

DEPARTMENT OF BASIC SCIENCES

MID SEMESTER EXAMINATION, 2<sup>ND</sup> SEMESTER, 2017/2018 SESSION

MATH 102. GENERAL MATHEMATICS II

TOTAL MARKS: 15 TIME ALLOWED: 30 MINS

INSTRUCTION: ATTEMPT ALL QUESTIONS.

Question 1

a) Define a mapping

(2 marks)

b) Evaluate  $\lim_{x \rightarrow 0} \frac{1 + \frac{1}{x}}{1 - \frac{1}{x}}$ .

(3 marks)

Question 2

Using first principle find  $\frac{dy}{dx}$  of (a)  $y = \frac{1}{x^2}$

(3 marks)

(b)  $y = x^4$

(2 marks)

Question 3

a) Find  $\frac{dy}{dx}$  of  $y = \frac{\sin x}{\cos x}$

(2 marks)

b) If  $y = px^2 + qx^{-2} + r$ , show that  $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} = 8px$

(3 marks)