Shivaji University, Kolhapur
Summer Examination 2020

Course Name : 65809-Physics Paper XV
Subject Name : (65809)Physics Paper XV
Paper Name : 65809-Physics Paper XV
Date : 02/11/2020
Time : 11:00AM - 12:00PM

Paper Code : 65809
Max. Marks : 50

महत्वाची सूचना : विद्यार्थ्यांनी 30 पैकी 25 प्रश्न सोडवावेत (प्रत्येकी 2 मार्कस) अथवा 60 पैकी 50 प्रश्न सोडवावेत (प्रत्येकी 1 मार्क)

Q.1

In electrostatics the Coulomb's law is given by.....

a) $\vec{E} = q/4\pi\varepsilon_0 \ \nabla \ (-1/r^2)$
b) $\vec{E} = q/4\pi\varepsilon_0 \ \nabla \ (-1/r)$
c) $\vec{E} = q/4\pi \ \nabla \ (1/r^2)$
d) $\vec{E} = q^2/4\pi\varepsilon_0 \ \nabla \ (-1/r^2)$

.

(1)a
(2)b
(3)c
(4)d

Q.2

The solid angle subtended by a closed surface at any point inside is $\oint d\omega = \ldots$
a) π
b) 2π
c) 3π
d) 4π

.

(1)a
(2)b
(3)c
(4)d

Q.3

The Laplace's Equation is applicable to...
a) Region with certain charge
b) Charge free region
c) Both a and b
d) None of above

.

(1)a
(2)b
(3)c
(4)d

Q.4

In free space Poisson's equation becomes...
a) Maxwell's equation
b) Ampere's equation
c) Stead state equation
d) Laplace's equation

.

(1)a
(2)b
(3)c
(4)d

Q.5

If the material has zero permittivity, the maximum potential it can pass is.....
a) ∞
b) $-\infty$
c) Unity
d) Zero

.

(1)a
(2)b
(3)c
(4)d

Q.6

Magnetic field exists around.....
a) Moving charges
b) Iron
c) Copper
d) Aluminium

.

(1)a
(2)b
(3)c
(4)d

Q.7

SI unit of permittivity of free space is.....
a) Farad
b) Weber
c) $C^2N^{-1}m^{-2}$
d) $C^2N^{-1}m^2$

.

(1)a
(2)b
(3)c
(4)d

Q.8

The time varying magnetic field induces _____ electric field.

a) conservative
b) non-conservative
c) irrotational
d) Helical

.

(1)a
(2)b
(3)c
(4)d

Q.9

The magnetic induction in the interior of a standard solenoid is given by _____, where notations have their usual meanings.

a) $B=\mu_0 n^2 A$
b) $B=\mu_0 nA$
c) $B=\mu_0 nI$
d) $B=\mu_0 I$

.

(1)a
(2)b
(3)c
(4)d

Q.10

Self-inductance of a standard solenoid is depends upon _____.

a) current passing through it
b) length of a solenoid
c) cross-section area of a solenoid
d) magnetic field

.

(1)a
(2)b
(3)c
(4)d

Q.11

Time varying field is characterized by _____.

a) $\vec{\nabla}\times\vec{E}=0$
b) $\vec{\nabla}.\vec{E}=0$
c) $\vec{\nabla}\times\vec{E}\neq 0$
d) $\vec{\nabla}.\vec{E}\neq 0$

.

(1)a
(2)b
(3)c
(4)d

Q.12

Magnetic flux linked with the coil is depends on _____

a) cross section area of the coil
b) current flowing through the coil
c) number of turns of the coil
d) All (a), (b). and (c)

.

(1)a
(2)b
(3)c
(4)d

Q.13

Electric field E due to static charges satisfies the condition _____.

a) $\vec{\nabla}\times\vec{E}=0$
b) $\oint_c \vec{E}\cdot\vec{dl}=0$
c) $\vec{\nabla}\times\vec{E}\neq 0$
d) Both (a) &(b)

.

(1)a
(2)b
(3)c
(4)d

Q.14

Mutual inductance per unit length of two windings with $n_1$and n_2 turns per unit length over a frame of cross sectional area A is _____

a) $\mu_0\frac{n_1 n_2}{A}$
b) $\mu_0\frac{A}{n_1 n_2}$
c) $\mu_0 n_1 n_2$ A
d) $\mu_0\frac{n_2}{n_1}A$

.

(1)a
(2)b
(3)c
(4)d

Q.15

According to Neumann's formula, mutual inductance _____ with increase of separation between the loops.

a) increases
b) remains unchanged
c) Varies irregularly
d) Decreases

.

(1)a
(2)b
(3)c
(4)d

Q.16

The Maxwell's wquation which remains unchanged when a medium get changed is ---

a) $\vec{\nabla}.\vec{B}=0$
b) $\vec{\nabla}.\vec{E}=\frac{\rho}{\epsilon_0}$
c) $\vec{\nabla}\times\vec{B}=\mu_0\vec{J}+\mu_0\epsilon_0\frac{\partial\vec{E}}{\partial t}$
d) none of these

.

(1)a (3)c
(2)b (4)d

Q.17

Differential form of Ampere's circuital law is ---

a) $\vec{\nabla} \times \vec{B} = \mu_0 \vec{j}$ b) $\vec{\nabla} \times \vec{B} = \frac{\partial \vec{E}}{\partial t}$

c) $\vec{\nabla} . \vec{B} = 0$ d) none of these

.

(1)a (3)c
(2)b (4)d

Q.18

Which of the following is the correct statement?

a) $\vec{B} = \mu_0 \vec{H}$ b) $\vec{D} = \epsilon_0 \vec{E}$

c) $\vec{\nabla} . \vec{B} = 0$ d) All of these

.

(1)a (3)c
(2)b (4)d

Q.19

Which of the following law do not form a Maxwell's equation?

a) Plank's law b) Gauss's law

c) Faraday's law d) Ampere's law

.

(1)a (3)c
(2)b (4)d

Q.20

Maxwell's forth equation is based on --- law.

a) Ampere's law b) Faraday's law

c) Coulomb's law d) Lenz's law

.

(1)a (3)c
(2)b (4)d

Q.21

Which of the following represent Gauss's law in magnetostatic?

a) $\vec{\nabla} . \vec{B} = 0$ b) $\vec{\nabla} . \vec{E} = \frac{\rho}{\epsilon_0}$

c) $\vec{\nabla} . \vec{E} = \frac{\partial \vec{E}}{\partial t}$ d) $\vec{\nabla} \times \vec{H} = \vec{J} + \frac{\partial \vec{D}}{\partial t}$

.

(1)a (3)c
(2)b (4)d

Q.22

Maxwell introduced an additional term in ---

a) Gauss's law b) Faraday's law

c) Ampere's law d) Coulomb's law

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(1)a (3)c
(2)b (4)d

Q.23

Displacement current density in vacuum is ---

a) $\frac{\partial \vec{D}}{\partial t} = 0$ b)) $\frac{\partial \vec{D}}{\partial t} = \epsilon_0 \frac{\partial \vec{E}}{\partial t}$

c) $\frac{\partial \vec{D}}{\partial t} = \vec{D} + \epsilon_0 \frac{\partial \vec{E}}{\partial t}$ d) none of these

.

(1)a (3)c
(2)b (4)d

Q.24

Electromagnetic waves are .....

a) transverse waves.

b) longitudinal waves.

c) Seismic waves

d) None of above

.

(1)a (3)c

(2)b (4)d

Q.25

The main difference between a radio wave and sound wave is it's .....

a) basic nature
b)amplitude
c) energy
d) frequency

.

(1)a (3)c
(2)b (4)d

Q.26

Which of the following is not an electromagnetic wave?

a) Sound
b) Radio
c) Light
d) Infrared

.

(1)a (3)c
(2)b (4)d

Q.27

Electromagnetic waves .....

a) need a medium to travel through.
b) can travel through a vacuum.
c) some time need
d) both a and b

.

(1)a (3)c
(2)b (4)d

Q.28

Maxwell's Equations describe the interaction of which two fundamental forces?

a) Electricity and Magnetism
b) Electricity and the Weak Nuclear force
c) Magnetism and the Weak Nuclear force
d) Magnetism and Gravity

.

(1)a (3)c
(2)b (4)d

Q.29

In electromagnetic fields.....

a) total energy is conserved
b) total momentum is conserved
c) both a and b
d) torque is conserved

.

(1)a (3)c
(2)b (4)d

Q.30

The wave propagation vector is complex quantity in....

a) vacuum
b) dielectrics
c) conductors
d) Badconductors

.

(1)a (3)c
(2)b (4)d