National University

of Computer & Emerging Sciences Peshawar Campus

Student Name: _____ Roll No: _____

Program: BS (AI & SE) Examination: **Sessional-1**

Semester: Fall-2023 Total Marks: 15, Weightage: 15

Time Allowed: 1 hour Date: 26/09/2023

Course: Calculus & Analytical Geometry (MT1003) Instructor: Shams Ul Arifeen

NOTE: Attempt all questions. Calculator is not allowed.

Q. 1 (CLO-1): Solve the inequality and express the solution in term of intervals. (6 marks)

(a) $x^2 - 5x + 6 \geq 0$

(b) $|2x - 3| < 4$

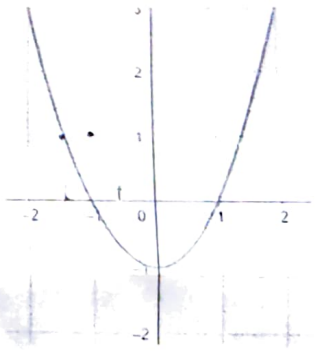
(c) Find the domain of $f(x) = \sqrt{x^2 - 5x + 6}$

Q. 2 (CLO-1): Sketch the graph of the following function (5 marks)

$$f(x) = \begin{cases} 2, & |x| > 2 \\ x^2, & |x + 1| \leq 1 \\ \sqrt{x}, & 0 < x \leq 2 \end{cases}$$

Evaluate $f(-3)$, $f(-1)$, $f(2)$, and $f(3.5)$.

Q. 3 (CLO-1): Graph of f is shown. (4 marks)



(a) Explain whether the function is even, odd, or neither and discuss symmetry.

(b) Specify the interval over which the function is increasing and the interval where it is decreasing.

(c) Compute x-intercept(s), root(s), and y-intercept.

(d) Identify the input and output and express in the interval form .

Good Luck