BUDDHA INSTITUTE OF TECHNOLOGY, GIDA, GORAKHPUR

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CT-1 (2nd Year) (EVEN SEMESTER 2022-23)

MAY-2023

Course: B.Tech **Semester: IV**

Subject: Maths-IV **Subject Code: KAS402**

M.M. 30 **Time: 2:00 hrs** **Roll No._____**

SECTION-A

1. Attempt all questions. Each questions carry equal marks. **Marks: 5*1=5**

Q. No.	Question	Level of Taxonomy	Course Outcome
a.	Find the partial differential equation formed by eliminating arbitrary constants a and b from $z = (x+a)(y+b)$.	L3	CO1
b.	Evaluate $(D + 4D' + 5)^2 z = 0$	L3	CO1
c.	Find P.I. of $(D^2 + DD')z = \cos(x+y)$	L3	CO1
d.	Show that the P.D.E. $y^2 u_{xx} - x^2 u_{yy} = 0$ is hyperbolic in the first quadrant.	L3	CO2
e.	Find the general solution of $\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} = \sin x$	L3	CO1

SECTION-B

Attempt ALL questions. Each questions carry equal marks. **Marks: 3*5= 15**

Q. No.	Question	Level of Taxonomy	Course Outcome
a.	Solve $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x\,\partial y} - 2\frac{\partial^2 z}{\partial y^2} = (y-1)e^x$	L3	CO1
	or		
a.	Use Cauchy's method of Characteristics to solve $u_x + u_y = 2x + 2y$, $where\ u(x,0) = x^2$	L3	CO1
b.	Solve $z = p^2 x + q^2 y$	L3	CO1
	or		
b.	Solve $D(D + D' - 1)(D + 3D' - 2)z = x^2 - 4xy + 2y^2$	L3	CO1
c.	Solve $(mz - ny)p + (nx - lz)q = ly - mx$	L3	CO1

SECTION-C

Attempt ALL questions. Each questions carry equal marks. **Marks: 2*5=10**

Q. No.	Question	Level of Taxonomy	Course Outcome
a.	Solve $x^2 r - y^2 t + xp - yq = \log x$	L3	CO1
b.	Use by the method of separation of variable to solve $4\frac{\partial u}{\partial t} + \frac{\partial u}{\partial x} = 3u$, $u = 3e^{-x} - e^{-5x}$, $when\ t = 0$.	L3	CO2
	OR		
b.	A string is stretched and fastened to two points l apart. Motion is started by displacing the string in the form $y = A\sin\frac{\pi x}{l}$ from which it is released at time $t = 0$. Show that the displacement of any point at a distance x from one end at time t is given by $y(x,t) = A\ \sin\frac{\pi x}{l}\cos\frac{\pi c t}{l}$.	L3	CO2