

DTEMS PAST PAPERS
TECHNICAL

SIR ARTHUR LEWIS COMMUNITY COLLEGE
DEVISION OF TECHNICAL EDUCATION AND MANAGEMENT STUDIES

EXAMINATION#3 2005

PROGRAMME TITLE : Architectural Technology
Construction Engineering
Electronic Engineering
Automotive Engineering
Mechanical Technicians

PROGRAMME CODE : 3BD-ART-AD 3BD-CON-AD 3EE-ESC-AD
3ME-AUT-AD 3ME-MEC-AD

COURSE TITLE : **Calculus II**

COURSE CODE : **MAT 216**

DURATION : 2 HOURS

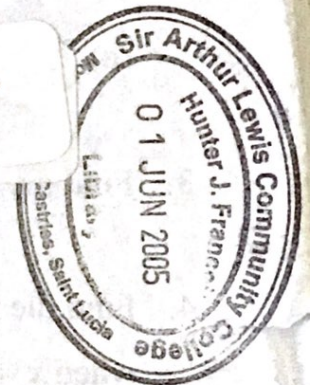
TIME AND DATE : 9:00 a.m. 13th May 2005.

ROOM : L1, L2,

COURSE TUTOR : Mr. F. Combie Mr. D. Combie

INVIGILATOR(S) : Mr. D. Combie Mr. F. Combie

#C18



INSTRUCTIONS

1. Answer **ALL** questions
2. Ensure your answers and pages are numbered correctly.
3. **DO NOT work in pencil.** Use **black** or **blue** ink pen.
4. You will be rewarded for neat clear explanations and presentation.
5. Show all relevant working necessary for arriving at your answer.



**DO NOT TURN THIS COVER SHEET UNTIL
YOU ARE TOLD TO DO SO**

1. Find the general solution for y in the following equations:

(a) $\frac{dy}{dx} - 2x^3 = e^{3x}$

[3]

(b) $\frac{dy}{dx} = \frac{y}{x}$

[6]

(c) $\frac{dy}{dx} + y = e^{-x}$

[5]

2. Find the general solution for y in the following equations:

(a) $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} - 14y = 0$

[4]

(b) $9\frac{d^2y}{dt^2} - 12\frac{dy}{dt} + 4y = 0$

[4]

(c) $\frac{d^2y}{d\theta^2} + y = 0$

[4]

3. Find the general solution for the equation $(x^2 - xy)\frac{dy}{dx} = -y^2$

[11]

4. Find the particular solution of $y\frac{dy}{dx} = 3 - y^2$, given that $y = 0$ when $x = 0$

[7]

5. Find the particular solution of $\frac{dy}{dx} + y \cot x = 5e^{\cos x}$ given that

$y = -4$ when $x = \frac{\pi}{2}$

[8]

6. (a) Find the general solution of $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 6y = 0$

[3]

(b) Hence find the particular solution given that $y = 2$ when $x = 0$

and $\frac{dy}{dx} = 3$ when $x = 0$

[11]

