


Subject: MATHEMATICS-II  
Time: 90 min

Answer the following Questions (3 X10 =30 M)

S.No	Questions	Marks	CO	Cognitive Level
1	A Solve $y^2 dx + (x^2 - xy - y^2)dy = 0$	5	CO1	Apply
	B Solve $(D^2 - 3D + 2)y = \cosh x$	5	CO1.CO2	Apply
(OR)				
2	A Solve $(D^2 - 6D + 13)y = 8e^x \sin 2x$	5	CO1.CO2	Apply
	B Solve $(D^2 - 1)y = \frac{2}{1+e^x}$ By the method of Variation of parameters	5	CO2	Evaluate
3	A Solve $(D^3 + 2D^2 + D)y = e^{2x} + \sin 2x$	5	CO1.CO2	Apply
	B Solve $(x^2 D^2 - xD + 2)y = x \log x$	5	CO2	Apply
(OR)				
4	The charge $q(t)$ on the capacitor is given by D.E., $10 \frac{d^2 q}{dt^2} + 120 \frac{dq}{dt} + 1000q = 17 \sin 2t$ . At time zero and the charge on the capacitor is $\frac{1}{2000}$ coulomb. Find the charge on the capacitor for $t > 0$ .	10	CO3	Evaluate
5	Solve $((1+x)^2 D^2 + (1+x)D + 1)y = 4 \cos[\log(1+x)]$	10	CO2	Apply
(OR)				
6	Solve $\frac{dx}{dt} + 5x - 2y = t, \frac{dy}{dt} + 2x + y = 0$	10	CO3	Apply

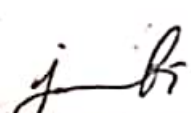
  
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Sub: MATHEMATICS-II  
Time: 90 min

Answer the following Questions (3 X10 =30 M)

S.No	Questions	Marks	CO	Cognitive Level
1	A Form the Partial differential equations by the elimination of arbitrary functions from $\phi(x+y+z, x^2+y^2+z^2) = 0$	5	CO3	Apply
	B Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$	5	CO3	Apply
(OR)				
2	Solve $4r + 12s + 9t = e^{3x-2y}$	10	CO3	Apply
3	A Find the angle of intersection of the spheres $x^2 + y^2 + z^2 = 29$ and $x^2 + y^2 + z^2 + 4x - 6y - 8z - 47 = 0$ at the point (4,-3,2)	5	CO4	Remember
	B If $\bar{a}$ is a differential function and $\phi$ is a differential scalar function then prove that $\text{div}(\Phi \bar{a}) = (\text{grad } \Phi) \cdot \bar{a} + \Phi \text{div } \bar{a}$	5	CO4	Evaluate
(OR)				
4	Prove that $\nabla \times (\nabla \times \bar{a}) = \nabla (\nabla \cdot \bar{a}) - \nabla^2 \bar{a}$	10	CO4	Evaluate
5	Evaluate $\iint \bar{F} \cdot d\bar{s}$ , if $\bar{F} = yz\bar{i} + 2y^2\bar{j} + xz^2\bar{k}$ and S is a surface of the cylinder $x^2 + y^2 = 9$ contained in the first octant between the planes $Z=0$ and $Z=2$	10	CO5	Evaluate
(OR)				
6	Verify Stokes theorem for $\bar{F} = -y^3\bar{i} + x^3\bar{j}$ , where S is the circular disc $x^2 + y^2 \leq 1, z = 0$	10	CO5	Apply

  
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