Center of preparatory studies

Math Unit

Math Level 2 Pure (FPM 102B)

Midterm Exam – Model Paper

Term 1 Fall, 2024-25

Student Name										
Student ID										**Date:15/10/2024**
Section										**Duration: 1hour 30 minutes**
Instructor/s	**Mohammad Mustafa**									

General Instructions

- Place your DU ID card on your desk throughout the examination period.
- Read the task instructions carefully.
- Use only a blue or black pen. (Pencil is allowed only for writing tasks)
- Not allowed to use programmable calculators and/or smart-watches/phones or any other smart devices inside the exam hall.
- Must abide by DU's Academic Integrity Policy (AIP)- Policy No. DU-AC-007

Dhofar University's Academic Integrity Policy (AIP) is intended to foster hard work, honesty, and responsibility. It strictly prohibits all forms of academic misconduct, including cheating and collusion, plagiarism, and impersonation. By signing below, I agree to abide by the AIP.

تهدف سياسة النزاهة الأكاديمية بجامعة ظفار إلى تعزيز العمل الجاد والأمانة والمسؤولية و تحظر تمامًا جميع الأشكال التي تخالف النزاهة الأكاديمية، بما في ذلك الغش والتواطؤ والسرقة الأدبية والإنتحال. بالتوقيع أدناه ، أوافق على الالتزام بسياسة النزاهة الأكاديمية.

Signature of the student _____

Marking Grid					
Question 1		8	Question 3		8
Question 2		7	Question 4		7
			Total		30

marked by: _____	**Moderated/ Checked by:** _____
Signature: _____ **Date:** _____	**Signature:** _____ **Date:** _____

Question 1: MULTIPLE CHOICE. Circle the correct answer. (8Marks)

1) The domain of following relation $\{(\mathbf{1},\mathbf{2}),(\mathbf{1},\mathbf{3}),(\mathbf{3},\mathbf{0}),(\mathbf{4},\mathbf{1})\}$ **is:**

(a) $\{\mathbf{1},\mathbf{3}\}$ (b) $\{\mathbf{1},\mathbf{0},\mathbf{1}\}$

(c) $\{\mathbf{1},\mathbf{3},\mathbf{4}\}$ (d) $\{\mathbf{2},\mathbf{3},\mathbf{0},\mathbf{1}\}$

2) If $f(x) = \frac{2x-1}{4x}$,Then $f(1) =$

(a) $\frac{1}{4}$ (b) -1 (c) 4 (d) undefined

3) The range of the function in the given graph is:

x	y
-5	-5
-2	1
4	13

(a) $\{-5, -2, 4\}$ (b) $\{-5, 1, 13\}$ (c) $\{-5, -2\}$

(d) $\{-5, 1\}$

4) The domain of the function $\frac{x}{x^2-4x-5}$ is:

(a) $R-\{1,5\}$ (b) $R-\{-1,5\}$ (c) $R-\{1,-5\}$ (d) $R-\{-1,-5\}$

5) If $\log_2 x = 3$, then $x =$

(a) 2 (b) 9 (c) 8 (d) 3

6) If $5^x = 3$, then x =

(a) $\frac{\log 3}{log 5}$ (b) $\frac{\ln 3-1}{\ln 5}$ (c) $\frac{\ln 3}{\ln 5}-1$ (d) $\ln 3$

7) The solution of the logarithmic equation $\log_2 2 - \log_2 x = \log_2 3$

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) 6 (d) $\frac{1}{6}$

8)	A sample of 100 g of radioactive lead-210 decays to polonium-210 according to the function A(t)= $100e^{0.04t}$, where t is time in years. Find the amount of radioactive lead remaining after **3** years? (a) 104.3 (b) 100 (c) 0.970 (d) 112.7

Question 2: **(7 Marks)**

a) Solve the exponential equation: $2^{x+1}.4^{3x} = 16$ (4 marks)

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b) Find the value of x for the nearest hundredth $2(2^{3x-1}) - 4 = 2$ (3 marks)

Question 3: **(8 Marks)**

a) Without graphing, determine whether the given equation has a graph that is symmetric with respect to the x-axis, the y-axis, the origin, or none of these. (3 marks)

$$x^2 - 5y^2 = 1$$

Symmetry with respect to $x - axis$	Symmetry with respect to $y - axis$	Symmetry with respect to origin

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b) Find the domain of the following functions:

1) $f(x) = \sqrt{5x + 15}$ (3 marks)

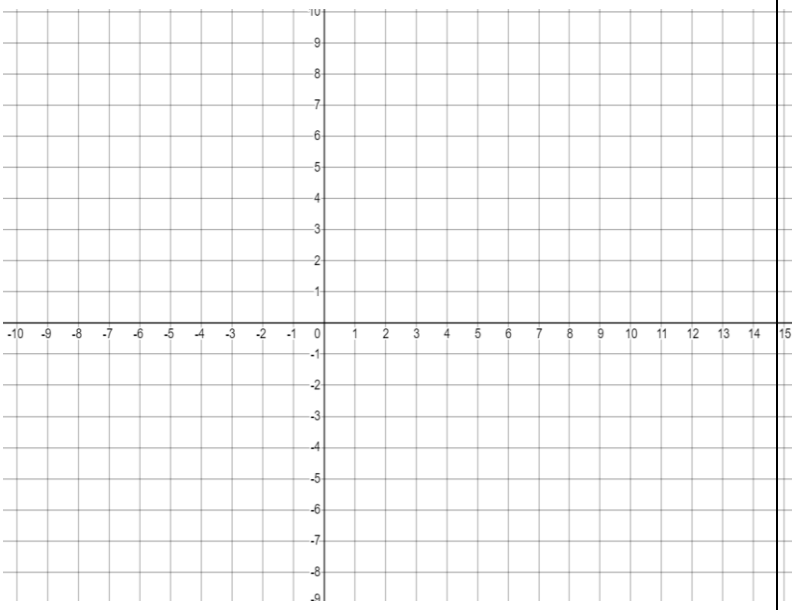
2) $f(x) = \frac{1}{x^2 + x - 12}$ (2 marks)

Question 4: **(7 Marks)**

(a) The population of a particular city is increasing at a rate proportional to its size. It follows the function $p(t) = 1 + k\ e^{0.08\ t}$ where k is a constant and t is the time in years. If the population is expected to be 45000 after 15 years, find the current population?? (2 Marks)

(b) Graph the logarithmic function: (5 Marks)

$$f\ (x) = \log_3(x - 2)$$



End of Midterm Exam – Model Paper

SCRATCH SHEET

Name: _____

Note:

1. This scratch sheet will not be marked.
2. Do not detach it from the rest of exam papers.