

# STAFF SELECTION COMMISSION

## COMBINED GRADUATE LEVEL (TIER – I) MOCK TEST

No. of Questions: 100

Maximum Marks: 200

Time: 60 Mts.

### GENERAL INTELLIGENCE & REASONING

**Directions (Q. 1 – 4):** In each of the following questions, select the related letter/ word/ number from the given alternatives.

1. ZRYQ : KCJB :: PWOV : ?

- 1) GBHA                      2) ISJT                      3) ELDK                      4) EOFP

2. 68 : 130 :: ? : 350

- 1) 220                      2) 224                      3) 222                      4) 226

3. Human : Machine :: Master : ?

- 1) House                      2) Slave                      3) Manager                      4) Son

4. Pigeon : Peace :: White flag : ?

- 1) Surrender                      2) Friendship                      3) Victory                      4) War

**Directions (Q. 5 – 7):** Find the odd word/ letter/ number from the given alternatives.

5. 1) Beijing                      2) Algiers                      3) New York                      4) Tokyo

6. 1) 12306                      2) 23212                      3) 32424                      4) 41206

7. 1) 4489                      2) 5329                      3) 8381                      4) 2401

8. If  $\blacklozenge\blacklozenge\blacklozenge + \times\times\times\times + \heartsuit\heartsuit = 35$

$$\blacklozenge\blacklozenge + \heartsuit\heartsuit = 19$$

$$\times\times\times + \heartsuit\heartsuit\blacklozenge = 24.5$$

$$\text{then } \heartsuit\heartsuit\heartsuit\blacklozenge + \blacklozenge\blacklozenge + \times\times = ?$$

- 1) 31.5                      2) 34.5                      3) 36.5                      4) 38.5

9. The pages of a book had been numbered 1 to 100 manually. How many times will it be essential to write the digit 5?

- 1) 20                      2) 19                      3) 18                      4) 24

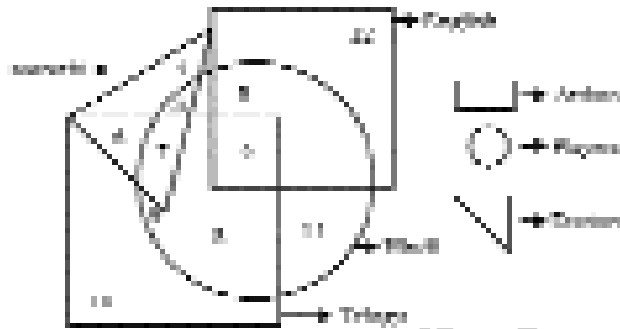
10. Arrange the words given below in a meaningful sequence.

1. Heel                      2. Shoulder  
3. Skull                      4. Neck  
5. Knee                      6. Chest  
7. Thigh                      8. Stomach  
9. Face                      10. Hand

1) 3, 4, 7, 9, 2, 5, 8, 10, 6, 1                      2) 3, 9, 4, 2, 10, 6, 8, 7, 5, 1

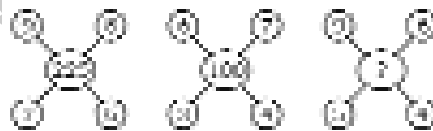
3) 2, 4, 7, 10, 1, 5, 8, 9, 6, 3                      4) 4, 7, 10, 1, 9, 6, 2, 5, 8, 3

**Directions (Q. 11 – 12):** In the following figure Small Square represents the persons who know English, Triangle represents those who know Marathi, Big Square represents those who know Telugu and Circle those who know Hindi. Different regions of the figures are represented by 1 to 12.

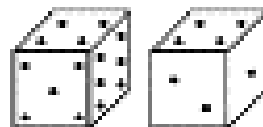


11. How many persons are there who can speak both Marathi and Telugu?  
 1) 10                                      2) 11                                      3) 13                                      4) None
12. How many persons can speak all the languages?  
 1) 1    2) 8    3) 2    4) None

**Directions (Q. 13 – 14):** In the following questions, select the missing number from the given responses.

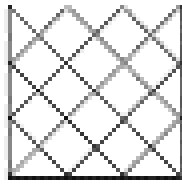


13. 1) 181                                      2) 172                                      3) 143                                      4) 168
14. If  $361324 = 37$  and  $484169 = 315$ , then  $625196 = ?$   
 1) 429    2) 329    3) 425    4) 325
15. Here two positions of dice are shown. If two dots are in the bottom, then how many dots will be on the top?



- 1) 2    2) 3    3) 5    4) 6
16. Five girls are sitting on a bench for photography. Seema is to the left of Rani and to the right of Bindu. Mary is to the right of Rani. Reeta is between Rani and Mary. Who is sitting in the middle for the photography?  
 1) Bindu                                      2) Rani    3) Reeta    4) Seema
17. Three friends had a dinner at a restaurant. When the bill was received, Ashutosh paid  $\frac{2}{3}$  part as much as Vivek paid and Vivek paid  $\frac{1}{2}$  part as much as Tanya paid. What fraction of the bill did Vivek paid?  
 1)  $\frac{1}{3}$     2)  $\frac{3}{11}$     3)  $\frac{1}{6}$     4)  $\frac{5}{8}$
18. Five friends A, B, C, D and E are standing in a row facing south, but not necessarily in the same order. Only B is between A and E. C is immediate to the right of E and D is immediate to the left of A. On the basis of above information, find the statement which is definitely true?  
 1) B is to the left of A    2) B is to the right of E  
 3) A is second to the left of C    4) D is third to the left of E

19. Find the number of triangles in the given figure.



- 1) 28                      2) 32                      3) 36                      4) 40

20. Group the given figures into three classes using each figure only once.



- 1) 1, 2, 4; 3, 5, 6; 7, 8, 9                      2) 1, 7, 8; 3, 5, 6; 2, 4, 9  
3) 1, 3, 4; 2, 8, 9; 5, 6, 7                      4) 1, 7, 8; 2, 3, 6; 4, 5, 9

21. Select a suitable figure from the four alternatives that would complete the figure matrix.

T	V	R
Z	Y	R
I	L	?

- 1) P                      2) S                      3) O                      4) U

22. A sheet of paper is folded and cut as shown below in question figures. Choose among the following four answer figures, how it will appear when open?

Question figure:



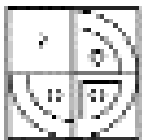
Answer figures:



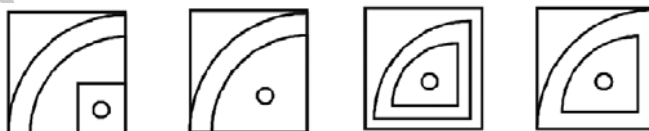
- 1)                      2)                      3)                      4)

23. Identify the figure that will complete the pattern.

Question figure:



Answer figures:



- 1)                      2)                      3)                      4)

24. If Blue means Pink, Pink means Green, Green means Yellow, Yellow means Red, Red means White and White means Purple then what is the colour of milk?

- 1) Red                                      2) Green                                      3) Pink                                      4) Yellow

25. 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 letters 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., 'T' can be represented by 31, 76 etc., and 'N' can be represented by 12, 79 etc. Similarly, you have to identify the set for the word 'POLE'.

**Matrix-I**

	0	1	2	3	4
0	G	V	E	A	C
1	R	O	N	G	L
2	M	N	E	L	I
3	O	T	I	T	A
4	N	L	N	E	P

**Matrix-II**

	5	6	7	8	9
5	R	E	O	N	G
6	N	P	V	E	L
7	M	T	I	O	N
8	E	A	I	C	O
9	N	T	A	R	L

- 1) 66, 11, 67, 02                                      2) 44, 11, 69, 85  
 3) 66, 89, 32, 56                                      4) 44, 13, 69, 65

**GENERAL AWARENESS**

26. In which year, Ashoka invaded Kalinga?

- 1) 261 BC                                      2) 235 BC                                      3) 238 BC                                      4) 275 BC

27. Which of the following polymer is obtained on the polymerization of hexamethylene diamine and adipic acid?

- 1) Toulene                                      2) Bakelite                                      3) Nylon – 6, 6                                      4) Terylene

28. Where is the headquarters of Botanical Survey of India located?

- 1) Lucknow                                      2) Darjeeling                                      3) Kolkata                                      4) Ootacamund

29. "Burning of Candle" is an example of-

- 1) Physical change                                      2) Chemical change  
 3) Both changes occur                                      4) None of these

30. Who among the following founded the India Society of Oriental Art to revive the ancient art traditions of India?

- 1) Abanindranath Tagore                                      2) Ravindranath Tagore  
 3) Surendranath Tagore                                      4) Mukul Day

31. Which of the following is first generation computer?

- 1) EDSAC                                      2) IBM – 1401  
 3) CDC – 1604                                      4) ICL – 2900

32. Which among the following is the world's largest Mangrove forest?

- 1) Pichavaram                                      2) Bhitarkanika  
 3) Sundarbans                                      4) Malayan Peninsular Mangroves

33. The Bakken Formation is one of the largest contiguous deposits of oil and natural gas. It is located in which country?  
1) Russia                      2) USA                      3) Iran                      4) Canada
34. A pond of water appears less deep due to  
1) Reflection                      2) Diffraction                      3) Refraction                      4) Polarisation
35. Which colour is the complementary colour of yellow?  
1) Blue                      2) Green                      3) Orange                      4) Red
36. Ventilators are provided near the ceiling of the room because  
1) The exhaled warm air rises up and goes out  
2) These provide cross ventilation in the room  
3) These provide some sunlight in the room  
4) None of these
37. On which date the World Polio Day is observed?  
1) 24<sup>th</sup> October                      2) 26<sup>th</sup> October  
3) 21<sup>st</sup> October                      4) 29<sup>th</sup> October
38. The "Aichi Targets" are related to .....  
1) Conservation of biodiversity  
2) Conservation of wet land  
3) Conservation of coral reefs  
4) Prevention of plastic use
39. Under which article of the Indian Constitution the Parliament can create a new all India service, if a resolution is passed by the Rajya Sabha  
1) Article 315                      2) Article 312  
3) Article 320                      4) Article 345
40. The "Strait of Dover" separates which of the following countries?  
1) United Kingdom and France                      2) Spain and Portugal  
3) Portugal and Italy                      4) Italy and Greece
41. The 'real executive authority' in a state is vested in .....  
1) Governor                      2) Legislative Council  
3) Legislative Assembly                      4) Council of Ministry
42. The Board of Industrial and Financial Reconstruction (BIFR) came into existence in  
1) 1975                      2) 1966                      3) 1987                      4) 1999
43. The vitamin that helps to prevent infections in human body is  
1) Vitamin A                      2) Vitamin B7  
3) Vitamin C                      4) Vitamin D
44. If  $n = 4$  then what is total number of orbitals and electron?  
1) 9, 18                      2) 16, 32                      3) 32, 16                      4) 18, 9

45. What is the Central dogma?
- 1) Genetic information flow from RNA → DNA → Protein
  - 2) Genetic information flow from DNA → RNA → Protein
  - 3) Genetic information flow from DNA → DNA → Protein
  - 4) Genetic information flow from RNA → Protein → DNA
46. With reference to the State Legislative Council, which among the following statement is/ are correct?
- i) The Legislative Council is a continuing House and two-third of the members retire every two years.
  - ii) Members of local bodies elect one-third of the total number of members of the Legislative Council.
  - iii) For the creation or abolition of state legislative council, related resolution must be passed by twothird majority.
- Choose the correct option from the given codes
- 1) Only i and ii
  - 2) Only ii and iii
  - 3) Only i and iii
  - 4) i, ii and iii
47. Where was the venue of All India Khilafat Conference of 1919?
- 1) Delhi
  - 2) Surat
  - 3) Kolkata
  - 4) Lucknow
48. Which of the following has facilitated globalisation of International trade the most?
- 1) Lowering of the tariff barriers
  - 2) Foreign Direct Investment
  - 3) Business Processes Outsourcing
  - 4) E-Commerce
49. Rohan Bopanna is associated with which of the following games?
- 1) Badminton
  - 2) Snooker
  - 3) Table tennis
  - 4) Tennis
50. The World Red Cross Day is observed every year on
- 1) 1 May
  - 2) 8 May
  - 3) 18 May
  - 4) 28 May

### QUANTITATIVE APTITUDE

51. The perimeter of a square and a circular field are the same. If the area of the circular field is 3850 sq metres, what is the area (in  $m^2$ ) of the square?
- 1) 4225  $m^2$
  - 2) 3025  $m^2$
  - 3) 2500  $m^2$
  - 4) 2025  $m^2$
52. A worker works for 60 hours in a week, and earns Rs.2,400. If his per hour wages increased by 40% & his working hours decreased by  $16\frac{2}{3}\%$ , then what will be the percentage effect on his wages?
- 1) decreased by  $16\frac{2}{3}\%$
  - 2) decreased by  $12\frac{1}{2}\%$
  - 3) increased by  $12\frac{1}{2}\%$
  - 4) increased by  $16\frac{2}{3}\%$
53. A number when divided by 119, leaves a remainder of 19. If it is divided by 17, it will leave a remainder of
- 1) 10
  - 2) 2
  - 3) 19
  - 4) 7

54. The average salary per head of all the workers of A.R. Publication is Rs.60. The average salary of 12 centre heads is Rs.400 and of the rest is Rs.56. The total number of workers in A.R. Publication is ....  
 1) 1032                                      2) 1035                                      3) 1030                                      4) 1020
55. A man can row a boat in still water with a speed of 10 km/hr. The speed of stream of a river is 3 km/hr and he takes one hour in travelling a distance upstream and come back again to same place. How far is the place from starting point?  
 1) 4.7 km                                      2) 4 km                                      3) 4.55 km                                      4) 5 km
56. Tejaswani deposited Rs.7,500 in a bank at the rate of 6% p.a simple interest. How much money should she deposit at the rate of 10% p.a. simple interest so that she get equal amount of simple interest on total deposit at the rate of  $8\frac{1}{2}\%$  per annum in a year?  
 1) Rs.5,000                                      2) Rs.12,000                                      3) Rs.10,000                                      4) Rs.12,500
57. The population of village is 11,000. If number of males are increased by 15% and number of females are increased by 12%, then population becomes 12,488. Find the difference between number of males and females of that village.  
 1) 200                                      2) 150                                      3) 400                                      4) 600
58. A cow was sold at 8% profit. If it were bought at 20% less and sold at 40% profit, then owner would gain Rs.640 more. Find the initial cost price of the cow.  
 1) Rs.20,000                                      2) Rs.25,000                                      3) Rs.15,000                                      4) Rs.16,000
59. Find the value of  $\sqrt[3]{333^3 + 333^3 + 334^3 - 3 \times 333 \times 333 \times 334}$   
 1) 1000                                      2) 990                                      3) 10                                      4) 310
60. In the given figure, PT is the tangent of a circle with centre O at point R. If diameter SQ is increased, it meets with PT at point P. If  $\angle SPR = x^\circ$  and  $\angle QSR = y^\circ$ .

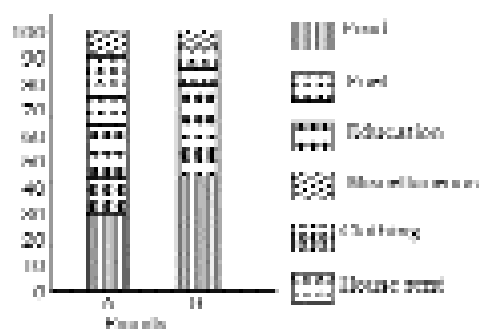


What is the value of  $x^\circ + 2y^\circ$ ?

- 1)  $90^\circ$                                       2)  $105^\circ$                                       3)  $135^\circ$                                       4)  $180^\circ$
61. If factors of  $x^3 + (a + 1)x^2 - (b - 2)x - 6$  are  $(x + 1)$  and  $(x - 2)$  the values of a and b are respectively is ....  
 1) 2 - 8                                      2) 1 - 7                                      3) 5 - 3                                      4) 3 - 7
62. If  $\tan(x + y) \tan(x - y) = 1$  then the value of  $\tan\left(\frac{2x}{3}\right)$  is  
 1)  $\frac{1}{\sqrt{3}}$                                       2)  $\frac{2}{\sqrt{3}}$                                       3)  $\sqrt{3}$                                       4) 1
63. If  $A : B = 1 : 2$ ,  $B : C = 3 : 4$ ,  $C : D = 6 : 9$  and  $D : E = 12 : 16$  then  $A : B : C : D : E$  is equals to  
 1) 2 : 4 : 6 : 9 : 16                                      2) 3 : 4 : 8 : 12 : 16  
 3) 3 : 6 : 8 : 12 : 16                                      4) 1 : 3 : 6 : 12 : 16

64. The base of a right prism is an equilateral triangle of area  $173 \text{ cm}^2$  and the volume of the prism is  $10380 \text{ cm}^3$ . The area of the lateral surface of the prism is:  
 1)  $1200 \text{ cm}^2$                       2)  $2400 \text{ cm}^2$                       3)  $3600 \text{ cm}^2$                       4)  $4380 \text{ cm}^2$
65. If  $\sqrt[6]{39}$  be acute angle and  $\cos \sqrt[6]{39} = \frac{15}{17}$ , then the value of  $\cot (90^\circ - \sqrt[6]{39})$  is  
 1)  $\frac{2\sqrt{8}}{15}$                       2)  $\frac{8}{15}$                       3)  $\frac{\sqrt{2}}{17}$                       4)  $\frac{8\sqrt{2}}{17}$
66. A and B together can do a piece of work in 16 days and B and C together can do the same work in 24 days. From starting A and B worked for 4 days and 7 days respectively, when A leaves the work then C joins the work and he works for 23 days and complete the work. Then find in how many days will C complete the work alone?  
 1) 16 days                      2) 8 days                      3) 32 days                      4) 72 days
67. Two vessels A and B contain milk and water in the ratio 4 : 3 and 2 : 3 respectively. In what ratio they must be mixed so that new mixture prepared contains half milk and half water?  
 1) 5 : 6                      2) 4 : 3                      3) 7 : 5                      4) 6 : 5
68. Two poles of equal height are standing opposite to each other on either side of a road, which is 28 m wide. From a point between them on the road, the angles of elevation of the tops are  $30^\circ$  and  $60^\circ$  respectively, then find the height of each pole.  
 1)  $6\sqrt{3}$                       2)  $5\sqrt{3}$                       3)  $4\sqrt{3}$                       4)  $7\sqrt{3}$
69. The average age of 24 boys and their teacher is 15 years. When the teacher's age is excluded, the average age decreases by 1 year. The age of the teacher is .....  
 1) 38 years                      2) 39 years                      3) 40 years                      4) 41 years
70. Three friends A, B and C started a business with capitals in ratio 5 : 7 : 6 respectively. C took back half of his capital after six months. If A invested Rs.40,000, then what will be the share of C in annual profit of Rs.33,000?  
 1) Rs.9,000                      2) Rs.12,000                      3) Rs.11,000                      4) Rs.10,000
71. Walking at 5 km/h Harshit reaches his school from his house 15 minutes early and walking at 3 km/h he is late by 9 minutes. What is the distance between his school and his house?  
 1) 5 km                      2) 8 km                      3) 3 km                      4) 2 km
72. 4 bells rings at an intervals of 30 minutes, 1 hour,  $1\frac{1}{2}$  hour and 1 hour 45 minutes respectively.  
 All the bells ring simultaneously at 12 noon. They will again ring simultaneously at .....  
 1) 12 midnight                      2) 3 am                      3) 9 am                      4) 6 am

Directions (Q. 73 – 75): Study the diagram and answer the questions.





73. If the total annual expenditure of family B is Rs.10,000 then money spent on clothes during the year is.....  
1) Rs.600                      2) Rs.6,000                      3) Rs.1,500                      4) Rs.200
74. What fraction of the total expenditure is spent on Education in family A?  
1)  $\frac{2}{3}$                       2)  $\frac{9}{13}$                       3)  $\frac{1}{5}$                       4)  $\frac{13}{20}$
75. If the total annual expenditure of family A is Rs.30,000 then money spent on food, clothes and house rents is.  
1) Rs.18,000                      2) Rs.21,000                      3) Rs.15,000                      4) Rs.18,500

**ENGLISH LANGUAGE**

**Directions (Q. 76 – 78):** Some part of the sentences have errors and some are correct. Find out which part of a sentence has an error. If a sentence is free from error, your answer is (4).

76. In a democratic society (1)/ every voter has a responsibility (2)/ to caste their vote in the election process. (3)/ No error (4).
77. We should not heave a sigh of relief (1)/ unless we will qualify (2)/ in the much awaited IAS prelims. (3)/ No error (4).
78. Many misfortunes in the world (1)/ comes across (2)/ the bridge of indecisions. (3)/ No error (4).

**Directions (Q. 79 – 81):** Sentences given with blanks to be filled in with an appropriate word(s). Four alternatives are suggested for each question. Choose the correct alternative out of the four and indicate it.

79. When Tina Dabi got the first rank, she looked ..... on hearing the news.  
1) desperate                      2) anxious                      3) depressed                      4) elated
80. It is somewhat less difficult to ..... but impossible to replace English medium inclination in UPSC Exams.  
1) deny                      2) approve                      3) propagate                      4) castigate
81. Had Burhan known the true path to avenge wrongs, he ..... have remained longer the poster boy of Kashmiri youths.  
1) would                      2) may                      3) might                      4) should

**Directions (Q. 82 – 83):** Out of the four alternatives, choose the one which best expresses the meaning of the given word.

82. It requires very perspicacious of the **judicial** investigation officer to find the conspiracy behind the infamous dope-test failure by Narsingh Yadav.  
1) discerning                      2) mysterious                      3) clever                      4) quick
83. The wrestler was **ousted** from representing India in the Rio Olympics.  
1) pushed                      2) dismissed                      3) forced                      4) expelled

**Directions (Q. 84 – 85):** Choose the word opposite in meaning to the given word.

84. Camroon decided to finish the script before it became **onerous**.  
1) unfamiliar                      2) light                      3) burdensome                      4) unique
85. The Ganga is as **deep** in midstream as at the banks.  
1) wide                      2) hollow                      3) narrow                      4) shallow

86. Four words are given in each question, out of which only one word is spelt correctly/ wrongly out of them. Find the word spelt correct/ wrong.

- 1) Occasion                      2) Omelette                      3) Oscillate                      4) Occurences

**Directions (Q. 87 – 88):** Four alternatives are given for the Idiom/ Phrase bold in below sentences. Choose the alternative which best expresses the meaning of the Idiom/ Phrase and mark it in the Answer Sheet.

87. As she couldn't pay the bill, she asked the owner to **put it on the cuff**.

- 1) on credit    2) against his credit  
3) in his bank account    4) in his friends account

88. The story behind the conspiracy for Rio Olympics does not **hold water** at first sight.

- 1) does not deserve much attention  
2) does not fulfill the requirements  
3) cannot be believed  
4) cannot be valued

**Directions (Q. 89):** Four alternatives are given for the Idiom/ Phrase. Choose the alternative which best expresses the meaning of the Idiom/ Phrase.

89. **To get the bird**

- 1) To get the awaited  
2) To have good luck  
3) To send away  
4) To get the impossible

**Directions (Q. 90 – 91):** A sentence/ a part of the sentence is italicised in bold. Below are given alternatives to the italicised part at (1), (2), (3) which may improve the sentence. Choose the correct alternative. In case no improvement is needed your answer is (4).

90. I am definitely late; the train **will have left** the station by the time I reach there.

- 1) will be leaving    2) will leave  
3) would have left    4) No improvement

91. Khaled was going to the forest to meet his brother who was then a celebrated militant **then the Indian armymen came on to interrogate them**.

- 1) then the Indian armymen had come to interrogate them.  
2) when the Indian armymen came to interrogate them.  
3) and here comes the Indian armymen to interrogate them.  
4) No improvement

**Directions (Q. 92):** A sentence/ a part of the sentence is italicised in bold. Below are given alternatives to the italicised part at (1), (2), (3) which may improve the sentence. Choose the correct alternative. In case no improvement is needed your answer is (4).

92. You too, should read newspaper daily. Only by doing this, **I answered** correctly and scored well in the interview.

- 1) I had answered    2) did I answer  
3) answered    4) No improvement

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

93. Extremely strong admiration for England or English customs  
1) Aristocrat                      2) Neo-rich                      3) Anglomania                      4) Parvenu
94. The place at which a river meets the sea  
1) Estuary                      2) Sanctuary                      3) Apiary                      4) Aviary
95. Military waking signal sounded in the morning  
1) Reveille                      2) Lullaby                      3) Anther                      4) Soprano

**Directions (Q. 96 – 100):** Read the passage carefully and choose the best answer to each question out of the four alternatives.

Andaman and Nicobar Islands consist of mainly two groups of islands, with distinctive features of the original residents - Negroid and Mongolese. It is strange to see how these two different groups migrated to these islands so far from the mainland - from India and Myanmar. The aboriginals found in these islands are the Jarawas, Sentinelese, Onges, Shompenites, mainly found in Andaman and the Nicobarese in Nicobar. Of these the Nicobarese in general, and some of the Onges, have accepted that so-called modern civilization and learned the use of modern tools and facilities. They can be seen frequently in the Port Blair market. The aboriginals are looked after by the Anthropological Department of the Government, who make regular visits to their islands and supply them with food and other necessities. These aboriginals still do not know how to use a matchbox and prepare fire by rubbing two pieces of wood; they also do not know the use of cloth. If the people from the Anthropological Department offer them clothes, they use them only as turbans and not to wrap their bodies.

96. The so-called modern civilization has been accepted in general by  
1) all the aboriginals  
2) the Nicobarese  
3) the Jarawas  
4) some of the Nicobarese and the Onges
97. The original residents migrated to the islands from  
1) India and Andaman                      2) Myanmar and Nicobar  
3) Sri Lanka and Myanmar                      4) India and Myanmar
98. The Jarawas, Sentinelese, Onges and Shompenites are mainly found in  
1) Andaman                      2) Nicobar  
3) Andaman and Nicobar                      4) Port Blair
99. The aboriginals are looked after by  
1) the Government of India  
2) the Anthropological Department of the Government  
3) the Tourism Department  
4) some NGOs
100. Original residents of Andaman and Nicobar Islands are .....  
1) Negroid                      2) Mongolese  
3) Negroid and Mongolese                      4) All of the above

**KEY**

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

**HINTS & SOLUTIONS**

1.  $As, Z \xrightarrow{-8} R \xrightarrow{+7} Y \xrightarrow{-8} Q$   
 $K \xrightarrow{-8} C \xrightarrow{+7} J \xrightarrow{-8} B$

Similarly,  $P \xrightarrow{+7} W \xrightarrow{-8} O \xrightarrow{+7} V$

$E \xrightarrow{+7} L \xrightarrow{-8} D \xrightarrow{+7} K$

2. As,  $68 = (4)^3 + 4$

$130 = (5)^3 + 5$

and  $350 = (7)^3 + 7$

Therefore,  $? = (6)^3 + 6 = 222$

3. Machine is made to work according to the instruction of human. Similarly, slave works under the instruction of his master.

4. Pigeon is the symbol of 'peace' and White flag is the symbol of 'surrender'.

5. All except New York are capital cities.

6.  $12306 \Rightarrow 1 \times 2 \times 3 = 06$

$23212 \Rightarrow 2 \times 3 \times 2 = 12$

$32424 \Rightarrow 3 \times 2 \times 4 = 24$

$41206 \Rightarrow 4 \times 1 \times 2 = 08 \neq 06$

7.  $4489 = 67 \times 67$

$5329 = 73 \times 73$

$2401 = 49 \times 49$

8381 = not a perfect square

8. Putting the value  $\blacklozenge = 3$ ,  $\times = 4$  and  $\blacklozenge = 5$  satisfies all three data.

As,  $\blacklozenge = 5 \Rightarrow \blacklozenge \blacklozenge = 2.5$

So,  $\blacklozenge \blacklozenge \blacklozenge \blacklozenge + \blacklozenge \blacklozenge + \times \times$

$= 3.5 \blacklozenge + 2 \blacklozenge + 2 \times$

$= 3.5 \times 5 + 2 \times 3 + 2 \times 4 = 31.5$

9. Range	No. of occurrence	Page no.
1 - 10	1	5
11 - 20	1	15
21 - 30	1	25
31 - 40	1	35
41 - 50	2	45, 50
51 - 60	10	51, 52, 53, 54, 55, 56, 57, 58, 59
61 - 70	1	65
71 - 80	1	75
81 - 90	1	85
91 - 100	1	95

20

10. The correct order is :

Skull	Face	Neck	Shoulder	Hand
3	9	4	2	10
Chest	Stomach	Thigh	Knee	Heel
6	8	7	5	1

11. Required no. of people =  $6 + 7 = 13$

12. No one can speak all the languages.

13.  $(9 \times 8) + (8 \times 6) + (6 \times 7) + (7 \times 9) = 72 + 48 + 42 + 63 = 225$

$$(6 \times 7) + (7 \times 4) + (4 \times 3) + (6 \times 3) = 42 + 28 + 12 + 18 = 100$$

$$(9 \times 6) + (6 \times 4) + (4 \times 5) + (9 \times 5) = 54 + 24 + 20 + 45 = 143$$

14.  $361324 \Rightarrow \sqrt{361} = 19$  and  $\sqrt{324} = 18$

$$\Rightarrow 19^2 - 18^2 = (19 + 18) \times (19 - 18) = 37 \times 1 = 37$$

$$484169 \Rightarrow \sqrt{484} = 22$$
 and  $\sqrt{169} = 13$

$$= 22^2 - 13^2 = (22 + 13) \times (22 - 13)$$

$$= 35 \times 9 = 315$$

$$625196 \Rightarrow \sqrt{625} = 25$$
 and  $\sqrt{196} = 14$

$$\Rightarrow 25^2 - 14^2 = (25 + 14) \times (25 - 14)$$

$$= 39 \times 11 = 429$$

15. Here the common faces with 4 dots are in same positions. Hence 2 will be opposite to 5.

16. Bindu - Seema - Rani - Reeta - Mary

17. Let Tanya paid Rs.x then, amount paid by Vivek = Rs.  $\frac{x}{2}$

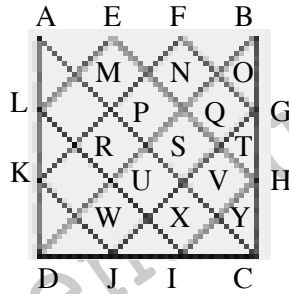
Again, amount paid by Ashutosh =  $\frac{x}{2} \times \frac{2}{3} = \frac{x}{3}$

Total bill =  $x + \frac{x}{2} + \frac{x}{3} = \frac{6x + 3x + 2x}{6}$   
 $= \frac{11x}{6}$

∴ Required fraction =  $\frac{\left(\frac{x}{2}\right)}{\frac{11x}{6}} = \frac{3}{11}$

18. The correct order is : D A B E C. 'D is third to the left of E' is correct.

19.



Simple triangles are AML, LRK, KWD, DWJ, JXI, IYC, CYH, HTG, GOB, BOF, FNE and EMA i.e. 12 in number.

- ★ Triangles composed of two components each are AEL, KDJ, HIC and FBG i.e. 4 in number.
- ★ Triangles composed of three components each are APF, EQB, BQH, GVC, CVJ, IUD, DUL and KPA i.e. 8 in number.
- ★ Triangles composed of six components each are ASB, BSC, CSD, DSA, AKF, EBH, GCJ and IDL i.e. 8 in number.
- ★ Triangles composed of twelve components each are ADB, ABC, BCD and CDA i.e. 4 in number.

Total number of triangles in the figure = 12 + 4 + 8 + 8 + 4 = 36

20. 1, 7, 8; 3, 5, 6; 2, 4, 9

21. T (2 Lines) + V (2 Lines) = R (4 Lines)

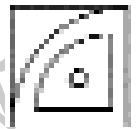
Z (3 Lines) + Y (2 Lines) = R (5 Lines)

I (1 Line) + L (2 Lines) = U (3 Lines)

22.



23.



24. As the colour of the milk is white and it is given that 'red means white'. So, the colour of milk is red.

51. Area of circular field =  $\pi r^2 = 3850$  sq.m.

$\Rightarrow \pi r^2 = 3850$

$$\Rightarrow r^2 = \frac{3850}{22} \times 7 = 1225 \Rightarrow r = 35 \text{ m}$$

Now, circumference of circle =  $2\pi r$

$$= 2 \times \frac{22}{7} \times 35 = 44 \times 5 = 220 \text{ m}$$

$$\text{Side of the square field} = \frac{220}{4} = 55 \text{ m}$$

$$\text{Area of square} = 55 \times 55 \text{ m}^2 = 3025 \text{ m}^2$$

52. Pay/hour  $\times$  number of hours = wages

$$\text{Increase} \leftarrow \begin{pmatrix} 5 & 6 \\ 7 & 5 \end{pmatrix} \rightarrow \text{Decrease} = 30$$

$$\text{by } 40\% \qquad \qquad \qquad \text{by } 16\frac{2}{3}\% = 35$$

$$\text{Wages increased by } \frac{5}{30} \times 100 = 16\frac{2}{3}\%$$

53.  $119 + 19 = 138$

$$\therefore \text{Required no.} = \frac{138}{17}$$

The remainder is 2.

54. No. of other workers except centre heads =  $x$

$$\therefore 12 \times 400 + x \times 56 = (x + 12) \times 60$$

$$\Rightarrow 4800 + 56x = 60x + 720$$

$$\Rightarrow 4x = 4080$$

$$x = 1020$$

$$\therefore \text{Total no. of employees} = 1020 + 12 \\ = 1032$$

55. Let the distance of the place from the starting point be  $x$  km

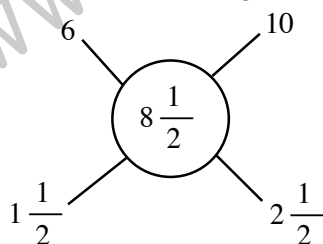
$$\therefore \text{The speed of the man along the stream} = 10 + 3 = 13 \text{ kms/hr}$$

$$\text{Speed of man against the stream} = 10 - 3 \\ = 7 \text{ kms/hr}$$

$$\therefore \frac{x}{13} + \frac{x}{7} = 1 \text{ or } 20x = 13 \times 7$$

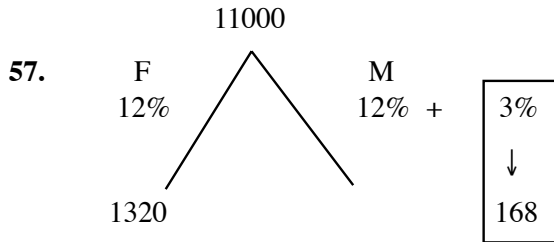
$$\therefore x = \frac{91}{20} = 4.55 \text{ km}$$

56. From the rule of alligation



∴ Ratio between 1<sup>st</sup> and 2<sup>nd</sup> sum = 3 : 5

$$\therefore 2^{\text{nd}} \text{ sum} = \frac{5}{3} \times 7500 = \text{Rs.}12,500$$

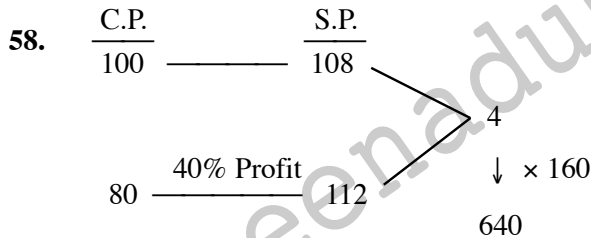


$$\therefore 3\% = 168$$

∴ No. of males = 5600 and

No. of females = 5400

Required diff. = 200



$$\therefore \text{initial cost price} = 100 \times 160 = \text{Rs.}16,000$$

59.  $a^3 + b^3 + c^3 - 3abc$

$$= \frac{1}{2} (a + b + c)[(a - b)^2 + (b - c)^2 + (c - a)^2]$$

$$= \frac{1}{2} (333 + 333 + 334) [(0)^2 + (-1)^2 + (1)^2]$$

$$= \sqrt[3]{\frac{1}{2} \times 1000 \times 2} = 10$$

60. In  $\Delta ORS$ ,  $OR = OS = \text{Radii}$

$$\therefore \angle ORS = y^\circ$$

$$\angle POR = y^\circ + y^\circ = 2y^\circ$$

[external angle property]

In  $\Delta POR$ ,

$$\angle OPR + \angle POR + \angle PRO = 180^\circ$$

$$\Rightarrow x^\circ + 2y^\circ + 90^\circ = 180^\circ$$

$$\Rightarrow x^\circ + 2y^\circ = 90^\circ$$

61.  $(x + 1)$  and  $(x - 2)$  are factors of

$$x^3 + (a + 1)x^2 - (b - 2)x - 6$$

At  $x = -1$ ,

$$(-1)^3 + (a + 1)(-1)^2 - (b - 2)(-1) - 6 = 0$$

$$\Rightarrow -1 + a + 1 + b - 2 - 6 = 0$$



$$a + b = 8 \dots(i)$$

At  $x = 2$ ,

$$2^3 + (a + 1) 2^2 - (b - 2) \times 2 - 6 = 0$$

$$\Rightarrow 8 + 4a + 4 - 2b + 4 - 6 = 0$$

$$2a - b = -5 \dots(ii)$$

On adding (i) and (ii),

$$3a = 3$$

$$a = 1; b = 7$$

**62.**  $\tan(x + y) \tan(x - y) = 1$

$$\Rightarrow \tan(x + y) = \frac{1}{\tan(x - y)} = \cot(x - y)$$

$$\Rightarrow \tan(x + y) = \tan(90^\circ - (x - y))$$

$$= x + y = 90^\circ - (x - y)$$

$$\Rightarrow 2x = 90^\circ \Rightarrow \frac{2x}{3} = 30^\circ$$

$$\therefore \tan \frac{2x}{3} = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

**63.**  $A : B = 1 : 2 = 3 : 6$

$$B : C = 3 : 4 = 6 : 8$$

$$C : D = 6 : 9 = 2 : 3 = 8 : 12$$

$$D : E = 12 : 16$$

$$\therefore A : B : C : D : E = 3 : 6 : 8 : 12 : 16$$

**64.** Volume of right prism = Area of the base  $\times$  height

$$\Rightarrow 10380 = 173 \times h$$

$$\Rightarrow h = \frac{10380}{173} = 60 \text{ cm}$$

$$\text{Now, Area of triangle} = \frac{\sqrt{3}}{4} \times (\text{Side})^2$$

$$\Rightarrow 173 = \frac{\sqrt{3}}{4} \times (\text{Side})^2$$

$$\therefore \text{Side} = \sqrt{\frac{173 \times 4}{\sqrt{3}}} = \sqrt{\frac{173 \times 4}{1.73}} = 20 \text{ cm}$$

$$\therefore \text{Perimeter} = 3 \times 20 = 60 \text{ cm}$$

$$\therefore \text{Area of the lateral surface} = \text{Perimeter base} \times \text{height} = 60 \times 60$$

$$= 3600 \text{ sq. cm}$$

**65.**  $\cos \theta = \frac{15}{17} = \frac{\text{Base}}{\text{hypotenuse}}$

$\therefore$  Perpendicular

$$= \sqrt{(17)^2 - (15)^2}$$

$$= \sqrt{289 - 225} = \sqrt{64} = 8$$

$$\therefore \cot(90^\circ - \theta) = \tan \theta = \frac{\text{Perpendicular}}{\text{Base}} = \frac{8}{15}$$

66.  $A + B = 16$   $\left\{ \begin{array}{l} 3 \\ 48 \\ 2 \end{array} \right.$

$B + C = 24$

$A + B$   $B + C$

$\downarrow$  4 days  $\downarrow$  3 days

12 units 6 units

Total work left = 30 units

$$\therefore \text{Efficiency of C} = \frac{30}{20}$$

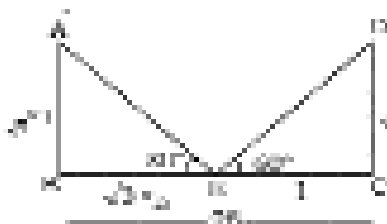
$$\therefore \text{Required days} = \frac{2}{3} \times 48 = 32 \text{ days}$$

67. Mixture - I Mixture - II

$$\begin{array}{c} \frac{4}{7} \quad \frac{2}{5} \\ \diagdown \quad \diagup \\ \frac{1}{2} \\ \diagup \quad \diagdown \\ \frac{1}{2} - \frac{2}{5} \quad \frac{4}{7} - \frac{1}{2} \\ \frac{1}{10} \quad : \quad \frac{1}{14} \end{array}$$

Required ratio = 7 : 5

68.



$$\therefore BC \text{ (ratio value)} = 4$$

$$\therefore 4 = 28$$

$$1 = 7$$

$$\therefore \sqrt{3} = 7\sqrt{3} \Rightarrow h = 7\sqrt{3}$$

69. Total age of all boys along with the teacher =  $(24 + 1) \times 15 = 375$  years

Total age of all boys excluding The teacher =  $24(15 - 1) = 336$  years

$\therefore$  The age of the teacher =  $375 - 336 = 39$  years

70. Profit Ratio of A, B and C

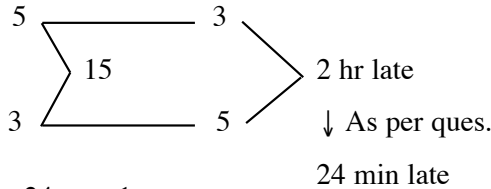
$$= (5 \times 12) : (7 \times 12) : (6 \times 6 + \frac{6}{2} \times 6)$$

$$= 60 : 84 : 54 = 10 : 14 : 9$$

∴ Share of C in the Profit

$$= \frac{9}{33} \times 33000 = \text{Rs.}9,000$$

71.



$$\therefore \frac{24}{120} = \frac{1}{5}$$

$$\therefore \text{Required distance} = 15 \times \frac{1}{5} = 3 \text{ km}$$

72. L.C.M of 30 min, 60 min, 90 min & 105 min = 1260 min

$$\text{Total hours} = \frac{1260}{60} = 21 \text{ hours}$$

∴ The bell will again ring simultaneously after 21 hours.

∴ Time will be = 9 a.m

73. Percentage expenditure on clothes for family B = 15

$$\therefore \text{Required expenditure} = \frac{10000 \times 15}{100} = \text{Rs.}1,500$$

74. Expenditure on education for family A = 20%

$$\text{Required fraction} = \frac{20}{100} = \frac{1}{5}$$

75. Food + clothes + house rent = 30 + 15 + 15 = 60%

$$\therefore \text{Required expenditure} = \frac{30000 \times 60}{100} = \text{Rs.}18,000$$

76. Since the subject (i.e, every voter) is singular, it will take singular possessive adjective. Replace 'their' by 'his/ her'. Also change 'caste' into 'cast'.

77. The part of the sentence which starts with 'unless' takes simple present tense. Change 'unless we will qualify' into 'unless we qualify'.

78. As the subject of the sentence (i.e, many misfortune) is plural, it requires plural verb as well. Thus, replace 'comes' by 'come'.

81. A past conditional sentence takes the following form: Had + Sub + V3, Sub + Would have + V3 + Obj.

90. An action that will have been completed in future while referring to a particular time frame, comes under future perfect tense.

92. Sentence starting with 'only' takes inversion form.

This model paper was prepared by subject experts of RACE Institute, Hyderabad