PART-A
GENERAL INTELLIGENCE & REASONING

Directions (1 – 3) : In the following qusetions select the related letters/word/ number from the given alternatives.

1. Eye : Ophthalmologist : : Music :
   (1) Player
   (2) Conductor
   (3) Pianist
   (4) Composer

2. D : B : : I : C : : P : D : : ?
   (1) Y : E
   (2) X : E
   (3) Y : D
   (4) Z : E

3. 01 : 08 : : 16 : ?
   (1) 125
   (2) 25
   (3) 27
   (4) 64

Directions (4 – 5) : In the following questions, find the odd letters/words/number pair from the given alternatives.

4. (1) EHIK
   (2) LNOQ
   (3) TWXZ
   (4) ADEG

5. (1) Across : Along
   (2) Small : Large
   (3) Day : Night
   (4) Up : Down

6. In the following letter series, how many B C N occur in such a way, that C is in the middle and B and N are on any one side?
   BCMXNCXNBXNCBNCB
   YBCXNBCNABONMZCB
   (1) 5
   (2) 3
   (3) 4
   (4) 2

7. Which one of the given responses would be a meaningful order of the following in ascending order?
   1. Sending 2. Encoding
   3. Receiving 4. Decoding
   (1) 1, 2, 3, 4 (2) 2, 1, 3, 4
   (3) 2, 4, 3, 1 (4) 4, 2, 1, 3

Directions (8-9) : In the following questions, a series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.

8. DKY, FJW, HIU, JHS, ?
   (1) KGR
   (2) KFR
   (2) LFQ
   (4) LGQ

9. 7, 8, 11, 16, 23, ?
   (1) 37
   (2) 40
   (3) 31
   (4) 32

10. If DISC is coded as 8749 and ACHE is coded as 3950, then HEAD is coded as
   (1) 3508
   (2) 3805
   (3) 5038
   (4) 5308

11. Barun is taller than Sanjay. Bipul is taller than Barun. Krishna is also not as tall as Bipul, but is taller than Barun. Who is the tallest?
   (1) Krishna
   (2) Sanjay
   (3) Barun
   (4) Bipul

12. Sunita is the 11th from either end of a row of girls. How many girls are there in that row?
   (1) 21
   (2) 22
   (3) 19
   (4) 20

13. Some capital letters are given below in the first line and numbers are assigned to each of them in the second line. The numbers are the codes for the letters and vice-versa.

M	O	E	A	S	J	T	Z
3	5	7	6	2	9	4	0

Choose the correct number code for the given set of letters.

   E A S T
   (1) 7624
   (2) 7625
   (3) 7620
   (4) 7623

14. From the given alternatives select the word which cannot be formed using the letters the given word.
   PUNISHMENT
   (1) PUSH
   (2) NAME
   (3) MINT
   (4) PEST

Directions (15–16) : In the following questions, select the missing number from the given responses.

15. 63   7   9
    30   5   6
    20   4   ?
   (1) 5
   (2) 2
   (3) 8
   (4) 3

16. 24   25   50
    24   20   10
    4   9   3
    12   5   ?
   (1) 20
   (2) 5
   (3) 10
   (4) 15

17. One morning Meena started walking towards the Sun. After walking a while she turned towards her left and again towards her left. After walking a while, she turned left. In which direction is she facing now?
   (1) West
   (2) South
   (3) North
   (4) East

18. Select the correct combination of mathematical signs to replace '*' signs and to balance the given equation.
   24 * 34 * 2 * 5 * 12
   (1) = ÷ − +
   (2) + + = ×
   (3) + ÷ × =
   (4) = ÷ + −

19. At a birthday party, 5 friends are sitting in a row. 'M' is to the left of 'O' and to the right of 'P'. 'S' is sitting to the right of 'T', but to the left of 'P'. Who is sitting in the middle?
   (1) P
   (2) S
   (3) M
   (4) O

Which of the conclusions can be drawn from the given statements?

Statements :

All the students in my class are intelligent.

Kaushik is not intelligent.

(1) Kaushik is not a student of my class.

(2) All other than Kaushik are intelligent.

(3) Some students are not intelligent.

(4) Non-intelligent are not students.

Direction : In the following question, a word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as in two matrices given below. The columns and rows of Matrix I are numbered from 0 to 4 and that of **Matrix II** are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, e.g. 'E' can be represented by 01, 13, etc. and 'L' can be represented by 56, etc. Similarly, you have to identify the set for the word given in each question.

LANE

MATRIX – I

	0	1	2	3	4
0	Z	M	S	R	C
1	J	L	D	B	G
2	M	B	C	M	H
3	R	L	N	S	I
4	B	D	M	R	J

MATRIX – II

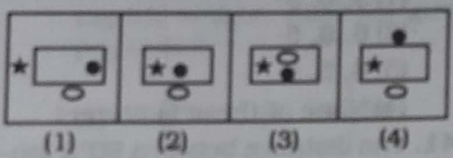|	5	6	7	8	9
5	X	K	T	E	S
6	Q	A	U	Y	P
7	U	V	O	W	E
8	Y	Y	A	E	U
9	X	O	E	V	A

(1) 11, 66, 33, 96

(2) 11, 67, 32, 97

(3) 31, 87, 32, 97

(4) 31, 66, 33, 97

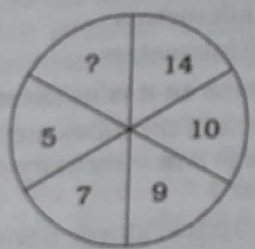**22.** Select the related figure from the given alternatives.

Question Figures :

Answer Figures :
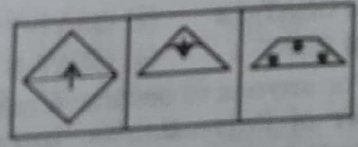

(1)   (2)   (3)   (4)
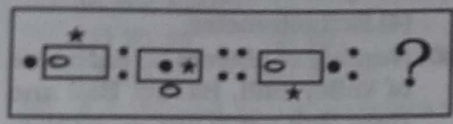
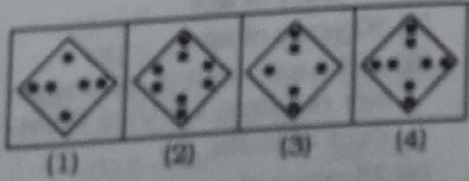**23.** Select the missing number from the given responses.

(1) 4   (2) 18

(3) 2   (4) 3

24. A piece of paper is folded and cut/punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.
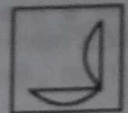
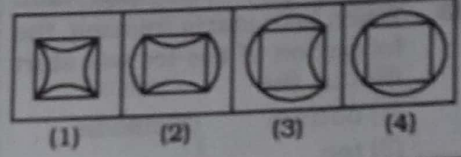**Question Figures :**

Answer Figures :

(1)   (2)   (3)   (4)

25. From the given answer figures, select the one in which the question figure is hidden/embedded.

Question Figure :

Answer Figures :

(1)   (2)   (3)   (4)

PART-B
GENERAL AWARENESS

26. Water gas is the combination of

(1) CO and H_2

(2) CO_2 and H_2

(3) CO and H_2O

(4) CO_2 and CO

27. Which of the following countries is not an exporter of tea?

(1) United Kingdom

(2) Sri Lanka

(3) India

(4) Kenya

28. Which of the following leader never became the president of Indian National Congress?

(1) Dadabhai Naoroji

(2) J. L. Nehru

(3) Motilal Nehru

(4) Bal Gangadhar Tilak

29. Pachmarhi biosphere reserve is in

(1) Andhra Pradesh

(2) Arunachal Pradesh

(3) Himachal Pradesh

(4) Madhya Pradesh

30. January 1 is observed as

(1) Global Family day

(2) World red cross day

(3) World telecommunication day

(4) Commonwealth day

31. 'Amrita Pritam's work "A Revenue Stamp" is

(1) A book of stories

(2) A novel

(3) A biography

(4) An autobiography

32. The sea coast of which one of the following states has become famous as a nesting place for the Giant olive Ridley turtles from South America ?
    (1) Goa   (2) Gujarat
    (3) Odisha   (4) Tamil Nadu

33. When lake starts freezing, the formation of the ice will start first at the
    (1) bottom   (2) middle
    (3) top
    (4) None of these

34. Which of the following types of light are strongly aborted by plants ?
    (1) violet and orange
    (2) blue and red
    (3) Indigo and yellow
    (4) yellow and violet

35. What is the web search Engine ?
    (1) It is an engine to download songs and movie from a particular website
    (2) It is an engine designed to look out for the information in internet
    (3) It is an engine designed to extract confidential information like password, account-ID through internet
    (4) Both 'A' and 'C'

36. The famous player Pele is associated with which of the following games ?
    (1) Table Tennis
    (2) Football
    (3) Hockey
    (4) Volleyball

37. A Mughal Queen whose name was written on all the Mughal Firmans and inscribed on the coins was
    (1) Maham Anana
    (2) Nurjahan
    (3) Mumtaz Mahal
    (4) Mariam Makani

38. The depletion of ozone layer in the upper atmosphere is mainly due to the emission of:
    (1) Un-burnt Hydrocarbons
    (2) Chlorofluro-carbons
    (3) Greenhouse Gases
    (4) Ultraviolet Radiations

39. Which instrument is used for measurement of angular distances between two objects ?
    (1) Sexant
    (2) Telstar
    (3) Spherometer
    (4) Refractometer

40. Number of players on each side of Volley Ball, Basket Ball and Base Ball game are respectively:
    (1) 5, 6, 9
    (2) 6, 9, 5
    (3) 6, 5, 9
    (4) None of these is correct

41. The distance between 90°E longitude and 91° E longitude at the poles is:
    (1) Zero kilometre
    (2) 5 kilometres
    (3) 50 kilometres
    (4) Same as it is at the equator

42. Which of the following is used as a primary memory of computer ?
    (1) Optical storge device
    (2) Magnetic storage device
    (3) RAM
    (4) Magneto-Optical storage device

43. Who regulates credit rating agencies in India?
    (1) IRDA   (2) RBI
    (3) SEBI   (4) SBI

44. India's first dedicated military satellite
    (1) GSAT–12   (2) GSAT–7
    (3) GSAT–1   (4) GSAT–8

45. For anyone to become a member of Rajya Sabha, he/she must be at least:
    (1) 35 years of age
    (2) 30 years of age
    (3) of the age what is minimum age required for Vice President of India
    (4) 25 years of age

46. Primary deficit is equal to:
    (1) Fiscal deficit — Interest payments
    (2) Budget deficit — Inter payments
    (3) Revenue deficit — Inter payments
    (4) None of these

47. Article 243 B(1) of the constitution provides for constitution of Panchayat in every state. The level of Panchayats referred under this is:
    (1) Village and District level
    (2) Village, Intermediate and District Level
    (3) Village level only
    (4) District level only

48. Name one famous poet of Delhi Sultanate who was adorned with title of "The Parrot of Hindustan":
    (1) Zia-Uddin Barani
    (2) Utbi   (3) Alberuni
    (4) Amir Khusro

49. These oceanic resources belong to open ocean and no individual country can utilize them without the concurrence of international institutions:
    (1) Beyond 200 nautical miles of exclusive economic zone
    (2) Beyond 100 nautical miles of exclusive economic zone
    (3) Beyond 19.2 nautical miles of exclusive economic zone
    (4) Beyond 12 nautical miles exclusive economic zone

50. Nearly how many Kilograms manganese is required to manufacture one tonne of steel?
    (1) 10 kgs   (2) 20 Kgs
    (3) 50 Kgs   (4) 100 kgs

PART-C
QUANTITATIVE APTITUDE

51. The two banks of a canal straight and parallel. A, B are three persons of whom A stands on one bank and B and C on the opposite banks. A finds the angle ABC is 30° while C finds that the angle ACB 60°. If B and C are 100 metres apart, the breadth of the canal is

(1) $\dfrac{25}{\sqrt{3}}$ metres

(2) $20\sqrt{3}$ metres

(3) $25\sqrt{3}$ metres

(4) $\dfrac{20}{\sqrt{3}}$ metres

52. If the height of a pole is $2\sqrt{3}$ metre and the length of its shadow is 2 metre, then the angle of elevation of the sun is

(1) 90°   (2) 45°

(3) 30°   (4) 60°

53. In a $\triangle ABC$, if $\angle A = 120°$ and $AB = AC$, then $\angle B$ is equal to

(1) 35°   (2) 60°

(3) 30°   (4) 80°

54. If $\tan\theta - 3\sin\theta = 0$ then what will be the value of $\sin^3\theta - \cos^3\theta -$

(1) $\dfrac{1}{9}\left(16\sqrt{2}+1\right)$

(2) $\dfrac{1}{27}\left(16\sqrt{2}-1\right)$

(3) $\dfrac{1}{9}\left(16\sqrt{2}-1\right)$

(4) $\dfrac{1}{27}\left(16\sqrt{2}+1\right)a$

55. $\dfrac{(0.87)^4 - (0.13)^4}{0.87\times0.87 + 0.13\times0.13} = ?$

(1) 1   (2) 0.87

(3) 0.13   (4) 0.74

56. If $2x + 3y = 13$ and $xy = 6$ then the value of $8x^3 + 27y^3$ will be

(1) 799   (2) 797

(3) 795   (4) 793

57. $\left(1-\dfrac{1}{3}\right)\left(1-\dfrac{1}{4}\right)\left(1-\dfrac{1}{5}\right)....\left(1-\dfrac{1}{n}\right) = ?$

(1) $\dfrac{1}{n}$ (2) $\dfrac{3}{n}$

(3) $\dfrac{2}{n}$ (4) $\dfrac{n-1}{3}$

58. If $a^2 + b^2 + c^2 - ab - bc - ca = 0$ then

(1) $a \neq b \neq c$ (2) $a = b = c$

(3) $a \neq b = c$ (4) $a \neq b \neq c$

59. From a cask of milk, containing 40 litres, 8 litres are drawn out and the cask is filled up with water. If the same process is repeated a second then a third time, what will be the number of litres of milk left in the cask :

(1) 20.48   (2) 20

(3) 19.48   (4) 21.58

60. A dishonest dealer professes to sell his goods at C.P. but uses a weight of 875 grams for a kilogram weight. Find his gain per cent ?

(1) $14\dfrac{2}{7}\%$ (2) $14\dfrac{1}{7}\%$

(3) $12\dfrac{1}{7}\%$ (4) $12\dfrac{2}{7}\%$

61. A circus artist is climbing from the ground along a rope stretched from the top of a vertical pole and tied at the ground. The height of the pole is 12 m and the angle made by the rope with ground level is 30°. The distance covered by the artist in climbing to the top of pole is

(1) $12\sqrt{2}$ m.   (2) 12 m.

(3) 24 m.   (4) 18 m.

62. Evalulate : $\left(\dfrac{243}{32}\right)^{-\frac{4}{5}}\times\left(\dfrac{3}{2}\right)^4$

(1) 1   (2) $\dfrac{16}{81}$

(3) $\dfrac{1}{81}$ (4) 16

63. The value of

$\sqrt{20+\sqrt{20+\sqrt{20+.....\infty}}}$ is :

(1) 4   (2) 3

(3) 5   (4) 0

64. If $\cos 40° = a$, then value of $\cos 100°$ will be–

(1) $1 - 2a^2$ (2) $2a^2 - 1$

(3) $2a^2 + 1$ (4) $2a^2$

65. $\sec 50°.\sin 40° + \cos 40°.\operatorname{cosec} 50° = ?$

(1) 2   (2) 0

(3) 1   (4) $\sqrt{3}$

66. A's income is $6\dfrac{1}{4}\%$ more than B's. B's income is less than A's by :

(1) $6\dfrac{1}{3}\%$ (2) $5\dfrac{17}{19}\%$

(3) 6%   (4) $5\dfrac{15}{17}\%$

67. If $x = \dfrac{1}{4+\sqrt{3}}$ and $y = \dfrac{1}{4-\sqrt{3}}$, then value of $\dfrac{1}{x+1} - \dfrac{1}{y-1}$ will be

(1) $\dfrac{\sqrt{2}}{5}$ (2) $\dfrac{\sqrt{3}}{11}$

(3) $\dfrac{\sqrt{2}}{11}$ (4) $\dfrac{\sqrt{3}}{4}$

68. The length of a rectangle is increased by 40% and its breadth is decreased by 30%. The change in the area of the rectangle is :

(1) 2% increase

(2) 2% decrease

(3) 4% decrease

(4) 5% increase

69. If either 3 men or 4 women can do a piece of work in 43 days, 7 men and 5 women working together can do the work twice as great in :

(1) 36 days   (2) 24 days

(3) 28 days   (4) 32 days

70. If a man can walk to a place in $4\dfrac{3}{4}$ hrs. walking at $3\dfrac{1}{4}$ km/hr. How long would it take an other man walking at $3\dfrac{1}{6}$ km/hr. to walk there and back :

(1) $9\dfrac{1}{4}$ hrs.   (2) $9\dfrac{3}{4}$ hrs.

(3) $9\dfrac{2}{3}$ hrs.   (4) $9\dfrac{1}{3}$ hrs.

71. If $\sin^2 x - \cos^2 x = \cot^2 y$ is true, then $\sin^2 y - \cos^2 y = \cot^2 x$ will

lso be true. This statement-

1) is always true

2) is always false

3) cannot be determined

4) fact are incomplete

A merchant has 100 kg. of sugar, part of which he sells at 7% profit and the rest at 17% profit. If he gains 10% on the whole, the amount sold at 7% profit is :

(1) 40 kg. (2) 35 kg.

(3) 70 kg. (4) 60 kg.

. A takes $7\frac{1}{2}$ hrs. and B 6 hours to walk round a circular track. If they start together in opposite directions, they will meet after :

(1) $2\frac{2}{3}$ hrs. 2) $3\frac{1}{3}$ hrs.

(3) $2\frac{1}{3}$ hrs.

(4) None of these

4. If 16 is divided into two parts so that twice the square of larger part is 164 more than the square of smaller part, then the value of larger part will be

(1) 6 (2) 8

(3) 10 (4) 12

75. A, B and C together can do a work in 3 days. If A or B alone can do the work in 8 days, then how long will take C along to do the same work ?

(1) 7 days (2) 6 days

(3) 12 days (4) 18 days

PART-D

ENGLISH COMPREHENSION

Directions (76–80) : You have a brief passage with five questions following passage. Read the passage carefully and choose the best answer to each question out of the four alternatives.

Passage

Long ago men spent most of their time looking for food. They ate anything they could find. Some lived

mostly on plants. They ate the fruit, stems, and leaves of some plants and the roots of others. When food was scarce, they ate the bark of trees. If they were lucky, they would find a bird's nest with eggs. People who lived near the water ate fish or anything that washed ashore, even rotten whales. Some people also ate insects and small animals like lizards that were easy to kill.

Later, men learned to make weapons. With weapons, they could kill larger animals for meat. These early people had big appetites. If they killed an animal, they would drink the blood, eat the meat, and chew the bones. When they finished the meal, there was nothing left.

At first men wandered from place to place to find their food. But when they began to grow plants, they stayed in one place and ate what they could grow. They tamed animals, trained them to work, and killed them for meat. Life was a little better then, but there was still not much variety in their meals. Day after day people ate the same foods.

Gradually men began to travel greater distances. The explorers who sailed unknown seas found new lands. And in these lands they found new foods and spices and took them back home.

The Portuguese who sailed around the stormy Cape of Good Hope to reach China took back "Chinese apples", the fruit we call oranges today. Later, Portuguese colonists carried orange seeds to Brazil. From Brazil oranges were brought to California, the first place to grow oranges in the United States. Peaches and melons also came from China. So did a new drink, tea.

76. What did men eat if there was shortage of food ?

(1) Rotten whales

(2) The bark of trees

(3) The root of trees

(4) A bird's nest with eggs

77. If men tamed animals, they made the animals ____ for them.

(1) race (2) search

(3) work (4) hunt

78. Where did oranges come from?

(1) Brazil (2) China

(3) U.S.A. (4) Portugal

79. What difference did weapons make in the kinds of food men ate ?

(1) With weapons, they could kill animals

(2) With weapons, they could kill both birds and animals for meat

(3) With weapon, they could kill all kinds of animals for meat

(4) With weapons, they could kill larger animals for meat

80. Which of the following statements is *not* true ?

(1) The Portuguese colonists carried orange seeds to Brazil.

(2) Oranges grow in California, in the United States.

(3) Explorers took back home new foods and spices.

(4) Peaches, melons, oranges, tea and spices came from China.

Directions (81-82) : In the following questions, some of the sentences have errors and some have none. Find out which part of a sentence has an error. The number of that part is your answer. If there is no error, the answer is (4) i.e. No error.

81. Standing at (1)/ the top of the hill, (2)/ the houses below were hardly visible. (3)/ No error (4).

82. Kambli is one of the players (1)/ who has been selected (2)/ for the test match. (3)/ No error (4).

Directions (83–85) : In the following questions, out of the four alternatives, choose the one which expresses the **right meaning** of the given word.

83. **BRAVADO**

(1) commotion

(2) pretence

(3) complaint (4) bravery

84. **DISGRUNTLED**

(1) rowdy (2) annoyed

(3) compulsory

(4) rude

85. **DESULTORY**

(1) artful (2) fanciful

(3) disorderly (4) playful

Directions (86–87) : In the following questions, out of the four alternatives choose the word **opposite** in meaning to the given word.

86. **ACCUSTOMED**

(1) pernicious (2) imprudent

(3) worried (4) unusual

87. **VARIETY**

(1) appraisal

(2) uniformity

(3) elucidation

(4) advocacy

Directions (88–90) : In the following questions, sentences have been given with blanks to be filled in with an appropriate and suitable word. Four alternatives have been suggested for each question. Choose the correct alternative out of the four.

88. The new India that Nehru led called itself a sovereign ____ Democratic Republic.

(1) capitalist (2) revisionist

(3) populist (4) socialist

89. ____ you work hard, you won't be able to clear even the preliminaries.

(1) If

(3) Unless (2) Until

(4) Lest

90. Last year our company made a ____ of several lakhs of rupees.

(1) profit

(3) rise (2) gain

(4) raise

Directions (91–92) : In the following questions, four alternatives are given for the **bold** idiom/phrase. Choose the alternative which best expresses the meaning of the **bold** idiom/phrase.

91. The village headman pretends to be **a good samaritan.**

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(1) commotion
(2) pretence
(3) complaint (4) bravery

DISGRUNTLED

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91. The village headman pretends to be a **good samaritan**.

(1) a religious person
(2) a helpful person
(3) a citizen of Samaria
(4) a law-abiding citizen

92. The beleaguered politician was anxious to **set the record straight**.

(1) give a speech
(2) win party support
(3) give a correct account
(4) make a confession

Directions (93–95) : In the following questions, out of the four alternatives, choose the one which can be substituted for the given words/sentence

93. Something which cannot be believed

(1) Inevitable (2) Ineffable
(3) Incredible (4) Ineluctable

94. Body of a human being or animal embalmed for burial

(1) Corpse (2) Mummy
(3) Morgue (4) Mortuary

95. Of very bad morals; characterised by debasement or degeneration.

(1) Desultory (2) Dilapidated
(3) Depraved (4) Dilatory

Directions (96-97) : In the following questions, four words are given in each question, out of which only one word is wrongly spelt. Find the misspelt word.

96. (1) Tackle (2) Strategy
(3) Tution (4) Tariff

97. (1) Equation (2) Fatigue
(3) Oposite (4) Publish

Directions (98 – 100) : In the following questions, a sentence/a part of the sentence is written in **bold**. Below are given alternatives to the bold part which may improve the sentence. Choose the correct alternative. In case no improvement is needed, choose **No Improvement**.

98. The two thieves distributed the loot **between them**.

(1) with themselves
(2) amongst themselves
(3) among themselves
(4) No improvement

99. The **equipment were** faulty.

(1) equipment were
(2) equipments are
(3) equipment was
(4) No improvement

100. Plants **cannot grow without sunshine**.

(1) No improvement
(2) Plants can thrive in the sun.
(3) Plants cannot grow on a cloudy day.
(4) Plants do not live in darkness.

ANSWERS

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

EXPLANATIONS

1. (4) Opthalmologist is a person who is specialised in eye and its diseases. Similarly, composer is a person who composes music.

2. (4) D : B :: I : C
↓   ↓   ↓   ↓
4   2   9   3

The square of the position number of the second letter is the position number of the first letter in each unit. Therefore,

P : D   and Y : E
↓   ↓   ↓   ↓
16   4   25   5

3. (2) $(1)^3 = 1$; $(2)^3 = 8$
Similarly,
$(4)^2 = 16$; $(5)^2 = 25$

4. (2)

E $\xrightarrow{+3}$ H $\xrightarrow{+1}$ I $\xrightarrow{+2}$ K

L $\xrightarrow{+2}$ N $\xrightarrow{+1}$ O $\xrightarrow{+2}$ Q

T $\xrightarrow{+3}$ W $\xrightarrow{+1}$ X $\xrightarrow{+2}$ Z

A $\xrightarrow{+3}$ D $\xrightarrow{+1}$ E $\xrightarrow{+2}$ G

5. (1) Except in the pair Across - Along, in all others the two words are antonymous to each other.

6. (2) | B | C | N | ; | N | C | B |

BCMXNCXNBX [NCB] [NCB]

YBCXN [BCN] ABONMZCB

7. (2) Meaningful order of words in ascending order :
   2. Encoding
      ↓
   1. Sending
      ↓
   3. Receiving
      ↓
   4. Decoding

8. (4)

D $\xrightarrow{+2}$ F $\xrightarrow{+2}$ H $\xrightarrow{+2}$ J $\xrightarrow{+2}$ L
K $\xrightarrow{-1}$ J $\xrightarrow{-1}$ I $\xrightarrow{-1}$ H $\xrightarrow{-1}$ G
Y $\xrightarrow{-2}$ W $\xrightarrow{-2}$ U $\xrightarrow{-1}$ S $\xrightarrow{-2}$ Q

9. (4) 7 + 1 = 8
     8 + 3 = 11
     11 + 5 = 16
     16 + 7 = 23
     23 + 9 = [32]

10. (3) D   I   S   C
     ↓ ↓ ↓ ↓
     8   7   4   9

A C H E
↓ ↓ ↓ ↓
3 9 5 0

Therefore, H E A D
            ↓ ↓ ↓ ↓
            5 0 3 8

11. (4) Bipul > Barun > Sanjay
Bipul > Krishna
Clearly, Bipul is the tallest.

12. (1) Total number of girls in the row = 11 + 11 – 1 = 21

13. (1) E A S T
      ↓ ↓ ↓ ↓
      7 6 2 4

14. (2) There is no 'A' letter in the given word. So, the word NAME cannot be formed.

15. (1) First Row
      7 × 9 = 63
Second Row
      5 × 6 = 30
Third Row
      4 × ? = 20
∴ $? = \dfrac{20}{4} = 5$

16. (1) First Column
      24 + 24 = 4 × 12
Second Column
      25 + 20 = 9 × 5
Third Column
      50 + 10 = 3 × ?
⇒ $? = \dfrac{60}{3} = 20$

17. (2)

Starting Point   North

West ← → East
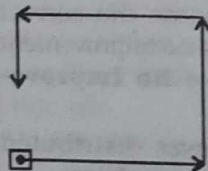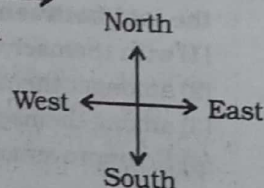
South

It is clear from the diagram that Meena is facing South.

18. (1) 24 * 34 * 2 * 5 * 12
⇒ 24 = 34 ÷ 2 – 5 + 12
⇒ 24 = 17 – 5 + 12

19. (1)

LEFT   T   S   P   M   O   RIGHT
      ↑   ↑   ↑   ↑
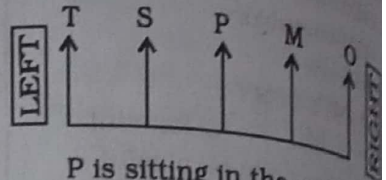
P is sitting in the middle.

20. (1) All the students (without exception) of a particular class are intelligent and Kaushik not intelligent. So, Kaushik not a student of that class.
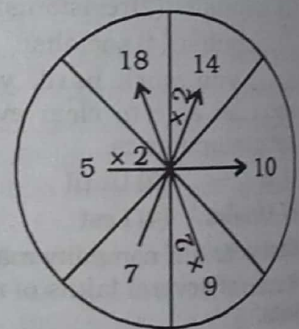
21. (3) L ⇒ 11, 31
A ⇒ 66, 87, 99
N ⇒ 32
E ⇒ 58, 79, 88, 97

Option	L	A	N	E
(1)	11	66	~~32~~	~~97~~
(2)	11	~~57~~	32	97
(3)	31	87	32	97
(4)	31	66	~~32~~	97

22. (2) From first figure to second figure the oval moves out of the rectangle in anticlockwise direction and shaded circle as well as star move inside the rectangle.
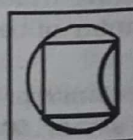
23. (2)

24. (2)
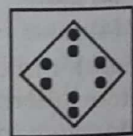
25. (3)

26. (1) Water gas is a synthesis gas, containing carbon monoxide (CO) and hydrogen gas (H_2). It is made by passing steam over a red-hot carbon fuel such as coke. The reaction between steam and hydrocarbons produce the gas mixture.

27. (1) Kenya, China, Sri Lanka, India and Vietnam are the leading exporters of tea in the world. These five countries are the major producers of tea as well. The United Kingdom is one of the major importers of tea. India is the world's largest tea-drinking nation.

28. (4) Bal Gangadhar Tilak never became the President of the Indian National Congress. He was one of the first and strongest advocates of "Swaraj" (self-rule) and a strong radical in Indian consciousness. "Swaraj is my birthright, and I shall have it!" was his famous quote.

29. (4) The Pachmarhi Biosphere Reserve is a non-use conservation area and biosphere reserve in the Satpura Range of Madhya Pradesh. It is located within Hoshangabad, Betul, and Chhindwara districts of Madhya Pradesh. UNESCO designated it as a biosphere reserve in 2009.

30. (1) Global Family Day, One Day of Peace and Sharing, is celebrated every January 1 in the United States as a global day of peace and sharing. Global Family Day grew out of the United Nations Millennium celebration, "One Day In Peace".

31. (1) Revenue Stamp' ('Raseedi Tikkat' in Punjabi, 1976) is Amrita Pritam's autobiography. It reflects her rebellious ideas; it is an expression of romantic mind and the sufferings of woman in her.

32. (3) The Rushikulya rookery coast in Ganjam district of Odisha has been in the news for being the mass nesting of endangered Olive Ridley turtles. In the Indian Ocean, the majority of olive ridleys nest in two or three large groups near Gahirmatha in Odisha.

33. (3) The reason why ice forms on the top of lakes and ponds is that once water cools below 39 degrees Fahrenheit, it becomes lighter and less dense the more it cools. This means that water expands as it freezes into ice. As a result, ice takes up more room than the water it was made from.

34. (2) Chlorophyll of plants absorbs light most strongly in the blue portion of the electromagnetic spectrum, followed by the red portion. Conversely, it is a poor absorber of green and near-green portions of the spectrum.

35. (2) A web search engine is a software system that is designed to search for information on the World Wide Web. The information may be a mix of web pages, images, and other types of files.

36. (2) Pele is a retired Brazilian footballer. He is regarded by many football critics, past players, current players and football fans in general to be the best player of all time.

37. (2) During the last years of Jahangir's reign, coins were struck in the name of Nur Jahan and the royal seal on firmans bore her signature. Mehr-Un-Nisa or Nur Jahan was the favorite wife of Jahangir.

38. (2) Chlorofluorocarbon or Freon (CFC) has been responsible for ozone depletion in the upper atmosphere. The Montreal Protocol has banned the production of CFCs, halons, and other ozone-depleting chemicals.

39. (1) A sextant is an instrument used to measure the angle between any two visible objects. Its primary use is to determine the angle between a celestial object and the horizon which is known as the object's altitude.

40. (3) In volleyball there are 6 players on each side; 3 of the players are positioned on the front court and 3 on the back court. It's 5 on 5 in case of basketball. Baseball is a bat-and-ball game played between two teams of nine players each.

41. (1) A degree of longitude is widest at the equator at 69.172 miles and gradually shrinks to zero at the poles. So the distance between 90°E longitude and 91° E longitude at the poles is zero.

42. (3) Primary storage, also known as main storage or memory, is the area in a computer in which data is stored for quick access by the computer's processor. The terms random access memory (RAM) and memory are often as synonyms for primary or main storage.

43. (3) Credit rating agencies are regulated by SEBI. The SEBI (Credit Rating Agencies) Regulations, 1999 govern the credit rating agencies and provide for eligibility criteria for registration of credit rating agencies, monitoring and review of ratings.

44. (2) GSAT-7, India's first satellite dedicated to use by the military, was successfully launched into orbit in August 2013. Built by the ISRO, the satellite was launched from Kourou in South America using a French-made Ariane rocket.

45. (2) For anyone to become a member of the Rajya Sabha, he/she must be at least 30 years of age. The remaining requirements are the same as becoming a member of the Lok Sabha.

46. (1) Primary deficit is derived after deducting the interest payments component from the fiscal deficit (Fiscal deficit = total expenditure - (total revenues - borrowings)) of any budget. The total of primary deficit and interest payments makes up the total or fiscal deficit.

47. (2) Article 243 B(1) talks about the constitution of Panchayats in every State. Panchayats at the village, intermediate and district levels. It adds that Panchayats at the intermediate level may not be constituted in a State having a population not exceeding twenty lakhs.

48. (4) Amir Khusro called himself called Tuti-e-Hind' (parrot of India). He was a Sufi musician, poet and scholar during the Delhi Sultanate.

49. (1) The oceanic resources beyond **200 km** of the Exclusive Economic Zone fall under this category. Indian has got the right to mine manganese nodules from the bed of the Indian Ocean from that area which lies beyond the Exclusive Economic Zone.

50. (1) Nearly 10 kilograms of manganese is required for manufacturing one tonne of steel. It is necessary to make steel ductile and durable.

51. (3)
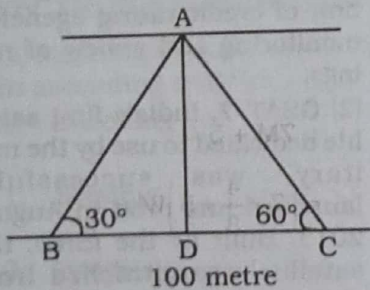
$BD = x$ metre (let)

∴ $CD = (100 - x)$ metre

$AD \perp BC$; $AD = y$ metre

From △ABD,

$$\tan 30° = \frac{AD}{BD}$$

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{y}{x}$$

$$\Rightarrow x = \sqrt{3}\, y \qquad ....(i)$$

From △ACD

$$\tan 60° = \frac{y}{100 - x}$$

$$\Rightarrow \sqrt{3} = \frac{y}{100 - x}$$

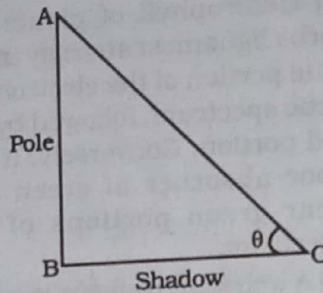$$\Rightarrow y = 100\sqrt{3} - \sqrt{3}\, x$$

$$\Rightarrow y = 100\sqrt{3} - \sqrt{3} \times \sqrt{3}\, y$$

$$\Rightarrow y = 100\sqrt{3} - 3y$$

$$\Rightarrow 4y = 100\sqrt{3}$$

$$\Rightarrow y = 25\sqrt{3} \ \text{metre}$$

52. (4)

$$\tan \theta = \frac{AB}{BC} = \frac{2\sqrt{3}}{2} = \sqrt{3}$$

$$\Rightarrow \tan \theta = \tan 60° \Rightarrow \theta = 60°$$

53. (3) ∠A = 120° and AB = AC

$$\Rightarrow \angle B = \angle C$$

But, ∠A + ∠B + ∠C = 180°

$$\Rightarrow 120° + \angle B + \angle B = 180°$$

$$\Rightarrow 2\angle B = 60°$$

$$\Rightarrow \angle B = 30°$$

54. (2) tan θ – 3 sin θ = 0

$$\Rightarrow \tan\theta = 3 \sin \theta$$

$$\Rightarrow \frac{\sin \theta}{\cos \theta} = 3 \sin \theta \Rightarrow \cos\theta = \frac{1}{3}$$

$$\Rightarrow \sin\theta = \sqrt{1 - \cos^2 \theta}$$

$$= \sqrt{1 - \frac{1}{9}} = \frac{2\sqrt{2}}{3}$$

So, $\sin^3\theta - \cos^3\theta$

$= (\sin\theta - \cos\theta)(\sin^2\theta + \cos^2\theta + \sin\theta\cos\theta)$

$$= \left(\frac{2\sqrt{2}}{3} - \frac{1}{3}\right)\left(1 + \frac{2\sqrt{2}}{3} \times \frac{1}{3}\right)$$

$$= \frac{1}{27}(2\sqrt{2} - 1)(9 + 2\sqrt{2})$$

$$= \frac{1}{27}(18\sqrt{2} - 9 + 8 - 2\sqrt{2})$$

$$= \frac{1}{27}(16\sqrt{2} - 1)$$

55. (4) Expression

$$= \frac{(0.87)^4 - (0.13)^4}{0.87 \times 0.87 + 0.13 \times 0.13}$$

$$= \frac{\left[(0.87)^2 + (0.13)^2\right]\left[(0.87)^2 - (0.13)^2\right]}{(0.87)^2 + (0.13)^2}$$

$$= (0.87)^2 - (0.13)^2$$

$$= (0.87 + 0.13)(0.87 - 0.13)$$

$$= 1 \times 0.74 = 0.74$$

56. (4) $2x + 3y = 13$

$$\Rightarrow (2x + 3y)^3 = 13^3$$

$$\Rightarrow (2x)^3 + (3y)^3 + 2 \times 2x \times 3y + 3y) = 13^3$$

$$\Rightarrow 8x^3 + 27y^3 + 18xy(2x + 3y) = 13^3$$

$$\Rightarrow 8x^3 + 27y^3$$

$$= 13^3 - 18xy(2x + 3y)$$

$$= 13^3 - 18 \times 6 \times 13$$

$$= 13(13^2 - 18 \times 6)$$

$$= 13 \times (169 - 108)$$

$$= 13 \times 61 = 793$$

57. (3) $\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right).....\left(1 - \frac{1}{n}\right)$

$$= \left(\frac{3-1}{3}\right)\left(\frac{4-1}{4}\right)......\left(\frac{n-1}{n}\right)$$

$$= \frac{2}{3} \times \frac{3}{4} \times .....\times \frac{n-1}{n} = \frac{2}{n}$$

58. (2) $a^2 + b^2 + c^2 - ab - bc - ca$

$$\Rightarrow 2a^2 + 2b^2 + 2c^2 - 2ab - 2ca = 0$$

$$\Rightarrow (a^2 - 2ab + b^2) + (b^2 - c^2) + (c^2 - 2ac + a^2) = 0$$

$$\Rightarrow (a + b)^2 + (b - c)^2 + (c - a)^2$$

$$\Rightarrow a - b = 0, b - c = 0, c -$$

$$\Rightarrow a = b, b = c \text{ and } c = a$$

$$\Rightarrow a = b = c$$

59. (1) **Rule** : After n such operations,

Milk left in vessel after n operation

= Whole quantity of milk

vessel x $\left(\frac{x - y}{x}\right)^n$

Where x = total milk

y = quantity of milk withdrawn

Here $x = 40$, $y = 8$, $n = 3$

∴ Required answer

$= \left(\dfrac{40-8}{40}\right)^3 \times 40$

$= \left(\dfrac{4}{5}\right)^3 \times 40 = \dfrac{64}{125} \times 40$
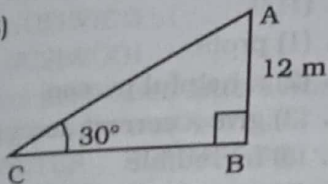
$= 20.48$ litres

60. (1) Gain %

$= \dfrac{\text{Error}}{\text{True value} - \text{error}} \times 100$

$= \dfrac{125}{1000-125} \times 100 = \dfrac{125}{875} \times 100$

$= 14\dfrac{2}{7}\%$

61. (3)

Clearly, the distance covered by the artist is equal to the length of the rope AC. AB = pole = 12 m

From Δ ABC,

$\sin 30° = \dfrac{AB}{AC} \Rightarrow \dfrac{1}{2} = \dfrac{12}{AC}$

⇒ AC = 24 m = distance covered by the artist.

62. (1) Expression

$= \left(\dfrac{243}{32}\right)^{-\frac{4}{5}} \times \left(\dfrac{3}{2}\right)^4$

$= \left(\dfrac{32}{243}\right)^{\frac{4}{5}} \times \left(\dfrac{3}{2}\right)^4$

$= \left(\dfrac{2^5}{3^5}\right)^{\frac{4}{5}} \times \left(\dfrac{3}{2}\right)^4 = \left(\dfrac{2}{3}\right)^4 \times \left(\dfrac{3}{2}\right)^4$

$= \left(\dfrac{2}{3} \times \dfrac{3}{2}\right)^4 = 1$

63. (3) Let

$x = \sqrt{20 + \sqrt{20 + \sqrt{20 + \ldots \infty}}}$

∴ $x^2 = 20 + \sqrt{20 + \sqrt{20 + \sqrt{20 \ldots \infty}}}$

$= 20 + x$

⇒ $x^2 - x - 20 = 0$

⇒ $x^2 - 5x + 4x - 20 = 0$

⇒ $(x - 5)(x + 4) = 0$

⇒ $x = 5$ or -4

But sum of positives can't be negative

∴ $x = 5$

64. (1) We know that,

$\cos 2θ = 1 - 2\sin^2 θ$

So, $\cos 100° = 1 - 2\sin^2 50°$ …(i)

Again $\sin 50°$

$= \cos(90° - 50°)$

$= \cos 40° = a$, (given)

⇒ from equation (i),

$\cos 100° = 1 - 2 \times a^2 = 1 - 2a^2$

65. (1) sec 50°. sin 40°+cos 40°.

cosec 50°= sec (90° – 40°). sin 40° + cos 40°.

cosec (90° – 40°) = cosec 40°.

sin 40° + cos 40°. sec 40°

$= \dfrac{\sin 40°}{\sin 40°} + \dfrac{\cos 40°}{\cos 40°}$

$= 1 + 1 = 2$

66. (4) Let B's income = x

A's income = $x + 0.0625x$

$= 1.0625x$

B's income is less than A's by

$1.0625x - x = 0.0625x$

$= \dfrac{0.0625x}{1.0625x} \times 100 = \dfrac{100}{17} = 5\dfrac{15}{17}$

67. (2) $x = \dfrac{1}{4+\sqrt{3}}$

⇒ $x + 1 = \dfrac{1}{4+\sqrt{3}} + 1$

$= \dfrac{1+4+\sqrt{3}}{4+\sqrt{3}} = \dfrac{5+\sqrt{3}}{4+\sqrt{3}}$

and $y = \dfrac{1}{4-\sqrt{3}}$

⇒ $y + 1 = \dfrac{1}{4-\sqrt{3}} + 1 = \dfrac{5-\sqrt{3}}{4-\sqrt{3}}$

⇒ $\dfrac{1}{x+1} - \dfrac{1}{y+1}$

$= \dfrac{4+\sqrt{3}}{5+\sqrt{3}} - \dfrac{4-\sqrt{3}}{5-\sqrt{3}}$

$= \dfrac{(4+\sqrt{3})(5-\sqrt{3})-(4-\sqrt{3})(5+\sqrt{3})}{(5+\sqrt{3})(5-\sqrt{3})}$

$= \dfrac{(20+5\sqrt{3}-4\sqrt{3}-3) - (20-5\sqrt{3}+4\sqrt{3}-3)}{5^2-3}$

$= \dfrac{\sqrt{3}+\sqrt{3}}{22} = \dfrac{2\sqrt{3}}{22} = \dfrac{\sqrt{3}}{11}$

68. (2) Let x, y be the length and breadth of the rectangle. The area of rectangle = xy

New length = $1.4x$

and new breadth = $0.7y$

∴ Area of new rectangle

$= (1.4x)(0.7y) = 0.98xy$

∴ Percentage decrease in area

$= \dfrac{xy - 0.98xy}{xy} \times 100 = 2\%$

69. (2) $3M = 4W$

∴ $1M = \dfrac{4}{3}W$

∴ $7M + 5W$

$= \left(7 \times \dfrac{4}{3} + 5\right)W = \dfrac{43}{3}W$

Let x be required no. of days

$\begin{array}{c} 1 : 2 \\ \dfrac{43}{3} : \end{array} \Big| :: 43 : x$

∴ $x = \dfrac{2 \times 4 \times 43 \times 3}{1 \times 43} = 24$

70. (2)Distance walked by 1st man

$= \left(3\dfrac{1}{4} \times 4\dfrac{3}{4}\right)$ km

$= \dfrac{13}{4} \times \dfrac{19}{4}$ km

Distance walked by 2nd man

$= \dfrac{2 \times 13 \times 19}{4 \times 4}$ km

$$= \frac{13 \times 19}{8} \text{ km}$$

∴ Time taken by 2nd man

$$= \frac{\frac{13 \times 19}{8}}{\frac{19}{6}} = \frac{39}{4} = 9\frac{3}{4} \text{ hrs.}$$

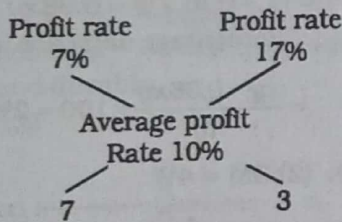**71.** (1) $\sin^2 x - \cos^2 x = \cot^2 y$

$\Rightarrow \sin^2 x - (1 - \sin^2 x) = \cot^2 y$

$\Rightarrow 2\sin^2 x = \cot^2 y + 1 = \csc^2 y$

...(i)

So, $\sin^2 y - \cos^2 y$

$= \sin^2 y - (1 - \sin^2 y) = 2\sin^2 y - 1$

$$= \frac{2}{\csc^2 y} - 1 = \frac{2}{2\sin^2 x} - 1$$

$= \csc^2 x - 1 = \cot^2 x$

72. (3) Average rate of profit

$= 10\%$

Profit rate   Profit rate
7%   17%

Average profit
Rate 10%

7   3

Two parts should be in the ratio 7 : 3

∴ Amount sold at 7% profit

$$= \frac{7}{10} \times 100 = 70 \text{ kg.}$$

73. (2) Let length of circular track = x km

Let A, B meet after t hours

Then (distance covered by A in t hours) + (distance covered by b in t hours) = x

$$\therefore \frac{x}{\frac{15}{2}} t + \frac{x}{6} t = x$$

$$\therefore t\left(\frac{2}{15} + \frac{1}{6}\right) = 1$$

$$\therefore t = \frac{30}{9} = \frac{10}{3} = 3\frac{1}{3} \text{ hrs.}$$

74. (3) Let the larger point is x, then small part = $16 - x$

According to question,

$2x^2 = (16 - x)^2 + 164$

$= 16^2 - 2 \times 16 \times x + x^2 + 164$

$\Rightarrow x^2 + 32x - 420 = 0$

$\Rightarrow (x + 42)(x - 10) = 0$

$\Rightarrow x = -42 \text{ or } 10$

75. (3) Time taken to complete the work when they all the three work together

$$= \frac{ABC}{AB + BC + CA}$$

or, $$3 = \frac{8 \times 8 \times C}{8 \times 8 + 8 \times C + C \times 8}$$

$$= \frac{64C}{64 + 16C}$$

∴ $192 + 48C = 64C$

or $$C = \frac{192}{16} = 12$$

∴ C along will complete the work in 12 days.

81. (4) No error

82. (2) When 'one of' is used in a sentence, then Noun/Pronoun coming after 'of' is considered 'Antecedent' and we use verb accordingly. The verb is not used according to 'one' that comes before 'of '.

Look at the sentences :

She is one of those who do not accept the view.

Dryden remains one of those who have set standards for English verse.

Hence, Kambli is one of the players who have been selected ...... will be the correct sentence.

83. (2) The word **Bravado (Noun)** means : a confident way of behaving sometimes as a way of hiding a lack of confidence.

84. (2) The word **Disgruntled (Adjective)** means : annoyed, browned off, cheesed off, discontented, displeased, dissatisfied, irritated, peeved, put out, sulky, sullen, testy, vexed, etc. Hence, its synonym is : **annoyed.**

Look at the senence :

He saw a **disgruntled** look the face of his wife when was to depart from her.

85. (3) The word **Desultory** (A jective) means : going fr one thing to another witho a definite plan or enthusias ; **disorderly.**

86. (4) The word **Accustom** means : acclimatised, a quainted, adapted, confirm conventional, customary, d ciplined, established, ever day, expected, familiar, fixe general, given to, etc. Its a onym should be **unusual.**

87. (2) The words variety and un fomity are **uniformity** antonymous.

88. (4) socialist

89. (1) If

90. (1) profit

91. (2) a helpful person

92. (3) give a correct account

93. (3) Incredible

94. (2) Mummy

95. (3) Depraved

96. (3) The correct spelling is : **ition**

97. (3) The correct spelling is : **posite**

98. (4) For two persons/things **tween** should be used.

Hence, between themse should be used.

Look at the sentence :

They divided the money among the children.

It is between you and m between ourselves.

99. (3) Singular Subject ag with a Singular Verb.

Equipment is an uncou noun.

100. (2) **Thrive** = flourish; to come strong, healthy etc.

Look at the sentence :

These animals rarely thr captivity.