Tutorial Sheet No. 04

Course: B.Tech. (CSE, IT, ECE, EEE, ME, CE, FT)

Year & Semester: I / II

Subject & Code: Mathematics – II (BAS – 203)

Unit & Topic: II / Improper Integrals

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1. Test the convergence of the following improper integrals:

(a) $\int_{-\infty}^{\infty} \frac{1}{a^2+x^2}\,dx$ [Ans.: convergent]

(b) $\int_{1}^{\infty} \frac{1}{x^{\sqrt{2}}}\,dx$ [Ans.: convergent]

(c) $\int_{-2}^{2} \frac{1}{x^6}\,dx$ [Ans.: divergent]

(d) $\int_{0}^{\infty} \frac{1}{\sqrt{9-x^2}}\,dx$ [Ans.: convergent]

(e) $\int_{0}^{\infty} \cos x\,dx$ [Ans.: oscillatory]

(f) $\int_{0}^{5} \frac{1}{(x-2)^2}\,dx$ [Ans.: divergent]

(g) $\int_{0}^{1} \frac{1}{x}\,dx$ [Ans.: divergent]

(g) $\int_{0}^{1} \frac{1}{\sqrt{1-x^2}}\,dx$ [Ans.: convergent]