



University of Technology
Department of Applied Sciences
Final Examination 2015/2016



Subject : Mathematics
Branch : Biotechnology
Examiner : Asst.Prof. Atheer J . Kadhim

Class : 1st year
Time : 3 hours
Date :

Note: Answer only Four questions and (17.5 marks) for each question.

Q1: (a) Given the following table, find the average deviation and the standard deviation:

Category	0-1	1-2	2-3	3-4	4-5	5-6
Frequency	3	2	12	4	6	8

(b) Graph and find the range and domain of $y = f(x) = \tan x$.

Q2: (a) Find the area under $y = f(x) = \cos x$ from $x = 0$ to $x = \pi$.

(b) Find $\frac{dy}{dx}$ for the function $y = f(x) = x^{\sin x}$

Q3: (a) Evaluate $\int \frac{dx}{x^2 - 2x - 3}$

(b) Find the range and the median for the data 2, 5, 3, 15, 12, 6, 7 .

Q4: (a) Prove that $\lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$

(b) Find the average deviation of the following data:

2, 3, 4, 5, 5, 6, 7, 10, 13, 14, 19

Q5: (a) Consider the following distribution histogram of temperatures in a particular city registered for the required (95) days, find the average of temperatures.

Temperatures	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Number of days	4	8	12	16	20	25	6	4

(b) Sketch the graph of $f(x) = x^2 - 4$ and $g(x) = -x^2 + 4$.