PSN College of Engineering and Technology
An Autonomous Institution, Affiliated to Anna University
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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Multiple Choice Question Bank

Branch: B.E	Regulation: 2022	Year / Semester: II /III
Course Code: EE630203	Course Name: ELECTROMAGNETIC FIELDS	

UNIT – 1 – VECTOR ANALYSIS

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

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

3. Which of the following are not vector functions in Electromagnetics?
a) Gradient
b) Divergence
c) Curl
d) There is no non- vector functions in Electromagnetics

Answer: d

4. The work done of vectors force F and distance d, separated by angle θ can be calculated using,
a) Cross product
b) Dot product
c) Addition of two vectors
d) Cannot be calculated

Answer: b

5. Find whether the vectors are parallel, (-2,1,-1) and (0,3,1)
a) Parallel
b) Collinearly parallel
c) Not parallel
d) Data insufficient

Answer: c

6. Lorentz force is based on,
a) Dot product
b) Cross product
c) Both dot and cross product
d) Independent of both

Answer: b

7. 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

8. The dot product of two vectors is a scalar. The cross product of two vectors is a vector. State True/False.
a) True
b) False

Answer: a

9. Which of the Pythagorean Theorem is valid in Electromagnetics?
a) |dot product| + |dot product| = 1
b) |cross product| – |cross product| = 1
c) $|\text{dot product}|^2 + |\text{cross product}|^2 = 1$
d) |dot product| + |cross product| = 0

Answer: c

10. Which of the following is not true?
a) A . (B . C) = scalar value
b) A . (B x C) = scalar value
c) A x (B . C) = scalar value
d) A x (B x C) = vector value

Answer: c
11. The del operator is called as
a) Gradient
b) Curl
c) Divergence
d) Vector differential operator

Answer: d

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

Answer: a

13. The Laplacian operator is actually
a) Grad(Div V)
b) Div(Grad V)
c) Curl(Div V)
d) Div(Curl V)

Answer: b

14. The divergence of curl of a vector is zero. State True or False.
a) True
b) False

Answer: a

15. The curl of gradient of a vector is non-zero. State True or False.
a) True
b) False

Answer: b

16. Identify the correct vector identity.
a) i . i = j . j = k . k = 0
b) i X j = j X k = k X i = 1
c) Div (u X v) = v . Curl(u) – u . Curl(v)
d) i . j = j . k = k . i = 1

Answer: c

17. A vector is said to be solenoidal when its
a) Divergence is zero
b) Divergence is unity
c) Curl is zero
d) Curl is unity

Answer: a

18. The magnetic field intensity is said to be
a) Divergent
b) Curl free
c) Solenoidal
d) Rotational

Answer: c.
19. A field has zero divergence and it has curls. The field is said to be
a) Divergent, rotational
b) Solenoidal, rotational
c) Solenoidal, irrotational
d) Divergent, irrotational

Answer: b

20. When a vector is irrotational, 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
21. The Cartesian system is also called as
a) Circular coordinate system
b) Rectangular coordinate system
c) Spherical coordinate system
d) Space coordinate system

Answer: b

22. The volume of a parallelepiped in Cartesian is
a) $dV = dx\ dy\ dz$
b) $dV = dx\ dy$
c) $dV = dy\ dz$
d) $dV = dx\ dz$

Answer: a

23. 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

24. The scalar factor of Cartesian system is unity. State True/False.
a) True
b) False

Answer: a

25. The angular separation between the vectors A = 4i + 3j + 5k and B = i – 2j + 2k is (in degrees)
a) 65.8
b) 66.8
c) 67.8
d) 68.8

Answer: c

26. The Cartesian coordinates can be related to cylindrical coordinates and spherical coordinates. State True/False.
a) True
b) False

Answer: a

27. Transform the vector A = 3i – 2j – 4k at P(2,3,3) to cylindrical coordinates
a) -3.6j – 4k
b) -3.6j + 4k
c) 3.6j – 4k
d) 3.6j + 4k

Answer: a

28. The spherical equivalent of the vector B = yi + (x + z)j located at (-2,6,3) is given by
a) (7,64.62,71.57)
b) (7,-64.62,-71.57)
c) (7,-64.62,71.57)
d) (7,64.62,-71.57)

Answer: d

29. Which of the following criteria is used to choose a coordinate system?
a) Distance
b) Intensity
c) Magnitude
d) Geometry

Answer: d

30. Vector transformation followed by coordinate point substitution and vice-versa, both given the same result. Choose the best answer.
a) Possible, when the vector is constant
b) Possible, when the vector is variable
c) Possible in all cases
d) Not possible

Answer: a

UNIT – 2 – ELECTROSTATICS

1. Coulomb is the unit of which quantity?
a) Field strength
b) Charge
c) Permittivity
d) Force

Answer: b

2. Coulomb law is employed in
a) Electrostatics
b) Magnetostatics
c) Electromagnetics
d) Maxwell theory

Answer: a

3. Find the force between 2C and -1C separated by a distance 1m in air(in newton).
a) $18 \text{ X } 10^{6}$
b) $-18 \text{ X } 10^{6}$
c) $18 \text{ X } 10^{-6}$
d) $-18 \text{ X } 10^{-6}$

Answer: b

4. Two charges 1C and -4C exists in air. What is the direction of force?
a) Away from 1C
b) Away from -4C
c) From 1C to -4C
d) From -4C to 1C

Answer: c

5. Find the force of interaction between 60 stat coulomb and 37.5 stat coulomb spaced 7.5cm apart in transformer oil($\varepsilon r=2.2$) in 10^{-4} N,
a) 8.15
b) 5.18
c) 1.518
d) 1.815

Answer: d

6. Find the force between two charges when they are brought in contact and separated by 4cm apart, charges are 2nC and -1nC, in μN.
a) 1.44
b) 2.44
c) 1.404
d) 2.404

Answer: c

7. The Coulomb law is an implication of which law?
a) Ampere law
b) Gauss law
c) Biot Savart law
d) Lenz law

Answer: b.
8. Two small diameter 10gm dielectric balls can slide freely on a vertical channel. Each carry a negative charge of 1μC. Find the separation between the balls if the lower ball is restrained from moving.
a) 0.5
b) 0.4
c) 0.3
d) 0.2

Answer: c

9. A charge of 2 X 10^{-7} C is acted upon by a force of 0.1N. Determine the distance to the other charge of 4.5 X 10^{-7} C, both the charges are in vacuum.
a) 0.03
b) 0.05
c) 0.07
d) 0.09

Answer: d

10. For a charge Q1, the effect of charge Q2 on Q1 will be,
a) F1 = F2
b) F1 = -F2
c) F1 = F2 = 0
d) F1 and F2 are not equal

Answer: b
11. The electric field intensity is defined as
a) Force per unit charge
b) Force on a test charge
c) Force per unit charge on a test charge
d) Product of force and charge

Answer: c

12. Find the force on a charge 2C in a field 1V/m.
a) 0
b) 1
c) 2
d) 3

Answer: c

13. Find the electric field intensity of two charges 2C and -1C separated by a distance 1m in air.
a) 18 X 10^{9}
b) 9 X 10^{9}
c) 36 X 10^{9}
d) -18 X 10^{9}

Answer: b

14. What is the electric field intensity at a distance of 20cm from a charge 2 X 10^{-6} C in vacuum?
a) 250,000
b) 350,000
c) 450,000

d) 550,000

Answer: c

15. Determine the charge that produces an electric field strength of 40 V/cm at a distance of 30cm in vacuum(in 10^{-8}C)
a) 4
b) 2
c) 8
d) 6

Answer: a

16. The field intensity of a charge defines the impact of the charge on a test charge placed at a distance. It is maximum at d = 0cm and minimises as d increases. State True/False
a) True
b) False

Answer: a

17. Electric field of an infinitely long conductor of charge density λ, is given by $E = \lambda/(2\pi\varepsilon h).aN$. State True/False.
a) True
b) False

Answer: a

18. Electric field intensity due to infinite sheet of charge σ is
a) Zero
b) Unity
c) σ/ε
d) σ/2ε

Answer: d

19. For a test charge placed at infinity, the electric field will be
a) Unity
b) +∞
c) Zero
d) -∞

Answer: c

20. In electromagnetic waves, the electric field will be perpendicular to which of the following?
a) Magnetic field intensity
b) Wave propagation

c) Both H and wave direction
d) It propagates independently

Answer: c
21. The lines of force are said to be
a) Real
b) Imaginary
c) Drawn to trace the direction
d) Not significant

Answer: c.
22. Electric flux density in electric field is referred to as
a) Number of flux lines
b) Ratio of flux lines crossing a surface and the surface area
c) Direction of flux at a point
d) Flux lines per unit area

Answer: b.
23. The electric flux density is the
a) Product of permittivity and electric field intensity
b) Product of number of flux lines and permittivity
c) Product of permeability and electric field intensity
d) Product of number of flux lines and permeability

Answer: a

24. Which of the following correctly states Gauss law?
a) Electric flux is equal to charge
b) Electric flux per unit volume is equal to charge
c) Electric field is equal to charge density
d) Electric flux per unit volume is equal to volume charge density

Answer: d

25. The Gaussian surface is
a) Real boundary
b) Imaginary surface
c) Tangential
d) Normal

Answer: b

26. Find the flux density of a sheet of charge density 25 units in air.
a) 25
b) 12.5
c) 6.25

d) 3.125

Answer: b

27. A uniform surface charge of $\sigma = 2\ \mu C/m^2$, is situated at z = 2 plane. What is the value of flux density at P(1,1,1)m?
a) 10^{-6}
b) -10^{-6}
c) 10^{6}
d) -10^{6}

Answer: b

28. Find the flux density of line charge of radius (cylinder is the Gaussian surface) 2m and charge density is 3.14 units?
a) 1
b) 0.75
c) 0.5
d) 0.25

Answer: d

29. If the radius of a sphere is $1/(4\pi)$m and the electric flux density is 16π units, the total flux is given by,
a) 2
b) 3
c) 4
d) 5

Answer: c

30. Find the electric field intensity of transformer oil ($\varepsilon r = 2$ approx) with density $1/4\pi$ (in 10^9 units)
a) 2.5
b) 3.5
c) 4.5
d) 5.5

Answer: c

UNIT – 3 – MAGNETOSTATICS

1. Biot Savart law in magnetic field is analogous to which law in electric field?
a) Gauss law
b) Faraday law

c) Coulomb's law
d) Ampere law

Answer: c

2. Which of the following cannot be computed using the Biot Savart law?
a) Magnetic field intensity
b) Magnetic flux density
c) Electric field intensity
d) Permeability

Answer: c

3. Find the magnetic field of a finite current element with 2A current and height $1/2\pi$ is
a) 1
b) 2
c) 1/2
d) 1/4

Answer: a

4. Calculate the magnetic field at a point on the centre of the circular conductor of radius 2m with current 8A.
a) 1
b) 2
c) 3
d) 4

Answer: b

5. The current element of the solenoid of turns 100, length 2m and current 0.5A is given by,
a) 100 dx
b) 200 dx
c) 25 dx
d) 50 dx

Answer: c

6. Find the magnetic field intensity at the centre O of a square of the sides equal to 5m and carrying 10A of current.
a) 1.2
b) 1
c) 1.6
d) 1.8

Answer: d

7. 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

Answer: c

8. In a static magnetic field only magnetic dipoles exist. State True/False.
a) True
b) False

Answer: a

9. The magnetic field intensity will be zero inside a conductor. State true/false.
a) True
b) False

Answer: b

10. Find the magnetic field when a circular conductor of very high radius is subjected to a current of 12A and the point P is at the centre of the conductor.
a) 1
b) ∞
c) 0
d) -∞

Answer: c
11. The point form of Ampere law is given by
a) Curl(B) = I
b) Curl(D) = J
c) Curl(V) = I
d) Curl(H) = J

Answer: d

12. The Ampere law is based on which theorem?
a) Green's theorem
b) Gauss divergence theorem
c) Stoke's theorem
d) Maxwell theorem

Answer: c

13. Electric field will be maximum outside the conductor and magnetic field will be maximum inside the conductor. State True/False.
a) True
b) False

Answer: a

14. Find the magnetic flux density of a finite length conductor of radius 12cm and current 3A in air(in 10^{-6} order)
a) 4
b) 5
c) 6
d) 7

Answer: b

15. Calculate the magnetic field intensity due to a toroid of turns 50, current 2A and radius 159mm.
a) 50
b) 75
c) 100
d) 200

Answer: c

16. Find the magnetic field intensity due to an infinite sheet of current 5A and charge density of 12j units in the positive y direction and the z component is above the sheet.
a) -6
b) 12k
c) 60
d) 6

Answer: d

17. Find the magnetic field intensity due to an infinite sheet of current 5A and charge density of 12j units in the positive y direction and the z component is below the sheet.
a) 6
b) 0
c) -6
d) 60k

Answer: c

18. Find the current density on the conductor surface when a magnetic field H = 3cos x i + zcos x j A/m, for z>0 and zero, otherwise is applied to a perfectly conducting surface in xy plane.
a) cos x i

b) –cos x i
c) cos x j
d) –cos x j

Answer: b

19. When the rotational path of the magnetic field intensity is zero, then the current in the path will be
a) 1
b) 0
c) ∞
d) 0.5

Answer: b

20. Find the magnetic field intensity when the current density is 0.5 units for an area up to 20 units.
a) 10
b) 5
c) 20
d) 40

Answer: a
21. The H quantity is analogous to which component in the following?
a) B
b) D
c) E
d) V

Answer: c

22. The magnetic flux density is directly proportional to the magnetic field intensity. State True/False.
a) True
b) False

Answer: a

23. 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

Answer: d

24. Given the magnetic field is 2.4 units. Find the flux density in air(in 10^{-6} order).
a) 2
b) 3
c) 4
d) 5

Answer: b

25. Find the electric field when the magnetic field is given by 2sin t in air.
a) $8\pi \times 10^{-7} \cos t$
b) $4\pi \times 10^{-7} \sin t$
c) $-8\pi \times 10^{-7} \cos t$
d) $-4\pi \times 10^{-7} \sin t$

Answer: a

26. Find the height of an infinitely long conductor from point P which is carrying current of 6.28A and field intensity is 0.5 units.
a) 0.5
b) 2
c) 6.28
d) 1

Answer: b

27. Find the magnetic field intensity due to a solenoid of length 12cm having 30 turns and current of 1.5A.
a) 250
b) 325
c) 175
d) 375

Answer: d

28. Find the magnetic field intensity at the radius of 6cm of a coaxial cable with inner and outer radii are 1.5cm and 4cm respectively. The current flowing is 2A.
a) 2.73
b) 3.5
c) 0
d) 1.25

Answer: c

29. Find the magnetic field intensity of a toroid of turns 40 and radius 20cm. The current carried by the toroid be 3.25A.
a) 103.45

b) 102
c) 105.7
d) 171

Answer: a

30. The magnetic field intensity of an infinite sheet of charge with charge density 36.5 units in air will be
a) 18.25
b) 11.25
c) 73
d) 1/36.5

Answer: a

UNIT – 4 – ELECTRIC AND MAGNETIC FIELDS IN MATERIALS

1. Find the conductivity of a material with conduction current density 100 units and electric field of 4 units.
a) 25
b) 400
c) 0.04
d) 1600

Answer: a

2. Calculate the displacement current density when the electric flux density is 20sin 0.5t.
a) 10sin 0.5t
b) 10cos 0.5t
c) 20sin 2t
d) 20cos 2t

Answer: b

3. Find the magnitude of the displacement current density in air at a frequency of 18GHz in frequency domain. Take electric field E as 4 units.
a) 18
b) 72
c) 36
d) 4

Answer: d

4. Calculate the frequency at which the conduction and displacement currents become equal with unity conductivity in a material of permittivity 2.
a) 18 GHz
b) 9 GHz
c) 36 GHz
d) 24 GHz

Answer: b

5. The ratio of conduction to displacement current density is referred to as
a) Attenuation constant
b) Propagation constant
c) Loss tangent
d) Dielectric constant

Answer: c

6. If the loss tangent is very less, then the material will be a
a) Conductor
b) Lossless dielectric
c) Lossy dielectric
d) Insulator

Answer: b

7. In good conductors, the electric and magnetic fields will be
a) 45 in phase
b) 45 out of phase
c) 90 in phase
d) 90 out of phase

Answer: b

8. In free space, which of the following will be zero?
a) Permittivity
b) Permeability
c) Conductivity
d) Resistivity

Answer: c

9. If the intrinsic angle is 20, then find the loss tangent.
a) tan 20
b) tan 40
c) tan 60

d) tan 80

Answer: b

10. The intrinsic impedance of free space is given by
a) 272 ohm
b) 412 ohm
c) 740 ohm
d) 377 ohm

Answer: d
11. Calculate the emf of a coil with turns 100 and flux rate 5 units.
a) 20
b) -20
c) 500
d) -500

Answer: d.
12. The equivalent inductances of two coils 2H and 5H in series aiding flux with mutual inductance of 3H is
a) 10
b) 30
c) 1
d) 13

Answer: d

13. The expression for the inductance in terms of turns, flux and current is given by
a) $L = N d\varphi/di$
b) $L = -N d\varphi/di$
c) $L = Ni\varphi$
d) $L = N\varphi/i$

Answer: a

14. The equivalent inductance of two coils with series opposing flux having inductances 7H and 2H with a mutual inductance of 1H.
a) 10
b) 7
c) 11
d) 13

Answer: b

15. A coil is said to be loosely coupled with which of the following conditions?
a) $K>1$

b) K<1
c) K>0.5
d) K<0.5

Answer: d

16. With unity coupling, the mutual inductance will be
a) L1 x L2
b) L1/L2
c) √(L1 x L2)
d) L2/L1

Answer: c

17. The inductance is proportional to the ratio of flux to current. State True/False.
a) True
b) False

Answer: a

18. Calculate the mutual inductance of two tightly coupled coils with inductances 49H and 9H.
a) 21
b) 58
c) 40
d) 49/9

Answer: a.
19. Find the inductance of a coil with turns 50, flux 3 units and a current of 0.5A
a) 150
b) 300
c) 450
d) 75

Answer: b

20. The inductance of a coaxial cable with inner radius a and outer radius b, from a distance d, is given by
a) L = μd ln(b/a)/2π
b) L = 2π μd ln(b/a)
c) L = πd/ln(b/a)
d) L = 0

Answer: a
21. Find the resistivity of a material having resistance 20kohm, area 2 units and length of 12m.
a) 6666.6
b) 3333.3

c) 1200
d) 2000

Answer: b

22. A resistor value of colour code orange violet orange will be
a) 37 kohm
b) 37 Mohm
c) 48 kohm
d) 48 Mohm

Answer: a

23. A infinite resistance is considered as a/an
a) Closed path(short circuit)
b) Open path
c) Not defined
d) Ammeter with zero reading

Answer:b

24. Find the time constant in a series R-L circuit when the resistance is 4 ohm and the inductance is 2 H.
a) 0.25
b) 0.2
c) 2
d) 0.5

Answer: d

25. Find the time constant for a R-C circuit for resistance R = 24 kohm and C = 16 microfarad.
a) 1.5 millisecond
b) 0.6 nanosecond
c) 384 millisecond
d) 384 microsecond

Answer: c

26. Find the capacitance when charge is 20 C has a voltage of 1.2V.
a) 32.67
b) 16.67
c) 6.67
d) 12.33

Answer: b

27. Calculate the capacitance of two parallel plates of area 2 units separated by a distance of 0.2m in air(in picofarad)
a) 8.84
b) 88.4
c) 884.1
d) 0.884

Answer: b

28. Compute the capacitance between two concentric shells of inner radius 2m and the outer radius is infinitely large.
a) 0.111 nF
b) 0.222 nF
c) 4.5 nF
d) 5.4 nF

Answer: b

29. The capacitance of a material refers to
a) Ability of the material to store magnetic field
b) Ability of the material to store electromagnetic field
c) Ability of the material to store electric field
d) Potential between two charged plates

Answer: c

30. A cable of core radius 1.25cm and impregnated paper insulation of thickness 2.13cm and relative permittivity 3.5. Compute the capacitance of the cable/km(in nF)
a) 195.7
b) 179.5
c) 157.9
d) 197.5

Answer: a

UNIT – 5 – ELECTROMAGNETIC WAVES

1. The first Maxwell law is based on which law?
a) Ampere law
b) Faraday law

c) Lenz law
d) Faraday and Lenz law

Answer: d

2. The benefit of Maxwell equation is that
a) Any parameter can be calculated
b) Antenna can be designed
c) Polarisation of the wave can be calculated
d) Transmission line constants can be found

Answer: a

3. The correct sequence to find H, when D is given is
a) D-E-B-H
b) D-B-E-H
c) It cannot be computed from the data given
d) D-H

Answer: a

4. The curl of the electric field intensity is
a) Conservative
b) Rotational
c) Divergent
d) Static

Answer: b.
5. Which of the following identities is always zero for static fields?
a) Grad(Curl V)
b) Curl(Div V)
c) Div(Grad V)
d) Curl(Grad V)

Answer: d

6. Find the Maxwell first law value for the electric field intensity is given by A sin wt az
a) 0
b) 1
c) -1
d) A

Answer: a

7. Find the electric field applied on a system with electrons having a velocity 5m/s subjected to a magnetic flux of 3.6 units.

a) 15
b) 18
c) 1.38
d) 0.72

Answer: b

8. Which of the following relations holds good?
a) Bq = ILE
b) E = ILBq
c) Eq = ILB
d) B = ILEq

Answer: c

9. When the Maxwell equation is expressed in frequency domain, then which substitution is possible?
a) d/dt = w/j
b) d/dt = j/w
c) d/dt = jw
d) Expression in frequency domain is not possible

Answer: c

10. Calculate the emf of a material having a flux linkage of $2t^2$ at time t = 1second.
a) 2
b) 4
c) 8
d) 16

Answer: b

11. Calculate the emf of a material having flux density 5sin t in an area of 0.5 units.
a) 2.5 sin t
b) -2.5 cos t
c) -5 sin t
d) 5 cos t

Answer: d

12. To find D from B, sequence followed will be
a) B-E-D
b) B-H-D
c) E-H-D
d) E-B-D

Answer: a
13. Maxwell second equation is based on which law?
a) Ampere law
b) Faraday law
c) Lenz law
d) Coulomb law

Answer: a

14. The Maxwell second equation that is valid in any conductor is
a) Curl(H) = Jc
b) Curl(E) = Jc
c) Curl(E) = Jd
d) Curl(H) = Jd

Answer: a

15. In dielectric medium, the Maxwell second equation becomes
a) Curl(H) = Jd
b) Curl(H) = Jc
c) Curl(E) = Jd
d) Curl(E) = Jd

Answer: a

16. Find the displacement current density of a material with flux density of 5sin t
a) 2.5cos t
b) 2.5sin t
c) 5cos t
d) 5sin t

Answer: c

17. Find the conduction current density of a material with conductivity 200units and electric field 1.5 units.
a) 150
b) 30
c) 400/3
d) 300

Answer: d

18. Calculate the conduction density of a material with resistivity of 0.02 units and electric intensity of 12 units.
a) 300
b) 600

c) 50
d) 120

Answer: b

19. In the conversion of line integral of H into surface integral, which theorem is used?
a) Green theorem
b) Gauss theorem
c) Stokes theorem
d) It cannot be converted

Answer: c

20. An implication of the continuity equation of conductors is given by
a) $J = \sigma E$
b) $J = E/\sigma$
c) $J = \sigma/E$
d) $J = jwE\sigma$

Answer: a

21. Find the equation of displacement current density in frequency domain.
a) $Jd = jw\varepsilon E$
b) $Jd = jw\varepsilon H$
c) $Jd = w\varepsilon E/j$
d) $Jd = j\varepsilon E/w$

Answer: a

22. The total current density is given as $0.5i + j – 1.5k$ units. Find the curl of the magnetic field intensity.
a) $0.5i – 0.5j + 0.5k$
b) $0.5i + j -1.5k$
c) $i – j + k$
d) $i + j – k$

Answer: b

23. At dc field, the displacement current density will be
a) 0
b) 1
c) Jc
d) ∞

Answer: a

24. Both the conduction and displacement current densities coexist in which medium?
a) Only conductors in air
b) Only dielectrics in air
c) Conductors placed in any dielectric medium
d) Both the densities can never coexist

Answer: c
25. The charge density of a electrostatic field is given by
a) Curl of E
b) Divergence of E
c) Curl of D
d) Divergence of D

Answer: d

26. In the medium of free space, the divergence of the electric flux density will be
a) 1
b) 0
c) -1
d) Infinity

Answer: b

27. In a medium other than air, the electric flux density will be
a) Solenoidal
b) Curl free
c) Irrotational
d) Divergent

Answer: d

28. For a solenoidal field, the surface integral of D will be,
a) 0
b) 1
c) 2
d) 3

Answer: a

29. In a dipole, the Gauss theorem value will be
a) 1
b) 0
c) -1
d) 2

Answer: b

30. Find the electric flux density of a material whose charge density is given by 12 units in a volume region of 0.5 units.
a) 12
b) 24
c) 6
d) 48

Answer: c