Module 1	*VECTOR ANALYSIS*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May – 17**	**May - 18**	**NOV – 18**
1.	Explain Cartesian co-ordinate system along with the equations of differential length, differential surfaces and differential volume elements.	**7**					
2.	The given points are A (x = 2, y = 3, z = -1) and B (r = 4, θ = 25°, φ = 120°). Find (i) Spherical co-ordinates of A (ii) Cartesian co-ordinates of B and (iii) Distance from A to B.	**7**					
3.	Give the importance of unit vectors. And discuss the concepts of co-ordinate system vector.		**3**				**4**
4.	Given points A (x = 2 , y = 3, z = -1) and B (=4, =-500 ,z=2). Find a unit vector in Cylindrical coordinate (a)At point B directed towards point A (b) At point A directed towards point B		**7**				
5.	Explain spherical coordinate system in brief. Also write the equations of differential length, differential surfaces and differential volume elements		**3**				
6.	Explain how dot product and cross product of vectors is carried out (2)			**3**	**4**		
7.	Explain cylindrical co-ordinate system of vectors in brief			**4**			
8.	Define and Explain unit vectors in Cartesian and cylindrical co-ordinate systems.				**3**		
9.	Obtain the Spherical co-ordinates of $10\bar{a}x$ at the point P(x = 2, y = 3, z = 4).					**7**	
10.	Explain spherical co-ordinate system and give relationship between Cartesian and spherical co-ordinate system.						**7**

Module 2	*Coulomb's law and Electric Field Intensity*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May – 17**	**May - 18**	**NOV – 18**
1.	An infinite uniform line charge having line charge density of ρL = 200 nC/m placed on the z-axis. Find the total electric field intensity at (6, 8, 3) m	**7**					
2.	Derive the expression of (Electric field intensity) at any point P due to infinite uniform line charge distribution in free space (2)	**7**					**7**
3.	Express for electric field intensity at any point to a line charge with uniform charge density C/m on the infinitely long Z-axis.		**7**	**7**			
4.	State coulomb's law of electric for various type of charge distribution. (2)		**4**			**3**	
5.	A point charge Q1 = 2μC is located at P1(3,7,-4) and Q2 = -5μC is at P2 (2,4,-1) (7) At a point (12,15,18) find (i) E (ii) |E| (iii) aE			**7**			
6.	State and explain Coulomb's law (3)			**3**		**3**	**3**
7.	An infinite uniform linear charge = 2.0 nC/m lies along the x axis in free space, while point charge of 8.0 nC is located at (0, 0, 1) Find E at (2, 3, 4).				**7**		
8.	Derive the expression for at point P on the axis of charged circular ring, carrying a charge uniformly along its circumference with density				**7**		

Module 3	*Electric Flux Density, Gauss' law and Divergence*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May – 17**	**May - 18**	**NOV – 18**
1.	Define divergence and its physical significance.	**7**					
2.	Derive expression of electric field intensity due to an electric dipole.	**7**					
3.	Derive Maxwell's first equation applied to electrostatic using Gauss's law	**7**					
4.	State and explain the gauss's law Also write limitations of Gauss's law (4)		**4**	**3**	**3**		**4**
5.	Explain electric dipole. Derive the expression for E and V at any distant point from dipole (3)			**4**			**3**

Module 4	*Energy and Potential*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May – 17**	**May - 18**	**NOV – 18**
1.	Derive relationship between potential and electric field intensity	**7**					
2.	Define the potential gradient. Derive relationship between potential and electric field intensity (2)		**4**			**7**	
3.	A Point charge of 16 nC is located at Q (2, 3, 5) in free space, and a uniform line charge of 5 nC/m is at the intersection of the planes x = 2 and y = 4. If the potential at the origin is 100V, find V at Point P (4, 1, 3).		**7**				

Module 5	*Current and Conductors & Dielectrics and capacitance*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May – 17**	**May - 18**	**NOV – 18**
1.	Explain boundary conditions between two perfect dielectric materials. (2)	**7**				**7**	
2.	Derive the relation between I and J (2)	**7**			**4**		
3.	Derive and explain continuity equation for steady current. (2)		**7**	**4**			
4.	Derive the expression curl H = J (2)		**3**			**4**	
5.	Give examples of different capacitor configuration.					**3**	
6.	Define relaxation time and derive equation for Relaxation time						**7**
7.	Define displacement current and current density.						**3**

Module 6	*Poisson's and Laplace's Equation*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May –**	**May - 18**	**NOV –**
1.	Derive Poisson's and Laplace's equations. (3)	**7**	**3**	**3**			
2.	Write Poisson's and Laplace equation. also state use of this equation and uniqueness theorem					**3**	

Module 7	*The Steady Magnetic Field*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May – 17**	**May – 18**	**NOV – 18**
1.	State and explain Ampere's circuital law (3)	**7**				**4**	**4**
2.	Explain concept of scalar magnetic potential and magnetic vector potential. (2)		**3**	**7**			
3.	State and explain Biot-sawart's law for static magnetic fields as applied to different types of current distribution (3)		**7**		**7**	**7**	
4.	For steady magnetic fields, prove that $\nabla \times H = J$			**7**			
5.	State and explain Stoke's theorem (4)			**3**	**7**	**3**	**4**

Module 8	*Magnetic Forces, Materials and Inductance*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May – 17**	**May - 18**	**NOV – 18**
1.	Derive Lorentz Force Equation. (2)	**7**					7
2.	Explain Magnetic dipole moment and magnetization (2)				**4**	**3**	
3.	Discuss inductance. Explain self-inductance and mutual inductance.				**7**		
4.	Classify magnetic materials.				**3**		

Module 9	*Time Varying Fields and Maxwell's equation*						
Sr. No.	**Questions**	**Nov – 15**	**June - 16**	**Nov - 16**	**May – 17**	**May - 18**	**NOV – 18**
1.	State Maxwell's equations in integral form and explain physical significance of the equations.	**7**	**4**				
2.	State and explain ampere's circuit law both in integral differential form as used in magnetic field		**4**				
3.	Write Maxwell's equations in integral form and point form (3)			**4**	**3**		**4**
4.	Derive Point form of Maxwell's equation for static field and time varying field using Faraday's law					**7**	