DTEMS PAST PAPERS
TECHNICAL

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

## *EXAMINATION#3 2005*

| | | |
|---|---|---|
| PROGRAMME TITLE | : | Architectural Technology<br>Construction Engineering<br>Electronic Engineering<br>Automotive Engineering<br>Mechanical Technicians |
| PROGRAMME CODE | : | 3BD-ART-AD 3BD-CON-AD 3EE-ESC-AD<br>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]