2020

BUSINESS MATHEMATICS (Honours)

Paper : COMMH - DC-7

(CBCS)

Full Marks : 32 Time : Two Hours

The figures in the margin indicate full marks.

Answer the following questions.

1. There are 7 men and 3 ladies. Find the number of ways in which a committee of 6 persons can be formed if the committee is to have at least 2 ladies. 4

2. Prove that $\log_2\left[\log_2\left\{\log_3\left(\log_2 27^3\right)\right\}\right]=0$ 5

Or

Find the increasing arithmetic progression, the sum of whose first three terms is 27 and the sum of their squares is 275. 5

3. The annual increase in the population of a state is 25 per thousand and the present number of inhabitants is 26,24,000. What will be the population in three years' time ? 5

4. Evaluate limit : $\lim\limits_{x\to 3}\dfrac{(x-3)}{\sqrt{x-2}-\sqrt{4-x}}$ 5

Or

The *Cost Function* is given by $C(x)=\frac{1}{3}x^3-5x^2+75x+10$. At what output level the marginal cost attains its minimum? Also find the marginal cost at this level. 5

5. (a) Verify Euler's Theorem for the homogeneous function : $x^2 + 10xy + y^2$

(b) Integrate : $\int \frac{(x+2)^2}{\sqrt{x}}\, dx$ 4+4

Or

(a) If $f(x, y) = 3x^3 - 5x^2y + 2y^3$, show that $x\frac{\partial f}{\partial x} + y\frac{\partial f}{\partial y} = 3f(x, y)$.

(b) $\int (2x+5)\sqrt{x^2+5x}\, dx$ 4+4

6. Solve by Cramer's Rule : 5

$$\begin{aligned} 2x - y + z &= 6 \\ x + 2y + 3z &= 3 \\ 3x + y - z &= 4 \end{aligned}$$