B. A./B. Sc./B. COM. DEGREE END SEMESTER EXAMINATION – OCT. 2020: JANUARY 2021

SEMESTER – 5: MATHEMATICS (OPEN COURSE)

COURSE: **15U5OCMAT1: APPLICABLE MATHEMATICS**

(Common for Regular 2018 admission and Improvement 2017/ Supplementary 2017/2016/2015 admissions)

Time: Three Hours   Max. Marks: 75

PART A

Each Question carries 1 Marks. Answer All Questions

1.   Find$\log_4 16$
2.   In which quadrant the point (-5, 1) lies?
3.   Solve $x^2 - 5x + 6 = 0$
4.   2 coins are tossed simultaneously. Describe the sample space.
5.   Differentiate e^{3x}
6.   Evaluate the h.c.f. of 513 and 783
7.   Find the square root of 225.
8.   Find the value $64^{1/3}$
9.   Find the Area of an equilateral triangle whose side is 6cm
10. Find a number when it is added to its half gives 33.   (1 x 10 = 10)

PART B

Each Question carries 2 Mark. Answer Any Eight

11. Simplify $(x^2y^4)^{1/2}(x^6y^3)^{1/3}$
12. Draw the graph of $3x + y = 6$
13. Differentiate $x^2 \sin x$
14. Evaluate $\int_0^1 x^3 \, dx$
15. If a bag contains 4 red and 5 black balls. What is the probability that a ball drawn at random
     is black.
16. Divide 108 into two parts in the ratio 4:5
17. CP=500, SP=565 Find profit %
18. Find the two numbers whose sum and differences are 25 and 5 respectively.
19. The average of 20 values is 27 and if each value is multiplied by 2, find the new average.
20. The area of a rectangle is $240 cm^2$. If its length is 20cm find its breadth?   (2 x 8 = 16)

PART C

Each Question carries 5 Marks. Answer Any Five

21. Show that $\cos^2 60° + \cos^2 45° + \tan^2 30° + \sin^2 0° = \frac{13}{12}$.
22. How many six distinct letter words can be formed from the letter of the word 'RANDOM'
     beginning with 'R' and ending with 'M'.

23. A die is thrown twice. What is the probability that sum of the numbers obtained is 9 or 10.
24. A vehicle travels from A to B at a speed of 40km/hr and from B to A at a speed of 60km/hr. Find the average speed during the whole journey.
25. Rishi requires 40% to pass. If he gets 185 marks and fails by 15 marks, what was the maximum he could have got?
26. Find the derivative of $(3x + 1)(4x - 2)$
27. What principal will amount to Rs.20800 in 2 years at the simple interest of 2% per annum.

(5 x 5 = 25)

PART D
Each Question carries 12 Marks. Answer any two

28. A committee of 7 is to be formed from 5 men and 6 women. In how many ways can this be done if the committee contains
    a) 2 women
    b) at least 2 women
29. a) Differentiate $(2x + 1)sin3x$
    b) Evaluate $\int_0^1 (x + 1)(3x + 2)dx$
    c) Differentiate $cos\sqrt{x}$
30. a) Simplify $\left(x - \frac{1}{x}\right)\left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right)(x^2 - \frac{1}{x^2})$
    b) In an election between two candidates A and B, A got 65% of the total votes cast and won the election by 2748votes. Find the total number of votes cast if no vote is declared invalid.
31. a) The area of a square is 16 sq.cm. Find the area of the square joining the mid points of the sides.
    b) A factory increased its production of three wheelers from 80000 to 92610 in 3 years. Find the annual rate of growth of production.

(12 x 2 = 24)

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