

M-203

Second Semester 1440/1441

Department of Mathematics, College of Science

Second Home Assignment (Max. Marks 25)

All Questions Carry Equal Marks

Q#1 Evaluate the integral: $\int_0^1 \int_x^{\sqrt[3]{x}} e^{\frac{1}{4}y^2(2-y^2)} dy dx$.

Q#2 Sketch the region of integration and use polar coordinates to find the value of the integral :

$$\int_0^a \int_{-\sqrt{a^2-x^2}}^{\sqrt{a^2-x^2}} \frac{x^2+y^2}{1+(x^2+y^2)^2} dy dx.$$

Q#3 Find the surface area of $z=y^2$ over the triangle in the xy -plane with vertices $(0,0)$, $(0,2)$ and $(2,2)$.

Q#4 Evaluate the triple integral $\iiint_Q \sqrt{x^2 + y^2 + z^2} dv$, where the

solid Q is bounded by the graphs of the equations

$$z = \sqrt{4 - x^2 - y^2} \text{ and } z = \sqrt{x^2 + y^2}.$$

Q#5 Find the moment of inertia about the z -axis of the solid having the shape of the region Q bounded by the graphs of the equations $z = x^2 + y^2$, $z = 1$ and density $\delta = \sqrt{x^2 + y^2}$.