

Question Bank AM-II IA-II(2025-26)

Q.1 Evaluate $\int_0^{\infty} x e^{-x} dx$

Q.2 Evaluate $\int_0^1 \int_0^x xy \, dy dx$

Q.3 Evaluate $\int_0^2 \int_0^2 \int_0^{yz} xyz \, dx dy dz$

Q.4 Show that $\int_0^2 x^2(2-x)^3 \, dx = \frac{16}{15}$

Q.5 Evaluate $\int_0^a \int_0^{\sqrt{a^2-y^2}} y 2\sqrt{x^2+y^2} \, dy dx$ by changing to polar coordinates.

Q.6 Find by double integration the area of the cardioid $r = a(1 + \cos\theta)$

Q.7 Change the order of integration $\int_0^5 \int_{2-x}^{2+x} dy dx$

Q.8 Evaluate $\iiint_{x^2+y^2+z^2=a^2} \frac{dx dy dz}{x+y+z}$ throughout the volume of sphere

Q.9 Evaluate $\int_0^{\log 2} \int_0^{x+y} \int_0^x e^{x+y+z} \, dz dy dx$

Q.10 Show that

$$\int_0^{\infty} \frac{\log(1+ax^2)}{x^2} \, dx = \frac{\pi}{\sqrt{a}}, \quad a \geq 0$$