

Ph.D. Course Work-2018B
3rd Sessional
Recent Development in Mathematics
(PhD-103)

Duration: 1Hr.

Full Marks: 30

(Answer *any three* from the following)

1. (a) Show that the change of variables $\alpha = \cos \varphi$ changes the equation 3

$$\frac{d^2 y}{d\varphi^2} + \cot \varphi \frac{dy}{d\varphi} + n(n+1)y = 0 \text{ into the Legendre's equation}$$

- (b) Solve in series the Legendre's equation 7

$$(1-x^2)\frac{d^2 y}{dx^2} - 2x\frac{dy}{dx} + n(n+1)y = 0$$

2. (a) Solve $\frac{d^2 y}{dx^2} + (x-1)\frac{dy}{dx} + y = 0$ in powers of $(x-2)$. 6

- (b) Define Hypergeometric Series and Hypergeometric Function. 4

3. Write the difference between Uniform motion and Non-Uniform motion with example. What is the important result of Maxwell's electromagnetic theory? 5+5

4. Explain Principle of Relativity. 10
