SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF MATHEMATICS

18MAB201T/Transforms and Boundary value problems

UNIT IV-FOURIER TRANSFORMS

ANSWERS-TUTORIAL SHEET -1

PART-B QUESTIONS

5. $F\{f(x)\} = \frac{2i}{s^2}\frac{1}{\sqrt{2\pi}}[\sin sa - as\cos sa]$

PART-C QUESTIONS

7. $F\{f(x)\} = \frac{-4}{\sqrt{2\pi}}\left[\frac{s\cos s - \sin s}{s^3}\right]$ **and** $\int_0^\infty \left(\frac{x\cos x - \sin x}{x^3}\right)\cos\frac{x}{2}dx = -\frac{3\pi}{16}$

8. $F\{f(x)\} = \sqrt{\frac{2}{\pi}}\frac{\sin as}{s}$

$$\int_{-\infty}^{\infty}\frac{\sin as\cos sx}{s}ds = \begin{cases}\frac{\pi}{2} & \text{for} \quad |x| < a \\ 0 & \text{for} \quad |x| > a\end{cases}$$

$$\int_0^\infty \frac{\sin x}{x}dx = \frac{\pi}{2}$$

12. $F\{f(x)\} = \sqrt{\frac{2}{\pi}}\left(\frac{1-\cos s}{s^2}\right)$ **and** $\int_0^\infty \frac{\sin^4 t}{t^4}dt = \frac{\pi}{3}$