

**M.Sc. ELECTRONICS**  
**Third Semester**  
**Electromagnetic Theory and Microwave Technology**  
**(MSE - 12)**

*(The figures in the margin indicate full marks for the questions)*

**Duration: 20 minutes**

**Marks – 20**

**PART A- Objective Type**

**I. Choose the correct answer from the following options:**

**1×20=20**

1. If  $\vec{A}$  and  $\vec{B}$  are parallel then angle between them is

- a.  $90^\circ$                       b.  $0^\circ$                       c.  $60^\circ$                       d. None of these.

2. The vector product  $\vec{A} \times \vec{B}$  is

- a. commutative                      b. not commutative                      c. Both of these                      d. None of these.

3. If the vector  $\vec{A}$  is irrotational then

- a.  $\vec{\nabla} \times \vec{A} = 0$                       b.  $\vec{\nabla} \cdot \vec{A} = 0$                       c. Both of these                      d. None of these.

4. Laplacian of a scalar field  $V$  is

- a.  $\nabla^2 V = 0$                       b.  $\nabla^2 V = \frac{\rho}{\epsilon}$                       c. Both of these                      d. None of these

5. Divergence of any function  $f(x,y,z)$  is a

- a. Scalar quantity                      b. Vector quantity                      c. Unit vector quantity                      d. None of these

6. The intensity at a point due to charge is inversely proportional to the

- a. Amount of charge                      b. Size of the charge  
c. Distance of the point                      d. Square of the distance from the charge.

7. The relation between potential  $V$  and Electric field  $E$  is

- a.  $\vec{\nabla} \cdot \vec{V} = \vec{\nabla} \cdot \vec{E}$                       b.  $\nabla V = -E$                       c.  $\nabla \times \vec{V} = -E$                       d. None of these.

8. The surface over which Gauss's law is applicable must be

- a. Closed                      b. Open                      c. Closed and open both                      d. None

9. In the Equation conduction current density  $J = \sigma E$  Where  $\sigma$  is  
 a. Conductivity                      b. Resistivity                      c. Both of these                      d. None of these.
10. Among them nonpolar molecule is  
 a.  $H_2O$                       b.  $NH_3$                       c.  $H_2$                       d. None of these
11.  $\nabla \cdot J = -\frac{\partial \rho}{\partial t}$   
 a. Maxwell eq                      b. Kirchoffs current law                      c. Continuity eq                      d. None of these
12. The current passing through resistor due to actual motion of charges is called as  
 a. Displacement current                      b. Conduction current                      c. Current density                      d. None of these
13. According to Faraday's law, induced emf is given by  
 a.  $\nabla e = -\frac{\partial \phi}{\partial t}$                       b.  $\nabla e = -\frac{\partial D}{\partial t}$                       c.  $\nabla e = -\frac{\partial B}{\partial t}$                       d.  $\nabla e = -\frac{\partial H}{\partial t}$
14. At any instant of time  $\vec{E}$  and  $\vec{H}$  in a plane wave is  
 a. parallel to each other                      b. Perpendicular to each other                      c. None of these                      d. Both of these
15. A transmission line is said to be matched when  
 a. Load impedance ( $Z_L$ ) is equal to characteristics impedance ( $Z_0$ ).  
 b.  $Z_L > Z_0$   
 c. Both of These.  
 d. None of These.
16. The standing wave ratio is  
 a.  $S = \frac{1+\Gamma}{1-\Gamma}$                       b.  $S = \frac{1-\Gamma}{1+\Gamma}$                       c. Both of these                      d. None of these
17. Poynting theorem is given by  
 a.  $\vec{E} \times \vec{H}$                       b.  $\vec{H} \times \vec{E}$                       c. Both of these                      d. None of these.
18. Series resistance of the transmission line is given by  
 a.  $R + j\omega L$                       b.  $G + j\omega C$                       c. Both of these                      d. None of these.
19. Which antenna is used for TV communication  
 a. Parabolic Antenna                      b. Horn Antenna                      c. Yagiuda Antenna                      d. None of these.
20. Isotropic antenna is having directivity  
 a. zero                      b. Unity                      c. Both of these                      d. None of these

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