College Name: _____

Student Name: _____   Seat No: _____

Copy No: _____

Date: June 7, 2017   **Max Time: 2 Hrs**
                                                                 Max Marks: 60

INSTRUCTIONS:
1. **Attempt any 4 questions. Do not write anything on the question paper.**
2. **Mobile phones or any other communicating device will not be allowed in the examination room. Students will have to remove the batteries of these devices before entering the examination hall.**

Q1   Solve the following linear programming problem by Corner point method.

Maximize $Z = 6x_1 + 12x_2$

Subject $2x_1 + x_2 \leq 10$
                      $x_1 + 2x_2 \leq 15$
                      $x_1, x_2 \geq 0$

Q2 a) Determine the size of the area bounded by function, the X-axis over the indicated interval of $f(x) = 4xe^{x^2}$, between $x = 1$, and $x = 3$.

b) Solve the differential equation $\dfrac{dy}{dx} = \dfrac{2y}{3x}$

Q3 a) Discuss continuity of $f(x) = \begin{cases} 2x+1 & x < -1 \\ -2x-3 & -1 \leq x \end{cases}$ At x $= -1$

b) Find $f'(x)$ using limit approach f (x) = (x^3 – x^2)

Q4   Determine value of x for which   f(x) $= 2x^3 - \dfrac{5x^2}{2} - 4x + 10$ is

          (i) an increasing function (ii) a decreasing function

Q5 a) Find $f''(x)$ if f(x) = cos4x / sin5x

b) Solve the following linear programming problem by the corner point method
          Maximize $z = 30x_1 + 20x_2$
          Subject to $3x_1 + x_2 \leq 18$
                        $x_1 + x_2 \leq 12$
                        $x_1 \geq 2$
                        $x_2 \geq 3$

Q6 a) Integrate (i) $\int x\sqrt{x+9}\ dx$ **(ii)** $\int \dfrac{1}{x^2} \ln x\ dx$

b) Integrate $\int \dfrac{2x+3}{(x+1)(x-2)} dx$

END OF EXAM PAPER