Course Code: 3MSCM2
Course: Integral Transform-I
Credit: 4
Last Submission Date: April 30 (for January Session)
October 31, (for July session)

Max. Marks:-70
Min. Marks:-25

Note:-attempt all questions.

Que.1 State & Prove Initial & Final value theorem.

Que.2 Solve the Following by replace transform

1. $e^{-2t}(3\cos 6t - 5\sin 6t)$ 2. $e^{t}\sin^{2} t$

3. $t^{2}\cos at$ 4. $\frac{\sin at}{t^{2}}$ 5. $\int_{0}^{\infty}\frac{\sin t}{t}\,dl = \frac{\pi}{2}$

Que.3 Solve $\frac{d^{4}y}{dx^{4}} + m^{4}y = 0$

Que.4 Solve $\frac{d^{2}y}{dx^{2}} + a^{2}y = \sec(ax)$

Que.5 The initial temperature of a slap of homogenous material bounded by the planes x = 0 and x= L is to find the temperature in this solid after the face x = o is insulated and the temperature of face x = L is reduced to zero.

Que.6 A string is stretched between two fixed points (0,0) and (c,0). If it is displaced into the curve $y = b\sin\left(\frac{\pi x}{c}\right)$ and released from rest in that position at time t = 0, find its displacement at any time t > 0 and any point 0 < x < c.

Que.7 Find the Fourier transform of

$$f(x) = \begin{bmatrix} 1 - x^{2}, & |x| \leq 1 \\ 0 , & |x| > 1 \end{bmatrix}$$

Que.8 Find the sine and cosine transform of

$$\frac{e^{ax} + e^{-ax}}{e^{\pi x} - e^{-\pi x}}$$

Que.9 Find the finite Fourier sine and cosine transform of f (x) = x

Que.10 Find the finite cosine transform of

$$(1 - \frac{x}{\pi})^{2}$$