Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2016

Examination: Third Year Semester V

Course Code: ECC503 and Course Name: Electromagnetic Engineering

Time: 1 hour

Max. Marks: 50

Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	$\vec{J} = x \vec{E}$, here x is
Option A:	μ
Option B:	E
Option C:	α
Option D:	σ
Q2.	At what condition Poisson's equation becomes Laplace's equation?
Option A:	When Volume charge density becomes 1.
Option B:	When volume charge density becomes 0.
Option C:	They are always equal.
Option D:	They are always different
Q3.	The negative gradient of the magnetic field intensity gives
Option A:	Electric Potential
Option B:	Scalar Magnetic potential
Option C:	Vector magnetic potential
Option D:	Magnetic flux
Q4.	The electric flux density of a surface with permittivity of 2 is given by 12
	units. What the flux density of the surface in air?
Option A:	24
Option B:	6
Option C:	1/6
Option D:	0
Q5.	Memristor is an electrical component that
Option A:	allows the flow of current
Option B:	limits and regulate the flow of current
Option C:	are volatile
Option D:	are not able to retain memory
Q6.	The Time varying magnetic field produces Electro motive force is given by
Option A:	Ampere's law

Option B:	Faraday's law
Option C:	Continuity equation
Option D:	Oersted's experiment
Q7.	A infinite line charge has a charge density of 1nC/m. Determine the magnitude of
	electric field at a distance of $4.5 * 10^9 m$
Option A:	4 V/m
Option B:	$4 \times 10^9 \frac{V}{m}$
Option C:	$4 \times 10^{-9} \frac{V}{m}$
Option D:	4×10^{-6}
	$\frac{4 \times 10}{m}$
Q8.	A Gaussian sphere has two charges Q_1 and $-Q_2$ inside it while another two
	charges Q_3 and Q_4 are outside the sphere. Determine the total electric flux density
Ontion A:	$O_1 + O_2 + O_2 + O_4$
Option A:	$Q_1 + Q_2 + Q_3 + Q_4$
Option 6.	$Q_1 + Q_2$
Option C:	$Q_1 - Q_2$
Option D:	$Q_1 - Q_2 - Q_3 - Q_4$
00	Find the charge density from the function of electric flux density given by 12x
Q9.	7_7
Option A:	19
Option B:	-5
Option C:	5
Option D:	-19
Q10.	The skin depth in a poor conductor is independent of
Option A:	permittivity
Option B:	permeability
Option C:	frequency
Option D:	none of these
Q11.	Which of the following statements is an implication of Maxwell's equations?
Option A:	Interdependence of electric and magnetic fields
Option B:	Finite speed of propagation of an electromagnetic wave
Option C:	Light itself is an electromagnetic wave
Option D:	Interdependence of electric and magnetic fields
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Q12.	Determine the skin depth for a conductor having a conductivity of 2 mho/m at a
	frequency of 0.5 GHz
Option A:	0.0159 m
Option B:	0.0159 μm
Option C:	159 m
Option D:	159 mm

Q13.	The electric flux density is the
Option A:	Product of permittivity and electric field intensity
Option B:	Product of number of flux lines and permittivity
Ontion C:	Product of permeability and electric field intensity
option c.	roduct of permeability and creetile field intensity
Option D:	Product of number of flux lines and permeability
Q14.	Which of the following is a correct expression for the characteristic impedance of a transmission line?
Option A:	$Z_0 = \sqrt{\frac{R + j\omega L}{G + j\omega C}}$
Option B:	$Z_0 = \sqrt{\frac{G + j\omega C}{R + j\omega L}}$
Option C:	$Z_0 = \sqrt{(R + j\omega L)(G + j\omega C)}$
Option D:	$Z_0 = \sqrt{\frac{L}{C}}$
Q15.	In good conductors, the electric and magnetic fields will be
Option A:	45 in phase
Option B:	45 out of phase
Option C:	90 in phase
Option D:	90 out of phase
016.	Which of the following are the primary constants of a transmission line?
Option A:	R, L, G, C
Option B:	$\gamma_1 Z_0$
Option C:	v. VSWR
Option D:	R and L
Q17.	Identify which of the following is the unit of magnetic flux density?
Option A:	Weber
Option B:	Weber/m
Option C:	Tesla
Option D:	Weber ⁻¹
Q18.	The input impedance of a half wave transmission line with a load impedance of

	12.5 ohm is
Option A:	25
Option B:	50
Option C:	6.25
Option D:	12.5
Q19.	"Total electric flux through any closed surface is equal to the charge enclosed by
	that surface". This is
Option A:	Lenz's law
Option B:	Gauss's law
Option C:	Maxwell's law
Option D:	Faraday's law
Q20.	The point form of Ampere law is given by
Option A:	Curl(B) = I
Option B:	$\operatorname{Curl}(D) = J$
Option C:	$\operatorname{Curl}(V) = I$
Option D:	$\operatorname{Curl}(\mathrm{H}) = \mathrm{J}$
	shown below in the figure. The field at centre O of square has the direction along $\begin{array}{c} q \\ A \\ \hline \\ C \\ 3 q \end{array}$
Option A:	AB
Option B:	СВ
Option C:	AC
Option D:	DB
Q22.	Identify which of the following equations are not Maxwell's equation for time varying field
Option A:	$\nabla J + \frac{\partial \rho_{\nu}}{\partial t} = 0$
Option B:	$\nabla . D = v$
Option C:	$\nabla E = -\frac{\partial B}{\partial t}$
Option D:	$\oint H.dl = \int \left(\sigma E + \varepsilon \frac{\partial E}{\partial t}\right).ds$
Q23.	Graphene is an allotrope ofconsisting of a single layer of atoms arranged in two-dimensional honeycomb lattice

Option A:	Germanium
Option B:	Lead
Option C:	Aluminium
Option D:	Carbon
Q24.	Which of the following conditions will not guarantee a distortion less
	transmission line
Option A:	$\mathbf{R} = 0 = \mathbf{G}$
Option B:	RC = GL
Option C:	Very low frequency range ($R \gg \omega L$ and $G \gg \omega C$)
Option D:	Very high frequency range ($R^{\sim} \omega L$ and $G^{\sim} \omega C$)
Q25.	Microstrip lines belongs to the group of lines known as
Option A:	Microwave waveguides
Option B:	Opposite transmission lines
Option C:	Parallel plate transmission line
Option D:	Optical transmission lines