(Sem-1) SEC

2024
MATHEMATICS
Paper Code : SEC0108503

(Reasoning and Logic)

Full Marks : 36

Time : 2 hours

The figures in the margin indicate
full marks for the questions.

1. Answer the following: $1 \times 6 = 6$
   - (a) A number is as much greater than 36 as is less than 86. Find the number.
   - (b) Find the average of the reciprocals of x and y.

   - (c) If $\sqrt{2} = 1.4142$, find the value of $\dfrac{\sqrt{2}}{2+\sqrt{2}}$

   - (d) Seema, Meena and Reema begin to jog around a circular stadium and they complete their revolutions in 54 sec, 42 sec, and 63 sec respectively. After how much time will they come together at the starting point?

   - (e) If $\dfrac{a}{b} = \dfrac{5}{6}$ and $\dfrac{b}{c} = \dfrac{15}{16}$, Find the value of $\dfrac{c^2 - a^2}{c^2 + a^2}$

   - (f) If $\log_{10} 2 = 0.3010$ and $\log_{10} 3 = 0.4771$. Then find the value of $\log_{10} 1.5$.

2. Answer any five the following: $2 \times 5 = 10$
   - (a) By selling 33 metres of cloth, one gains the selling price of 11 metres. Find the gain percent.

(b) The weekly incomes of two persons are in the ratio of 7:3 and their weekly expenses are in the ratio of 5:2. If each of them saves Rs. 300 per week, find their weekly incomes.

(c) Deepak invested an amount of Rs. 21250 for 6 years. At what rate of simple interest will be obtain the total amount of Rs. 26350 at the end of 6 years?

(d) After 3 years, how much compound interest will be obtained on Rs. 7800 at the interest rate of 5 % per annum?

(e) In how many different ways can the letters of the word "DESIGN" be arranged so that the vowels are at the two ends?

(f) Reenu's age after 6 years will be three-sevenths of the father ages, was 10 years ago, the ratio of their ages was 1:5. What is the Reenu's fathers age at present?

(g) Of the three numbers, second is twice the first and is also numbers is 44, What is the largest number?

Wire the third, if the average of 3

(h) Difference of two numbers is 1660. If 7.5 % of one number is 12.5% of the other number, find the two numbers.

(i) A rectangular carpet has an area of 120 sq. metres and a perimeter of 46 metres. Find the length of its diagonal.

(j) The milk and water in two vessels A and B are in the ratio 4:3 and 2:3 respectively In what ratio the liquids in both the vessels be mixed to obtain a new mixture in vessel C containing half milk and half water.

3. Answer any four of the following: $5 \times 4 = 20$
(a) Peter can cover a certain distance in 1 hr 24 min by covering two third of the distance at 4 kmph and the rest at 5kmph. Find the total distance.

(b) The monthly income of a person was Rs. 13500 and his monthly expenditure was Rs 9000. Next year, his income increased by 14% and his expenditure by 7%. Find the percentage increase in his savings.

(c) Study the information given below and answer the following questions:

A family comprises seven members of which there are two couples. These seven members includes A,B,C,D,E,F and G. C is the sister of B. A is the father of F and E is the brother of F and F is the female. G is the mother of B. D is the mother in law of G.

i) How is G related to A?
    1. Daughter in law.   2. Daugher.
    3. Brother.   4. Grandfather.

ii) How is E related to C?
    1. Father.   2. Mother.
    3. Sister.   4. Grandparents.

iii) What is the relation between B and D?
    1. D is the father of B.   2. B is the brother of D.
    3. B and D are cousins.   4. D is the grandfather of B.

iv) How is F related to B?
    1. Uncle.   2. Nephew.
    3. Grandson.   4. Aunt.
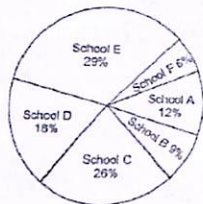
v) How is A related to D?
    1. Father.   2. Mother.
    3. Sister.   4. Grandparents.

(d) A can do a piece of work in 80 days. He works at it for 10 days and then B alone finishes the remaining work in 42 days. In how much time will A and B working together, finish the work.
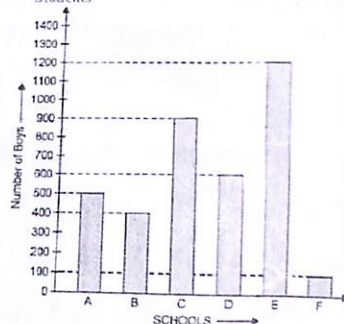
(2)

(3)

(e) Three equal jugs are filled with a mixture of milk and water. The proportion of milk and water in each glass is in the ratio 1:2, 2:3, 3:4. The contents of the three jugs are emptied in to a single vessel. What is the proportion of milk and water in it?

(f) A shopkeeper with an overdraft facility at 18 percent with a bank borrowed Rs. 15000 on June 8, 2011 and returned the money on june 3,2011 so as to clear the dept. Find the amount.

(g) Study the following pie-chart and bar diagram and answer the following questions.

Percentage-wise Distribution of students in 6 Different Schools. Total number of students = 6000.

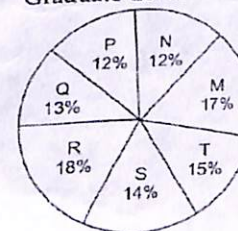Number of Boys in Each School Out of 6000 Students

1. What is the number of girls in the school C, the number of girls in school E and the number of boys in schools together?
   i. 1700   ii. 1900   iii. 1600   iv. 1800.

2. What is the ratio of the number of boys in school C, the number of girls in school B and the total number of students in school E?
   i. 45:7:97   ii. 43:9:97   iii. 45:7:87   iv. 43:9:87.

3. What is the difference between the total number of students in school F and the number of boys in school E?
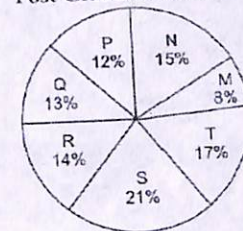   i. 820   ii. 860   iii. 880   iv. 900.

4. In which of the following schools the total number of students is equal to the number of girls in school E?
   i. A   ii. B   iii. C   iv. D   v. F.

(h) The following pie-chart show the distribution of students of graduate and post graduate levels in 7 different institutes: M, N, P, Q, R, S and T in a town. Study the pie chart carefully and answer the questions given below:
Distribution of students at graduate and post graduate levels in seven institutes.

Total Number of Students of Graduate Level = 27300

Total Number of Students of Post-Graduate Level = 24700

1. How many students of institutes M and S are studying at graduate level?

2. Find the total number of students studying at post graduate level from institutes N and P.

3. What is the total number of graduate and post graduate ievel students in institute R?

4. What is the ratio between the number of students studying at post graduate and graduate levels respectively from institute S?

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(4)

(5)