

Roll No.

21271

B. Sc. (Physics) (Hons.) 2nd Semester

Examination – May, 2019

MATHEMATICAL PHYSICS - II

Paper : Phy-201

Time : Three hours] [Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting at least two questions from each Section.

SECTION - I

1. Solve the differential equation : 8

$$y^2 dx + (x^2 - xy - y^2) dy = 0$$

2. Solve the differential equation : 8

$$\frac{d^2 y}{dx^2} + 4 \frac{dy}{dx} + 4y = e^{2x} + e^{-2x}$$

P. T. O.

3. Apply the method of variation of parameters to the equation :

$$\frac{d^2 y}{dx^2} + 9y = \sec 3x$$

4. Use undetermined coefficient method to solve differential equation :

$$\frac{d^2 y}{dx^2} - 8 \frac{dy}{dx} + 15y = 9xe^{2x}; y(0) = 5, y'(0) = 10$$

SECTION - II

5. Obtain the Fourier series of the function :

$$f(x) = \begin{cases} 0 & -\pi \leq x \leq 0 \\ 1 & 0 < x < \pi \end{cases}$$

6. Represent $f(x) = \begin{cases} 1 & 0 < x < \frac{1}{2} \\ 0 & \frac{1}{2} < x < 1 \end{cases}$ in

(a) Fourier sine series

(b) Fourier cosine series

7. Explain square Wave and Full wave rectifier.

8. (a) Define systematic and Random Errors.

(b) Discuss the standard and probable errors.

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