

April 2025
B.A./B.Sc.
Second Semester
MULTI-DISCIPLINARY COURSE – 2
MATHEMATICS
Course Code: MAO 2.11
(Quantitative Aptitude)

Total Mark: 50

Pass Mark: 20

Time: 2 hours

I. Answer three questions, taking one from each unit.

UNIT I

1. (a) Find the smallest 5-digit number which is exactly divisible by 476. 2
- (b) How many zeros will be required to number the pages of a book containing 1000 pages? 2
- (c) If $\frac{b}{a} = 0.25$, then what is the value of $\frac{2a-b}{2a+b} + \frac{2}{9}$. 2
- (d) Find the last digit in the decimal representation of $\left(\frac{1}{5}\right)^{200}$ 2
- (e) Find the value of $\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{5}\right)\dots\left(1 - \frac{1}{100}\right)$. 2
- (f) Find the greatest possible length of a scale that can be used to measure exactly the following length of clothes; 3 m 510 cm and 12 m 90 cm. 2
2. (a) Find the least number which must be subtracted from 2361 to make it a perfect square. 2
- (b) Find the value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$. 2
- (c) If the average of a, b, c, d be M and $ab + bc = -ca$, then find the average of a^2, b^2, c^2 . 2
- (d) If $3^{x+1} + 3^{x-1} = 270$, find the value of x . 2
- (e) Solve for x , if $4^{\sqrt{x}^{\sqrt{x}}} = 256$. 2

- (f) Find the value of $\log_{\sqrt{2}} 32$. 2

UNIT II

3. (a) If 75% of a number is added to 75, then the result is the number itself. Find the number. 2
- (b) What is the percentage change in the result when we add 25 to a certain number x , instead of subtracting 25 from the same number x ? 2
- (c) If the cost price of 25 articles is equal to the selling price of 20 articles, find the gain %. 2
- (d) The difference between cost price and selling price is Rs 221. If the profit percent is 17%, then what is the cost price? 2
- (e) If $2x^2 - 7xy + 3y^2 = 0$, then find the value of $x : y$. 2
- (f) Find two numbers such that their mean proportional is 6 and third proportional is 20.25. 2
4. (a) What number should be subtracted from 23, 30, 57 and 78, so that they become proportional? 2
- (b) A man invests Rs. x and Rs. $2x$ at 15% simple interest and 8% compound interest (compounded annually) for two years respectively. Difference between S.I. and C.I. received after 2 years is Rs. 820. Find the value of x . 2
- (c) Rs. 120 is divided between X, Y, Z , so that X 's share is Rs. 20 more than Y and Rs. 20 less than that of Z . Find Y 's share. 2
- (d) In what ratio must water be mixed with milk to gain 20% by selling the mixture at cost price? 2
- (e) An ore contains 5% aluminium. What is the quantity of ore required to get 52kg of aluminium? 2
- (f) A child saves Rs. 24 with 60 coins consisting of 50 p or 25 p coins. Find the number of 25 p coins he had. 2

UNIT III

5. (a) If 36 men can do a piece of work in 25 hours, in how many hours will 15 men do it? 2
- (b) If 5 students utilize 18 pencils in 9 days, how long at the same rate will 66 pencils last for 15 students? 2

- (c) Pipe A can fill a tank in 30 hours and pipe B in 45 hours. If both the pipes are opened in an empty tank, how much time will they take to fill it? 2
- (d) A is twice as good a workman as B and together they do a piece of work in 18 days. In how many days will A alone finish the work. 2
- (e) X can do $\frac{1}{4}$ of a work in 10 days, Y can do 40% of the work in 40 days and Z can do $\frac{1}{3}$ of the work in 13 days. Who will complete the work first? 2
- (f) A cyclist covers a distance of 750 m in 2 min 30 sec. What is the speed in km/hr of the cyclist? 2
6. (a) A 160 m long train crosses a 160m long platform in 16 seconds. Find the speed of the train. 2
- (b) Speeds of the boat along the current and against the current are 14 km/hr and 7 km/hr respectively. What is the speed (in km/hr) of the current? 2
- (c) What was the day of the week on 16th July 1776? 2
- (d) If 1st August 2021 was Sunday, then what was the day on 1st November 2021? 2
- (e) At what time between 2 and 3 o'clock will the hands of a clock be together? 2
- (f) How many times are the hour hand and the minute hand of a clock at right angles during their motion from 1:00 p.m. to 10:00 p.m.? 2

II. Answer any two of the following questions.

7. (a) Four bells first begin to toll together and then at intervals of 6, 7, 8 and 9 seconds respectively. Find how many times the bells toll together in two hours and at what interval they toll together. $3\frac{1}{2}$
- (b) A batsman's runs just before the last match of the season adds up to 750. In his last two innings, he scores only 6 runs, and his average drops by 2. Find his final average of the season $3\frac{1}{2}$

8. (a) After getting two successive discounts, a shirt with a list price of Rs. 150 is available at Rs.105. If the second discount is 12.5%, find the first discount. $3\frac{1}{2}$
- (b) *A*, *B* and *C* took a house on rent for 1 year for Rs. 13824. They remained together for 4 months and then *C* left the house. After 5 months *B* also left the house. How much rent should each pay? $3\frac{1}{2}$
9. (a) A contract is to be completed in 50 days and 105 men were set to work, each working 8 hours a day. After 25 days, $\frac{2}{5}$ of the work is finished. How many additional men must be employed so that the work may be completed on time, each man now working 9 hours a day? $3\frac{1}{2}$
- (b) Train *A* moving at speed 72 km/hr crosses train *B* moving at $\frac{3}{4}$ speed of train *A* in the same direction in 1 minute and 26 seconds. The length of train *A* is $\frac{25}{18}$ of the length of train *B*.
What is the difference between the length of the two trains? $3\frac{1}{2}$
-