UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Second Semester - Spring 2023

Paper: Elementary Mathematics – II Course Code: MATH-211

Roll No.

Time: 3 Hrs. Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following:

(6x5=30)

- 1. Find the domain of the real valued function given by $f(x) = \sqrt{2+x} + \sqrt{7-x}$.
- 2. Find the values of x which satisfy the inequality $2x^2 25x + 12 > 0$.
- 3. Find the derivative of the function $5^{\ln(\cos x)}$
- 4. Evaluate the integral $\int x^3 \sqrt{x^2 + 1} dx$.
- 5. Evaluate the definite integral $\int_{-3}^{7} |x-5| dx$.
- 6. Evaluate the limit

$$\lim_{x \to 2} \frac{x^2 + x - 6}{8 - x^3}.$$

Q.2. Solve the following:

(3x10=30)

1. Find the values of the constants a and b if the given function is continuous and differentiable at $x = \frac{\pi}{6}$,

$$f(x) = \begin{cases} \sin(2x), & 0 < x \le \frac{\pi}{6}; \\ ax + b, & \frac{\pi}{6} < x \le 1. \end{cases}$$

- 2. Find $\frac{dy}{dx}$ by implicit differentiation for the the curve $\ln(x^2 + y^2) = y^3$.
- 3. Evaluate $\int \frac{5x^2+9}{x\sqrt{x^2+16}} dx$.