

2nd In Semester Examination-2019

B.Com 5th Semester

Subject: **Mathematics**

Full Marks: 25

Time: 45 Min

Answer any five (05) from the following questions:

1. In a G.P. the first term is 3, the last term is 768 and the sum of the series is 1533. Find the common ratio and number of terms. 5
2. If the area of the triangle whose vertices are (x,y) ,(1,2) and (2,1) is 8 square units, then show that $x + y = 19$. 5
3. In what ratio does the x-axis divide externally the line segment joining the points (3,2) and (-2,1)? 5
4. Solve the following LPP graphically: 5

$$\begin{aligned} &\text{Minimize} && Z = 2x + 6y \\ &\text{Subject to constraints} && \\ &&& 2x + 3y \geq 6 \\ &&& x + y \leq 6 \\ &&& y \geq 1 \\ &&& x \geq 0, y \geq 0 \end{aligned}$$

5. Write a short note on the uses of Linear Programming Problem (LPP) in business and commerce. 5
6. Write the dual of the following primal problem: 5

$$\begin{aligned} &\text{Maximize} && Z = 3x + 2y \\ &\text{Subject to} && 3x + 4y \leq 22 \\ &&& 3x + 2y \leq 16 \\ &&& y \leq 3 \\ &&& x \geq 0, y \geq 0 \end{aligned}$$

7. A function is defined as follows:

$$f(x) = \begin{cases} -x & \text{if } x \leq 0 \\ x & \text{if } 0 < x \leq 1 \\ 2 - x & \text{if } x \geq 1 \end{cases}$$

Is the function continuous at $x = 1$? 5

8. Find $\frac{dy}{dx}$, where 2+3=5

(i) $y = 4x^3 - 9x^2 + 28x - 68$

(ii) $y = \frac{\sqrt{x}-1}{\sqrt{x+1}}$

9. Write the first principle of derivative and hence find derivative of x^2 . 5

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