

UNDERGRADUATE END SEMESTER EXAMINATION - OCTOBER 2025**SEMESTER 5 : MATHEMATICS (OPEN COURSE)****COURSE : 19U5OCMAT1 : APPLICABLE MATHEMATICS***(For Regular 2023 Admission and Supplementary 2022/ 2021/ 2020/ 2019 Admissions)*

Time : Three Hours

Max. Marks: 75

PART A**Answer any 10 (2 marks each)**

1. From a point 35 meters away from the foot of a tower, the top of the tower is observed at an angle of elevation of 45° , then the height (in meters) of the tower is?
2. Write in logarithmic form: $49^{-3/2} = \frac{1}{343}$.
3. Find the LCM of 72, 84, 126.
4. Differentiate $e^{3x} \cos 2x$
5. Divide 108 into two parts in the ratio 4:5
6. Evaluate $\int 7 \sin 3x \, dx$
7. $\left(\frac{36}{25}\right)^{3/2} =$
8. 5 men can complete a job in 8 days. How many days will it take if 12 men do the job?
9. If $a^2 + b^2 = 73$ and $ab = 24$, find $a+b$
10. A car moves at a speed of 80km/hr. What is its speed in m/sec?
11. Find the square root of 1156
12. What is the probability of getting a head when a coin is tossed.

(2 x 10 = 20)**PART B****Answer any 5 (5 marks each)**

13. Find the perimeter of an isosceles right-angled triangle having an area of 200cm^2
14. A die is thrown twice. What is the probability that the sum of the numbers obtained is 9?
15. Find the quotient if the divisor is $\frac{6}{5}$ times the remainder and the dividend and remainder are given as 10965 and 75 respectively.
16. How many eight distinct letter words can be formed from the letters of the word 'TRIANGLE' beginning with 'T' and ending with 'E'?
17. A person deposited Rs.8000 in a bank. After 2 years he withdrew Rs.3000 and at the end of four years, he received an amount of Rs.6800. Find the rate of simple interest?
18. In a single throw of a die, what is the probability of getting a number greater than 4?
19. Find the largest number which divides 245 and 1029 leaving a remainder of 5 in each case.
20. Find the smallest number by which 9408 must be divided so that it becomes a perfect square. Also find the square root of the perfect square thus obtained.

(5 x 5 = 25)**PART C****Answer any 3 (10 marks each)**

21. (a) The ratio of the number of male and female workers in a factory is 5:8. If there are 115 male workers determine the number of female workers in the factory.
(b) In an examination, 94% of the candidates passed and 114 failed. How many candidates appeared?

22. (a) Differentiate $\log(\sin(\cos x))$.
(b) A bag contains 10 black and 10 white balls. Two balls are drawn. Find the probability that both the balls are of same colour.
23. A committee of 5 is to be formed from 7 men and 6 women. In how many ways can this be done if the committee contains
a) at least 3 men
b) at least 2 women
24. If 3 men or 4 women can reap a field in 43 days, how long will 7 men and 5 women take to reap it?

(10 x 3 = 30)