Chettinad College of Engineering & Technology
Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

Department of Electronics and Communication Engineering

EC 8451- Electromagnetic Fields

UNIT-1 INTRODUCTION

MCQ BANK

1. When two vectors are perpendicular, their
a) Dot product is zero
b) Cross product is zero
c) Both are zero
d) Both are not necessarily zero
ANSWER : a. Dot product is zero

2. The cross product of the vectors 3i + 4j – 5k and –i + j – 2k is,
a) 3i – 11j + 7k
b) -3i + 11j + 7k
c) -3i – 11j – 7k
d) -3i + 11j – 7k
ANSWER : b. -3i + 11j + 7k

3. Electromagnetic forces are defined by
a) Fleming's right hand rule
b) Fleming's left hand rule
c) Faraday's law
d) Ampere law
ANSWER: b. Fleming's left hand rule

4. The polar form of Cartesian coordinates is
a) Circular coordinates
b) Spherical coordinates
c) Cartesian coordinates
d) Space coordinates
ANSWER :a. Circular coordinates

5. The del operator is called as
a) Gradient

b) Curl
c) Divergence
d) Vector differential operator
ANSWER: d. Vector differential operator

6. The relation between vector potential and field strength is given by
a) Gradient
b) Divergence
c) Curl
d) Del operator
ANSWER :a. Gradient

7. A vector is said to be solenoidal when it's
a) Divergence is zero
b) Divergence is unity
c) Curl is zero
d) Curl is unity
ANSWER: a. Divergence is zero

8. When a vector is ir-rotational, which condition holds good?
a) Stoke's theorem gives non-zero value
b) Stoke's theorem gives zero value
c) Divergence theorem is invalid
d) Divergence theorem is valid
ANSWER: b. Stoke's theorem gives zero value

9. A charge is placed in a square container. The position of the charge with respect to the origin can be found by
a) Spherical system
b) Circular system
c) Cartesian system
d) Space coordinate system
ANSWER: c. Cartesian system

10. A charge located at point p $(5,30^0,2)$ is said to be in which coordinate system?
a) Cartesian system
b) Cylindrical system
c) Spherical system
d) Space system

ANSWER: b. Cylindrical system

11. Example of spherical system in the following is
a) Charge in space
b) Charge in box
c) Charge in dielectric
d) Uncharged system
ANSWER : a. Charge in space

12. The mathematical perception of the gradient is said to be
a) Tangent
b) Chord
c) Slope
d) Arc
ANSWER: c. Slope

13. Divergence of gradient of a vector function is equivalent to
a) Laplacian operation
b) Curl operation
c) Double gradient operation
d) Null vector
ANSWER: a. Laplacian operation

14. Determine the divergence of $F = 30\ i + 2xy\ j + 5xz^2\ k$ at (1,1,-0.2) and state the nature of the field.
a) 1, solenoidal
b) 0, solenoidal
c) 1, divergent
d) 0, divergent
ANSWER: b. 0, solenoidal

15. Identify the nature of the field, if the divergence is zero and curl is also zero.
a) Solenoidal, irrotational
b) Divergent, rotational
c) Solenoidal, irrotational
d) Divergent, rotational
ANSWER: c. Solenoidal, irrotational

16. The curl of a curl of a vector gives a
a) Scalar

b) Vector
c) Zero value
d) Non zero value
ANSWER: b. Vector

17. The integral form of potential and field relation is given by line integral. State True/False
a) True
b) False
ANSWER: a. True

18. A field in which a test charge around any closed surface in static path is zero is called
a) Solenoidal
b) Rotational
c) Irrotational
d) Conservative
ANSWER: d. Conservative

19. The potential in a lamellar field is
a) 1
b) 0
c) -1
d) ∞
ANSWER:b. 0

20. Find the value of divergence theorem for the field D = $2xy\,i + x^2\,j$ for the rectangular parallelepiped given by x = 0 and 1, y = 0 and 2, z = 0 and 3.
a) 10
b) 12
c) 14
d) 16
ANSWER:b. 12

21. The divergence theorem converts
a) Line to surface integral
b) Surface to volume integral
c) Volume to line integral
d) Surface to line integral
ANSWER:b. Surface to volume integral

22. Find the value of Stoke's theorem for A = x i + y j + z k. The state of the function will be
a) Solenoidal
b) Divergent
c) Rotational
d) Curl free
ANSWER:d. Curl free

23. If a function is described by F = ($3x + z, y^2 - \sin x^2 z, xz + ye^{x5}$), then the divergence theorem value in the region 0<x<1, 0<y<3 and 0<z<2 will be
a) 13
b) 26
c) 39
d) 51
ANSWER:c. 39

24. Find the Laplace equation value of the following potential field
$V = x^2 - y^2 + z^2$
a) 0
b) 2
c) 4
d) 6
ANSWER:b. 2

25. When a potential satisfies Laplace equation, then it is said to be
a) Solenoidal
b) Divergent
c) Lamellar
d) Harmonic
ANSWER:d. Harmonic