Roll No. | 2 | 2 | 0 | 1 | 6 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |

SHAMBHUNATH INSTITUTE OF ENGINEERING AND TECHNOLOGY

Subject Code: BAS402 **Subject: Engg. Maths IV**

Course: B. Tech. **Branch: CSE/EE**

Semester: IV

FIRST SESSIONAL EXAMINATION, EVEN SEMESTER, (2023-2024)

Time – 1 hr 30 min. **Maximum Marks – 30**

SECTION – A

1. Attempt *Any* five

Q N	QUESTION	Marks	CO	BL
a.	Find the solution of $p + q = z$.	2	CO1	L5
b.	Solve $\frac{\partial^3 z}{\partial x^3} = 0$	2	CO1	L5
c.	Find the particular integral of $(D^2 + DD')z = \cos(x + y)$.	2	CO1	L1
d.	Find the CF of $(D^2 - D'^2)z = \sin(2x + 3y)$.	2	CO1	L3
e.	Find the solution of $(D + D')(D + 2)z = 0$.	2	CO1	L3
f.	Find PI of $(D^2 - 2DD' + D'^2)z = e^{x+3y}$.	2	CO1	L3

2. Attempt any *ONE* partof the following:

Q N	QUESTION	Marks	CO	BL
a.	i. Solve the partial differential equation $x(y^2 + z)p - y(x^2 + z)q = z(x^2 - y^2)$ ii. Solve $p + 3q = 5z + \tan(y - 3x)$.	5	CO1	L3
b.	Solve: $(D^2 - 2DD' + D'^2)z = e^{x+2y} + x^3$.	5	CO1	L3
c.	Solve $x^2r - y^2t = xy$.	5	CO1	L3

SECTION - B

3. Attempt *Any* five

Q N	QUESTION	Marks	CO	BL
a.	Classify $3r + 4s + t = 0$.	2	CO2	L3
b.	Write down the PDE form of one dimensional heat equation.	2	CO2	L4
c.	Solve $4u_x + u_y = 3u; u(0, y) = e^{-5y}$.	2	CO2	L1
d.	Describe heat equation in two dimension in steady state.	2	CO2	L2
e.	Find the condition for which the following PDE is parabolic; $yu_{xx} + (x + y)u_{xy} + xu_{yy} = 0$.	2	CO2	L3
f.	Name the equation $(D^2 + D'^2)z = 0$.	2	CO2	L1

P.T.O.

4. Attempt any *ONE* part of the following:

Q N	QUESTION	Marks	CO	BL
a.	Solve the equation $4\frac{\partial u}{\partial x}+\frac{\partial u}{\partial y}=3u, u(0,y)=4e^{-y}-e^{-5y}$ by the method of separation of variables.	5	CO2	L3
b.	A tightly stretched flexible string has its ends fixed at $x=0$and $x=l$. At time $t=0$, the string is given a shape defined by $f(x)=\mu x(l-x)$, μ is a constant and then released. Find the displacement $y(x,t)$ of any point x of the string at any time $t>0$.	5	CO2	L3
c.	An insulated rod of length l has its ends A and B maintained at 0^0C and 100^0C respectively until steady state conditions prevail. If B is suddenly reduced to 0^0C and maintained at 0^0C, find the temperature at a distance x from A at time t.	5	CO2	L3

loom's Taxonomy Level (BL) :-

emember (L1), Understanding(L2), Apply (L3), Analyze (L4), Evaluating(L5), Creating(L6)