University of Mumbai
Examination 2020 under cluster 5 (APSIT)

Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2016

Examination: Third Year Semester V

Course Code and Course Name: ECC503 Electromagnetic Engineering

Time: 1 hour   Max. Marks: 50

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

Q1.	The electric potential due to an electric dipole of length L at a point distance r away from it will be doubled if the
Option A:	Length L is doubled
Option B:	r is doubled
Option C:	r is halved
Option D:	L is halved
Q2.	The electrostatic energy in an electric field does not depend on which of the following?
Option A:	Magnitude of charges
Option B:	Permittivity
Option C:	Applied electric field
Option D:	Flux lines
Q3.	Which of the following equation results from the Ampere circuital law?
Option A:	$\nabla \times E = -\dfrac{\partial B}{\partial t}$
Option B:	$\nabla . B = 0$
Option C:	$\nabla . D = \rho$
Option D:	$\nabla \times H = J + \dfrac{\partial D}{\partial t}$
Q4.	Coulomb is the unit of which quantity?
Option A:	Field strength
Option B:	Charge
Option C:	Permittivity
Option D:	Force
Q5.	ESD stands for
Option A:	Electronic Surveillance device
Option B:	Electric shock damage
Option C:	Electrostatic discharge
Option D:	Electronic Software distribution

Q6.	The current in a metal at any frequency is due to
Option A:	Conduction current
Option B:	Displacement current
Option C:	Both conduction and displacement current
Option D:	Neither conduction nor displacement current
Q7.	When the conduction current density and displacement current density are same, the dissipation factor will be
Option A:	Zero
Option B:	Minimum
Option C:	Maximum
Option D:	Unity
Q8.	_____ spray the ink directly through a series of holes onto the surface of paper as the printhead scans back and forth across the paper.
Option A:	Inkjet printer
Option B:	Photocopy
Option C:	Thermal printers
Option D:	Ribbons
Q9.	Which of the following statements about electric field lines associated with electric charges is false?
Option A:	Electric field lines can neither be straight or curved
Option B:	Electric field lines form closed loops
Option C:	Electric field lines begin on positive charges and end on negative charges
Option D:	Electric field lines do not intersect
Q10.	When the rotational path of the magnetic field intensity is zero, then the current in the path will be
Option A:	1
Option B:	0
Option C:	∞
Option D:	0.5
Q11.	The intrinsic impedance η of a conducting medium for which σ = 58 Ms/m, μ_{r1} at a frequency of 100 MHz is
Option A:	$2.14 \times 10^5 \angle 45° \ \Omega$
Option B:	$1.84 \times 10^{-3} \angle 45° \ \Omega$
Option C:	$3.69 \times 10^{-3} \angle 45° \ \Omega$
Option D:	$3.69 \times 10^{-3} \angle -45° \ \Omega$
Q12.	The capacitance of a material refers to
Option A:	a) Ability of the material to store magnetic field
Option B:	b) Ability of the material to store electromagnetic field

Option C:	c) Ability of the material to store electric field
Option D:	d) Potential between two charged plates
Q13.	Find the ratio of permeability of the two media when the wave is incident on the boundary at 45 degree and reflected by the boundary at 60 degree.
Option A:	1:1
Option B:	$\sqrt{3}$:1
Option C:	1:$\sqrt{3}$
Option D:	1:$\sqrt{2}$
Q14.	For a test charge placed at infinity, the electric field will be
Option A:	Unity
Option B:	plus ∞
Option C:	Zero
Option D:	minus ∞
Q15.	For a solenoidal field, the surface integral of D will be
Option A:	0
Option B:	1
Option C:	2
Option D:	3
Q16.	If maximum and minimum voltages on a transmission lines are 4V and 2V respectively, VSWR is
Option A:	0.5
Option B:	2
Option C:	1
Option D:	8
Q17.	The current element of the magnetic vector potential for a surface current will be
Option A:	J dS
Option B:	I dL
Option C:	K dS
Option D:	J Dv
Q18.	For a lossy transmission line short circuited at the receieving end, the input impedance is given by (Z_0 is tha characteristic impedance, γ is the propagation constant and l is the length of the line
Option A:	$Z_0 \coth \gamma l$
Option B:	$Z_0 \cot \gamma l$
Option C:	$Z_0 \tanh \gamma l$
Option D:	$Z_0 \tan \gamma l$
Q19.	Polarization is characteristic of EM wave that gives the direction of

Option A:	Electric component of a wave with respect to ground
Option B:	Magnetic component of EM wave with respect to ground
Option C:	Both electrical and magnetic components with respect to ground
Option D:	Product of electric and magnetic components
Q20.	One complete rotation around the chart amounts to
Option A:	$0.25\,\lambda$
Option B:	$0.5\,\lambda$
Option C:	1λ
Option D:	0.75λ
Q21.	Which of the following parameters is not a primary parameter?
Option A:	Resistance
Option B:	Attenuation constant
Option C:	Capacitance
Option D:	Conductance
Q22.	In which direction is the plane wave $\bar{E} = 50\sin(10^8 t + 2z)\widehat{a_y}$ V/m, (where $\widehat{a_y}$ is the unit vector in y direction), travelling?
Option A:	Along y direction
Option B:	Along -y direction
Option C:	Along z direction
Option D:	Along -z direction
Q23.	The curl of the electric field intensity is
Option A:	Conservative
Option B:	Rotational
Option C:	Divergent
Option D:	Static
Q24.	The reflection coefficient lies in the range of
Option A:	$0 < \tau < 1$
Option B:	$-1 < \tau < 1$
Option C:	$1 < \tau < \infty$
Option D:	$0 < \tau < \infty$
Q25.	Identify the devices that do not use electromagnetic energy.
Option A:	Television
Option B:	Washing machine
Option C:	Microwave oven
Option D:	Mobile phones