Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
100 Level 2nd Semester Examination – Dec./Jan. 2016/17
BGE 131-3 Basic Mathematics & Engineering Technology

Uva Wellassa University

(PART C)

Instructions to candidates
Duration: One(01) hour
Number of questions: Two(02) Essay Questions
Mark allocation: 50 mark
Use standard symbols without definition.
Scientific calculators are allowed.
Answer all questions

1.

a. Find the value of x in $3^x = 27$. (03 mark)

b. Solve the following inequality for x.

$$x + 5 > 7 - x$$ (03 mark)

c. Prove that $\frac{\sin(A-B)}{\cos A \cos B} = \tan A - \tan B$. (05 mark)

d. Let $A = \begin{pmatrix} 2 & -1 \\ 0 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 6 & 4 \\ 5 & -1 \end{pmatrix}$, find:

i. $A + B$ (03 mark)
ii. $2A$ (02 mark)
iii. transpose of A (02 mark)
iv. determinant of B (03 mark)
v. inverse of A (04 mark)

2.

a. Evaluate the following limits.

i. $\lim_{x \to 1}(x^2 + 3x - 9)$ (02 mark)

ii. $\lim_{x \to 3} \frac{x^2 - 5x + 6}{x - 3}$ (03 mark)

iii. $\lim_{x \to 2} \frac{x^4 - 16}{x - 2}$ (03 mark)

b. Find $\frac{dy}{dx}$ of the following functions.

i. $y = 2x^5 - 3x + 7$ (02 mark)

ii. $y = (x+1)(x+3)$ (02 mark)

iii. $y = \frac{2x+1}{x^2}$ (02 mark)

iv. $y = \sin^2(x^3 - 5)$ (03 mark)

c. Integrate the following functions with respect to x.

i. $\int (x^2 + 3x - 2)dx$ (02 mark)

ii. $\int \frac{2x+1}{x^2+x+4} dx$ (03 mark)

iii. $\int x \ln x \, dx$ (03 mark)