1. Order of the differential equation $\left(\frac{dy}{dx}\right)^2 + 5\frac{dy}{dx} + 2y = 0$ is

(a) 0 (b) 1 (c) 2 (d) 3

2. The integrating factor of $\frac{dy}{dx} + \frac{x}{1-x^2}y = x$ is

(a) $(1-x^2)^{-\frac{1}{2}}$ (b) $(1-x^2)^2$ (c) $(1-x^2)^{\frac{1}{4}}$ (d) $(1-x^2)^{\frac{1}{2}}$

3. The value of $\lim_{x\to 0}\frac{\tan x - x}{x - \sin x}$ is

(a) 0 (b) 1 (c) 2 (d) 3

4. The value of $\lim_{x\to 0}\frac{\sqrt{1+x}-\sqrt{1-x}}{x}$ is

(a) 0 (b) 1 (c) 2 (d) 3

5. Value of $\int_0^{\frac{\pi}{2}} \frac{\sin x dx}{\sin x + \cos x}$ is

(a) $\frac{\pi}{2}$ (b) π (c) $\frac{\pi}{4}$ (d) $\frac{3\pi}{2}$

6. If $y = e^{ax}$ then y_n is

(a) $a^n e^{ax}$ (b) e^{anx} (c) $a^{2n}e^{ax}$ (d) None of these

7. $\log_{10} 5$ is

(a) Rational number (b) Irrational number (c) complex number (d) none of these

8. The value of ξ in MVT for the function $f(x) = x^2$ in [1,2] is

(a) 1 (b) 1.5 (c) 2 (d) None of these

9. General solution of $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 0$ is

(a) $y = c_1 + c_2$ (b) $y = c_1e^x + c_2e^{2x}$ (c) $y = c_1e^{-x} + c_2e^{-2x}$ (d) $y = c_1e^x + c_2$

10. $y = A + \frac{B}{x}$ satisfies the relation

(a) $\frac{d^2y}{dx^2} + \frac{2}{x}\frac{dy}{dx} = 0$ (b) $\frac{d^2y}{dx^2} - 4y = 0$ (c) $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + 2y = 0$ (d) none of these

11. if $x^p x^q = (x+y)^{p+q}$ then $\frac{dy}{dx}$ is equal to

(a) $\frac{y}{x}$ (b) $\frac{x}{y}$ (c) $\frac{py}{qx}$ (d) $\frac{qy}{px}$