

Vidyasagar College for Women

Internal Examination 2022

Mathematics (Gen.) 1st Sem

Full Marks-10

CC1/GE1

Time- 30 min

1. The number of real roots of $x^3 + x - 1 = 0$ is

- a) 0 b) 1 c) 2 d) 3

2. If $u = \sin^{-1} \frac{x+y}{\sqrt{x}+\sqrt{y}}$ then $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} =$

- a) $\sin u$ b) $\tan u$ c) $\frac{1}{2} \sin u$ d) $\frac{1}{2} \tan u$

3. Solution of $(D^2 - 3D + 2)y = e^{3x}$ is

- a) $y = c_1 e^{-x} + c_2 e^{-2x} + \frac{1}{2} e^{3x}$ b) $y = c_1 e^{-x} + c_2 e^{-2x} - \frac{1}{2} e^{3x}$
c) $y = c_1 e^x + c_2 e^{2x} - \frac{1}{2} e^{3x}$ d) $y = c_1 e^x + c_2 e^{2x} + \frac{1}{2} e^{3x}$

4. The equation of the plane section of the sphere $x^2 + y^2 + z^2 = 49$ whose center is at $(2, -1, 3)$ is

- a) $2x + y + 3z = 14$ b) $2x + y + 3z = 14$
c) $2x + y + 3z = 14$ d) $2x + y + 3z = 14$

5. The shortest distance between the straight line given by $ax + by + cz + d = 0$ and $a'x + b'y + c'z + d' = 0$ and the Z-axis is

- a) $\frac{cd' - c'd}{\sqrt{(bc' - b'c)^2 + (ca' - c'a)^2}}$ b) $\frac{c'd - cd'}{\sqrt{(bc' - b'c)^2 + (ca' - c'a)^2}}$
c) $\frac{cd' + c'd}{\sqrt{(bc' - b'c)^2 + (ca' - c'a)^2}}$ d) 0

Vidyasagar College for Women

Tutorial Examination 2022

Mathematics (Gen.) 1st Sem

Full Marks-15

CC1/GE1

Time- 24 Hrs

1. Discuss the nature of roots of $x^3 + x - 1 = 0$.
2. If $u = \sin^{-1} \frac{x+y}{\sqrt{x}+\sqrt{y}}$ then find $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y}$.
3. Solve $(D^2 - 3D + 2)y = e^{3x}$.
4. Find the equation of the plane section of the sphere $x^2 + y^2 + z^2 = 49$ whose center is at $(2, -1, 3)$.
5. Find the shortest distance between the straight line given by $ax + by + cz + d = 0$ and $a'x + b'y + c'z + d' = 0$ and the Z-axis .