

QP Code: D141790		Total Pages: 1	Name:
		Register No.	
SECOND SEMESTER (CUFYUGP) DEGREE EXAMINATION, APRIL 2026			
APPLIED PHYSICS / PHYSICS			
APH2MN101 / PHY2MN101: ELECTROMAGNETISM AND NETWORK THEOREMS			
2024 Admission onwards			
Maximum Time :2 Hours		Maximum Marks :70	
Section A			
All Questions can be answered. Each Question carries 3 marks (Ceiling : 24 Marks)			
1	State Coulomb's law and write its mathematical expression		
2	Define electric field intensity. Derive expression for electric field due to a point charge.		
3	State Gauss's law. Write its mathematical form.		
4	Define magnetic flux. Write relation between magnetic flux and magnetic field.		
5	State Kirchhoff's Current Law and Kirchhoff's Voltage Law		
6	Explain principle of superposition of forces.		
7	Write short notes on electric field lines and properties		
8	State Ampere's circuital law.		
9	Define electric dipole and dipole moment.		
10	Define ideal voltage source and ideal current source.		
Section B			
All Questions can be answered. Each Question carries 6 marks (Ceiling : 36 Marks)			
11	Define electric field at a point. Two equal and opposite charges of magnitude 12nC each are placed on x-axis at +5cm and -5cm about the origin. Find out the direction and magnitude of electric field at +5cm on y-axis		
12	Derive magnetic field at center of circular current loop.		
13	Explain Thevenin's theorem and procedure.		
14	Solve the following three simultaneous equations by the use of determinants and Cramer's rule. $I_1 + 3I_2 + 4I_3 = 14$, $I_1 + 2I_2 + I_3 = 7$, $2I_1 + I_2 + 2I_3 = 2$.		
15	A magnetron in a microwave oven emits electromagnetic waves with frequency $f = 2450$ MHz. What magnetic field strength is required for electrons to move in circular paths with this frequency?		
16	The maximum values of the alternating voltage and current are 400 V and 20 A respectively in a circuit connected to 50 Hz and these quantities are sinusoidal. The instantaneous values of the voltage and current are 283V and 10 A respectively at $t=0$ both increasing positively. I) Write down the expression for voltage and current at time t . II) Determine the power consumed in the circuit.		
17	Explain Maximum Power Transfer Theorem		
18	Derive torque on current carrying loop in uniform magnetic field.		
Section C			
Answer any ONE .Each Question carries 10 marks (1x10=10 Marks)			
19	Derive electric field due to uniformly charged spherical shell.		
20	Derive AC through RLC series circuit and condition for resonance.		