

# KAMARAJ COLLEGE (Autonomous)

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(Affiliated to Manonmaniam Sundaranar University, Tirunelveli)

(4 Pages)

Reg. No:.....

Question Code: 26E00203

Course Code : 24USMA21/25USMA21

UG Degree - End Semester Examinations, April 2026

Second Semester

B.Sc., MATHEMATICS

Mathematics for Competitive Examinations - II

(For those who joined in July 2024 and June 2025 onwards)

Time : 3Hours

Maximum : 75 Marks

## PART - A (10 × 1 = 10 Marks)

Answer ALL Questions

Choose the correct answer :

- CO:1  
K:1
1. If 4 men can complete a work in 12 days, how many days will 6 men take to complete the same work?
- (a) 6 (b) 8  
(c) 10 (d) 12
- CO:1  
K:2
2. 10 workers can do a job in 15 days. In how many days will 5 workers do the same job?
- (a) 15 (b) 20  
(c) 25 (d) 30
- CO:2  
K:1
3. A can complete a work in 20 days. What part of the work does he do in 1 day?
- (a)  $1/10$  (b)  $1/15$   
(c)  $1/20$  (d)  $1/25$
- CO:2  
K:2
4. A can do a work in 18 days and B in 9 days. In how many days can they complete the work together?
- (a) 6 days (b) 7 days  
(c) 8 days (d) 5 days
- CO:3  
K:2
5. A pipe can fill a tank in 10 hours. How long will it take to fill half the tank?
- (a) 4 hours (b) 5 hours  
(c) 6 hours (d) 7 hours

- CO:3 6. A pipe can fill a tank in 12 hours and another in 18 hours. How  
K:2 long will they take together?  
(a) 7.2 hours (b) 8.4 hours  
(c) 7.5 hours (d) 8.5 hours
- CO:4 7. A man walks at a speed of 5 km/h. How far will he walk in 3  
K:1 hours?  
(a) 10km (b) 15km  
(c) 20km (d) 30km
- CO:4 8. A train travels at 54 km/h. How long will it take to cover 81 km?  
K:1  
(a) 1.5 hours (b) 1.2 hours  
(c) 1 hour (d) 1.7 hours
- CO:5 9. Find the simple interest on ₹2000 at 12% per annum for 3 years.  
K:2  
(a) Rs. 734 (b) Rs. 675  
(c) Rs. 695 (d) Rs. 720
- CO:5 10. Find the compound interest on ₹1000 at 10% per annum for 2  
K:2 years.  
(a) Rs. 227 (b) Rs. 235  
(c) Rs. 210 (d) Rs. 202

**PART - B (5 X 5 = 25 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 250 words.**

- CO:1 11. (a) If 15 oranges cost Rs. 35, what do 39 orange costs?  
K:3  
**(OR)**  
(b) If 18 binders bind 900 books in 10 days. How many binders will be required to bind 660 books in 12 days?
- CO:2 12. (a) If A can do a piece of work in 8 days and B alone can do it in  
K:3 12 days, how many days both will take to finish the work?  
**(OR)**  
(b) A, B and C can do a piece of work in 20, 30 and 60 days respectively. In how many days can A do the work if he is assisted by B and C on every third day?
- CO:3 13. (a) When a cistern is in through repair it is filled by the inlet in  
K:3  $3\frac{1}{2}$  hours. But, due to a leakage in the bottom, it takes half an hour longer. When the cistern is full, how long would the leak takes to empty the cistern?

**(OR)**

(b) Pipes A and B can fill a tank in 5 and 6 hours respectively. Pipe C can empty it in 12 hours. If all the three pipes are opened together, then find the time tank will be filled.

CO:4 14. (a) If I walk at 5 kmph. I miss a train by 7 minutes. If however, I  
K:4 walk at 6 kmph, I reached the station 5 minutes before the arrival of the train. How far do I walk to reach the station?

**(OR)**

(b) A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?

CO:5 15. (a) A certain sum of money at simple interest becomes Rs. 1062  
K:4 in 2 years and Rs. 1183.50 in 3  $\frac{1}{2}$  years. What is the rate of interest per annum?

**(OR)**

(b) There is 60% increase in an amount in 6 years at simple interest. What will be the compound interest of Rs. 12,000 after 3 years at the same rate?

**PART - C (5 X 8 = 40 Marks)**

**Answer ALL Questions choosing either (a) or (b).**

**Answer should not exceed 500 words.**

CO:1 16. (a) If 8 men, working 9 hours a day can build a wall 18 meters  
K:4 long, 2 meters broad and 12 meters high in 10 days, how many men will be required to build a wall 32 meters long, 3 meters broad and 9 meters high, by working 6 hours a day, in 8 days?

**(OR)**

(b) 2 men and 7 boys together complete a certain work in 16 days while 3 men and 8 boys together complete the same work in 12 days. Find, in how many days will 8 men and 8 boys together complete it.

CO:2 17. (a) A and B can do a piece of work in 12 days, B and C in 15  
K:3 days, C and A in 20 days. In how many days will they finish it together and separately?

**(OR)**

(b) A machine P can print one lakh books in 8 hours, machine Q can print the same number of books in 10 hours while machine R can print them in 12 hours. All the machines are started at 9 A.M. while machine P is closed at 11 A.M. and the remaining two machines complete work. Approximately at what time will the work (to print one lakh books) be

finished?

- CO:3 18. (a) Pipe A can fill a tank in 6 hours and pipe B can fill in 4 hours.  
K:3 If they are opened on alternate hour and if pipe A is opened first, in how many hours tank shall be full?

**(OR)**

- (b) Three pipes A, B and C can fill a tank from empty to full in 30 minutes, 20 minutes, and 10 minutes respectively. When the tank is empty, all the three pipes are opened. A, B and C discharge chemical solutions P, Q and R respectively. What is the proportion of the solution R in the liquid in the tank after 3 minutes?

- CO:4 19. (a) A thief is spotted by a policeman from a distance of 200  
K:4 metres. When the policeman starts the chase, the thief also starts running. If the speed of the thief is 10 km/h and that of the policeman 12 km/h, how far will the thief have to run before he is overtaken?

**(OR)**

- (b) Robert is travelling on his cycle and has calculated to reach point A at 2 P.M. if he travels at 10 kmph, he will reach there at 12 noon if he travels at 15 kmph. At what speed must he travel to reach A at 1 P.M.?

- CO:5 20. (a) What is the difference between compound interests on  
K:4 ₹5,000 compounded yearly and half-yearly for  $1\frac{1}{4}$  year at 8% per annum?

**(OR)**

- (b) Mr. Thomas invested an amount of Rs. 13,900 divided in two different schemes A and B at the simple interest rate of 14% p.a. and 11% p.a. respectively. If the total amount of simple interest earned in 2 years be Rs. 3508, what was the amount invested in Scheme B?