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OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Electromagnetic Engineering

Sub. Code: 63469/81065/80808

Day and Date: Wednesday,17-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: **1. All questions are compulsory**
2. Assume suitable data wherever necessary and mention it boldly
3. Figures to the right indicate full marks

Q1) Solve the following MCQs. **[14]**

1. According to Biot- Savart's law, which parameter is inversely proportional to the differential magnetic field intensity (dH)?
A) current
B) magnitude of differential length
C) sine of angle between filament & line connecting differential length to point
D) square of the distance from differential element to point

2. Electromagnetic waves travelling in a medium having relative permittivity 1.3 and relative permeability 2.14. The speed of electromagnetic waves in medium must be
A) 1.8 × 10^8 m/s B) 1.8 × 10^4 m/s
C) 1.8 × 10^6 m/s D) 1.8 × 10^2 m/s.

3) The Cartesian system is also called as
A) Circular coordinate system B) Rectangular coordinate system
C) Spherical coordinate system D) Space coordinate system

4) Find the magnetic flux density when a point from a finite current length element of current 0.5A and radius 100nm.
A) 0 B) 0.5 C) 1 D) 2

5) Ampere law states that,
A) Divergence of H is same as the flux
B) Curl of D is same as the current
C) Divergence of E is zero
D) Curl of H is same as the current density

6) Apply divergence theorem for D= 5r2/4 i in spherical coordinates between r=1 and r=2.
A) 80π B) 5π C) 75π D) 85π

7) Standing wave ratio is defined as the
A) Ratio of voltage maxima to voltage minima
B) Ratio of current minima to current maxima
C) Product of voltage maxima and voltage minima
D) Product of current maxima and current minim

Q2) Attempt any TWO of the following **[14]**

a)State and Explain Coulombs Law.
b)Derive the expression for Electric field intensity at a point due infinite line charge?
c)Explain Method of Image for line charge

Q3) Attempt any TWO of the following **[14]**

a. Evaluate both sides of Divergence theorem D= 5x3/2 ax for the volume of cube 1`1m on the edge centered at origin and with edge parallel to the axis
b. State and explain Gauss law and its application.
c. Explain Spherical co-ordinate system

Q4) Answer any two: **[14]**

a) Derive and Explain wave equation for electric and magnetic field for lossless media.
b) Write a note on : i) VSWR ii) Characteristics Impedance iii) Reflection Coefficient
c) A transmission line has R = 4.11 Ω/KM, L = 0.00337 H/KM G = 0.29 μ mho/KM, C = 0.00945 μF/KM. Determine input impedance, characteristics impedance and propagation constant of 20 km long line terminated in a load 100 + j 100 Ω at a frequency 1 kHz.

Q5) Answer any two: **[14]**

a) State and Explain Stoke's theorem.
b) A lossless transmission line of 50Ω is terminated in 25 + j50, Ω. Find using Smith chart
i) VSWR ii) Reflection Coefficient
c) Explain Smith chart and its applications.

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (101) Bachelor of Engineering (81065) Electromagnetic Engineering Part 3 SEM 5
2] (101) Bachelor of Engineering (63469) Electromagnetic Engineering Part 2 SEM 4
3] (1154) B.Tech. CBCS (80808) Electromagnetic Engineering Part 3 SEM 5