

**BABCOCK UNIVERSITY**  
**DEPARTMENT OF BASIC SCIENCES**  
**SECOND SEMESTER, 2016/2017**  
**MID SEMESTER EXAMINATION**

**COURSE TITLE: GENERAL MATHEMATICS II      COURSE CODE: MATH 102**

**TIME ALLOWED: 30 MINUTES.**

**QUESTION ONE**

a) State the domain of the following functions defined by;

(i)  $f(x) = \frac{x^2 - 2x}{x^2 - 5x + 6}$

(ii)  $f(x) = \frac{1}{\sqrt{x^2 + x - 6}}$

(iii)  $f(x) = 10x$

(iv)  $f(x) = \frac{3}{\cos x}$

(6 marks)

**QUESTION TWO**

Discuss the continuity of the function defined by  $f(x) = \frac{x^3 + x^2 - 17x + 15}{x^2 + 2x - 15}$  at the points  $x = 3$  and  $x = -5$ . Hence, determine if the discontinuity can be removable.

(10 marks)

**QUESTION THREE**

Differentiate the following functions with respect to  $x$

i.  $y = x^4 \cos^{-1} 5x$

ii.  $y = \sec 3x \sin 2x$

iii.  $y = e^{\cot x}$

(14 marks)