



## PHYSICS

## **BOOKS - UNITED BOOK HOUSE**

## **QUESTION PAPER 2016**



1. The speed of electromagnetic waves in

vacuum is

A. 
$$\sqrt{\in}_{0}\mu_{0}$$
  
B.  $\frac{1}{\sqrt{\in}_{0}}\mu_{0}$   
C.  $\in_{0}\mu_{0}$   
D.  $\frac{1}{\in_{0}}\mu_{0}$ 

#### **Answer:**

#### Watch Video Solution

**2.** For a monochromatic light incident on a metal surface, the maximum velocity of

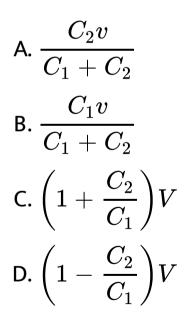
emitted photoelectrons is v. Then the

stopping potential would be

A. 
$$2m\frac{v^2}{e}$$
  
B.  $m\frac{v^2}{e}$   
C.  $2m\frac{v^2}{2}e$   
D.  $\frac{mv^2}{\sqrt{2}e}$ 

#### Answer:

**3.** A capacitor of capacitance  $C_1$  is charged up to potential V and then connected in parallel to an uncharged capacitor of capcitance  $C_2$ The final potential difference across each capacitor will be-



#### Answer:



## 4. Which of the following phenomenon does

not occur to both sound and light waves?

A. interfence

**B. Diffraction** 

C. coherence

D. Polarisation

#### Answer:



5. Two cells each of emf e but internal resistance  $r_1$  and  $r_2$  are connected in series through an external resistance R. IF the potential difference across the first cell is szero while current flow, the relation of R in terms of  $r_1$  and  $r_2$ 

A. R=
$$r_1+r_2$$

B. R=
$$r_1 - r_2$$

C. R= $(r_1+r_2)$ 

D. R=
$$rac{1}{2}(r_1-r_2)$$

#### Answer:

#### Watch Video Solution

# **6.** The ratio of minimum wavelength of Lyman and Balmer series in hydroden spectrum will be

A. 10

B. 5

C. 0.25

D. 1.25

#### **Answer:**



7. If an electric dipole of moment  $\overrightarrow{p}$  be placed along a uniform electric field of intessity  $\overrightarrow{E}$ , the torque acting on the dipole is

A. 
$$\overrightarrow{T}=\overrightarrow{p} imes\overrightarrow{E}$$

$$egin{aligned} \mathsf{B}.\,\overrightarrow{T} &= \overrightarrow{p} imes \overrightarrow{\cdot} E \ \mathsf{C}.\,\overrightarrow{T} &= \overrightarrow{p} imes \overrightarrow{\cdot} E \ \mathsf{D}.\,\overrightarrow{T} &= 0. \end{aligned}$$

#### Answer:



#### 8. In an astronomical telescope, focal length of

the objective is made

A. half that of the eye-piece

B. equal to that of the ey piece

#### C. shorter than that of the ey-piece

D. greater than that of the ey-piece

#### Answer:

Watch Video Solution

**9.** A conducting circular loop of radius r carries a constant current I. It is placed in a ukniform magnetic field  $\overrightarrow{B}$  such that  $\overrightarrow{B}$  is perpendicular to the place of the loop. The

#### magnetic force acting on the loop is

A. Blr

B. 2pilB

C. Zero

D. piLB

Answer:

10. A series LCR circuit acts as a purely resistive

circuit, when

A. ωL>1/ωc

B. ωL<1/ωc

C. ωL=1/ωc

D. none of these.

#### Answer:

11. The relative magnetic permeability of a

diamagnetic substance is

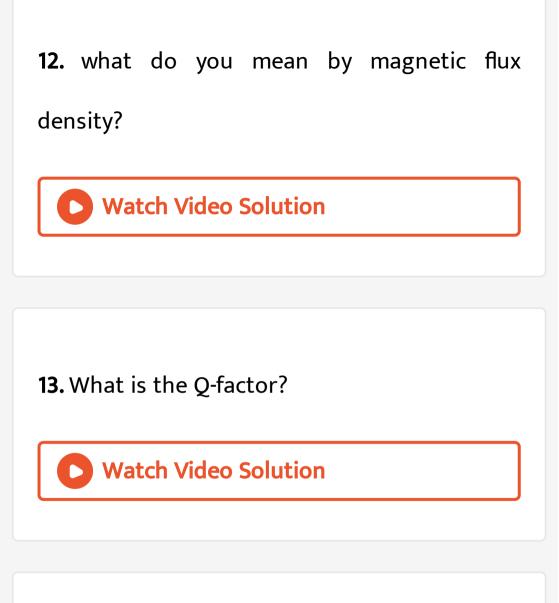
A. a. zero

B. b. slightly greater than 1

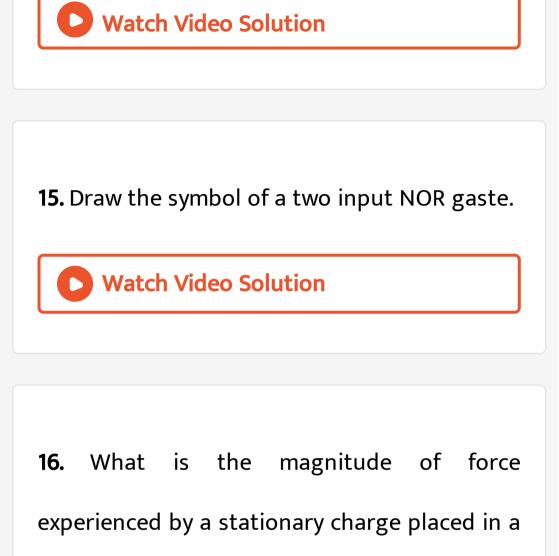
C. c. slightly less than 1

D. d. slightly less than zero.

Answer:



**14.** What is the decimal equivalent of the binary number 10011?



uniform electric field?

**17.** In an electron is not deflected when passing through a certain region of space, can we be sure that there is no magnetic filed in that region?



18. Write down lens maker's formula.

**19.** What should be the value of the shunt to be connected in parallel to a galcanometer of resistance G, so that 1/n part of the main current will pass through the shunt?

Watch Video Solution

**20.** Equal number of identical cells are joined in series and again in parallel. Under what conditoin , will the currents in both the cases be the same ?



**21.** In a compact coil of 50 turns, the current strength is 10A and the radius of the coil is  $25 \times 10^2$  meter. Find the magnitude of the magnetic field at its centre.



**22.** Mention two characteristics of electromagnetic waves.

23. In a hydrogen atom, an electron of charge e revolves in an orbit of radius r with speed v.Find the magnitude of the resulting magnetic moment of the electron.



24. The energy of an excited hydrogen atom is

-1.51 eV. Determine the angular momentum of

the electron according to Bogr's hypothesis.





#### 25. Why is satellite used for TV transmission to

far places?

Watch Video Solution

26. What do you mean by demodulation? What

is the importance of modulation index?

27. What is an equipotential between the

plates of a parallel plate capacitor.



**28.** Two capacitors of capacitances 5  $\mu F$  and 10  $\mu F$  are charged to 16 volts and 10 volts respectively. Find the common potential when they are connected in parallel to each other.

**29.** 64 identtical water drops coalesce to form a larger drop. If the nature and amount of charge be the same for all the drops, calculate the potential, capcitance and stored energy of the larger drop.

**Watch Video Solution** 

30. With an accompaying diagram, write down

Biot-Sawart's law in vector form. Can a

'cyclotron neutrons?



**31.** Define magnetic permeability and magnetic susceptibility of a magnetic material. Determine the relation between magnetic permeability and magnetic susceptibility.

Watch Video Solution

**32.** Define critical angle. A luminous object is placed at a depth h in a medium of refractive index  $\mu$ . Show that the radius r of the circular

base of the one through which light can emerge is  $r=h/\sqrt{\mu^2-1}$ 



**33.** If  $I_1 \& I_2$  be the sizes of real images for

two positions of a convex lens between object

and screen, then the size of the object is



**34.** Define absolute refractive index.



**35.** Write down Einstein's photoelectric equation and mention the symbols used. The photoelectric threshold wavelength for a certain metal as 400mm. Find the maximum kinetic enrgy of the emitted electrons from the metal surface by ultraviolet light of wavelength 200nm. Given  $h = 6.63 \times 10^{34}$ 

36. State the postulates of Bohr's model of

hydrogen atom.



**37.** Wahat is a p-n junction diode? Draw the circuit diagram of a full wave rectifier using p-n junction diodes. Show the imput and output voltage waveforms by a schematic graph.

38. What is AND gate? Draw the symbol of AND

gate and perpare its truth table.

Watch Video Solution

**39.** What is a photodiode? Draw theI-V characteristic curve of a photodiode. Mention one use of photodiode.

40. Establish Ohm's law from the concept of

drift velocity of free elctrons.

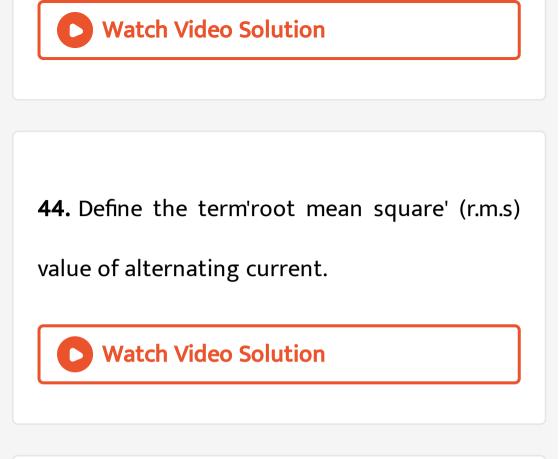
### Watch Video Solution

**41.** Define mobility of free electrons. A potential difference of 5 volts is applied across a conductor of length 10 cm Find the mobility of an electron if he drift velocity of an electron is  $2.5 \times 10^{-2}$  cms.

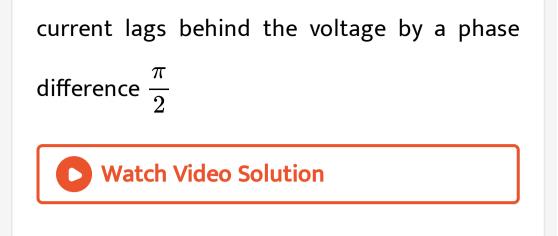
**42.** State Faraday's laws of electromgentic induction.



**43.** The magnetic flux through a coil is varying according to the relation  $\phi = (4t^2 + 2t - 5)Wb$ , t measured in seconds. Calculate the induced current through the coil at t = 2s, if the resistance of the coil is 5 $\Omega$ .



**45.** AC voltage is applied on purely inductive circuit of inductance L. If the voltage be  $e=E_0\sin(\omega t)$  then show mathematically



**46.** If L is 100 mH and the applied a.c. source frequency be 50Hz, find the inductive reactance in the above case.



47. State Huygen's principle for propagtion of

light wave .

#### Watch Video Solution

**48.** The magnifying power of a telescope in normal adjustment is 20, and the focal length of the eyepiece is  $5 \times 10^{-2}$  m. what is the magnifying power obtained when the system is adjusted so that the final image of a distant

object is formed  $25 imes 10^{-2}$  m away from the eyepiece? Watch Video Solution 49. For a concave mirror, prove that  $rac{1}{u}+rac{1}{v}=rac{1}{f}$ , where u, v and f have their usual meanings.

