

‘RANIGANJ GIRLS’ COLLEGE

Mathematics (Programme)

SECOND PAPER

Full Marks: 10

Attempt the following questions and put tick mark in the appropriate answer

$(1 \times 10 = 10)$

(1) The value of $\frac{n+2}{n+1}$, when $n \rightarrow \infty$ is

- (a) -2 (b) 2 (c) 1 (d) -1

(2) The sequence $\left\{ \frac{2n+1}{n+4} \right\}$ is

(a) Monotonic increasing and Bounded

(b) Monotonic Increasing

(c) Bounded

(d) Monotonic Decreasing and Bounded

(3) The integrating factor of $dx + (1+x+y)dy = 0$ is

- (a) $\frac{1}{x}$ (b) $\frac{1}{y}$ (c) $\frac{1}{x-y}$ (d) $\frac{1}{x+y}$

(4) Envelope of the family of straight lines $y = mx + \frac{a}{m}$ is

- (a) $x^2 + y^2 = a^2$ (b) $xy = a^2$ (c) $y^2 = 4ax$ (d) $x^2 = 4ay$

(5) The number of asymptotes of a curve of n -th degree is

- (a) At least one (b) At least n (c) At most n (d) At most one

(6) Locus of centre of curvature is known as

- (a) Circle of curvature (b) Chord of curvature (c) Evolute (d) Envelope

(7) $\int_{\pi}^{\infty} \frac{\sin^2 x}{x^2} dx$ is

- (a) Convergent (b) Divergent (c) Oscillatory (d) Proper

(8) If $n > 0$, then the gamma function is defined as

(a) $\int_0^1 e^{-x} x^{n-1} dx$ (b) $\int_0^1 e^{-nx} x^{n-1} dx$ (c) $\int_0^{\infty} e^{-x} x^{n+1} dx$ (d) $\int_0^{\infty} e^{-x} x^{n-1} dx$

(9) If $z = xyf\left(\frac{x}{y}\right)$ then the value of $x \frac{\partial z}{\partial x} + y \frac{\partial z}{\partial y}$ is

- (a) z (b) 0 (c) $\frac{1}{z}$ (d) $2z$

(10) P. I. of the differential equation $(D^2 - 3D + 2)y = e^{5x}$ is

- (a) e^{5x} (b) $\frac{1}{12}e^{5x}$ (c) $\frac{1}{6}e^{5x}$ (d) $\frac{1}{4}e^{5x}$