, 9, 25, 49, _____

(a) 36
(b) 16
(c) 64
(d) 81

Q44. To gain 25% after announcing a discount of 10%, the shopkeeper must mark the price of the article with cost price Rs. 360 as:

(a) Rs. 486
(b) Rs. 450
(c) Rs. 460
(d) Rs. 500

Q45. Which of the following individuals is NOT associated with the musical instrument santoor?

(a) Ustad Amjad Ali Khan
(b) Tarun Bhattacharya
(c) Pt. Shiv Kumar Sharma
(d) Bhajan Sopori

Q46. Pragya invited males and females to her birthday party in the ratio of 7 : 6. If the number of males in the party were 56, then the total number of guests attending the party were:

(a) 108
(b) 48
(c) 112
(d) 104

Q47. Which are the two colors that are formed at the two extreme ends of Prism?

(a) Blue and Green
(b) Yellow and Orange
(c) Red and Orange
(d) Violet and Red

Q48. Two statements are followed by two given conclusions. Choose the correct option considering the statement to be irrespective of the commonly known facts.

Statement 1: Only cows are mammals.

Statement 2: No scientists are mammals.

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Conclusion 1: Some cows are scientists.

Conclusion 2: Some scientists are mammals.

(a) Both conclusion 1 and conclusion 2 follow
(b) Only conclusion 2 follows
(c) Neither conclusion 1 nor conclusion 2 follow
(d) Only conclusion 1 follows

Q49. If the mean is 25 and the standard deviation is 5 then the coefficient of variation is:

(a) 48%
(b) 60%
(c) 20%
(d) 27%

Q50. If one substitutes @ with either "+" or "*" (multiplication), in the expression 1@2@3@4@5@6, what is the maximum value that can be derived assuming that the correct order of mathematical operations are followed.

(a) 732
(b) 720
(c) 721
(d) 612

Q51. A certain sum of money was divided among three friends: Rajeev, Kewal and Amit in the ratio of 2 : 3 : 7. If Amit's share is Rs. 15 more than that of Kewal, then what is the sum of money which was divided:

(a) Rs. 180
(b) Rs. 57
(c) Rs. 45
(d) Rs. 27

Q52. Where is Pakhal Wildlife Sanctuary located?

(a) Warangal
(b) Chandauli
(c) Seoni
(d) Lakhimpur

Q53. Select the number than can replace the question mark (?) in the following equation.

12 + 8-5 × 1/2× 12-{45÷ (34-19)}=?

(a) 13
(b) -10
(c) -25
(d) -13

Q54. Bhawna borrowed Rs. 4,500 from a lender at the rate of 15% per annum, simple interest on 26 March 2018 and cleared the loan on 7 June of the same year. What amount did she pay to clear her loan?

(a) Rs. 4,635
(b) Rs. 53,775
(c) Rs. 135
(d) Rs. 49,275

Q55. Decimal expansion of 109/100 is:

(a) 100+9+0/100
(b) 1+9/10
(c) 1+0/10+9/100
(d) 10+9/100

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Q56. How many countries are the members of OPEC as of November 2020?

(a) 18
(b) 13
(c) 28
(d) 20

Q57. The fractions 1/3, 4/7, 2/5 written in ascending order are:

(a) 2/5, 4/7, 1/3
(b) 1/3, 2/5, 4/7
(c) All the fractions are equivalent fractions.
(d) 4/7, 1/3, 2/5

Q58. Value of A for the equation:

tan A + tan 2A + tan 3A = tan A tan 2A tan 3A is

(a) π/3 only
(b) 2π/3 only
(c) π/3, 2π/3
(d) 5π/6

Q59. What is correct about the Khilafat Movement in India?

(a) It was a movement in demand of Pakistan
(b) It was a movement in support of the Turkish Sultan
(c) It was a movement to restore the Mughal Royal family in India
(d) It was a movement against the massacre of Jallianwala Bagh

Q60. The zoological name of the common housefly is:

(a) Triticum Aestivum
(b) Musca Domestica
(c) Fannia
(d) Homo Sapiens

Q61. In any triangle ABC, a + b + c = 2s with usual notation, then Sin(A/2) = ?

(a) √((s(s-a))/bc)
(b) √(s-b)(s-c)/(s(s-a))
(c) √((s-c)(s-a)/ac)
(d) √((s-b)(s-c)/bc)

Q62. The total number of articles that were present originally in the Indian Constitution during its implementation is:

(a) 391
(b) 396
(c) 392
(d) 395

Q63. The length of each side of a square whose diagonals are 10 cm each, is:

(a) 5 cm
(b) 7 cm
(c) 5√2 cm
(d) 10√2 cm

Q64. By selling a watch for a certain amount, Deepika suffered a loss of 10%. By selling the same watch for Rs. 140 more, she would have gained 4%. What was the cost price of the watch?

(a) Rs. 860
(b) Rs. 1140
(c) Rs. 1000
(d) Rs. 760

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Q65. The selling price of 9 articles is equal to the cost price of 15 articles. In this transaction there is a:

(a) loss of 66.6% nearly
(b) loss of 40%
(c) gain of 66.6% nearly
(d) gain of 40%

Q66. Which of the following is an application software?

(a) LINUX
(b) macOS
(c) UNIX
(d) Graphics software

Q67. The first island to operate seaplane service is:

(a) Majuli
(b) Andaman and Nicobar Island
(c) Neil Island
(d) Diu

Q68. Let $f(x) = x^2$, in R, then the range of f will be:

(a) non negative numbers
(b) negative real numbers
(c) positive real numbers
(d) integers

Q69. The 'Yellow Vest' protests are associated with which country?

(a) France
(b) China
(c) Japan
(d) Russia

Q70. A statement is followed by two assumptions. You have to consider the statement and the following assumptions and decide the correct option.

Statement: "If you are a computer engineer, we want you as our senior consultant" - an advertisement by company XYZ.

Assumption 1: Engineers are expected to be better performers by company XYZ.

Assumption 2: The company XYZ needs a senior consultant.

(a) Only Assumption 1 is Implicit
(b) Only Assumption 2 is Implicit
(c) Both Assumption 1 & Assumption 2 are Implicit
(d) Neither Assumption 1 nor Assumption 2 are Implicit

Q71. $\sqrt{(8-2\sqrt{15})}$ is equal to:

(a) $3 - \sqrt{5}$
(b) $\sqrt{5} + \sqrt{3}$
(c) $\sqrt{5} - \sqrt{3}$
(d) $5 - \sqrt{3}$

Q72. The Nobel prize awarding institue, Swedish Academy, is associated with which field?

(a) Peace
(b) Physiology
(c) Medicine
(d) Literature

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Q73. Who presented the Interim Union Budget on 1 February 2019?

(a) Piyush Goyal
(b) Shiv Pratap Shukla
(c) Manmohan Singh
(d) Arun Jaitley

Q74. The momentum of an object of mass 'm' moving with a velocity 'v' is given by:

(a) mv^2
(b) $1/2mv^2$
(c) mv
(d) $(mv)^2$

Q75. There is a group of six persons; A, B, C, D, E and F in a room. In the group, there are two married couples. B is Italian and is the mother of C. F is the grandmother of C. F is from Canada. D is the grandfather of E and E and D is from Australia. There is one Italian, one Canadian, one Irish, one French and two Australian people in the group. The French person is a male and married. Nobody who is a grandchild is married. What is the nationality of A and who is his wife?

(a) French, F
(b) French, B
(c) Italian, B
(d) Irish, F

Q76. Who was the first Chairman of Rajya Sabha?

(a) S. V. Krishnmoorthy Rao
(b) Smt. Violet Alva
(c) Ganesh Vasudev
(d) Dr. Sarvepalli Radhakrishnan

Q77. At which place in Haryana is the Government of India developing a nuclear power plant?

(a) Palwal
(b) Kalka
(c) Ballabgarh
(d) Gorakhpur

Q78. Who among the following is NOT a nationalist extremist leader of the Indian National Congress?

(a) Bal Gangadhar Tilak
(b) Bipin Chandra Pal
(c) Surendra Nath Banerjee
(d) Sri Aurobindo Ghosh

Q79. Since the HCF of (48, 144) = 48,
therefore the LCM of (48, 144) = ?

(a) 144
(b) 48 × 144
(c) 3
(d) 48

Q80. Pick the odd pair of words from the below options

(a) Stringent : flexible
(b) Steadfast : irresolute
(c) Docile : submissive
(d) Monotonous : exciting

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Q81. In a certain code, MAD = 56, CAT = 80, then DEN = _____

(a) 208
(b) 29
(c) 100
(d) 126

Q82. Which of the following states lie along the border of Pakistan?

a. Gujarat
b. Punjab
c. Rajasthan
d. Haryana

(a) a, b and d
(b) d, c and a
(c) b, c and d
(d) a, b and c

Q83. Read the following information carefully and answer the question that follow:

A word-number arrangement machine, when given input as set of words and numbers, rearranges them following a particular rule and generates a stepwise output until the rearrangement is complete following that rule.

Following is an illustration of the input and steps of rearrangement until the last step.

Input: Tokyo 7 Rio @ 5 Salva We

Step 1: Tokyo 7 Rio @ We 5 Salva

Step 2: Tokyo 7 Rio We @ 5 Salva

Step 3: 7 Rio We @ 5 Salva Tokyo

Step 4: Rio 7 We @ 5 Salva Tokyo

In addition, step 4 is the last step.

For the input, "Let 1 mail & check me and", What is Step 4?

(a) mail 1 me Let & and check
(b) 1 & and check me Let mail
(c) mail 1 and & check me Let
(d) and check me Let mail 1 %

Q84. The nearest Spiral galaxy to Milky way is:

(a) Pinwheel galaxy
(b) Andromeda galaxy
(c) Dwarf galaxy
(d) Sun flower galaxy

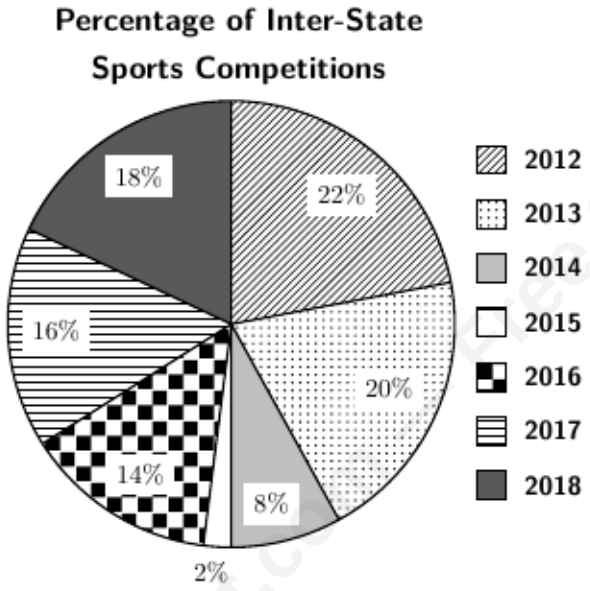
Q85. The space diagonal of a cube measures $8\sqrt{3}$ cm. What is the volume of the cube?

(a) 512 cm^3
(b) $512\sqrt{3}$ cm^3
(c) $1536\sqrt{3}$ cm^3
(d) 1536 cm^3

Q86. The pie-chart shows the percentage of inter-state sports competitions in different years from 2012 to 2018.

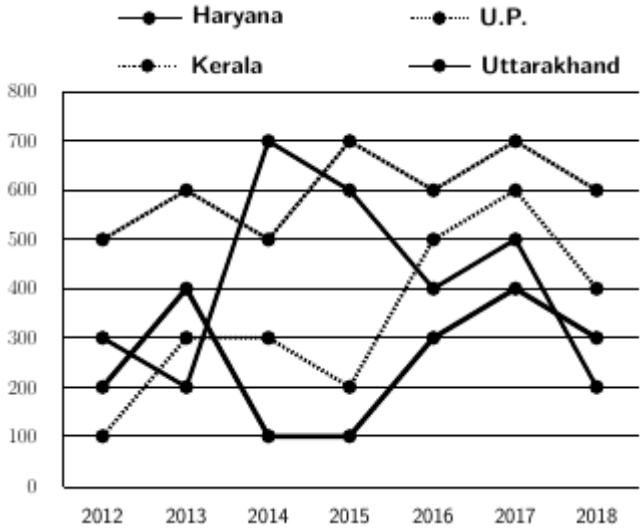
Considering the total number of inter-state sports competitions to be 200, find the difference in the number of inter-state sports competitions in 2015 and that in 2016.

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(a) 28
(b) 26
(c) 24
(d) 22

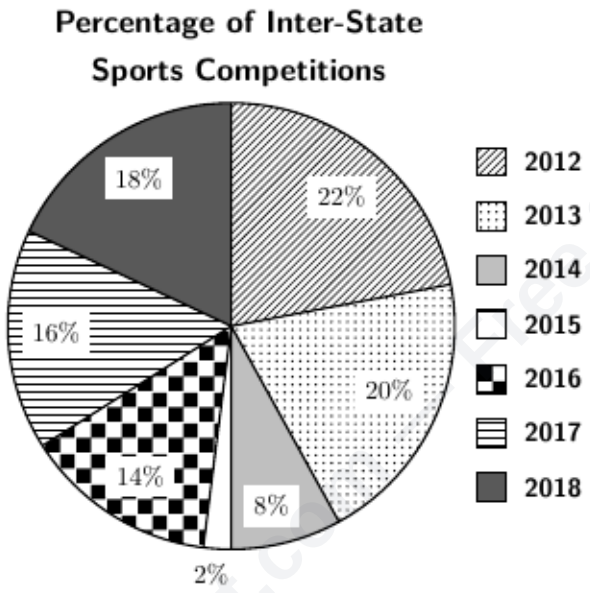
Q87. The line graph shows the number of students who appeared in XYZ exam from various states during the period 2012-2018. What is the average number of students who appeared in the XYZ exam in the year 2012 from all the states together?



(a) 285
(b) 275
(c) 270
(d) 280

Q88. The pie-chart shows the percentage of inter-state sports competitions in different years from 2012 to 2018.

Considering the total number of inter-state sports competitions to be 200, find the total number of inter-state sports competitions held in 2012, 2013, 2017 and 2018.



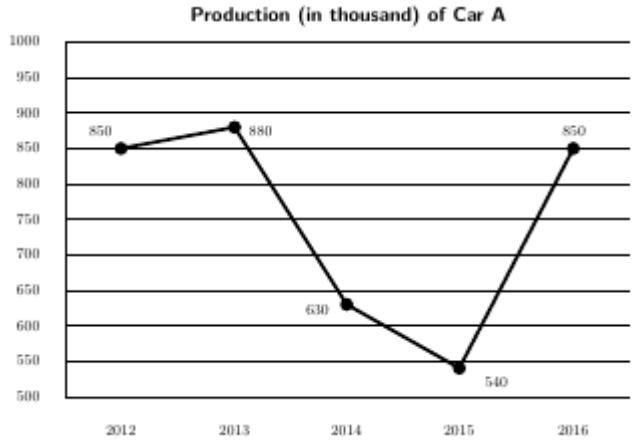
(a) 154
(b) 168
(c) 152
(d) 148

Q89. The table below shows the ratio of manufacturing of Car A to the manufacturing of Car B by the same company from 2012-2016.

The Line graph shows the manufacturing (in thousands) of Car A, from 2012-2016.

What is the ratio of number of Car B manufactured in 2012 to the number of Car A manufactured in 2014?

Year	Production Ratio of A to B
2012	17 : 16
2013	8 :7
2014	9 : 10
2015	18 : 19
2016	7 : 6



(a) 79 : 61
(b) 80 : 61
(c) 79 : 63
(d) 80 : 63

Q90. Given below is a statement followed by two courses of actions. Assuming everything in the statement to be true, irrespective of the commonly known facts, decide which of the two suggested course(s) of action logically follow for pursuing?

Statement: There is a shortage of water in Delhi during summers.

Course of action 1: There should be more water conservation projects initiated by the government of Delhi.

Course of action 2: The government should encourage rain water harvesting in all new and existing residential complexes.

(a) Only course of action 2 follows
(b) Both course of action 1 and course of action 2 follow.
(c) Neither course of action 1 nor course of action 2 follows
(d) Only course of action 1 follows

Q91. Select the option that is related to the third term in the same way as the second term is related to the first term.

Ten : Decade :: Thousand : _____

(a) Century
(b) Millennium
(c) Lustrum
(d) Triennium

Q92. In which of the given options, is the letters skipped between adjacent letters in the order 1, 2, 3.

(a) ACDE
(b) FHLP
(c) EFJN
(d) FHKO

Q93. Choose the conclusion(s) which logically follow from the given statement, disregarding commonly known facts.

Statement: No country is free from terrorism these days.

Conclusion A: It has become difficult for countries to control terrorism these days.

Conclusion B: The countries and their people in general have become lazy.

(a) Neither Conclusion A nor Conclusion B follow
(b) Only Conclusion B follows
(c) Only Conclusion A follows
(d) Both Conclusions A & B follow

Q94. There are six toys arranged one above the other in form of a stack, the lowermost is numbered 1 and the toy above it as 2 and so on. Each toy is of a different colour Purple, Pink, White, Yellow, Red and Grey. Purple toy is at the even position but not at the top. The red toy is not adjacent to the white or yellow toy. Grey toy is at 5th position. There are two toys between pink and white toy where pink toy is above the white one. White toy is not at the bottommost position. Which toy among the following options is not at an odd position?

(a) Red toy
(b) White toy
(c) Yellow toy
(d) Grey toy

Q95. Choose the odd option among the following.

(a) 5/10
(b) 11/13
(c) 1/3
(d) 2/3

Q96. If aPb implies a + b, aSb implies a - b, aMb implies a * b and aDb implies a ÷ b; Find the value of 5P6S3M4D8

(a) 10
(b) 8.5
(c) 9.5

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(d) 8

Q97. Pradeep says, "Vishal's mother is the only daughter of my mother". How is Pradeep related to Vishal?

(a) Father
(b) Brother
(c) Grandfather
(d) Maternal uncle

Q98. Four elements have been listed, out of which three are alike in some manner and one is different. Select the odd one.

(a) Neon
(b) Argon
(c) Helium
(d) Sodium

Q99. In a class of 47 students, Anurag's roll number is eighteenth from the end. What is his roll number from the beginning?

(a) 30
(b) 29
(c) 27
(d) 28

Q100. A statement is followed by two conclusions. Choose the correct option considering the statement to be true irrespective of the commonly known facts.

Statement: Don't throw garbage here. If you violate this non-littering sign, a fine of Rs. 5000 will be imposed.

Conclusion:

1. The same fine is charged for littering offence everywhere.
2. This warning is written at every public place or non-littering zone.

(a) Both conclusion 1 and conclusion 2 follow
(b) Only conclusion 1 follows
(c) Neither conclusion 1 nor conclusion 2 follow
(d) Only conclusion 2 follows

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Varahamihira

The correct answer is Varahamihira.

Key Points

• Chandragupta II (380 – 418 AD)

• He was the son of Samudragupta and Dattadevi was Chandragupta II.

• He was married to Kuberanaga, a Naga princess from central India.

• He was the first ruler of the Gupta empire who had started a silver coin.

• He is credited with keeping in his court nine gems (Navrantnas)

• The nine gems or Navratna were –

• Amarsimha (Sanskrit lexicographer and a poet), Dhanvantri (renowned Physician), Harisena (Poet/Writer), Kalidasa (Renowned poet, Playwright), Kahapanaka (Astrologer), Sanku (Architect), Varahmihira (Astronomer), Vararuchi (Grammarian, Sanskrit scholar), Vetalbhatta (Magician).

• Varahmihir

• He Was an astronomer believed to be one of the nine gems in Chandragupta II's court. Hence, Option 4 is correct.

• His book 'Brihatsamhita' is an encyclopedia of astronomy, botany, physical geography, and natural history.

• His other works are Pancha Siddhantika, Brihat Jataka etc.

Nine Gems of Chandragupta II:

Additional Information

• Vishakhadatta

• He was a great Sanskrit poet and playwright of the Gupta age.

• He points out his father's name as Maharaja Bhaskaradatta in his great historical drama Mudrarakshasa which is his only surviving literary work.

• Apart from it, Vishakhadatta also wrote 'Devichandraguptam' which also exists only in fragments in the Natyadarpan of Ramachandra and Gunachandra.

• It also survived in the form of quotations in the Nataka Lakshana Ratnakosha of Sagarnandi and two works of king Bhoj – the Shringaraprakasha and the Sarasvati Kanthabharana.

• Brahmagupta

• He holds a unique position in the history of Ancient Indian Mathematics.

• He contributed such elegant results to Geometry and Number Theory that today's mathematicians still marvel at their originality.

• His theorems lead to the calculation of the circumradius of a triangle and the lengths of the diagonals of a cyclic quadrilateral, construction of a rational cyclic quadrilateral, and integer solutions to a single second-degree equation are certainly the hallmarks of a genius.

• Moggallana

• He was one of the closest disciples of Buddha according to Theravada tradition and was known as Mahamaudgalyayana or Maudgalyayana.

• Among Shakyamuni Buddha's disciples such as Sariputra, Subhuti, Mahakasyapa, Moggallana was considered as the second of the Buddha's most capable and trusted disciples.

• The other most capable and trusted disciple was Sariputra.

• Both Sariputra and Moggallana were considered as the chief assistant of Lord Buddha and Ananda was considered as the personal attendant of Lord Buddha.

Q2. Answer: (b) True

In this question the statement say that all farmers are very hardworking that means some or few hardworking persons are farmers because all farmers are hardworking. So we can say that the conclusion some very hardworking persons are farmers is true.

Hence, "option 2" is the correct answer.

Q3. Answer: (c) Eratosthenes

The correct answer is Eratosthenes.

Key Points

• Eratosthenes

• He was the ancient Greek scholar is called the 'father of geography. Hence, Option 3 is correct.

• He was the first one to use the word geography and he also had a small-scale notion of the planet that helped him to determine the circumference of the earth.

• He was multi-talented. He was a Greek mathematician, geographer, poet, astronomer, and music theorist.

• They calculated the circumference of the Earth without leaving place Egypt

• In his three-volume work Geography, he described and mapped his entire world known to him, without even dividing the Earth into five climate zones which are given below: Two freezing zones around the poles, two temperate zones, and a zone encompassing the equator and the tropics

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• He was a man of learning and exploring, becoming the chief librarian at the Library of Alexandria

• He invented the discipline of geography, including the terminology used today.

Additional Information

Scholar	Facts
Aristotle	He was a disciple of Plato, the main disciple of the great philosopher Socrates. He had a keen interest in Physics, biology, and philosophy. But he has not done any remarkable work in the field of Geography.
Herodotus	He was a Persian-born historian who had worked a lot on the biographies of the kings of that era, the most prominent of them being Darius.
Ptolemy	He was an astronomer and a geographer. However, he lived long after Eratosthenes who had founded the subject of Geography before the birth of Christ.

Q4. Answer: (d) metamorphic

The correct answer is Metamorphic.

Key Points

• Metamorphic Rocks

• These rocks form under the action of volume, pressure, and temperature (PVT) changes.

• Metamorphism happens when rocks are forced down to lower levels by tectonic processes or when molten magma rising through the crust comes in contact with the crustal rocks or the underlying rocks are exposed to great amounts of pressure by overlying rocks.

• The materials of rocks chemically modify and recrystallize due to thermal metamorphism.

• There are two types of thermal metamorphism: Contact metamorphism and Regional metamorphism.

• Contact metamorphism: The rocks come in contact with hot intruding magma and lava and the rock materials recrystallize under high temperatures.

• Regional metamorphism: The rocks experience recrystallization due to deformation caused by tectonic shearing together with high temperature or pressure or both.

• Quartzite is a metamorphic rock. Hence, Option 4 is correct.

• The original form of Quartzite is pure quartz sandstone.

• It is formed when quartz-rich sandstone is exposed to high temperatures and pressures.

• Quartzite is mainly formed through two types of metamorphism namely Contact and Barrovian.

Additional Information

Rocks	Facts
Igneous rocks	Formed due to the cooling, solidification, and crystallization of magma. The common examples of igneous rocks are basalt, gabbro, etc.
Sedimentary rocks	Formed due to the accumulation or deposition of sediments derived from the older rocks, plants, and animals. The common examples of sedimentary rocks are sandstone, conglomerate, etc.
Metamorphic rock	They are formed when existing rocks are changed by heat, pressure, or reactive fluids, such as hot, mineral-laden water. For example, Marble, Quartzite, Schist, etc.

Q5. Answer: (c) When % SSR you 2 meet shall

The pattern followed here is:

Given:

Similarly,

For "When % SSR 2 meet shall you":

Thus, this statement "When % SSR you 2 meet shall" will be the step 2.

Hence, the correct answer is "Option 3".

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Q6. Answer: (b) 259

The logic followed here is:

$1^1 + 0 = 1$

$2^2 + 1 = 5$

$3^3 + 2 = 29$

4^4 + 3 = 259

Hence, "259" is the correct answer.

Q7. Answer: (a) 36 minutes

Given:

Time to complete one round by Ansh = 18 min

Time to complete one round by Siddhi = 12 min

Calculation:

To get the LCM we have to factorize the numbers

Factor of 18 = 2 × 3 × 3

Factor of 12 = 2 × 2 × 3

LCM = 2 × 2 × 3 × 3 = 36

Therefore They will meet again at the starting point after 36 minutes

Q8. Answer: (d) Project JATAN

The correct answer is Project JATAN.

Key Points

• Project JATAN

• It is a virtual museum builder software, that enables the creation of a digital collection management system for Indian museums and is deployed in several national museums across India.

• Its objective is to make a digital imprint of all the objects preserved in museums and help researchers, curators, and other people interested in the field.

• Designed and developed by Human Centres Design and Computing Group, Centre for Development of Smart Computing (C-DAC) Pune. Hence, Option 4 is correct.

• The digital imprints (of preserved objects and monuments) created using the JATAN software are integrated into the national digital repository and portal for making them accessible to the public.

• The National portal and digital repository (developed by C-DAC, Pune) for museums of India provide integrated access to theme-based collections and artifacts (in terms of sculptures, paintings, manuscripts, weapons, coins, and numerous other categories of artifacts) irrespective of the physical and geographical locations of museums.

• Centre for Development of Smart Computing (C-DAC) Pune has also developed “Darshak”, a mobile-based application aimed at improving the museum visit experience among the differently-abled.

Additional Information

Project	Facts
SATH-E Project	Sustainable Action for Transforming Human Capital (SATH) focuses on two main sectors - Education and Health and to build three ‘Role Model’ States. SATH-E aspires to be a ‘saathi’, to the educational system with the student and the teacher at its center”.
Project Zojila	In 2018, the Zojila tunnel project was launched. The tunnel is Asia's longest and strategic bi-directional tunnel, which will provide all-weather connectivity between Srinagar, Kargil, and Leh.
Project BHARATMALA	A total of 225 road projects with an aggregate length of 9,613 km have been appraised and approved till March 2019 under Bharatmala Pariyojana.

Q9. Answer: (b) 6^(th)

Colour : Purple, Pink, White, Yellow, Red and Grey.

Purple toy is at the even position but not at the top. Grey toy is at 5th position.

There are two toys between pink and white toy where pink toy is above the white one. White toy is not at the bottommost position. Red toy is not adjacent to the white or yellow toy.

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The figure are shown below –

Hence, "option 2" is the correct answer.

Q10. Answer: (d) Portuguese

The correct answer is Portuguese.

Key Points

• Portuguese

• The Portuguese were the first to discover a new sea route to India.

• Prince Henry of Portugal started a school for training seamen on scientific navigation.

• Due to his interest and enthusiasm in the field of Navigation, he has been called “Henry, the Navigator”.

• On 20^(th) May 1498, a Portuguese sailor, Vasco- da- Gama crossed the Cape of Good Hope and reached Calicut in India.

• He was given a warm reception by the Hindu ruler King Zamorin of Calicut.

• Portuguese explorer Vasco de Gama becomes the first European to reach India via the Atlantic Ocean when he arrives at Calicut on the Malabar Coast. Da Gama sailed from Lisbon, Portugal, in July 1497, rounded the Cape of Good Hope, and anchored at Malindi on the east coast of Africa. Hence, Option 4 is correct.

• In 1501 he came to India for the second time and set up a factory at Cannanore.

• De Almedia was appointed as the first viceroy in India in 1505 and he initiated the ‘Blue Water’ policy or the mastery of sea by strong naval power. In 1509, De Almedia was followed by Albuquerque as the second viceroy and he was in that power till 1515.

• Albuquerque laid the foundation of the Portuguese power in India by conquering Goa in 1510, and it became the headquarters of the Portuguese in India. In 1515, he conquered Ormuz; an island in the Persian Gulf He also built a fort at Cochin with the approval of its ruler.

Additional Information

The Advent of the Europeans:

• | Company | Established | Head Quarter / Capital |

Portuguese East India Company	**1498**	**Cochin (1510 – 30), Goa (1530 – 1961)**
English East India Company	1600	West coast: Surat (1608 – 87), Bombay (From 1687) East coast: Koromandal, Masulipattanum (1611 – 41), Madras (from 1641) Bengal: Under Madras (up to 1700) Calcutta (from 1700)
Dutch East India Company	1602	East Coast: Koromandal, Pulicut (up to 1690), Negapattanum (from 1690); Bengal: Hugli (from 1655)
Danish East India Company	1616	Serampore (Bengal) : 1676 – 1845
French East India Company	1664	Sural (1668 – 73), Pondicherry (1673 – 1954)

Q11. Answer: (c) Bidya Devi Bhandari

The correct answer is Bidya Devi Bhandari.

Key Points

• Bidya Devi Bhandari

• She was born on 19 June 1961 and she is a Nepalese politician, serving as the second president of Nepal, in office since 28 October 2015.

• She is the first woman to hold office in the country.

• She served as the vice-chairperson of the Communist Party of Nepal (Unified Marxist–Leninist) and was the chair of the All Nepal Women's Association before being elected president.

• Bhandari previously served as the Minister of Defence, the first woman to hold the office, from 2009 to 2011.

• She also served as the Minister of Environment and Population in 1997 and has been an active campaigner for environmental awareness and women's rights in Nepal.

• In June 2017, she visited the headquarters of the IUCN in Gland, Switzerland, and met with the director-general Inger Andersen to discuss enhanced collaboration on nature conservation and sustainable development.

• As of October 2020, Bidya Devi Bhandari is the President of Nepal. Hence, Option 3 is correct.

• In 2016, Forbes placed her on number 52 in their list of the world's 100 most powerful women.

Additional Information

Madhav Kumar	**He is known informally as Makuney, is a Nepali politician who served as the Prime Minister of Nepal from 25 May 2009 to 6 February 2011.**
Nanda Bahadur Pun	He is a Nepalese politician and also known as Nanda Kishor Pun, is the second and the current vice president of Nepal, in office since 2015.
Khadga Prasad Sharma Oli	He is a Nepalese politician and former Prime Minister of Nepal. He served three terms as prime minister from 11 October 2015 to 3 August 2016, from 15 February 2018 to 13 May 2021 as the first elected prime minister under the new constitution, and from 13 May 2021 to 13 July 2021.

Q12. Answer: (d) Fifteen percent of the total number of members of the House of People

The correct answer is Fifteen percent of the total number of members of the House of People.

Key Points

• 91st Constitutional Amendment Act, 2003:

• Made the following provisions to limit the size of Council of Ministers, to debar defectors from holding public offices, and to strengthen the anti-defection law:

• The total number of ministers, including the Prime Minister, in the CentralCouncil of Ministers, shall not exceed 15% of the total strength of the LokSabha. Hence, Option 4 is correct.

• A member of either house of Parliament belonging to any political party who is disqualified on the ground of defection shall also be disqualified to be appointed as a minister.

• The total number of ministers, including the Chief Minister, in the Council of Ministers in a state shall not exceed 15% of the total strength of the Legislative Assembly of that state. But, the number of ministers, including the Chief Minister, in a state shall not be less than 12.

• Article 74 of the Constitution deals with the status of the council of ministers while Article 75 deals with the appointment, tenure, responsibility, qualification, oath, and salaries and allowances of the ministers.

• The COM consists of three categories of ministers, namely, cabinet ministers, ministers of state, and deputy ministers. At the top of all these ministers stands the Prime Minister.

Additional Information

• Articles spanning from 74 to 78 in Part V broadly deal with the Central Council of Minister.

ARTICLES	DESCRIPTION
74	Council of Ministers to aid and advise President
75	Other provisions as to Ministers
77	Conduct of business of the Government of India
78	Duties of the Prime Minister as respects the furnishing of information to the President, etc.
88	Rights of Ministers concerning the Houses.

Q13. Answer: (d) a irrational number

Calculation:

Let us assume that $3 + 2\sqrt{5}$ is a rational number.

So, it can be written in the form a/b

$3 + 2\sqrt{5} = a/b$

Here a and b are coprime numbers and $b \neq 0$

Solving $3 + 2\sqrt{5} = a/b$ we get,

$\Rightarrow 2\sqrt{5} = a/b - 3$

$\Rightarrow 2\sqrt{5} = (a - 3b)/b$

$\Rightarrow \sqrt{5} = (a - 3b)/2b$

This shows $(a - 3b)/2b$ is a rational number. But we know that $\sqrt{5}$ is an irrational number.

Therefore $3 + 2\sqrt{5}$ is an irrational number

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Q14. Answer: (a) Highways

The correct answer is Highways.

Key Points

• Bharatmala Pariyojana:

• It is an umbrella program for the highways sector envisaged by the Ministry of Road Transport and Highways. Hence, Option 1 is correct.

• Under Phase-I of Bharatmala Pariyojana, implementation of 34,800 km of national highways in 5 years (from 2017 to 2022) has been approved at an estimated outlay of Rs. 5,35,000 crore.

• National Highways Authority of India (NHAI) has mandated the development of about 27,500 km of national highways under Phase-I.

• However, as per ICRA Limited, Phase-I is likely to be delayed by four years due to the prevailing uncertainty due to Covid-19 and the consequent impact on valuations.

• ICRA Limited is an Indian independent and professional investment information and credit rating agency.

• Phase-II envisages around 48,000 km of road network across India by 2024.

Additional Information

• Objectives of Bharatmala Pariyojana:

• To optimize the efficiency of freight and passenger movement across the country by bridging critical infrastructure gaps through effective interventions.

• The effective interventions include the development of economic corridors, inter corridors and feeder routes, national corridor efficiency improvement, border, and international connectivity roads, coastal and port connectivity roads, and greenfield expressways.

• Economic Corridors: These are integrated networks of infrastructure within a geographical area designed to stimulate economic development.

• Greenfield Projects: They lack constraints imposed by prior work on the site. Typically, it entails development on a completely vacant site and architects start completely from scratch.

• Brownfield Projects: They carry constraints related to the current state of the site and might be contaminated or have existing structures that architects have to tear down or modify in some way before the project can move forward.

• To generate a large number of direct and indirect employment opportunities in the construction and infrastructure sector and also as part of the enhanced economic activity resulting from better road connectivity across the country.

• To connect 550 districts in the country through national highway linkages.

Q15. Answer: (a) Only C & D

In the statement, no newspaper is read by an illiterate. That means an illiterate person does not read the newspaper. By which from option A it says that all newspapers are read by postgraduates but according to the statement it is not true because any literate person and read all newspapers but degree is not defined. From option B some newspapers that are read, are read by postgraduates but according to the statement, it is not true because any literate person and read some newspapers but their degree is not defined. In option c it says that some newspapers are not read by illiterates that means illiterate people can not read some newspapers, so it is correct. In option d it says that no illiterate ever read a newspaper that means it follows the statement so it is correct.

Hence, "option 1" is the correct answer.

Q16. Answer: (d) 74/5 days

Given:

Work done by Amit = 15 days

Work done by Balbir = 10 days

Amit alone works = 3 days after Balbir joins him

Formula used:

Work done = Time × Efficiency

Calculation:

LCM of 15 and 10 = 30

Amit 1 day work = 30/15 = 2 units

Balbir 1 day work = 30/10 = 3 units

Amit alone work for 3 days = 2 × 3 = 6 days

Remaining work = (30 – 6) = 24 days

Work done by Both = 24/(2 + 3)

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=> 24/5 = 44/5 days

Work will be finished by Amit and Balbir = (44/5 + 3) = 74/5 days

Therefore Required time to finished the whole work is 74/5 days

Q17. Answer: (d) 48

The correct answer is 48.

Key Points

• Global Innovation Index 2020

• It was released by the World Intellectual Property Organisation (WIPO).

• India is at the 48^(th) position in the list of top 50 innovative countries. Hence, Option 4 is correct.

• India occupied the 52^(nd) position in the 2019 rankings.

• India has climbed two spots and has been ranked 46^(th) in the Global Innovation Index (GII) 2021 rankings.

Important Points

• Global Innovation Index (GII) 2021:

• It is launched by the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations.

• It aims to capture the multi-dimensional facets of innovation ranking and rich analysis referencing around 132 economies.

• It is published in partnership with the Portulans Institute and other corporate partners:

• The Brazilian National Confederation of Industry (CNI), Confederation of Indian Industry (CII), Ecopetrol (Colombia), and the Turkish Exporters Assembly (TIM).

• The index ranks world economies according to their innovation capabilities and consists of roughly 80 indicators grouped into innovation inputs and outputs.

• Innovation inputs: Institutions; Human capital and research; Infrastructure; Market sophistication; Business sophistication.

• Innovation outputs: Knowledge and technology outputs; Creative outputs

• Switzerland, Sweden, the U.S., and the U.K. continue to lead the innovation ranking and have all ranked in the top 5 in the past three years.

• The Republic of Korea joins the top 5 of the GII for the first time in 2021.

• Four Asian economies feature in the top 15: Singapore (8), China (12), Japan (13), and Hong Kong, China (14).

Additional Information

• The India Innovation Index:

• It has been developed by NITI (National Institution for Transforming India) Aayog on the lines of the GII.

• The index goes beyond traditional approaches by considering the best parameters in measuring innovation such as patents per million of population, publication in scientific journals, percentage of GDP spending on research.

• It also adds parameters that are specific to the Indian economy (eg. Demographic dividend), to give it a more holistic coverage.

Q18. Answer: (c) 15°

Concept:

The opposite angles of a parallelogram are equal

Calculation:

According to the question

=> (7x – 30)° = 5x°

=> (7x – 5x) = 30

=> 2x = 30

=> x = 15°

Therefore The value of x is 15°

Q19. Answer: (b) 2005

The correct answer is 2005.

Key Points

• The National Rural Health Mission (NRHM)

• It was launched on 12th April 2005, to provide accessible, affordable, and quality health care to the rural population, especially the vulnerable groups. Hence, Option 2 is correct.

• NRHM seeks to provide equitable, affordable, and quality health care to the rural population, especially the vulnerable groups.

• Under the NRHM, the Empowered Action Group (EAG) States as well as the North Eastern States, Jammu, and Kashmir, and Himachal Pradesh have been given special focus.

• The thrust of the mission is on establishing a fully functional, community-owned, decentralized health delivery system with inter-sectoral convergence at all levels, to ensure simultaneous action on a wide range of determinants of health such as water, sanitation, education, nutrition, social and gender equality.

• NRHM focuses on Reproductive, Maternal, Newborn, Child Health, and Adolescent (RMNCH+A) Services.

• The emphasis here is on strategies for improving maternal and child health through a continuum of care and the life cycle approach.

• It recognises the inextricable linkages between adolescent health, family planning, maternal health and child survival. Moreover, the linking of community and facility-based care and strengthening referrals between various levels of the health care system to create a continuous care pathway is also to be focussed.

Q20. Answer: (c) Brasilia

The logic followed here is:

Beijing is the capital of China.

Similarly,

Brasilia is the capital of Brazil.

Whereas;

Shanghai is the city of China, Buenos Aires is the capital of Argentina. And Rio De Janeiro is the city of Brazil.

Hence, "Brasilia" is the correct answer.

Q21. Answer: (c) G56H

The logic followed here is:

Hence, "G56H" is the correct answer.

Q22. Answer: (c) Vadodara, Gujarat

The correct answer is Vadodara, Gujarat.

Key Points

• India's first railway university:

• On 15 December 2018, Union Railways Minister Piyush Goyal has dedicated India’s first railway university to the Nation in Vadodara. Hence, Option 3 is correct.

• The Railway University is the first of its kind institution in the nation and the third in the world after Russia and China.

• It is named the National Rail and Transportation Institution (NRTI).

• It will be a deemed university that will offer professional courses in technology and management of transportation networks.

• The chairman of Railways Board Sh. Ashok Lohani has been named the Vice-Chancellor of the University.

• It will host visiting faculty from renowned institutions like XLRI School of Management and Indian Business School, Hyderabad and others.

• The National Rail and Transportation Institution (NRTI) started its operation on September 5 earlier this year.

Additional Information

Thane	**• It is a city just outside Mumbai, in the western Indian state of Maharashtra. - It’s known as the ‘City of Lakes’, and its more than 30 lakes include tree-lined Upvan Lake, a popular recreational spot.**
Varanasi	• It is a city in the northern Indian state of Uttar Pradesh dating to the 11th century B.C. - Regarded as the spiritual capital of India, the city draws Hindu pilgrims who bathe in the Ganges River’s sacred waters and perform funeral rites. - Along the city's winding streets are some 2,000 temples, including Kashi Vishwanath, the “Golden Temple,” dedicated to the Hindu god Shiva.
Rourkela	• It is a planned city located in the northern part of Odisha, India. - It is the third-largest Urban Agglomeration in Odisha. - It is situated about 328 kilometers north of state capital Bhubaneswar and is surrounded by a range of hills and encircled by rivers Koel, Sankha, & Brahmani.

Q23. Answer: (c) ISA

The correct answer is ISA.

Key Points

• The International Solar Alliance (ISA)

• It became a treaty-based international intergovernmental organization on 6^(th) December 2017.

• The ISA, headquartered in India, has its Secretariat located on the campus of the National Institute of Solar Energy, Gwalpahari, Gurgaon, Haryana. Hence, Option 3 is correct.

• The ISA is an Indian initiative, jointly launched by the Prime Minister of India, Narendra Modi, and the President of France on 30^(th) November 2015 in Paris, on the sidelines of COP-21, the UN Climate Conference.

• It aims at addressing obstacles to deployment at scale of solar energy through better harmonization and aggregation of demand from solar rich countries lying fully or partially between the Tropic of Cancer and Tropic of Capricorn.

Additional Information

NATO	**• The North Atlantic Treaty Organization, also called the North Atlantic Alliance, is an intergovernmental military alliance between 28 European countries and 2 North American countries. - The organization implements the North Atlantic Treaty that was signed on 4 April 1949**
The Anti-Terrorism Squad (ATS)	• It is a special police force in several states of India including Maharashtra, Gujarat, Kerala, Uttar Pradesh, Rajasthan, Bihar, Jharkhand, and West Bengal. - In Maharashtra, it is headed by a senior of the Indian Police Service. - The squad has stopped several terrorist attacks in the country. - ATS was founded in Maharashtra in 1990 by then Additional Commissioner of Mumbai Police Aftab Ahmed Khan popularly known as A.A. Khan.
OECD	• The Organisation for Economic Co-operation and Development is an intergovernmental economic organization with 38 member countries, founded in 1961 to stimulate economic progress and world trade. - Headquarters: Paris, France

Q24. Answer: (c) Address of the web page displayed on the internet

The correct answer is the Address of the web page displayed on the internet.

Key Points

• URL

• URL stands for Uniform Resource Locator.

• The link address on the internet is the URL.

• The URL was introduced in 1994 by Tim Berners-Lee as well as the Working Group on Internet Engineering.

• The URL is the address or string of a character that is used to browse Internet data. Hence, Option 3 is correct.

• The URL is the form of a Uniform Resource Identifier(URI).

• The information is included in the URL.

• The URL includes the following details, which are given below

• Name of the protocol: A colon accompanied by a double forward slash: (//)

• Hostname (name of domain) or IP Address.

• A colon accompanied by the port number.

• The file’s path.

Additional Information

Software	**It is a set of instructions, data, or programs used to operate computers and execute specific tasks. It is the opposite of hardware, which describes the physical aspects of a computer.**
Searching engine	It is a software system that is designed to carry out web searches. They search the World Wide Web in a systematic way for particular information specified in a textual web search query.
A web browser	It is a software application used to access information on the World Wide Web is called a Web Browser. When a user requests some information, the web browser fetches the data from a web server and then displays the webpage on the user’s screen.

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Q25. Answer: (c) right angled

Calculation:

Let the sides of the triangle be 3x, 4x and 5x respectively

we know that the sum of the square of the base side and square of the height side is equal to the square of the hypotenuse.

$AB^2 + BC^2 = AC^2$

$\Rightarrow (3x)^2 + (4x)^2 = (5x)^2$

$\Rightarrow 9x + 16x = 25x$

$\Rightarrow 25x = 25x$

Therefore The sides of a triangle are in the ratio 3 : 4 : 5 the triangle is right angled

Q26. Answer: (b) Pyrometer

The correct answer is Pyrometer.

Key Points

• Pyrometer

• The device for measuring relatively high temperatures, such as are encountered in furnaces. Hence, Option 2 is correct.

• Most pyrometers work by measuring radiation from the body whose temperature is to be measured.

• Radiation devices have the advantage of not having to touch the material being measured.

• Radiation Pyrometers are used to measure the temperature of red hot metals up to 3000°C.

• It is also known as an Infrared thermometer or Radiation thermometer or non-contact thermometer used to detect the temperature of an object's surface temperature, which depends on the radiation (infrared or visible) emitted from the object.

• It acts as a photodetector because of the property of absorbing energy and measuring EM wave intensity at any wavelength.

• These are used to measure high-temperature furnaces.

• These devices can measure the temperature very accurately, precisely, pure visually, and quickly.

• Pyrometers are available in different spectral ranges (since metals – short wave ranges and non-metals-long wave ranges).

Additional Information

An ammeter	**• It is a measuring instrument used to measure the current in a circuit. Electric currents are measured in Amperes, hence the name. - The ammeter is usually connected in series with the circuit in which the current is to be measured.**
Barometer	• It is used to measure local atmospheric pressure. - Fluid pressures can be measured regarding an arbitrary datum. - The common datum is - Absolute zero pressure - Local atmospheric pressure
Fluxmeter	• The search coil magnetometer or induction magnetometer, based on an inductive sensor, is a magnetometer that measures the varying magnetic flux. - An inductive sensor connected to a conditioning electronic circuit constitutes a search coil magnetometer.

Q27. Answer: (a) 22,000

Given:

The population of a town increased = 10%

Present population = 20,000

Concept used:

Percentage increase will be successive percentage increase

Calculation:

According to the question

$\Rightarrow 20,000 + 20,000 \times 10/100$

$\Rightarrow 20,000 + 2000$

$\Rightarrow 22,000$

Therefore The population of town in the next year will be 22,000

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Q28. Answer: (d) 15/600

Calculation:

=> 15/600 = 0.025

It is a terminating decimal

=> 29/343 = 0.08454....

It is a non - terminating decimal

=> $7/2^2 \times 7^2 = 7/196 = 0.03571...$

It is a non - terminating decimal

=> 77/210 = 0.3666....

It is a non - terminating decimal

Therefore 15/600 is a terminating decimal

Q29. Answer: (c) 1962

The correct answer is 1962.

Key Points

• The Indian space program:

• With the setting up of the Indian National Committee for Space Research (INCOSPAR) in 1962, space activities in the country were initiated. Hence, Option 3 is correct.

• In the same year, the work on Thumba Equatorial Rocket Launching Station (TERLS) near Thiruvananthapuram was also started.

• Indian Space Research Organisation (ISRO) was established in August 1969.

• The Government of India constituted the Space Commission and established the Department of Space (DOS) in June 1972 and brought ISRO under DOS in September 1972.

• The Department of Space (DOS) has the primary objective of promoting the development and application of space science and technology to assist in the all-around development of the nation.

Important Points

• Towards this, DOS has evolved the following programmes:

• Launch Vehicle programme has the indigenous capability for launching spacecraft.

• INSAT Programme for telecommunications, broadcasting, meteorology, development of education, etc.

• Remote Sensing Programme for application of satellite imagery for various developmental purposes

• Research and Development in Space Sciences and Technology for serving the end of applying them for national development

Additional Information

• The Space Commission formulates the policies and oversees the implementation of the Indian space programme to promote the development and application of space science and technology for the socio-economic benefit of the country.

• DOS implements these programmes mainly through:

• Indian Space Research Organisation (ISRO)

• Physical Research Laboratory (PRL)

• National Atmospheric Research Laboratory (NARL)

• North Eastern-Space Applications Centre (NESAC)

• Semi-Conductor Laboratory (SCL)

Q30. Answer: (c) John McCarthy

The correct answer is John McCarthy.

Key Points

• John McCarthy is considered the father of Artificial Intelligence.

• John McCarthy was an American computer scientist.

• The term "artificial intelligence" was coined by him. Hence, Option 3 is correct.

• He is one of the founders of artificial intelligence, together with Alan Turing, Marvin Minsky, Allen Newell, and Herbert A. Simon.

• He co-authored the document that coined the term "artificial intelligence" (AI), developed the Lisp programming language family, significantly influenced the design of the ALGOL programming language, popularized time-sharing, invented garbage collection, and was very influential in the early development of AI.

Additional Information

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John Peter Berger	**He was an English art critic, novelist, painter, and poet. His novel G. won the 1972 Booker Prize.**
Charles William Bachman	He was an American computer scientist, who spent his entire career as an industrial researcher, developer, and manager rather than in academia. He was particularly known for his work in the early development of database management systems.
David John Bradley	He is an English actor. He is known for playing Argus Filch in the Harry Potter film series.

Q31. Answer: (c) 40 days

Given:

Ali can complete a piece of work = 8 days

Balvinder can complete a piece of work = 10 days

Ali, Balvinder and Chander can complete a piece of work = 4 days

Formula used:

Work done = Time × Efficiency

Calculation:

LCM of 8, 10 and 4 is 40

Work done by Ali in 1 day = 40/8 = 5 units

Work done by Balvinder in 1 day = 40/10 = 4 units

Work done by Ali, Balvinder and Chander together = 40/4 = 10 units

According to the question

Chander alone can finish the work = (Work done by Ali, Balvinder and Chander) – (Work done by Ali and Balvinder)

=> (10 – 9) units = 1 unit

Chander alone finish the work = 40/1 = 40 days

Therefore Required time to complete the work by Chander is 40 days

Q32. Answer: (a) 97/9

Concept Used:

Follow the BODMAS rule according to the table given below:

Calculation:

(43/4-31/3)÷(3/4-3/5)+3/5×5/7× 7/9

=> (19/4 – 10/3) ÷ (3/4 – 3/5) + 3/5 × 5/7 × 7/9

=> (57 – 40)/12 ÷ (3/4 – 3/5) + 3/5 × 5/7 × 7/9

=> 17/12 ÷ (15 – 12)/20 + 3/5 × 5/7 × 7/9

=> 17/12 ÷ 3/20 + 3/5 × 5/7 × 7/9

=> 17/12 × 20/3 + 3/5 × 5/7 × 7/9

=> 85/9 + 3/5 × 5/7 × 7/9

=> 85/9 + 1/3

=> 88/9

=> 97/9

Therefore The required value is 97/9

Q33. Answer: (c) K. K. Venugopal

The correct answer is K. K. Venugopal.

Key Points

• K.K. Venugopal:

• The tenure of Attorney General K.K. Venugopal is extended by the government for a period of one more year with effect from July 1.

• This is the second time the Centre has extended its tenure. He received his first extension of term in 2020.

• He was the 15th Attorney General after senior advocate Mukul Rohatgi and was appointed in July 2017.

• He is the Attorney General of India as of October 2020. Hence, Option 3 is correct.

• He had recently represented the Union of India in a case that led to the cancellation of Class 12 exams due to the pandemic &

several sensitive cases, including the challenge to the abrogation of Article 370 and the Citizenship Amendment Act.

Important Points

• Attorney General Of India

• S/he is the top legal officer in the country & part of the Union Executive.

• S/he is not considered a government servant.

• Assisted by 2 Solicitor Generals & 4 Additional Solicitor Generals.

• Under the Constitution of India, Article 76 deals with for Attorney General of India & Article 165 for the Advocate General of States.

• Eligibility

• Qualified to be appointed as Supreme Court judge.

• Citizen of India.

• Judge of High Court (HC) for 5 years/advocate HC for 10 years/eminent jurist President's opinion.

• Tenure is Not fixed.

• Appointed by President on Government advice.

Additional Information

Rajnish Kumar	**• He is an Indian banker. - He held the position of Chairman of the State Bank of India. - He became chairman of the State Bank of India on 7 October 2017 and his three-year term ended on 6 October 2020. - He joined SBI as a Probationary officer in 1980.**
K. V. Chowdary	• He is an officer of the 1978 batch of the Indian Revenue Service. - He assumed the charge as Central Vigilance Commissioner on 10 June 2015. - He has served as Chairman of the Central Board of Direct Taxes. - In 2015 he was appointed as the chairman of the Central Vigilance Commission.
Vinod Kumar Sharma	• He is an Indian actor, writer, and director who works in Hindi films, television, and stage. - He is the recipient of a Sangeet Natak Akademi Award for direction in theatre. - He is the founder and director of Khilona Theatre Company, since September 1987.

Q34. Answer: (c) 120 km/h

Given:

Train is travelling 50% faster than a bus

Distance between Karnal and Panipat = 75 km

Time = 12.5 min

Formula used:

Speed = Distance/Time

Calculation:

Let the speed of the bus be x km/h

Then,

Speed of the train = (150/100)x = (3/2)x km/h

According to the question

=> 75/x – 75/(3/2)x = (125/10 × 60)

=> 75/x – 50/x = 5/24

=> 25/x = 5/24

=> x = (25 × 24)/5

=> x = 120 km/h

Therefore The speed of the bus is 120 km/h.

Alternate Method The speed of the bus = 2x km/hr

then, the speed of train = 150% of 2x = 3x km/hr

let time taken by train and bus each = y hours

and

Distance = Speed × time

=> 3x × y = 2x × (y + 12.5/60)

=> 3xy = 2xy + (5/12)x

=> y = 5/12 hours

and we know, the distance is 75 km.

So, 3xy = 75

=> 3x × (5/12) = 75

=> x = 60 km/hr

So,

The speed of Bus = 2x = 2 × 60 = 120 km/hr

Q35. Answer: (d) Rahi Sarnobat

The correct answer is Rahi Sarnobat.

• In the 25-meter rapid fire pistol event, Rahi Sarnobat became the first Indian woman to clinch the gold medal in a shooting event of the Asian Games. Hence, Option 4 is correct.

Key Points

• Rahi Sarnobat:

• She is a record-breaking 25m pistol shooter from India.

• The two-time Olympian was the first Indian pistol shooter to win an ISSF World Cup gold and the first Indian woman shooter to win gold at the Asian Games.

• When she won bronze at the ISSF World Cup in Fort Benning in 2011, Rahi Sarnobat also became the first Indian woman to qualify for the Olympics in the 25m pistol event.

• She had barely scraped through to the final rounds in Fort Benning but delivered there, missing out on silver by 0.1 points in an event where the gold was won by Chen Ying with a then-world record score of 796.7.

Additional Information

• Asian Games 2018:

• India competed at the 2018 Asian Games in Jakarta and Palembang, Indonesia, from 18th August to 2nd September.

• Neeraj Chopra was the flag bearer for the opening ceremony while Rani Rampal was named as the flag bearer for the closing ceremony.

• India ranked 8th in the 2018 Asian Games Medal Table with 69 medals in total.

• China topped the medal tally with 132 Golds and a total of 289 Medals.

• Japanese swimmer Ikee Rikako has been named as the Most Valuable Player (MVP) of the recently-concluded 18th edition of the Asian Games.

• The 18-year-old, who bagged six gold and two silver medals in the tournament, became the first female athlete to win the MVP title.

• India secured a bronze medal in the men's team regu event which was the country's first medal in sepak takraw since the debut of the sport in the 1990 Asian Games.

• India secured its first-ever medal in table tennis in the Asian Games as the men's team won a Bronze medal by defeating Japan in the quarterfinal of Table tennis at the 2018 Asian Games.

Important Points

• Upcoming Asian Games:

• 2022 Asian Games will be held in Hangzhou, Zhejiang, China.

• 2026 Asian Games will be held in Nagoya, Japan.

Q36. Answer: (d) 135 square units

Given:

Formula used:

Rectangle area = Length × Breadth

Triangle = (1/2)× Height × Base

Calculation:

In this diagram One rectangle + one right angle triangle

=> 19 × 6 + (1/2)× 7 × 6

=> 114 + 21

=> 135 square unit

Therefore The area of the compound shape is 135 square units.

Q37. Answer: (a) BHEL

The correct answer is BHEL.

Key Points

• Maharatna PSU

• The Maharatna dispensation was instituted by the Union government in order to enable big Central Public Sector Enterprises (CPSEs) to grow into global giants (introduced in 2010).

• CPSEs are companies in which the Central Government or other CPSEs own 51 percent or more of the stock.

• The government has bestowed the title of 'Maharatna' on the state-owned Power Finance Corporation (PFC).

• The Department of Public Enterprises, which is part of the Ministry of Finance, issued an order to that effect.

• PFC is the country's 14th public sector business to be granted 'Maharatna' status, joining the names of ONGC, Indian Oil Corporation, Steel Authority of India Limited (SAIL), and BHEL, among others.

Important Points

• Bharat Heavy Electricals Limited (BHEL)

• It is Maharatna PSU. Hence, Option 1 is correct.

• It is engaged in the design, engineering, manufacturing, construction, testing, commissioning, and servicing of a wide range of products, systems, and services for the core sectors of the economy.

• It supplies electric locomotives to the Indian Railways and defense equipment such as the Super Rapid Gun Mount (SRGM) naval guns manufactured in partnership with the Ordnance Factory Board and simulators to the Indian Armed Forces.

Additional Information

• List of Maharatna Companies

S.No	Central Public Sector Enterprises (CPSE)
1	National Thermal Power Corporation (NTPC)
2	Oil and Natural Gas Corporation (ONGC)
3	Steel Authority of India Limited (SAIL)
4	Bharat Heavy Electricals Limited (BHEL)
5	Indian Oil Corporation Limited (IOCL)
6	Hindustan Petroleum Corporation Limited (HPCL)
7	Coal India Limited (CIL)
8	Gas Authority of India Limited (GAIL)
9	Bharat Petroleum Corporation Limited (BPCL)
10	Power Grid Corporation of India (POWERGRID)
11	Power Finance Corporation (PFC)
12	Rural Electrification Corporation Limited (REC)
13	Oil India Limited (OIL)
14	Hindustan Aeronautics Limited (HAL)

Q38. Answer: (c) 75

Shortcut Trick

When the number of rows equals the number of plants per row, the total number of plants forms a perfect square.

Number of plants per row = √5625

For perfect squares ending in 25, the square root always ends in 5.

The remaining part is 56, which can be factored into two consecutive numbers as 7 × 8. Appending 5 to the smaller factor (7) gives 75.

Therefore The correct answer is 75 plants.

Alternate Method

Given:

Total number of plants = 5625

Number of rows = Number of plants in each row

Formula Used:

Total plants = Number of rows × Number of plants per row

Calculations:

=> Let the number of plants in each row be x.

=> Number of rows = x

=> Total plants = x × x

=> $x^2 = 5625$

=> $x = \sqrt{5625}$

=> By prime factorization: 5625 = 3 × 3 × 5 × 5 × 5 × 5

=> x = √(3² × 5^4)

=> $x = 3 \times 5^2$

=> x = 3 × 25

=> x = 75

Therefore The correct answer is 75 plants.

Additional Information

Square Root Trick for Numbers Ending in 25

If a perfect square ends in 25, separate the 25 and find two consecutive integers whose product matches the remaining part. The square root is formed by appending 5 to the smaller integer.

Square Root Shortcut for Numbers Near 50 and 100

For numbers near a known perfect square base (like 2500 or 10000), you can estimate the root quickly by checking the last two digits which relate to the square of the difference from the base.

Perfect Square Properties

A perfect square never ends in 2, 3, 7, or 8. Additionally, the digital sum (or digital root) of a perfect square is always exactly 1, 4, 7, or 9.

Q39. Answer: (d) 144°

Calculation:

The total number of families = (150 + 400 + 40 + 250 + 160)

=> 1000

Item of expenditures on food = 400

The central angle for food = 400/1000 × 360

=> 144°

Therefore The central angle for food is 144°

Q40. Answer: (c) 2016

The correct answer is 2016.

Key Points

• Setu Bharatam scheme:

• The Setu Bharatam scheme was launched by Prime Minister Narendra Modi on March 4, 2016, for building rail over bridges and underpasses for safe and smooth travel on national highways. Hence, Option 3 is correct.

• The scheme was launched to make all the National Highways free of railway level crossings to prevent frequent road accidents and loss of lives at level crossings.

• The government had identified around 208 places for the construction of rail over-bridges and underpasses and earmarked funds worth almost Rs 10,200 crore for the implementation of the scheme.

• The Indian government has also undertaken the task of rebuilding around 1500 bridges that are around 50-60 years old.

• Unmanned railway crossings are one of the main causes of rail accidents in India, especially in rural areas. The Indian Government has targeted to eliminate all such crossings before the end of this year so that such accidents can be avoided.

• The government has envisaged the replacement of all the level crossings on National Highways by Road Over Bridges or Road Under Bridges under the Setu Bharatam scheme by 2020.

Important Points

• Objectives of Setu Bharatam Scheme:

• To make all the national highways free from railway crossing by the year 2019. Some of the major objectives of the Setu Bharatam Project were:

• Construction of bridges on the national highways across the country.

• Construction of around 280 under and over railway tracks bridges by the Government with an expense of around Rs. 100 Crore.

• Around 64 bridges would get the green signal at the end of the year 2016.

• Use of scientific techniques such as measurement of distance, longitude, latitude, material, designs, etc. during the construction of bridges.

Additional Information

• Indian Bridge Management System(IBMS):

• It is a digital database of all bridges in the country to rate their structural condition so that timely repair and rehabilitation work can be carried out based on the criticality of the structure.

Q41. Answer: (c) Cell

The correct answer is Cell.

Key Points

• Cell:

• A cell is the smallest unit capable of independent existence which can reproduce itself. Hence, Option 3 is correct.

• All living organisms, except for viruses, are composed of one or more cells.

• Single-cell organisms; such as, bacteria, protozoa, and other micro-organisms are termed unicellular, while plants and animals that contain many cells are termed multicellular.

• Highly complex organisms; such as, human beings consist of billions of cells, all of which are adapted to carry out specific functions; for example, groups of these specialized cells are organized into tissue and bodily organs.

• Although cells may differ widely in size, appearance, and function, their essential features are similar.

Important Points

• Almost all cells perform biochemical processes, generate and process energy, and store genetic information to be passed down to future generations of cells.

• Advanced single-celled and multicelled organisms have nuclei that carry the DNA, primitive cells; such as, bacteria, have no nucleus and carry their DNA loosely in coils throughout the cells

• The number of cells in an organism varies; for example, bacteria are single-celled organisms; the average adult human body has about one hundred trillion cells.

• Cells are the structural unit of all organisms and come in a range of sizes and shapes.

• Animal cells contain only an outside cell membrane.

• In most fungi, bacteria, and plants; there is a rigid cell wall outside the membrane.

• Each cell is composed of a mass of jelly-like substance called the cytoplasm, surrounded by a membrane.

Additional Information

Protoplasm	**It is the cytoplasm and nucleus of a cell.**
Cytoplasm	It is a thick solution that fills each cell and is enclosed by the cell membrane.
A vacuole	It is a membrane-bound cell organelle.

Q42. Answer: (d) Brahmi

The correct answer is Brahmi.

Key Points

• Ashoka's inscription:

• The most famous Mauryan ruler was Ashoka.

• He was the first ruler who tried to take his message to the people through inscriptions.

• Most of Ashoka’s inscriptions were in Prakrit and were written in the Brahmi script.

• Prakrit inscriptions were written in Brahmi and Kharosthi scripts, which even a commoner could read and understand.

• The inscriptions found in the area of Pakistan are in the Kharoshthi script.

• The Edicts of Ashoka are 33 inscriptions engraved on pillars, large stones, and cave walls by Ashoka the Great, the third king of the Mauryan Empire of India.

• One set, the so-called Major Rock Edicts, are consistent in their message that the people should adhere to the concept of Dhamma, defined as

• “right behavior”,

• “good conduct” and

• “decency toward others”.

Important Points

• Decipherment of Asokan Brahmi by James Princep in 1838:

• Some of the most momentous developments in Indian epigraphy took place in the 1830s.

• This was when James Prinsep, an officer in the mint of the East India Company, deciphered Brahmi and Kharosthi, two scripts used in the earliest inscriptions and coins.

• He found that most of these mentioned a king referred to as Piyadassi – meaning “pleasant to behold”; there were a few inscriptions that also referred to the king as Asoka, one of the most famous rulers known from Buddhist texts.

Additional Information

• Relevant inscriptions and important edicts:

Edict/ Inscription	Remarks
Allahabad – Kosam/Queens Edict/Kausambi or Schism Edict	• Ashoka asks the members of the Sangha to refrain from causing division in the ranks. - Samudragupta’s inscription is on this edict itself. - Jahangir shifted it to the fort at Allahabad.
Kandahar Inscription	It is a famous bilingual edict in Greek and Aramaic.
Kalinga Edicts (Bhauli and Jaugada)	Mentions ‘All men are my children.’
Sannati Inscription (Karnataka)	Site of all 14 major rock edicts as well as two separate Kalinga edicts.
Rummindei Inscription (Nepal)	It mentions that the village of Lumbini (birthplace of the Buddha) be exempted from Bali and was to pay only one-eighth of the bhaga.
Girnar Rock Inscription of Rudradaman (Kathiawar)	Mentions the Sudarshan lake constructed by Pushyagupta, a Rashtriya (means provincial governor) of Saurashtra during Chandragupta Maurya’s reign.
Minor Rock Edict 1	This indicates that Ashoka turned towards Buddhism gradually, after 2.5 years in power.
Minor Rock Edict 3	Ashoka greets Sangha, professes his deep faith in the Buddha, dhamma, and Sangha, also recommends six Buddhist texts for monks, nuns, and general laity.
Inscriptions at Shahbazgarhi and Mansehra.	Written in Kharosthi script.

Q43. Answer: (d) 81

The logic followed here is:

First term is square of 1, then second term is square of 3, then third term is square of 5, then fourth term is square of 7. series of odd number of its square.

Hence, "81" is the correct answer.

Q44. Answer: (d) Rs. 500

Given:

Gain = 25%

Discount = 10%

CP = Rs. 360

Calculation:

Let the marked price be x

According to the question

$x – [x \times (10/100)] – [(25 \times 360)/100] = 360$

$\Rightarrow x – x/10 – 90 = 360$

$\Rightarrow 9x/10 = 360 + 90$

$\Rightarrow 9x/10 = 450$

$\Rightarrow 9x = 4500$

$\Rightarrow x = 500$

Therefore The marked price is Rs. 500

Q45. Answer: (a) Ustad Amjad Ali Khan

The correct answer is Ustad Amjad Ali Khan.

Key Points

• Santoor

• The Indian santoor instrument is a trapezoid-shaped hammered dulcimer and a variation of the Iranian Santur.

• The instrument is generally made of walnut and has 25 bridges.

• It is a traditional instrument in Jammu and Kashmir and dates back to ancient times.

• It was called Shatha Tantri Veena in ancient Sanskrit texts.

• The santoor is a folk instrument.

• Pandit Shivkumar Sharma

• He is an Indian music composer and santoor player from the state of Jammu and Kashmir.

• He is a very famous classical musician who has acquired international fame by playing the classical instrument, Santoor.

• Tarun Bhattacharya

• He is an Indian classical musician who plays the santoor, a type of hammered dulcimer.

• He studied with Ravi Shankar.

• Bhajan Sopori

• He is an Indian instrumentalist.

• He is a player of the santoor, an ancient stringed musical instrument.

• On the occasion of 67th Indian Republic Day 2016, Pandit Bhajan Sopori was accorded Jammu and Kashmir State lifetime achievement award.

• Amjad Ali Khan

• He is an Indian classical sarod player. Hence, Option 1 is correct.

• He is a sixth-generation descendant of the Bangash Gharana of sarod players; his family claims to have invented the sarod.

• He is the son of Hafiz Ali Khan (1888–1972), an Indian sarod player and recipient of Padma Bhushan.

• He is best known for his clear and fast ekhara taans.

• Awards and honors received: Padma Vibhushan, Banga-Vibhushan, Sangeet Natak Akademi Award, Sangeet Natak Akademi Fellowship, and Rajiv Gandhi National Sadbhavna Award.

• Amjad Ali Khan has relinquished his plans to set up an international residential institute in Kerala to impart training in the music of different genres (Hindustani, Carnatic and Western) after Kerala decides to include bureaucrats in governing body of this proposed international music academy

Q46. Answer: (d) 104

Given:

Ratio of males and females = 7 : 6

number of males in the party = 56

Formula used:

Number of male guest = Total number of guest × ratio of male/Total value of ratio of male and female

Calculation:

Let total number of guests attending the party are x.

Ratio of male and female guest = 7 : 6

=> 56 = x × 7/13

=> x = (56 × 13)/7

x = 8 × 13

x = 104

Therefore Total number of guests attending the party are 104.

Q47. Answer: (d) Violet and Red

The correct answer is Violet and Red.

Key Points

• White light comprises all colors of the VIBGYOR i.e. Violet, Indigo, Blue, Green, Yellow, Orange, Red.

• When we optically combine these colors we get white light.

• The wavelength of light defines the color of the light and in VIBGYOR, wavelength increases from left to right.
• That means Violet color has minimum wavelength while Red color has a maximum wavelength.
• Prism is a triangular slab of transparent glass through which light can pass.
• But before going into prism we must remember that when light passes from one medium to another, it undergoes refraction.
• Refraction is the phenomenon of bending of light when it travels from one medium to another.
• Now the amount of bending of light depends on the wavelength of light.
• The smaller the wavelength of light, the greater is its bending when it passes from one medium to another.
• That is, we can say that the amount of bending of light is inversely proportional to the wavelength of light.
• This property of light leads to the splitting of different colors of light when passed through a prism as shown in the figure.
• Violet bends the most because it has a shorter wavelength compared to other colors and the red color bends the least and can be seen at the end opposite to the base of the prism. Hence, Option 4 is correct.

Q48. Answer: (c) Neither conclusion 1 nor conclusion 2 follow

The diagram are given below -

Conclusion 1: Some cows are scientists. False (Only cows are mammals that means all mammals are cow and some scientists are mammals, so some cows are scientists are false.)

Conclusion 2: Some scientists are mammals. False (No scientists are mammals in the statement but in conclusion some scientists are mammals which does not true.)

Neither conclusion 1 nor conclusion 2 follow.

Hence, "option 3" is the correct answer.

Q49. Answer: (c) 20%

Given:

Mean = 25

Standard deviation = 5

Formula used:

Coefficient of variation = Standard deviation/Mean × 100

Calculation:

According to the question

=> (5/25 × 100)

=> 20%

Therefore The coefficient of variation is 20%

Q50. Answer: (c) 721

In this question substitutes @ with either + or ×, put in the expression 1@2@3@4@5@6 to get maximum value -

Put know that multiply with 1 get same value to get the maximum value we put + near to 1 not ×, and other than 1 we put ×.

1 + 2 × 3 × 4 × 5 × 6 = 1 + 720

= 721 is the maximum value.

Hence, "721" is the correct answer.

Q51. Answer: (c) Rs. 45

Given:

Ratio of Rajeev, Kewal and Amit = 2 : 3 : 7

Amit's share = Rs. 15 more than that of Kewal

Calculation:

Let the ratio of Rajeev, Kewal and Amit be 2x, 3x and 7x respectively

Total sum of money = (2x + 3x + 7x) = 12x

According to the question

=> (7x – 3x) = 15

=> 4x = 15

Now,

The sum of money which was divided = 12x

=> (15/4x × 12x)

=> Rs. (15 × 3)

=> Rs. 45

Therefore The required sum of money is Rs. 45

Q52. Answer: (a) Warangal

The correct answer is Warangal.

Key Points

• Pakhal Wildlife Sanctuary

• It was established in the year 1952 and is located around 50 km away from the town of Warangal, in the state of Telangana. Hence, Option 1 is correct.

• This town is located in Warangal District.

• Pakhal Wildlife Sanctuary is located beside Pakhal Lake, which is an artificial lake.

• Pakhal Wildlife Sanctuary is spread over a total area of 839 sq km and the area of Pakhal Lake is around 30 sq km.

• The area of Pakhal Wildlife Sanctuary consists of a large plateau bounded by low hills and is rich with diverse natural vegetation, which includes tropical dry deciduous mixed forests, mixed teak, and bamboo forests.

• There are also various species of animals that can be found here.

• The natural picturesque magnificence and landscape of Pakhal Wildlife Sanctuary is extremely captivating and attracts several tourists throughout the year.

• Pakhal Wildlife Sanctuary was established in the year 1952.

• The man-made Pakhal Lake, situated in the vicinity, was constructed during the first decade of the 13th century (1213 AD), by Ganapati Deva, the Kakatiyan Ruler.

• The name of Pakhal Wildlife Sanctuary was derived from the name of the person who excavated the lake.

Important Points

• Wildlife Sanctuaries

• Sanctuary is an area that is of adequate ecological, faunal, floral, geomorphological, natural, or zoological significance.

• The Sanctuary is declared for the purpose of protecting, propagating, or developing wildlife or its environment. Certain rights of people living inside the Sanctuary could be permitted.

• Wildlife sanctuaries of India are classified as IUCN Category IV protected areas.

• Wildlife (Protection) Act, 1972 provided for the declaration of certain areas by the State government as wildlife sanctuaries if the area was thought to be of adequate ecological, geomorphological, and natural significance.

• As of August 2021, 566 wildlife sanctuaries were established in the country which is 3.72 % of the geographical area of the country.

• The oldest bird sanctuary is Vedanthangal Bird Sanctuary near Chennai in Tamil Nadu state. It was established in 1796.

Q53. Answer: (d) -13

Concept Used:

Follow the BODMAS rule according to the table given below:

Calculation:

12 + 8-5 × 1/2× 12-{45÷ (34-19)}=?

=>12 + 8 – 5 × 1/2 × 12 – {45 ÷ 15} = ?

=> 12 + 8 – 5 × 1/2 × 12 – 3 = ?

=> 12 + 8 – 5 × 6 – 3 = ?

=> 20 – 30 – 3 = ?

=> -10 – 3 = ?

=> -13 = ?

Therefore The value of ? is -13

Q54. Answer: (a) Rs. 4,635

Given:

Principal = Rs. 4500

Rate = 15%

Time = 74 days (26 march 2018 to 7 june 2018)

Formula used:

SI = (P × R × T)/100

Amount = Principal + SI

Calculation:

According to the question

=> [(4500 × 15 × 74)/100 × 365]

=> 136.84

Now,

Amount = 4500 + 136.84

=> Rs. 4636.84

=> Rs. 4635 (approx)

Therefore The required amount did she pay to clear her loan is Rs. 4,635.

Q55. Answer: (c) 1+0/10+9/100

Calculation:

Decimal expansion of 109/100 is

=> 1 + 0/10 + 9/100

Therefore The decimal expansion of 109/100 is 1+0/10+9/100

Q56. Answer: (b) 13

The correct answer is 13.

Key Points

• OPEC

• OPEC stands for Organization of the Petroleum Exporting Countries.

• It is a permanent, intergovernmental organization, created at the Baghdad Conference in 1960, by Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela.

• It aims to manage the supply of oil to set the price of oil in the world market, to avoid fluctuations that might affect the economies of both producing and purchasing countries.

• It is headquartered in Vienna, Austria.

• OPEC membership is open to any country that is a substantial exporter of oil and which shares the ideals of the organization.

• As of November 2020, OPEC has 13 member countries: five in the Middle East (Western Asia), seven in Africa, and one in South America.

• According to the U.S. Energy Information Administration (EIA), OPEC's combined rate of oil production (including gas condensate) represented 44% of the world's total in 2016, and OPEC accounted for 81.5% of the world's "proven" oil reserves.

• Today OPEC is a cartel that includes 14 nations, predominantly from the middle east whose sole responsibility is to control prices and moderate supply.

Additional Information

• OPEC+

• The non-OPEC countries which export crude oil along with the 14 OPECs are termed OPEC plus countries.

• OPEC plus countries include Azerbaijan, Bahrain, Brunei, Kazakhstan, Malaysia, Mexico, Oman, Russia, South Sudan, and Sudan.

• Saudi and Russia, both have been at the heart of a three-year alliance of oil producers known as OPEC Plus — which now includes 11 OPEC members and 10 non-OPEC nations — that aims to shore up oil prices with production cuts.

Q57. Answer: (b) 1/3, 2/5, 4/7

Calculation:

=> 1/3 = 0.33

=> 4/7 = 0.57

=> 2/5 = 0.40

The ascending order are 1/3, 2/5, 4/7

Therefore The fractions 1/3, 4/7, 2/5 written in ascending order are 1/3, 2/5, 4/7

Q58. Answer: (c) π/3, 2π/3

Given:

tan A + tan 2A + tan 3A = tan A tan 2A tan 3A

Calculation:

tan A + tan 2A + tan 3A = tan A tan 2A tan 3A

=> tan A + tan 2A = -tan 3A + tan A tan 2A tan 3A

=> tan A + tan 2A = -tan 3A (1 – tan A tan 2A)

=> (tan A + tan 2A)/(1 – tan A tan 2A) = -tan 3A

=> tan (A + 2A) = -tan 3A

=> tan 3A = -tan 3A

=> 2 tan 3A = 0

=> tan 3A = 0

=> tan 3A = tan nπ

=> 3A = nπ

=> A = nπ/3

Put the value of n = 1

=> A = π/3

Put the value of n = 2

=> A = 2π/3

Therefore Required value is π/3, 2π/3

Q59. Answer: (b) It was a movement in support of the Turkish Sultan

The correct answer is It was a movement in support of the Turkish Sultan.

Key Points

• The Khilafat Movement (1919-20):

• It was essentially a movement to express Muslim support for the Caliph of Turkey against the allied powers particularly Britain. Hence, Option 2 is correct.

• The Khilafat Movement, which began in 1919, brought the Muslims and the Hindus on a common platform against British rule, was the most important cause of the Non - Cooperation Movement.

• Turkey had aligned itself in the First World War with Germany - led Axis powers that were defeated by Great Britain - led Allied powers.

• The politically - conscious Muslims were critical of the British and their allies' treatment of the Turkish (Ottoman) Empire that had divided it and properly removed Thrace from Turkey.

Additional Information

• - The Muslims also regarded the Sultan of Turkey as the Caliph or the religious head of the Muslims and they strongly felt that his position over the Muslim religious places should not be undermined.

• Under the leadership of the Ali Brothers (Maulana Mohammed Ali and Maulana Shaukat Ali), Maulana Azad, Hakim Ajmal Khan and Hasrat Mohani, and countrywide Khilafat agitation, a Khilafat Committee was soon formed.

• The All - India Khilafat Conference held in November 1919 in Delhi decided to withdraw all government cooperation if the government did not meet its demands.

• Mahatma Gandhi saw the Khilafat agitation as an opportunity not to unite Hindus and Muslims in a hundred years' time.

• Also, the Muslims League gave full support to the National Congress and its political agitation.

• In early 1920, Gandhi declared that the Khilafat question overshadowed the constitutional reforms and the Jallianwala massacre and announced that he would lead a non - cooperation movement if the terms of peace with Turkey did not satisfy the Indian Muslims.

• The Ali Brothers (Maulana Mohammed Ali and Maulana Shaukat Ali), Maulana Azad, Hakim Ajmal Khan, and Hasrat Mohani were the leaders of the Khilafat Movement. Mahatma Gandhi later also became one of the leaders of the Khilafat Movement in India by strongly advocating the Khilafat cause.

Q60. Answer: (b) Musca Domestica

The correct answer is Musca Domestica.

Key Points

• Houseflies

• It belongs to the order Diptera and genus Musca.

• The scientific name of a housefly is Musca domestica. Hence, Option 2 is correct.

• It is often seen as a nuisance as well as a health hazard as they contaminate food with their feces.

• However, the larvae are considered useful as they can be used to feed livestock and farmed fish.

• Moreover, housefly larvae also have the potential to be used as an agent for biodegradation – able to recycle nutrients in nature.

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• Adult house flies grow to a length of 0.7 cm with a wingspan of around 1.5 cm.

• Moreover, males tend to have smaller wings than females.

• The head of the fly is very distinct, with a convex front and an almost-flat conical back.

• The flies also have compound eyes which are capable of detecting color spectrums that cannot be seen by humans.

• They are also very sensitive, able to recognize the subtlest of movements. Interestingly, houseflies are also able to process visual information nearly seven times quicker than a human.

• This means houseflies are effectively able to see the world in slow-motion. Hence, it makes them annoyingly hard to swat or kill.

• Houseflies have mandibles, but they are vestigial. Instead, the other mouthparts form a tube-like structure called a proboscis, which is an organ adapted for a liquid diet.

Additional Information

Triticum Aestivum	Common Wheat
Fannia	Lesser house fly
Homo Sapiens	Modern Human

Q61. Answer: (d) √((s-b)(s-c)/bc)

Given:

a + b + c = 2s

Formula Used:

Cos A = 1 - 2Sin²A/2

Cos A = (b² + c² - a²) / 2bc (cosine rule)

Calculation:

a + b + c = 2s

=> a + b = 2s – c

=> a + c = 2s – b

We know that

Cos A = (b² + c² – a²)/2bc

2sin²(A/2) = 1 – Cos A

=> 2 sin2(A/2) = 1 – (b2 + c2 – a2)/2bc

=> 2 sin2(A/2) = (2bc - b² - c² + a²)/2bc

=> 2 sin2(A/2) = [a2 - (b² + c² - 2bc)]/2bc

=> 2 sin2(A/2) = [a2 - (b - c)²]/2bc

=> 2 sin2(A/2) = (a + b – c) (a – b + c)/2bc

(as a + b = 2s - c and a + c = 2s - b)

=> 2 sin2(A/2) = (2s – c – c) (2s – b – b)/2bc

=> 2 sin2(A/2) = (2s – 2c) (2s – 2b)/2bc

=> 2 sin2(A/2) = 2(s – c) × 2(s – b)/2bc

=> sin2(A/2) = (s – c) × (s – b)/bc

=> sin(A/2) = √((s-b)(s-c)/bc)

Therefore The correct answer is option (4).

Q62. Answer: (d) 395

The correct answer s 395.

Key Points

• The original Indian Constitution, when adopted by Constituent Assembly in 1949, had 395 articles and 22 parts. Hence, Option 4 is correct.

• Many other articles and three other parts were added to it by subsequent constitutional amendments.

• As of now, the Indian constitution has about 450 articles in 25 parts.

• The Constitution of India contains 395 articles in 22 parts.

• It also contains 12 schedules. Since its adoption in 1949, it has been amended 103 times.

• The total number of Amendment Bills introduced till today in parliaent is 126.

Additional Information

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• The last year 2019-20, was extremely important from the point of view of the important constitutional amendments, landmark judgments, and several constitutional crises. Here we are consolidating the important constitutional articles which remain in news throughout the year.

• India, also known as Bharat is a sovereign, socialist, secular, democratic, republic with a parliamentary system of government. The republic is governed by the constitution of India which was adopted on 26th November 1949 and came into force on January 26th, 1950.

• Since the constitution of India was adopted on November 26th, 1949, this day is observed as Samvidhan Diwas or Constitution Day in India.

• It came into force two months later to mark the anniversary of “poorna swaraj” hence, this day is celebrated as Republic Day in India.

• The constitution of India is the lengthiest written constitution in the world. The unique feature of the constitution of India is that it has adopted provisions from various other constitutions suiting the aspirations and challenges of the Indian population.

Q63. Answer: (c) 5√2 cm

Given:

Diagonal of square = 10 cm

Formula used:

Diagonal of square = √2a

Calculation:

According to the question

=> √2a = 10 cm

=>a = 10\√2 cm

=> a = 5√2 cm

Therefore The length of each side of a square whose diagonals are 10 cm each is 5√2 cm

Q64. Answer: (c) Rs. 1000

Given:

Loss = 10%

By selling the same watch = Rs. 140 more

Gain = 4%

Calculation:

Let the cost price be Rs. 100

SP = Rs. 100 – 10 = Rs. 90

When she gained 4%

=> Rs. 100 + 4 = Rs. 104

Difference = Rs. (104 – 90) = Rs. 14

If the difference is Rs. 14, the cost price = Rs. 100

If the difference is Rs. 140, the cost price = Rs. 100/14 × 140

=> Rs. 1000

Therefore The cost price of watch is Rs. 1000

Q65. Answer: (c) gain of 66.6% nearly

Given:

SP of 9 articles = CP of 15 articles

Formula used:

Gain% = Gain/CP × 100

Calculation:

Let SP of 9 articles = CP of 15 articles = x

SP of 1 article = x/9

CP of 1 article = x/15

Gain% = (x/9 – x/15)/x/15 × 100

=> (2x/45)/(x/15) × 100

=> 2/3 × 100

=> 200/3

=> 66.66%

Therefore There is a gain of 66.6% nearly

Q66. Answer: (d) Graphics software

The correct answer is Graphics software.

Key Points

• Application software

• It is a program or a group of programs designed for the end-users.

• It is a term that is used for software created for a specific purpose.

• In short, it is called an App.

• Graphics software

• It is visual images or designs on some surface, such as a wall, canvas, screen, paper, or stone, to inform, illustrate, or entertain.

• Graphic art software is a subclass of the application software used for graphic design, multimedia development, stylized image development, technical illustration, general image editing, or simply to access graphic files. Hence, Option 4 is correct.

• Art software uses either raster or vector graphic reading and editing methods to create, edit, and view art.

• Most art software includes common functions, creation tools, editing tools, filters, and automated rendering modes.

• Many, however, are designed to enhance a specialized skill or technique.

• Specialized software packages may be discontinued for various reasons such as lack of appreciation for the result, lack of expertise and training for the product, or simply not worth the time and money investment, but most likely due to obsolescence compared to newer methods or integration as a feature of newer more complete software packages.

Additional Information

Linux	**open-source Unix-like operating system released for computers on September 17, 1991.**
macOS	Graphical operating system developed and marketed by Apple Inc. since 2001.
Unix	It is a family of multitasking, multiuser computer operating systems

Q67. Answer: (b) Andaman and Nicobar Island

The correct answer is Andaman and Nicobar Island.

Key Points

• India's first Commercial Operation of Sea Plane Services

• India's first Commercial Operation of Sea Plane Services in the Andaman and Nicobar Islands has begun on 23 January 2011. Hence, Option 2 is correct.

• The seaplane will fly between Port Blair and Havelock Island.

• Also, the seaplane will fly up to Barren Island, India's lone active volcano, where tourists will be able to get an aerial view of the volcanic Islands.

• The seaplane, Cessna Caravan 208 A, is fitted with modern navigation features has a total seating capacity of 10, 8 of them being for passenger seats.

• It can travel up to 250 km in about an hour and can also land on the ground using the wheel configuration.

• The seaplane is basically for tourists but local people can also enjoy the flight.

• The launch of the seaplane service is a step towards faster promotion of the tourism sector in the islands.

• The launch of the seaplane service will also help improve connectivity between different islands of the Union territory.

Important Points

Andaman and Nicobar Islands	**• It is a union territory of India consisting of 572 islands, of which 38 are inhabited, at the junction of the Bay of Bengal and the Andaman Sea. - The territory is about 150 km north of Aceh in Indonesia and separated from Thailand and Myanmar by the Andaman Sea.**
Majuli	• It is the biggest inhabited riverine island in the world located in the river Brahmaputra. - It is India's First island district. - It is the nerve center of neo-Vaishnavite culture. - It has many 'Sattras' (religious and cultural institutions). - It has been included in the tentative list of World Heritage Sites by UNESCO.

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Neil Island	• It is one of India's the Andaman Islands, in the Bay of Bengal. - Bharatpur Beach has coral reefs teeming with tropical fish. - Laxmanpur Beach is known for its sunset views. - Howrah Bridge is a natural rock formation accessible at low tide. Near the island's wharf is Neil Kendra village, with a curving, sandy bay dotted with boats. - Off the southeast coast, the tiny Sir Hugh Rose Island is a sanctuary for turtles. - On 30 December 2018, Prime Minister Narendra Modi announced that Neill Island would be renamed Shaheed Dweep.
Diu	• It is an island off the Southern coast of Gujarat's Kathiawar peninsula, separated from the mainland by a tidal creek. - It has an area of 40 km² and a population of 44,110. - It belongs to Diu District and lies 5 km to the east of Diu Head.

Q68. Answer: (a) non negative numbers

Concept:

Range of a Function:

• The range of a function is the set of all possible output values (f(x)) for the given domain.

• For the function $f(x) = x^2$, where x in R, the output is always a non-negative real number.

• This is because the square of any real number is always greater than or equal to zero.

• Minimum value of f(x) occurs at x = 0, which gives f(0) = 0.

• As x increases or decreases, f(x) increases without any upper limit.

Calculation:

Given,

Function: $f(x) = x^2$

Domain: x in R

=> f(0) = 0 in range

=> For x = ±1, ±2, f(x) = 1, 4, which are > 0

=> f(x) ≥ 0 for all real x

=> So, the range is [0, ∞)

=> f(x) can take any value from 0 to ∞

The range of f(x) is the set of all non-negative real numbers.

Understanding Positive vs Non-negative Real Numbers:

• Positive real numbers are all real numbers greater than zero, i.e., (0, ∞), and do not include 0.

• Non-negative real numbers include all positive real numbers and 0, i.e., [0, ∞).

• The function $f(x) = x^2$ is defined for all real numbers, and it gives an output ≥ 0 for any x in R.

• At x = 0, $f(x) = 0^2 = 0$, which is part of the range.

• Since 0 is not included in positive real numbers, option 3 is incorrect.

• Therefore Option 3 is incorrect because it excludes 0, which is part of the range.

Hence Option 1 is the correct answer

Q69. Answer: (a) France

The correct answer is France.

Key Points

• Yellow Vest Protest:

• France has witnessed four consecutive weekends of demonstrations against fuel tax rises, high living costs, and other issues. Hence, Option 1 is correct.

• The protest became known as the yellow vest or gilets Jaunes movement because protesters took to the streets wearing the high-visibility yellow jackets that are required to be carried in every vehicle by French law.

• The original Yellow Vest protests were dominated by working-class people who were upset over a fuel tax increase and their declining living standards.

• Protests have also erupted over other issues, including calls for higher wages, lower taxes, better pensions, and easier university entry requirements.

• The widely supported movement's core aim is to highlight the economic frustration and political distrust of poorer working families.

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• There are two common themes that unite the yellow vest.

• The first is the concentrated focus against the French state i.e almost all of the protesters agree that the state is not doing enough and has neglected their needs.

• They want the French government to lower fuel taxes, reinstate rural post offices, increase their 'purchasing power', cut property taxes, and hire more doctors for rural clinics.

• The second common theme is their very wide geographical dispersion.

• It is spread out across metropolitan France and even overseas.

Additional Information

France	**• Capital: Paris - President: Emmanuel Macron - Population: 6.74 crores (2020)**
China	• President: Xi Jinping Trending - Capital: Beijing - Population: 140.21 crores (2020) - Currency: Renminbi
Japan	• Currency: Japanese yen - Capital: Tokyo - Prime minister: Fumio Kishida - Population: 12.58 crores (2020)
Russia	• President: Vladimir Putin - Capital: Moscow - Population: 14.41 crores (2020) - Currency: Russian ruble

Q70. Answer: (b) Only Assumption 2 is Implicit

Assumption 1: Engineers are expected to be better performers by company XYZ - There is no such information that Company XYZ expects Engineers to perform better.

Assumption 2: The company XYZ needs a senior consultant - Yes, company XYZ needs a senior consultant and it is clearly mentioned in its advertisement.

Hence, "option 2" is the correct answer.

Q71. Answer: (c) √5 - √3

Given:

√(8-2√15)

Calculation:

√(8-2√15)

=> √(5+3 -2√5√3)

=> √[(√5)²+(√3)² -2√5√3]

=> √(√5-√3)²

=> √5 – √3

Therefore The required value is √5 – √3

Q72. Answer: (d) Literature

The correct answer is Literature.

Key Points

The Swedish Academy

• It is responsible for choosing the Nobel Laureates in Literature. Hence, Option 4 is correct.

• By the terms of Alfred Nobel's will, the Nobel Prize in Literature has been awarded by the Swedish Academy since 1901.

• The Swedish Academy was founded in 1786 by Swedish King Gustav III.

• The Academy is composed of 18 members whose tenure is for life.

• Known as De Anderton (The Eighteen), current members of the Academy include distinguished Swedish writers, linguists, literary scholars, historians, and prominent jurists.

• Its working body is the Nobel Committee, elected from among its members for a three-year term.

Q73. Answer: (a) Piyush Goyal

The correct answer is Piyush Goyal.

Key Points

• Interim Budget 2019

• Piyush Goyal, Minister of Finance, presented the Indian Budget 2019 (Interim Budget 2019-20) on February 1, 2019. Hence, Option 1 is correct.

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• The Indian Budget 2019 is 27.84 lakh crore rupees.

• The expenditure has increased significantly when compared with the Union Budget 2018, where the expenditure figure was 24.42 lakh crore rupees.

• The total revenue expected in the financial year 2019-20 (without considering borrowing) is only Rs. 20.80 lakh crores. As you can see the expenditure (Rs.27.84 lakh crores) is way higher than the receipts (Rs.20.80 lakh crores).

• The Indian government needs to borrow Rs. 7 lakh crore in the financial year 2019-20 to meet its expenditure. Borrowings and other liabilities are known as Fiscal Deficits.

• As per budget 2019, the Fiscal Deficit is 3.4% of Indian GDP.

• Ideally, the Fiscal Deficit should be kept below 3% of GDP.

Additional Information

Piyush Goyal	**• He is a politician and cabinet minister of the Government of India having portfolios such as Minister of Textiles, Minister of Commerce and Industry, and Minister of Consumer Affairs, Food and Public Distribution. - He was elevated to the Cabinet Minister position on 3 September 2017. - He is the Leader of the House in the Rajya Sabha.**
Shiv Pratap Shukla	• He is an Indian politician and was the Minister of State for Finance in the First Modi ministry. - He is a Member of Parliament in the upper house of the Indian Parliament. - He represents the state of Uttar Pradesh.
Manmohan Singh	• He is an Indian economist, academic, and politician who served as the 13th Prime Minister of India from 2004 to 2014. - Currently, he is a Member of Parliament in the Rajya Sabha, representing the state of Rajasthan. - A member of the Indian National Congress, Singh was the first Sikh Prime minister of India.
Arun Jaitley	• He was an Indian politician and attorney. - A member of the Bharatiya Janata Party, Jaitley served as the Minister of Finance and Corporate Affairs of the Government of India from 2014 to 2019.

Q74. Answer: (c) mv

The correct answer is mv.

Key Points

• Momentum:

• The momentum, p of an object is defined as the product of its mass, m, and velocity, V.

• Momentum = Mass x Velocity

• That is, p = mv. Hence, Option 3 is correct.

• Momentum has both direction and magnitude. Its direction is the same as that of velocity, V.

• The SI unit of momentum is a kilogram-meter per second (kg.m.s^(-1)).

• Newton's second law of motion states that the time rate of change of momentum is equal to the force acting on the particle.

Important Points

• Conservation of momentum

• It is the general law of physics according to which the quantity called momentum that characterizes motion never changes in an isolated collection of objects; that is, the total momentum of a system remains constant.

• We can use conservation of momentum to find the change in momentum and using the impulse-momentum equation, we find the force that the block applies to the bullet.

• Some examples of the law of conversation of momentum:

• Air-filled balloons

• System of gun

• bullet Motion of rockets

Additional Information

• The kinetic energy of an object is the energy that it possesses due to its motion.

• It is defined as the work needed to accelerate a body of a given mass from rest to its stated velocity.

• Kinetic energy = 1/2 mv2

• The SI unit of kinetic energy is Joule or kg.m².s ^(-2)

Q75. Answer: (b) French, B

The family tree are given below -

Nationality of A is French and B is the wife of A.

Hence, "French, B" is the correct answer.

Q76. Answer: (d) Dr. Sarvepalli Radhakrishnan

The correct answer is Dr. Sarvepalli Radhakrishnan.

Key PointsRajya Sabha

• It is the Upper House (second house or house of elders).

• It represents the states and union territory of the Indian union.

• Rajya Sabha (first constituted in 1952) is a continuing chamber.

• It is a permanent body and not subject to dissolution.

• The Chairman of the Rajya sabha is the Vice President of India.

• Therefore the first chairman of the Rajya Sabha was Dr. Sarvepalli Radhakrishnan. Hence, Option 4 is correct.

• He was the first Vice president of India.

• Dr. Zakir Hussain was the 3^(rd) president of India (Term of Office: 13 May 1967 to 3 May 1969).

• Varahagiri Venkata Giri was the 4^(th) president of India (Term of Office: 3 May 1969 to 20 July 1969 and 24 August 1969 to 24 August 1974).

• Neelam Sanjiva reddy was the 6^(th) president of India (Term of Office: 25 July 1977 to 25 July 1982).

Additional Information

S. V. Krishnamoorthy Rao	**• He was an Indian Politician belonging to the Indian National Congress. - He was a member of the Upper House of the Indian Parliament the Rajya Sabha from 1952 to 1962.**
Violet Hari Alva	• She was the 1st female Deputy Chairman of the Rajya Sabha.
Ganesh Vasudev Mavalankar	• He is popularly known as Dadasaheb was an independence activist, the President of the Central Legislative Assembly, then-Speaker of the Constituent Assembly of India, and later the first Speaker of the Lok Sabha, the lower house of the Parliament of India.

Q77. Answer: (d) Gorakhpur

The correct answer is Gorakhpur.

Key Points

• The Gorakhpur Haryana atomic power project

• It is also known as the Gorakhpur Haryana Anu Vidyut Pariyojana (GHAVP), which is located at Gorakhpur, in Fatehabad district, Haryana, India. Hence, Option 4 is correct.

• The power station is planned to be developed with four indigenously developed 700MW pressurized heavy water reactor (PHWR) units by the state-owned Nuclear Power Corporation of India (NPCIL).

• The £2.26bn ($2.9bn) project is being developed in two phases with each phase comprising two reactors.

• Although the environmental clearance for the project was issued in 2013 and the foundation stone was laid in January 2014, the development suffered delays due to local opposition and a long land acquisition process.

• The foundation stone of the 2800 Megawatt nuclear power plant was laid on 13 January 2014.

Important Points

• India’s Nuclear Energy Program

• India has consciously proceeded to explore the possibility of tapping nuclear energy for power generation. In this direction three-stage, nuclear power program was formulated by Homi Bhabha in the 1950s.

• Atomic Energy Act, 1962 was framed and implemented with the set objectives of using two naturally occurring elements Uranium and Thorium having good potential to be utilized as nuclear fuel in Indian Nuclear Power Reactors.

• The estimated natural deposits of Uranium are about 70,000 tonnes and Thorium is about 3, 60,000 tonnes in the country.

Additional Information

Nuclear Power plants in Operation	Nuclear Power Plants under Construction	Planned Nuclear Power Plants

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• Rawatbhata (Rajasthan) - Tarapur (Maharashtra) - Kudankulam (Tamil Nadu) - Kakrapar (Gujarat) - Kalpakkam (Tamil Nadu) - Narora (Uttar Pradesh) - Kaiga (Karnataka)	• Kakrapar 3&4 (Gujarat) - Rawatbhata (Rajasthan) - Kudankulam 3&4 (Tamil Nadu) - Kalpakkam PFBR (Tamil Nadu)	• Jaitapur (Maharashtra) - Kovvada (Andhra Pradesh) - Mithi Virdi (Gujarat) - Haripur (West Bengal) - Gorakhpur (Haryana) - Bhimpur (Madhya Pradesh) - Mahi Banswara (Rajasthan) - Kaiga (Karnataka) - Chutka (Madhya Pradesh) - Tarapur (Maharashtra)

Q78. Answer: (c) Surendra Nath Banerjee

The correct answer is Surendra Nath Banerjee.

Key Points

• The Congress split into two parts - Moderates and Extremists in the year 1907 at the Surat Session of Congress, which was also popularly known as 'Surat Split'.

• Extremists are not satisfied with the methods and achievements of moderates.

• They were three groups of extremists. They are the Maharashtrian group led by Bal Gangadhar Tilak, the Bengal group led by Bipin Chandra Pal and Aurobindo Ghosh, and the Punjab group led by Lala Lajpat Rai.

• The most prominent leaders of the Extremists were Bal Gangadhar Tilak, Lala Lajpat Rai, and Bipin Chandra Pal, who are known collectively as the Lal-Bal-Pal trio.

Important Points

• Surendra Nath Banerjee

• He was among the earliest political leaders during British rule.

• He was the moderate leader of the Indian National Congress. Hence, Option 3 is correct.

• Also called ‘Rashtraguru’ and ‘Indian Burke’.

• Founded newspaper ‘The Bengalee’.

• He founded the Indian National Association, a Nationalist organization through which he led two sessions of the Indian National Congress in 1883 and 1885.

• Later on, he became the senior member of the Indian National Congress and was among the founding members of it.

• He was the second Indian to qualify Indian civil service examination in 1869 but was removed from it claiming that he has misrepresented his age.

• He again cleared the examination in 1871 and got posted as an Assistant Magistrate in Sylhet, but he was soon dismissed due to a serious judicial error.

Additional Information

• Bipin Chandra Pal

• Bipin Chandra Pal was one of the most prominent leaders of the Extremists.

• The Bengal group of extremists led by Bipin Chandra Pal and Aurobindo Ghosh.

• He was awarded the title 'Mightiest Prophets of Nationalism’ by Aurobindo Ghosh.

• He supported the Swadeshi Movement.

• He started the newspaper Swaraj, Paridaashak, Public Opinion and Tribune, Hindu Review, Independent, Democrat.

• Bal Gangadhar Tilak

• He was an Indian nationalist and an independence activist mentioned as the first leader of the Indian Independence Movement The British colonial authorities called him “The father of the Indian unrest.”

• He was also conferred with the title of “Lokmanya“, which means “accepted by the people (as their leader)”. Mahatma Gandhi called him “The Maker of Modern India“. Tilak was one of the first and strongest advocates of Swaraj.

• He is known for his quote in Marathi: “Swarajya is my birthright and I shall have it!”.

• He formed a close alliance with many Indian National Congress leaders including Bipin Chandra Pal, Lala Lajpat Rai, Aurobindo Ghose, V. O. Chidambaram Pillai, and Muhammad Ali Jinnah.

• He started the Deccan Educational Society with college batchmates, Vishnu Shastry Chiplunkar and Gopal Ganesh Agarkar to inspire nationalist education among Indian students.

• Parallel to his teaching activities, Tilak founded two newspapers ‘Kesari’ in Marathi and ‘Mahratta’ in English.

• Sri Aurobindo

• He was one of the first Indians educated in England.

• He was a poet, thinker, freedom fighter, yogi, and spiritual leader. He was born on 15 August 1872 in Kolkata, West Bengal.

• He propounded a philosophy of divine life on earth and founded an ashram in Puducherry.

• His epic poem Savitri is one of his greatest works him.

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• His participation in the Indian freedom struggle against the British gave him popularity and gradually evolved to become a spiritual and yogic guru.

• He came up with a new path of spirituality known as 'integral yoga'.

• The main objective of his teachings was to increase the level of consciousness of people and to be aware people of their true selves.

• He had written several books focused on Indian culture, socio-political development of the country, spirituality, etc.

Q79. Answer: (a) 144

Calculation:

LCM of (48, 144) = 2 × 2 × 2 × 2 × 3 × 3

=> 144

Therefore The LCM of (48, 144) is 144

Q80. Answer: (c) Docile : submissive

The logic followed here is:

In option 1, Stringent means "very strict" and flexible means "able to bend or move easily without breaking". So both are antonyms to each other.

In option 2, Steadfast means "faithful and loyal" and irresolute means "uncertain how to act or proceed". So both are antonyms to each other.

In option 3, Docile means "quiet and easy to control" and submissive means "ready to obey other people". So both are synonyms to each other. This is different from others.

In option 4, Monotonous means "never changing and therefore boring" and exciting means "causing strong feelings of pleasure and interest". So both are antonyms to each other.

Hence, "option 3" is the correct answer.

Q81. Answer: (d) 126

The logic followed here is:

(The sum of place value of 1st and 2nd letter) × place value of third letter = number code.

MAD = 56

(13 + 1) × 4 = 14 × 4 = 56

CAT = 80

(3 + 1) × 20 = 4 × 20 = 80

Similarly,

DEN = ?

(4 + 5) × 14 = 9 × 14 = 126

Hence, the correct answer is "126".

Q82. Answer: (d) a, b and c

The correct answer is a, b and c.

Key Points

• The Indian states that share borders with Pakistan are Jammu and Kashmir, Rajasthan, Gujarat, and Punjab. Hence, Option 4 is correct.

• The total length of the India-Pakistan border is 3,323 km. Third highest after Bangladesh, and China's border length).

• The Indian state, Jammu and Kashmir, shares the longest border with Pakistan, which has a length of 1222 km.

• International border shared between Indian states and Pakistan

• Gujarat: 506 Km border.

• Rajasthan: 1170 Km border

• Punjab: 425 km

• Jammu and Kashmir, and Ladakh: 1222 km

Additional Information

• The borders of Pakistan were drawn on August 17, 1947, two days after the partition.

• Sir Cyril Radcliffe set the boundaries for a newly independent Pakistan

• The Radcliffe Line was officially announced on August 17, 1947, a few days after the independence of India and Pakistan

• India has 15,106.7 Km of land border and a coastline of 7,516.6 Km including island territories.

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Q83. Answer: (c) mail 1 and & check me Let

The pattern followed here is:

Given:

Similarly,

For "Let 1 mail & check me and":

Thus this statement "mail 1 and & check me Let" will be the step 4.

Hence, the correct answer is "Option 3".

Q84. Answer: (b) Andromeda galaxy

The correct answer is the Andromeda galaxy.

Key Points

• The Andromeda Galaxy

• It is also known as Messier 31, is a spiral galaxy approximately 2.5 million light-years from Earth.

• It is the nearest major galaxy to the Milky. Hence, Option 2 is correct.

• It received its name from the area of the sky in which it appears i.e the constellation of Andromeda.

• It is the largest galaxy of the Local Group, which also contains the Milky Way, the Triangulum Galaxy, and other smaller galaxies.

• Despite earlier findings that suggested that the Milky Way contains more

• It is visible to the naked eye on moonless nights.

• It is currently approaching our galaxy at a speed of about 110 kilometers per second.

• In roughly 4 billion years, the Andromeda Galaxy is expected to merge without its own, forming a single, super-galaxy.

Additional Information

The Pinwheel Galaxy	**• It is a face-on spiral galaxy 21 million light-years away from Earth in the constellation Ursa Major. - It was discovered by Pierre Méchain in 1781 and was communicated that year to Charles Messier, who verified its position for inclusion in the Messier Catalogue as one of its final entries.**
Dwarf galaxy	• It is the most abundant type of galaxy in the universe but is difficult to detect due to its low luminosity, low mass, and small size. - They are most commonly found in galaxy clusters, often as companions to larger galaxies, and are classified into three main types: Dwarf Elliptical galaxies, Dwarf Spheroidal galaxies, and Dwarf Irregular galaxies.
Sunflower galaxy	• Messier 63 or M63, also known as NGC 5055 or the seldom-used Sunflower Galaxy, is a spiral galaxy in the northern constellation of Canes Venatici with approximately 400 billion stars.

Q85. Answer: (a) 512 cm³

Given:

The space diagonal of a cube = 8√3 cm

Formula used:

Diagonal of cube = √3a

Volume of cube = a^3

Calculation:

According to the question

=> √3a = 8√3 cm

=> a = 8 cm

Now,

Volume of the cube = $(8)^3$

=> 8 × 8 × 8 = 512 cm^3

Therefore The volume of the cube is 512 cm^3

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Q86. Answer: (c) 24

Calculation:

The total number of inter-state competitions = 200

Number of inter-state sports competitions in 2015 = 2%

=> (200 × 2/100) = 4

Number of inter-state sports competitions in 2016 = 14%

=> (200 × 14/100) = 28

The difference in the number of inter-state sports competitions in 2015 and that in 2016 = (28 – 4)

=> 24

Therefore Required difference is 24

Q87. Answer: (b) 275

Calculation:

Total number of students who appeared in the XYZ exam in the year 2012 = (500 + 300 + 200 + 100)

=> 1100

Average number of students who appeared in the XYZ exam in the year 2012 = (1100/4)

=> 275

Therefore Required average is 275

Q88. Answer: (c) 152

Calculation:

The total number of inter-state sports competitions = 200

Number of inter-state sports competitions held in 2012 = 22%

=> (200 × 22/100) = 44

Number of inter-state sports competitions held in 2013 = 20%

=> (200 × 20/100) = 40

Number of inter-state sports competitions held in 2017 = 16%

=> (200 × 16/100)

=> 32

Number of inter-state sports competitions held in 2018 = 18%

=> (20 × 18/100)

=> 36

The total number of inter-state sports competitions held in 2012, 2013, 2017 and 2018 = (44 + 40 + 32 + 36)

=> 152

Therefore Required number is 152

Q89. Answer: (d) 80 : 63

Calculation:

The ratio of number of car A and car B in 2012 = 17 : 16

The production of car A in 2012 = 850

Let the ratio of number of car A and car B be 17x and 16x respectively

=> 17x = 850

=> x = 50

The production of car B = 16x = 16 × 50 = 800

The number of car A manufactured in 2014 = 630

Required ratio = (800 : 630)

=> 80 : 63

Therefore The ratio of number of Car B manufactured in 2012 to the number of Car A manufactured in 2014 is 80 : 63

Q90. Answer: (b) Both course of action 1 and course of action 2 follow.

The first course of action follows because the Delhi government should initiate more water conservation projects because of the shortage of water in Delhi during summer. Due to this water shortage issue will be resolved.

The second course of action follows because the government should encourage rain water harvesting in all new and existing

residential complexes because of the shortage of water in Delhi during summer. Due to this water shortage issue will be resolved.

Hence, "option 2" is the correct answer.

Q91. Answer: (b) Millennium

The logic followed here is:

Decade is the period of ten years. So, ten is related to decade.

Similarly,

Millennium is the period of thousand years. So, thousand is related to millennium.

Hence, "Millennium" is the correct answer.

Q92. Answer: (d) FHKO

The logic followed here is:

From option 1 -

This option is not follow the letters skipped between adjacent letters in the order 1, 2, 3.

From option 2 -

This option is not follow the letters skipped between adjacent letters in the order 1, 2, 3.

From option 3-

This option is not follow the letters skipped between adjacent letters in the order 1, 2, 3.

From option 4 -

This option is the letters skipped between adjacent letters in the order 1, 2, 3.

Hence, "option 4" is the correct answer.

Q93. Answer: (c) Only Conclusion A follows

In conclusion A, it says that it has become difficult for countries to control terrorism these days. This is evident from the part "no country is free". So conclusion A follows the statement.

In the conclusion B says that the countries and their people in general have become lazy which does not follow the statement because there is no information about people of the country in the statement. So conclusion B is not follow the statement.

Hence, "option 3" is the correct answer.

Q94. Answer: (c) Yellow toy

Colour : Purple, Pink, White, Yellow, Red and Grey.

Purple toy is at the even position but not at the top. Red toy is not adjacent to white or yellow toy. Grey toy is at 5th position.

There are two toys between pink and white toy where pink toy is above the white one. White toy is not at the bottommost position.

The figure are shown below -

Hence, "option 3" is the correct answer.

Q95. Answer: (a) 5/10

The logic followed here is:

From option 2, 3 and 4 the given value are 11/13, 1/3 and 2/3 respectively which are infinite decimal, after the decimal point, the digits go on forever and ever but in option 1 5/10 is the finite decimal and gives 0.5 which are different from others.

Hence, "option 1" is the correct answer.

Q96. Answer: (c) 9.5

Given that 5P6S3M4D8

Putting the symbol meaning we get -

$5 + 6 - 3 \times 4 \div 8$

Apply BODMAS -

$5 + 6 - 3 \times 0.5$

$5 + 6 - 1.5$

$11 - 1.5$

9.5

Hence, "9.5" is the correct answer.

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Q97. Answer: (d) Maternal uncle

The family tree are given below -

Pradeep is the maternal Uncle of Vishal.

Hence, "Maternal Uncle" is the correct answer.

Q98. Answer: (d) Sodium

The logic followed here is:

Neon, Argon and Helium are the noble gases or inert gases but sodium is an alkali metal.

So, Sodium is different from other.

Hence, "Sodium" is the correct answer.

Q99. Answer: (a) 30

Total number of students = 47

Anurag's roll number from the end = 18

Anurag's roll number from the beginning = Total number of students - Anurag's roll number from the end + 1

Anurag's roll number from the beginning = 47 - 18 + 1

= 48 - 18

Anurag's roll number from the beginning = 30

Hence, "30" is the correct answer.

Q100. Answer: (c) Neither conclusion 1 nor conclusion 2 follow

First conclusion says that the same fine is charged for littering offence everywhere but in the statement says that don't throw garbage where non littering sign present. So the first conclusion not follow the statement.

In the second conclusion this warning is written at every public place or non-littering zone but in the statement warning is written in particular place not for everywhere. So the second conclusion not follow the statement.

So neither conclusion 1 nor conclusion 2 follow.

Hence, "option 3" is the correct answer.

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