K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
SESSION: 2023-2024 (EVEN SEMESTER)
I SESSIONAL TEST QUESTION PAPER
SET-A

USN | | | | | | | | | | |

Degree	:	B.E	Semester	:	IV
Branch	:	ECE	Course Code	:	BEC401
Course Title	:	ELECTROMAGNETIC THEORY	Date	:	29/5/2024
Duration	:	75 Minutes	Max Marks	:	25

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	Four10nC positive charges are located in the Z=0 plane at the corners of square 8cm on a side. A fifth 10nC positive charge is located at a point 8cm distance from the other charges. **Find** the magnitude of total force on this fifth charge for $\epsilon = \epsilon_0$.	5	Applying (K3)	CO1
(b)	State and **Derive** coulombs law of force between N-point charges in vector form.	5	Applying (K3)	CO1
(c)	A uniform line charge of ρ_L=25nC/m lies on the line x = -3m, y = 4m in free space. **Determine** electric field intensity at a point (2,3,15) m.	5	Applying (K3)	CO1
	OR			
2(a)	**Compute** cylindrical and spherical coordinates for the point P(3,5,7). Also write the equations for differential length, differential surface, differential volume for rectangular, cylindrical and spherical systems.	5	Applying (K3)	CO1
(b)	**Derive** an expression for electric field intensity due to infinite line charge.	5	Applying (K3)	CO1
(c)	**Calculate** the total charge within each of the indicated volumes. i) Universe: $\rho_v = e^{-2r}/r^2$ ii) $\rho_v = \rho^2 z^2 \sin(0.6\phi)$; $0 < \rho < 0.1$, $0 < \phi < \pi$, $2 < z < 4$	5	Applying (K3)	CO1
	PART-B			
3(a)	**Derive** Gauss's Law in integral form with its statement.	5	Applying (K3)	CO2
(b)	Given flux density $\vec{D} = 0.3r^2\hat{a}_r nc/m^2$ in free space. **Find** (i) Electric field intensity at point P(2,25^0,90^0) (ii) Find total charge within the sphere r = 3	5	Applying (K3)	CO2
	OR			
4(a)	State and **Derive** Divergence theorem.	5	Applying (K3)	CO2
(b)	**Determine** volume charge density at point P(1,0,1) for $\vec{D} = e^{-x}\sin y\hat{a}_x + 2z\hat{a}_z$	5	Applying (K3)	CO2

Course Incharge | HOD | IQAC- Coordinator | Principal

Professor & Head
Dept. of Electronics & Communication Engineering
K.S. School of Engineering & Management
Bangalore - 560 109

Dr. K. RAMA NARASIMHA
Principal/Director
K S School of Engineering and Management
Bengaluru - 560 109

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Course Title	:	ELECTROMAGNETIC THEORY	Date	:	29/5/2024
Duration	:	75 Minutes	Max Marks	:	25

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	Point charges of 50nc each are located at A(1,0,0), B(-1,0,0), C(0,1,0) & D(0,-1,0). **Determine** total force on charge at Point A and also find electric field at A.	5	Applying (K3)	CO1
(b)	**Derive** an expression for electric field intensity due to infinite line charge.	5	Applying (K3)	CO1
(c)	**Find** electric flux density in RCS at point P(6,8,-10) due to i) A point charge of 40mc at the origin ii) A uniform line charge of ρ_L=40μC/m on the z-axis	5	Applying (K3)	CO1
	OR			
2(a)	The Three vertices of a triangle are located at A(5,-4,8), B(-4,4,-5) & C(-4,2,6). **Determine** i) RAB x RAC ii) Area of Triangle	5	Applying (K3)	CO1
(b)	**Develop** an equation for electric field intensity for N-point charges.	5	Applying (K3)	CO1
(c)	**Interpret** Coulombs law to find the relation between charges Q1 and Q2 such that force on unit positive charge at (-2,3,0) have (i) No x-component (ii)No y-component. Two point charges Q1 and Q2 are located at (3,7,0)m and (4,0,0)m.	5	Applying (K3)	CO1
	PART-B			
3(a)	Starting from Del operator, **Derive** Maxwell's first equation.	5	Applying (K3)	CO2
(b)	**Examine** both sides of Gauss's Divergence theorem for $\vec{D} = 2xyz\,\hat{a_x} + 3y^2z\,\hat{a_y} + x\,\hat{a_z}$, -1< x, y, z<+1	5	Applying (K3)	CO2
	OR			
4(a)	**Derive** Gauss's Law in spherical co-ordinate system.	5	Applying (K3)	CO2
(b)	Given, $D = \frac{\rho^2 z^2}{3}\cos\phi\,\hat{a}_\phi$. **Find** flux crossing $\phi = \frac{\pi}{4}$ half plane defined by $0 \le \rho \le 3, 2 \le z \le 4$.	5	Applying (K3)	CO2

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Degree	:	B.E	Semester :	VI A & B
Branch	:	Electronics and Communication Engineering	Course Code :	21EC61
Course Title	:	Technological Innovation Management and Entrepreneurship	Date :	29/5/2024
Duration	:	60 Minutes	Max Marks :	20

Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	**Interpret** the different roles played by Managers.	5	Applying (K3)	CO1
(b)	Identify and **explain** the different functions of Management.	5	Understanding (K2)	CO1
	OR			
2(a)	**Obtain** the various steps in planning and Explain each in Brief.	5	Applying (K3)	CO1
(b)	"Management is an art as well as science", **Illustrate** this statement.	5	Understanding (K2)	CO1
	PART-B			
3(a)	**Express** the importance of planning.	5	Applying (K3)	CO1
(b)	**Discuss** factors affecting Span of Management.	5	Understanding (K2)	CO2
	OR			
4(a)	Define Decision Making and **Obtain** the different types of Decision Making.	5	Applying (K3)	CO1
(b)	Define Departmentalisation and **Discuss** the advantages and drawbacks of it.	5	Understanding (K2)	CO2

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Note: Answer ONE full question from each part.

Q No.	Question	Marks	K-Level	CO mapping
	PART-A			
1(a)	**Illustrate** different definitions of Management as Interpreted by Management Scholars.	5	Applying (K3)	CO1
(b)	**Discuss** different Management Levels and Skills using Skill mix Diagram.	5	Understanding (K2)	CO1
	OR			
2(a)	**Interpret** the different types of Planning.	5	Applying (K3)	CO1
(b)	**Differentiate** between administration and Management.	5	Understanding (K2)	CO1
	PART-B			
3(a)	**Identify** the limitations of planning.	5	Applying (K3)	CO1
(b)	Define Organization. **Illustrate** the principles of Organization.	5	Applying (K3)	CO2
	OR			
4(a)	**Obtain** steps involved in Rational Decision Making.	5	Applying (K3)	CO1
(b)	**Illustrate** committees and its types.	5	Applying (K3)	CO2

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