UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program : Third Semester - Fall 2021

Paper: Elementary Mathematics-II (Calculus)

Course Code: MATH-211

Roll No.

Time: 3 Hrs. Marks: 60

Q.1. Solve the following:

(6x5=30)

- 1. Find the domain of the real valued function given by $f(x) = \frac{1}{\sqrt{(1-x)(2-x)}}$.
- 2. Solve the equation |x| + |x 1| = 0 for x < 0.
- 3. Find the derivative of the function $5^{(\sin 3x)}$ with respect to x.
- 4. Evaluate the integral $\int x^2 e^x dx$.
- 5. Evaluate the definite integral $\int_{-1}^{5} |x-2| dx$.
- 6. Let the radius of the circle be increasing at the rate of 2 m/s. How fast is the area of that circle increasing when the radius of the circle is 40 m?

Q.2. Solve the following:

(3x10=30)

1. Examine whether the given function is continuous at x = 0,

$$f(x) = \begin{cases} (1+3x)^{\frac{1}{x}}, & x \neq 0; \\ e^2, & x = 0. \end{cases}$$

- 2. Find $\frac{dy}{dx}$ by implicit differentiation for the the curve $\tan^{-1}\left(\frac{y}{x}\right) + yx^2 = 1$.
- 3. Evaluate $\int \frac{1}{3\sin x + 4\cos x} dx$.