#### MULTIPLE CHOICE QUESTIONS ON PHY102

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#### Section A

## Answer to Question 1 is A.electrostatic

Question 2 : A \_\_\_\_\_\_ is the amount of charge that flow through a cross-section of a wire in one second if there is a steady current of one ampere (I A) in the wire A.coulomb B.potential C.Hooke's D.electric charge

#### Answer to Question 2 is D. electric charge

Question 3 : There are \_\_\_\_\_ types of elctric charges A.four B.three C.two D.one

#### Answer to Question 3 is C. two

Question 4 : Two ebonite rods rubbed with fur and suspended from a rigid support close to each other by threads will \_\_\_\_\_\_ each other A.relax B.contract C.attract D.repel

#### Answer to Question 4 is D. repel

Question 5 : A voltmeter connected across a 60Hz ac source reads 240V. Write down the expression of the instanteneous voltage as a function of time. A.240cos339.4t B.240sin339.4t C.339.4sin377t D.377cos339.4t

#### Answer to Question 5 is C.339.4sin377t

Question 6 : The work function of a metal is 3.45eV. Calculate th maximum wavelength of a photon that can eject photelectrons from the metal A.3.6×10-7m B.3.4×10-7m C.2.4×10-8m D.1.6×10-6m

#### Answer to Question 6 is A.3.6×10-7m

**Question 7 :** The half-life of a certain radioactive isotope is 32 hours. What fraction of the sample would remain after 16 huors?

A.0.25 B.0.71 C.0.62 D.0.50

## Answer to Question 7 is B. 0.71

**Question 8** : A potentiometer wire of length 100cm has a resistance of 10 $\Omega$ . It is connected in series to to a resistance R and a cell of emf 2V and negligible internal resistance. A source of emf of 10mV is balanced by a length of 40cm of the potentiometer wire. What is the value of the resistance R?

- A.2000Ω
- Β.950Ω

C.200Ω

D.790Ω

Answer to Question 8 is  $D.790\Omega$ 

Question 9 : A spectral line is emitted when an atom undergoes transition between two levels with a difference in energy of 2.4eV. What is the wavelength of the line? A.287nm B.377angstrome units C.518nm D.507angstrome units

#### Answer to Question 9 is C. 518nm

Question 10 : The law of \_\_\_\_\_\_ of charge states that the total electric charge in an isolated system, that is, the algebraic sum of the positive and negative charge present at any time, does not change A.moment

- **B.energy**
- C.conservation
- D.momentum

#### Answer to Question 10 is C. conservation

**Question 11 :** An RLC circuit contains an ac voltage source with rms value of 50V and has a frequency of 600Hz. Suppose that a resistance R = 20  $\Omega$ , capacitance C = 10.0  $\mu$ F and an inductance L = 4.0mH are connected in series to the source. Find the current in the circuit and the voltmeter reading across the inductor.

A.0.13A and 12.1V B.4.0A and 23.1V C.2.17A and 32.8V D.1.6A and 24.2V

#### Answer to Question 11 is C.2.17A and 32.8V

Question 12 : The electric field due to a distribution of charges, according to the \_\_\_\_\_\_ principle, is the vector sum of the fields of the individual charges making up the distribution A.permeability B.permittivity

- C.superposition
- D.distributive

# Answer to Question 12 is C. superposition

**Question 13 :** An air-cored transformer is assumed to be 100% efficient. The ratio of the secondary turns to the primary turns is 1:20. A 240V ac supply is connected to the primary coil and a  $6\Omega$  load is connected to the secondary coil. what is the current in the primary coil?

A.40.0A B.2.0A C.0.14A D.0.10A

## Answer to Question 13 is A. 40.0A

**Question 14** : When a copper surface is illuminated by radiation of wavelength 2537 angstrome units the value of the stopping potential is found to be 0.24volts. Calculate the work function of copper.

A.7.46eV B.3.26eV C.2.67eV

D.4.48eV

## Answer to Question 14 is D. 4.48eV

**Question 15** : An RLC circuit is used to tune a radio set to receive NOUN RADIO broadcasting at 105.9MHz in the FM band. The resistance and the inductance of the circuit of the radio set are  $12\Omega$  and  $1.4\mu$ H respectively. What capacitance should the circuit have?

A.1.64pF B.1.33mF

C.2.11pF

D.1.51µF

## Answer to Question 15 is A. 1.64pF

**Question 16** : In the relation k=14 $\pi$ co, co is the \_\_\_\_\_ of free space

A.permeability

B.permittivity

C.momentum

D.Coulomb

## Answer to Question 16. B. permittivity

Question 17 : The force exerted by charged particles on each other when they are at rest in a frame of reference is called \_\_\_\_\_\_ force A.electromotive B.electrostatic C.electrolite D.electric

#### Answer to Question 17 is B. electrostatic

Question 18 : An ac circuit consists of a voltage source v=200sin120 $\pi$ t and a 6µF capacitor in series. Calculate the current established in the circuit A.0.32A B.0.64A C.2.13A D.1.24A

#### Answer to Question 18 is A. 0.32A

Question 19 : Objects with net unlike charges \_\_\_\_\_\_ each other A.attract B.repel C.contract D.relax

#### Answer to Question 19 is B. repel

Question 20 : If Q1 and Q2 are the magnitude of two charges and r the distance between them, \_\_\_\_\_\_'s law states that the electric force exerted by one charge on the other F is F=kQ1Q2r2, where k is a constant A.electric charge B.Hooke's C.potential D.Coulomb

#### Answer to Question 20 is D. coulomb

# Section **B**

Question 1 : The surface integral of the electric field over a surface is called

- A. electric field
- B. permitivity
- C. charge
- D. electric flux

## Answer to question 1 is A. electric field

**Question 2**: The potential difference between two points B and A is equal to the ------ in taking a unit positive charge from A to B

- A. distance dependent
- B. force
- C. difference
- D. Workdone

## Answer to question 2 is . D.workdone

Question 3 : For capacitors in parallel, the potential difference across each capacitor is

- A. zero
- B. shared
- C. different
- D. the same

## Answer to question 3 is D. the same

**Question 4 :** The electrostatic force is conservative because the workdone in taking a charge round a closed path is

- A. one
- B. infinite
- C. large
- D. zero

## Answer to question 4is D. Zero

 $\label{eq:Question 5: When a dielectric material is subjected to a sufficiently strong electric field,$ 

- it becomes a
- A. capacitor
- B. conductor
- C. resistor

D. transistor

#### Answer to question 5 is B. conductor

Question 6 : The work done per unit charge moving from infinity to the point is called

- A. universal potential
- B. Electric potential
- C. zero potential
- D. magnetic potential

## Answer to question 6 is B. electric potential

Question 7 : The charges on capacitors connected in parallel are in the ratio of their

- A. resistivity
- B. capacitance
- C. effective charge
- D. charge

## Answer to question 7is B. capacitance

## Question 8 : Electric potential is measured in

- A. JV
- B. J/C
- C. JC
- D. NC

## Answer to question 8 is B. J/C

**Question 9**: The work done in taking a unit positive charge from one point to another in electric field is ------ of the path chosen between the two points

- A. independent
- B. parallel
- C. dependent
- D. perpendicular

## Answer to question 9 is A. independent

Question 10 : The electric field due to an infinite sheet of charge is ------ to the plane of the sheet

- A. parallel
- B. circular
- C. opposite
- D. perpendicular

## Answer to question 10 is D. perpendicular

**Question 11** : When a dielectric material is inserted between the plates of a capacitor it increases its

- A. permitivity
- B. resistance
- C. capacitance
- D. charge

## Answer to question 11 is C. capacitance

## Question 12 : The SI Unit of potential difference is the

- A. volt
- B. coulomb
- C. metre
- D. ohm

## Answer to question 12 is A. volt

**Question 13** : When a positive charge is repelled by another positively charged body its potential energy becomes

- A. increased
- B. decreased
- C. transfered
- D. constant

## Answer to question 13 is B. decreased

**Question 14 :** When the charge density at any point depends only on the distance of the point from a central point and not on the direction of the charge distribution is said to be

- A. ellipsoidal
- B. distance dependent
- C. spherically symmetric

D. directionless

#### Answer to question 14 is B. distance dependent

Question 15: Which of the following is a device that can store electric charge

- A. capacitor
- B. voltmeter
- C. resistor
- D. iron

#### Answer to question 15 is A. capacitor

Question 16 : For capacitors connected in series each has the same

- A. charge
- B. wire
- C. current
- D. potential difference

## Answer to question 16 is A. Charge

#### Question 17 : The energy stored in a system of charges is known as

- A. total charge
- B. electrostatic potential energy
- C. potential energy
- D. electrokinetics

## Answer to question 17 is B. electrostatic potential energy

**Question 18 :** The electric field outside a spherically symmetrical shell with radius r and total charge q is directed

- A. centrally
- B. linearly
- C. radially
- D. diagonally

#### Answer to question 18 is C. radially

#### Question 19: A body when raised above the earth's surface is said to acquire

- A. weight
- B. kinetic energy
- C. energy
- D. potential energy

## Answer to question 19 is B. Kinetic energy

Question 20 : Which of the following is not an example of dielectric material

- A. mica
- B. glass
- C. wood
- D. steel

## Answer to question is D. steel

## Section C

 ${\bf Question} \ {\bf 1}$  : A charge particle velocity in a plane perpendicular to a magnetic field describes

- A circular trajectory
- B. charge point
- C. horizontal parabola
- D. None of these

## Answer to question 1 is A. circular trajectory

 ${\bf Question}~{\bf 2}$  : According to Faraday's law, the mass of a substance liberated in electrolysis is proportional to the

- A. voltage passed
- B. quantity of electricity passed
- C. electrolytes
- D. charges

## Answer to question 2 is B. quantity of electricity passed

 ${\bf Question}~{\bf 3}$  : In the cathode ray oscilloscope, the electron beam can be deflected either by an electric field or by

- A. iron flux
- B. current density
- C. charge particles
- D. magnetic field

## Answer to question 3 is D. magnetic field

**Question 4** : In the cathode ray oscilloscope, when fast moving electrons strike the glass screen coated with zinc and sulphide they cause

- A. fluorescence
- B. incandesence
- C. losses
- D. magnetic field

#### Answer to question 4 is A. fluorescence

 $\ensuremath{\textbf{Question 5}}$  : The electrode by which the flow of the electrons leaves the electrolyte is called

- A. cathode
- B. corridor
- C. anode
- D. None of these

## Answer to question 5 is C. anode

Question 6 : Which of the following is not an element of a cathode ray tube

- A. bryer
- B. control grid
- C. electron gun
- D. heater

#### Answer to question 6 is A. bryer

**Question 7 :** The cyclotron is a mahine for accelerating charged particles and ions to a high

- A. velocity
- B. cyclons
- C. power
- D. voltage

Answer to question 7 is A. velocity

Question 8 : The chemical equivalent of a substance is its ------ divided by its valency

- A. molecular weight
- B. energy
- C. mass
- D. molecular weight

## Answer to question 8 is A. molecular weight

**Question 9** : When the direction of motion of the charged particle is neither parallel nor perpendicular to the direction of the magnetic field, it describes a

- A. magnet
- B. circular trajectory
- C. helical trajectory
- D. scalar

## Answer to question 9 is C. helical trajectory

## Question 10 : Which of the following is not magnetic

- A. steel
- B. nickel
- C. iron
- D. copper

## Answer to question 10 is D. copper

**Question 11** : A Charged particle moving in a uniform electric field follows a parabolic path because it is subjected to a

- A. high velocity
- B. constant acceleration
- C. low voltage
- D. uniform speed

## Answer to question 11 is B. constant acceleration

**Question 12** : The ------ of a substance is the number of times the average mass of one of the molecules is greater than the atomic mass unit

- A. molecular weight
- B. atomic mass
- C. atomic weight

D. molecular mass

#### Answer to question 12 is A. molecular weight

Question 13 : The process of conducting electricity by an electric solution is known as

- A. electrolysis
- B. conduction
- C. None of these
- D. electrification

#### Answer to question 13 is A. electrolysis

**Question 14** : The number of grammes of a substance equal to its molecular weight is called

- A. None of these
- B. A mole
- C. Atom
- D. node

## Answer to question 14 is B. A mole

Question 15 : A Cell designed for the study of electrolysis is called a ------

- A. generator
- B. battery
- C. cathode
- D. voltameter

#### Answer to question 15 is B. Battery

**Question 16 :** The electrode by which the flow of the electrons enters the electrolyte is called

- A. passage
- B. cathode
- C. Anode
- D. electrolysis

#### Answer to question 16 is B. cathode

## Question 17 : The direction of magnetic force is perpendicular to

- A. only the total velocity
- B. only magnetic field
- C. total velocity and magnetic field
- D. flux density

## Answer to question 17 is C. total velocity and magnetic field

Question 18 : The ----- is the use of electrolysis to coat one metal with another

- A. galvanization
- B. electroplating
- C. drilling
- D. casting

#### Answer to question 18 is B. electroplating

#### Question 19 : When current flows in one direction only it is called

- A. Eddy
- B. A.C
- C. None of these
- D. D.C

## Answer to question 19 is D. D.C

**Question 20** : The motion of a charged particle moving through a combination of the electric and magnetic fields, is described by the

- A. faraday's law
- B. charge force
- C. coulomb's law
- D. Lorenz force

#### Answer to question 20 is D. Lorenz force

## Section D

## Question 1 : Force per unit charge is called

- A. Gravitational field strength
- B. flux density
- C. Charge unit
- D. electric field strength

## Answer to is D. electric field strength

## Question 2 : Electrolytic capacitors have capacitances of upto

- A. 100µF
- B. 100000µF
- C. 10µF
- D. 15µF

## Answer to question 2 is B. 100000µF

Question 3 : According to ohm's law the potential difference is proportional to the

- A. voltage
- B. current
- C. temperature
- D. velocity

## Answer to question 3 is B. current

**Question 4** : The ------ of a battery is the chemical energy converted into electrical energy when unit charge is passed through it

- A. Potential difference
- B. circuit force
- C. battery voltage
- D. E.M.F

## Answer to question 4 is A. potential difference

**Question 5 :** Which law stated that an induced e.m.f flows in such a direction as to oppose the motion producing it

- A. newton's
- B. coulomb's
- C. Lenz's
- D. faraday's

## Answer to question 5 is D. faradays

**Question 6 :** An electrolytic capacitor consist of two electrodes of ------ positive and negative plates

- A. copper
- B. cobalt
- C. aluminium
- D. steel

#### Answer to question 6 is C. aluminum

#### Question 7 : Capacitance is measured in

- A. C/V
- B. CV
- C. V/m
- D. NV

## Answer to question 7 is A. C/V

 $\label{eq:Question 8: The force on a current-carrying conductor is greatest when the conductor is$ 

- at ----- to the field
- A. right angles
- B. acute angles
- C. opposite direction
- D. parallel lines

## Answer to question 8 is A. right angles

## Question 9 : The SI Unit of electromotive force is

- A. ohmmetre
- B. Ampere
- C. Newton
- D. Volt

## Answer to question 9 is D. volt

## Question 10 : A magnetic material is one which is capable of being

- A. attractive
- B. ironized
- C. magnetized
- D. repulsive

## Answer to question 10 is C. magnetized

## Question 11 : there are two types of electrolytic capacitors which are the

- A. wet and dry
- B. liquid and solid
- C. electron and proton
- D. iron and steel

## Answer to question 11 is A. wet and dry electrolytic capacitors

Question 12: Capacitors are classified into two, namely

- A. series and parallel
- B. small and large
- C. dielectric and insulators
- D. fixed and variable

## Answer to question 12 is D. flexible and variable

## Question 13 : The unit of magnetic flux density is

- A. A/M
- B. N/Am
- C. N/A
- D. N/m

## Answer to question 13 is B. N/Am

**Question 14 :** The process of magnetising an object made of magnetic material simply by bringing a magnet near is called

- A. remagnetisation
- B. induced magnetism
- C. demagnetization
- D. magnetism

## Answer to question 14 is B. induced magnetism

 ${\it Question}~15$  : The resistivity of a semi conductor decreases rapidly with increasing

- A. temperature
- B. surface area
- C. resistance
- D. voltage

#### Answer to question 15 is A. temperature

## Question 16 : The force acting per unit current lenght is called

- A. magnetic field strenght
- B. magnetic flux density
- C. resistivity
- D. current flux

## Answer to question 156is B. magnetic flux density

**Question 17 :** The maximum electric field a material can withstand without the occurence of breakdown is called

- A. capacitive strenght
- B. None of these
- C. conductive strenhgt
- D. dielectric strength

## Answer to question 17 is D. dielectric strength

Question 18 : A Capacitor whose capacitance vary continously can be use for

- A. tuning radio receivers
- B. breaking circuits
- C. breakdown
- D. None of these

#### Answer to question 18 is A. turning radio receiver

**Question 19 :** A neutral point is defined as a point at which the resultant magnetic flux density is

- A. repulsive
- B. zero
- C. highly dense
- D. one

#### Answer to question 19 is B. zero

## Question 20 : The unit of permeability of a medium

- A. H/m
- B. m/H
- C. H
- D. Ωm

## Answer to question 20 is A. H/m

# Section E

## Question 1 : The SI Unit of electric charge is

- A. hertz
- B. joule
- C. Newton
- D. coulomb

## Answer to question 1 is D. coulomb

## Question 2 : Gauss's law applies to any hypothetical closed surface called

- A. lower point
- B. Gaussian surface
- C. Gaussor
- D. free surface

## Answer to question 2 is B. Gaussian surface

Question 3 : The relation between an electric charge and electric field is express by

- A. Ohm's law
- B. Gausss law
- C. Newton's law
- D. Coulomb's law

## Answer to question 3 is D. coulomb's Law

## Question 4 : Coulomb's law applies to

- A. solids
- B. point charges
- C. point masses
- D. liquid bodies

## Answer to question 4 is B. point Charge

#### Question 5: Electric field is which type of physical quantity?

- A. vector
- B. None of these
- C. scalar
- D. charge

#### Answer to question 5 is A. Vector

#### Question 6 : what will happen to two glass rods after being rubbed with silk?

- A. repel eachother
- B. attract eachother
- C. breaks
- D. displace eachother

## Answer to question 6 is A. repel each other

**Question 7** : The direction of the electric field is opposite to that of the force if the charge is

- A. negative
- B. positive
- C. neutral
- D. large

#### Answer to question 7 is A. negative

#### Question 8 : Electric charge is quantized, occuring in only in

- A. discrete amounts
- B. None of these
- C. continous amounts
- D. few amounts

## Answer to question 8 is A. Discrete amounts

#### Question 9 : The electric field is measured in

- A. Newton
- B. N/K
- C. Newton per coulomb

D. coulomb

## Answer to question 9 is C. newton per coulomb

 $Question \ 10$  : In conservation of charge, the algebraic sum of the equal and opposite charges on the two bodies is

- A. zero
- B. 1C
- C. converted
- D. terminal

## Answer to question 10 is A. zero

Question 11 : The fact that electric forces add vectorially is known as the

- A. charge addition
- B. principle of charge
- C. coulomb's law
- D. superposition principle

## Answer to question 11 is D. Superposition principle

**Question 12** : The number of lines of force crossing any surface depends on the field strenght, the surface orientation of the

- A. Charge
- B. electric flux
- C. voltage
- D. surface

## Answer to question 12 is B. electric flux

**Question 13 :** The process of charging two bodies by means of rubbing them together is called charging by

- A. None of these
- B. friction
- C. electrons
- D. lightning

Answer to question 13 is B. friction

**Question 14** : The quantity of charge flowing per second through a conductor of 1A is known as

- A. Total Amperes
- B. coulomb
- C. volt
- D. watts

## Answer to question 14 is B. coulomb

Question 15: A region where an electric charge experiences a force is known as

- A. magnetic field
- B. charge field
- C. force field
- D. electric field

## Answer to question 15 is D. Electric field

## Question 16 : The unit of permitivity is

- A. farad per metre
- B. farad per coulomb
- C. farad
- D. farad per ampere

## Answer to question 16 is A. farad per metre

## Question 17 : which of the following is origin of the negative charge

- A. nucleus
- B. electron
- C. proton
- D. neutron

#### Answer to question 17 is B. electron

## ${\bf Question} \ {\bf 18}$ : The smallest charge that is possible to obtain is that of

- A. battery
- B. electricity
- C. neutron
- D. proton and electron

## Answer to question 18 is D. proton and electron

Question 19 : The electric flux is a

- A. vector and scalar
- B. scalar
- C. None of these
- D. vector

#### Answer to question 19 is D. vector

 ${\bf Question}~{\bf 20}$  : The number of lines of force crossing any closed surface is proportional to the

- A. electric flux
- B. temperature
- C. net charge
- D. electric field

Answer to question 1 is D. electric field