



Air University
Mid Semester Examinations: Spring 2025

10/2
C:53
Student ID: 241503

Subjective Part
(To be solved on Answer Books only)

Subject: Pre-Calculus
Class: BSCYB
Section(s): (II-A,B)
Course Code: (MA-118)

Time Allowed: 120 Minutes
Max Marks: 50
FM's Name: Usman Ghani
FM's Signature:

INSTRUCTIONS

- Attempt responses on the answer book only.
- Nothing is to be written on the question paper.
- Rough work or writing on question paper will be considered as use of unfair means.
- Tables / calculators are allowed.

Attempt all questions.

Q.1	CLO 1	PLO 2	C1	Marks 24
(a)✓	How many words can be formed from the letters of the following words using all letters when no letter is to be repeated AIRUNIVERSITY.			6
(b)✓	How many permutations of the letters of the word ATTACKED can be made if A is to be first letter in each arrangement?			6
(c)✓	Prove that in a single throw with two dice, the probability of rolling a sum greater than 6 is equal to the probability of rolling a sum less than 8.			6
(d)✓	A die is rolled twice: Event E1 is the appearance of an even number of dots and event E2 is the appearance of more than 4 dots. Prove that: $P(E1 \cap E2) = P(E1).P(E2)$			6
Q.2	CLO 2	PLO 2	C1	Marks 26
(a)✓	Construct the truth table for the given logical statement. $[(p \rightarrow q) \wedge p \rightarrow q]$.			6
(b)✓	Prove that, $p \vee (\sim p \wedge \sim q) \vee (p \wedge q) = p \vee (\sim p \wedge \sim q)$			6
(c)✓	Solve the triangle ABC, if $a = 53$, $\beta = 88^{\circ}36'$, $\gamma = 31^{\circ}54'$			6
(d)✓	Prove that: $\frac{\cos\theta + \sin\theta}{\cos\theta - \sin\theta} + \frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta} = \frac{2}{1 - 2\sin^2\theta}$			8

(Good Luck)