FINAL EXAMINATION

OBSERVE SILENCE IN THE EXAM ROOM

SECTION A

QUESTION 1. (20 Marks)

Solve the initial value problem.

$$y^{(4)} = -\sin t + \cos t; \quad y'''(0) = 7, \quad y''(0) = y'(0) = -1,$$
$$y(0) = 0$$

QUESTION 2. (20 Marks)

Given the velocity,

$$v = \frac{ds}{dt} = 32t - 2,$$

and the initial position of the body as s (1/2) = 4. Find the body's position at time t.

QUESTION 3. (20 Marks)

Given the acceleration, $a = d^2s/dt^2 = -4\sin 2t$, initial velocity v (0) = 2, and the initial position of the body as s (0) = -3. Find the body's position at time t.

SECTION B

QUESTION 4. (10 Marks)

Solve the initial value problem.

$$\frac{dy}{dx} = 10 - x, \qquad y(0) = -1$$

QUESTION 5. (10 Marks)

Solve the initial value problem.

$$\frac{dy}{dx} = 9x^2 - 4x + 5, \qquad y(-1) = 0$$

QUESTION 6. (10 Marks)

Solve the initial value problem.

$$\frac{ds}{dt} = \cos t + \sin t, \qquad s(\pi) = 1$$

QUESTION 7. (10 Marks)

Solve the initial value problem.

$$\frac{d^2y}{dx^2} = 2 - 6x; \quad y'(0) = 4, \quad y(0) = 1$$