`RANIGANJ GIRLS' COLLEGE

Mathematics (Generic)

(Second Semester)

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 $\frac{3n+2}{n+3}$, when $n \to \infty$ is

(a) 2 (b) -2 (c) 3 (d) 4

(2) The sequence $\left\{\frac{n+3}{2n+1}\right\}$ is

(a) Monotonic Increasing

(b) Monotonic Decreasing

(c) Bounded

(d) Monotonic Decreasing and Bounded

(3) The solution of $\frac{dy}{dx} + y = x$ is

(a) $y = (x-1) + ce^{-x}$ (b) $y = (x-1) + ce^{x}$ (c) $y = (x+1) + ce^{-x}$ (d) $y = x + ce^{-x}$

(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) A closed curve has

(a) No asymptotes (b) one asymptote (c) Finitely many asymptotes (d) n asymptotes

(6) Radius of curvature of the curve $y = e^{x}$ at the point (0, 1) is

(a) $2\sqrt{2}$ (b) $3\sqrt{2}$ (c) 0 (d) None of these

(7) $\int_0^{\frac{\pi}{2}} \log \sin x dx$ is

(a) Convergent (b) Divergent (c) Neither convergent nor divergent (d) None of these

(8) The value of $\int_0^{\infty} e^{-x} x^4 dx$ is

(a) 24 (b) 12 (c) 48 (d) 6

(9) If $z = \tan^{-1}\left(\frac{\sqrt{x}-\sqrt{y}}{\sqrt{x}+\sqrt{y}}\right)$ then the value of $x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y}$ is

(a) $\sin z \cos z$ (b) 0 (c) $\tan z$ (d) None of these

(10) P. I. of the differential equation $(D^2 + D + 1)y = e^{-x}$ is

(a) e^{-x} (b) $-e^{-x}$ (c) $3e^{-x}$ (d) $\frac{1}{3}e^{-x}$