Avinashilingam Institute for Home Science and Higher Education for Women
Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Continuous Internal Assessment Test I – August 2025

Semester V

Class: III UG **Time: 2 Hrs**

Major: B.Sc. Mathematics **Max. Marks: 60**

23BMAPA4 – Mathematics for Competitive Examinations

Course Outcomes:

CO1: Solve the problems related to numbers
CO2: Impart knowledge about fundamentals of arithmetical operations
CO3: Understand the concepts of distance and work
CO4: Compute the problems on business mathematics and mensuration
CO5: Identify an appropriate approach to solve quantitative problems

PART-A **6 x 1 = 6**

Choose the correct answer

1. Two numbers are in the ratio of 15 : 11. If their H.C.F. is 13, then the numbers are: CO1K2

   a. 75, 55 b. 105, 77 c. 15, 11 d.195, 143

2. How many $\frac{1}{8}$'s are there in $37\frac{1}{2}$? CO1K1

   a. 300 b.400 c. 500 d. can't be determined

3. The average height of 30 boys out of a class of 50, is 160 cm. If the average height of the remaining boys is 165 cm, the average height of the whole class (in cm) is: CO2K2

   a. 161 b.162 c.163 d.164

4. What number should be added to each of the numbers 8, 21, 13 and 31 so that the resulting numbers, in this order form a proportion? CO2K2

   a. 2 b.3 c.5 d.7

5. A car travels a distance of 715 km at a uniform speed. If the speed of the car is 10 kmph more, it takes 2 hours less to cover the same distance. The original speed was: CO3K4

   a. 45 kmph b. 55 kmph c. 60 kmph d.65 kmph

6. To fill a cistern, pipes A, B and C take 20 minutes, 15 minutes and 12 minutes respectively. The time in minutes that the three pipes together will take to fill the cistern, is: CO3K2

   a. 5 b. 10c. 12 d.15

PART – B **3 x 6 = 18**

Answer all the Questions

7. a. What is the unit's digit in the following products? CO1K3

   i) $(7^{71} \times 6^{59} \times 3^{65})$ ii) $(2467^{153} \times 341^{72})$

(or)

7. b. If $a = \frac{\sqrt{5}+1}{\sqrt{5}-1}$ and $b = \frac{\sqrt{5}-1}{\sqrt{5}+1}$, the what is the value of $\frac{a^2+ab+b^2}{a^2-ab+b^2}$? CO1K4

8. a. i) Of the total amount received by Kiran, 20% was spent on purchases and 5% of the remaining was spent on transportation. If he is left with Rs. 1520, what was the initial amount received?

ii)In a library, 20% of the books are in Hindi, 50% of the remaining books are in English, and the remaining 9000 books are in various other languages. What is the total number of books in the library? CO2K2

(or)

8. b. i) If $a+b:b+c:c+a=6:7:8$and $a+b+c=14$, then what is the value of c?

ii) If $\frac{a}{3}=\frac{b}{4}=\frac{c}{7}$, then what is the value of $\frac{a+b+c}{c}$? CO2K1

9. a.i) A and B can do a piece of work in 5 days; B and C can do it in 7 days; A and C can do it in 4 days. Who among these will take the least time if put to do it alone?

ii) 12 children take 16 days to complete a work which can be completed by 8 adults in 12 days. 16 adults started working and after 3 days 10 adults left and 4 children joined them. How many days will it take them to complete the remaining work? CO3K2

(or)

9. b.i)One tap can fill a cistern in 2 hours and another tap can empty the cistern in 3 hours. How long will they take to fill the cistern if both the taps are opened?

ii)12 buckets of water fill a tank when the capacity of each bucket is 13.5 litres. How many buckets will be needed to fill the same tank, if the capacity of each bucket is 9 litres?

iii)Bucket Phas thrice the capacity as bucket Q. It takes 60 turns for bucket P to fill the empty drum. How many turns it will take for both the buckets P and Q, having each turn together to fill the empty drum? CO3K3

PART – C **3 x 12 = 36**

Answer all the questions

10. a. Find the value of the following expressions: CO1K4

$i)\ 7\frac{1}{2}-\left[2\frac{1}{4}\div\left\{1\frac{1}{4}-\frac{1}{2}\left(1\frac{1}{2}-\frac{1}{3}-\frac{1}{6}\right)\right\}\right]$

$ii)\ 5-\left[\frac{3}{4}+\left\{2\frac{1}{2}-\left(0.5+\overline{\frac{1}{6}-\frac{1}{7}}\right)\right\}\right]$

$iii)\ \frac{3\frac{1}{4}-\frac{4}{5}\ of\ \frac{5}{6}}{\left[4\frac{1}{3}\div\frac{1}{5}-\left(\frac{3}{10}+21\frac{1}{5}\right)\right]}$

(or)

10. b. (i)When 50 is divided into two parts such that the sum of their reciprocals is $\frac{1}{12}$, what are the two parts?

(ii) A fraction becomes 2 when 3 is added to both its numerator and denominator, and it becomes 4 when 1 is subtracted from both the numerator and the denominator. What is the numerator of the original fraction? CO1K4

11. a. i) Two-thirds of a consignment was sold at a profit of 5%, and the remaining one-third at a loss of 2%. If the total profit was Rs. 400, what was the value of the consignment (in rupees)?

ii)Kishan bought a certain quantity of rice at the rate of Rs 150 per quintal and 10% of the rice was spoiled. At what price should he sell the remainder to gain 20% of his outlay?

iii)Successive discounts of x % and y % are equivalent to a single discount of how much percent? CO2K2

(or)

11. b. i) 20 men complete one-third of a piece of work in 20 days. How many more men should be employed to finish the rest of the work in 25 more days?

ii)If 9 examiners can examine a certain number of answer books in 12 days by working 5 hours a day; for how many hours a day would 4 examiners have to work in order to examine twice the number of answer books in 30 days?

iii)A and B start a business jointly. A invests Rs. 16000 for 8 months and B remains in the business for 4 months. Out of total profit, B claims $\frac{2}{7}$ of the profit. How much money was contributed by B?What is a forward rate, and how does it relate to interest rates over different time periods? CO2K3

12. a. i) Two pipes A and B fill a tank in 15 hours and 20 hours respectively while a third pipe C can empty the full tank in 25 hours. All the three pipes are opened in the beginning. After 10 hours, C is closed. In how much time, will the tank be full?

ii)Two pipes A and B can fill a cistern in 12 minutes and 15 minutes respectively but a third pipe C can empty the full tank in 6 minutes. A and B are kept open for 5 minutes in the beginning and then C is also opened. In what time is the cistern emptied?

iii) A man drives 150 km from A to B in 3 hours 20 minutes and returns from B to A in 4 hours 10 minutes. By how much does the average speed from A to B exceed the average speed for the entire trip? CO3K4

(or)

12. b.i) A train covers a certain distance in 50 minutes if it runs at an average speed of 48 kmph. What should be its speed to reduce the journey time to 40 minutes?

ii)Walking at $\frac{3}{4}$ of his usual speed, a man is late by 2 hours. What would have been his usual time to cover the distance?

iii) A is twice as fast as B, and B is thrice as fast as C. If C covers a journey in 54 minutes, how long will B take to cover the same journey? CO3K5

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