

University Roll no.-----

I Mid Term Examination, 2015-16

Mathematics - II

Paper Code – AHM 2001

Time: - 90 Min.

Max. Marks:-20

Section - A

Note: Attempt All Questions.

(1×5 = 05 Marks).

- 1) Find the value of $\Gamma\left(\frac{1}{6}\right)\Gamma\left(\frac{5}{6}\right)$
- 2) Find the volume of the sphere $x^2 + y^2 + z^2 = 4$
- 3) Define improper integral of first kind.
- 4) In spherical polar coordinates $dx dy dz$ is replaced by ?
- 5) Write the Liouville's extension of Dirichlet theorem of three variables with the conditions.

Section -B

Note: Attempt Any Three questions.

(3×2=6 Marks)

- 1) Evaluate $\int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \frac{dx dy}{(1+x^2+y^2)^{3/2}}$
- 2) Find the area between the curves $y^2 = 4x$ and $2x - 3y + 4 = 0$
- 3) Find the volume bounded between the paraboloid $x^2 + y^2 = az$ and the cylinder $x^2 + y^2 = a^2$

4) Test the convergence of $\int_{-\infty}^{\infty} \frac{dx}{1+x^2}$

Section - C

Note: Attempt Any Three questions.

(3×3=9 Marks)

1) Change the order of integration $\int_0^{2a} \int_{\sqrt{2ax-x^2}}^{\sqrt{2ax}} f(x,y) dy dx$

2) Evaluate $\int_0^1 \frac{x^2}{\sqrt{1-x^4}} dx \cdot \int_0^1 \frac{dx}{\sqrt{1-x^4}}$

3) By using the transformation $x+y=u$, $y=uv$ evaluate

$\iint x y (1-x-y)^{1/2} dx dy$ integration being taken over the area of the triangle bounded by the lines $x=0$, $y=0$, $x+y=1$.

4) Find the volume of the solid bounded by the co-ordinate planes and the surface $\sqrt{\frac{x}{a}} + \sqrt{\frac{y}{b}} + \sqrt{\frac{z}{c}} = 1$