



Note: *Attempt all questions.*

**Q.1:** Use Cramer rule and solve the following system:

$$5x+2y + 2z= 5$$

$$x +2y - 4z=2$$

$$-x - y+ 3z= - 4$$

**Q.2:** Find domain, range and sketch:

$$(1) y = 4\cos x+2$$

$$(2) y = |x-2|/2.$$

**Q.3:** by using L.Hopital rule find three of the following:

$$(1) \lim_{x \rightarrow \frac{\pi}{4}} (1 - \tan x) \sec x$$

$$(2) \lim_{x \rightarrow 0} \left( \frac{1}{x} - \frac{1}{\sin x} \right)$$

$$(3) \lim_{x \rightarrow \infty} x^2 e^{-x}$$

$$(4) \lim_{x \rightarrow 0} x^2 \ln x.$$

**Q.4:** derive three of the following:

$$(1) x + \sec y = 4 \quad (2) y = \int \cot x$$

$$(3) y = 4^{\cosh x} \quad (4) \ln xy = \ln \cos x$$

**Q.5:** Evaluate three of the following integrals:

$$(1) \int (e^x - e^{-x}) dx / (e^x - e^{-x} + 1)$$

$$(2) \int \tan^2 x \sec^2 x dx$$

$$(3) \int dx / x^2 - 4$$

$$(4) \int \sin 3x \cos 3x dx$$

**Q.6:** Find the area between  $y = x^2 + x$  and x-axis.