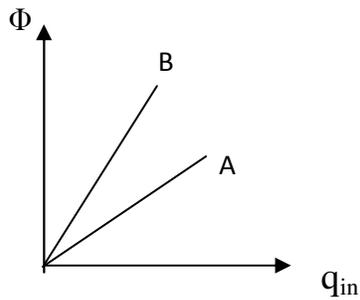


SAMPLE PAPER 2011-12

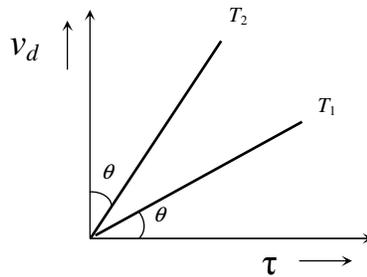
**PHYSICS
CLASS XII**

**TIME- 3 HRS.
MM-70**

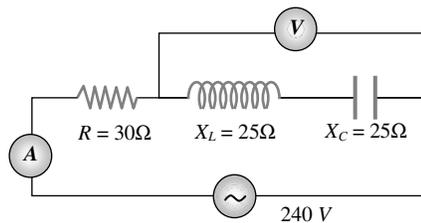
1. Given below is the graph between electric flux of closed surface enclosing a system of charges and system of charges for two different medium. The system of charges once kept in vacuum and then in water. Identify which one represents graph for charges inside water out of A and B?



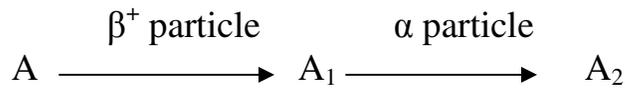
2. The v_d - τ graph for a conductor at temperature T_1 and T_2 applied across constant potential difference are as shown in the figure. Which out of T_1 & T_2 is at higher temperature?



3. In the circuit shown in figure, what will be the voltmeter and ammeter reading?

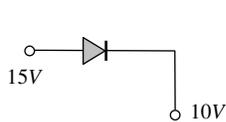


4. If a light beam shows no intensity variation when transmitted through a Polaroid which is rotated. Does it mean that the light is unpolarised ? Explain.
5. The work function of a metal is 2.3 eV. Will it show photoelectric emission for orange light of wave length 6800 \AA ? Give required calculation.
6. A radio active nucleus 'A' decays as given below.

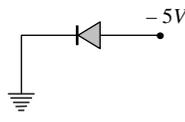


If the mass no and atomic no of A_2 are 182 and 71 respectively. Find the mass no and atomic no of "A"

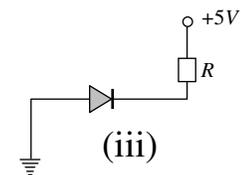
7. Sound waves can not be polarized. Why?
8. Give an example of each of (i) point to point communication (ii) broadcast communication
9. Give difference between sky wave and space wave propagation.
10. Identify the type of biasing from each fig given below.



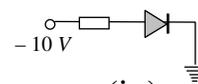
(i)



(ii)



(iii)

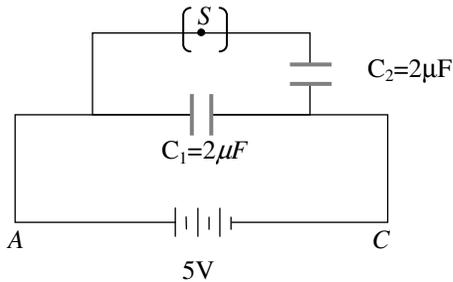


(iv)

11. Write postulates of Bohr's model of atomic spectra.

12. Why is the diffraction of sound waves more easily observed than diffraction of light waves? Hence write the condition required for diffraction to occur.

13. Figure shows two identical capacitors C_1 and C_2 , each of $2\mu\text{F}$ capacitance connected to a battery of 5V . Initially switch S is closed. After some time S is left open and distance between the plates increased from 5mm to 10mm of the two capacitors. How will the (i) charge and (ii) potential difference between the plates of the capacitors be affected ?



14. In an experiment with a potentiometer to measure the internal resistance of a cell when the secondary circuit is shunted by 5Ω the null point is 2.20 m . when the cell is shunted by 20Ω , the null point is 3.00 m . Calculate internal resistance of the cell.

15. Plot the variation in angle of deviation with angle of emergent when a white light passes through a prism. Give reason why there are two values of angle of emergent for the same angle of deviation.

16. Discuss the behavior of an electric dipole in non-uniform electric field with diagram and find
 a. Net force and b. net torque acting on it , for increasing field in the direction of dipole moment.

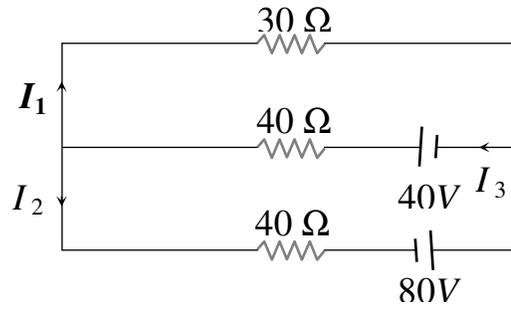
17. A long pillar (conducting) of radius R is carrying a current I , which is uniformly distributed over its cross section. Derive an expression for the magnitude of magnetic field inside as well as outside the pillar.

18. What do you mean by mutual induction? Name one device based on this phenomenon? Define SI unit of inductance.

OR

Define Self inductance, Derive an expression for self inductance of a solenoid.

19. Determine the current I_1 , I_2 , I_3 from network shown in figure



20. Using Ampere's circuital law find an expression for magnetic field due to current carrying toroid at its axial line.

21.(i) Draw a plane electromagnetic wave propagating in free space. Write its wave equations for its electric and magnetic vectors.

(ii) Give one use of each of following e.m. spectrum

(a) Gamma rays (b) ultraviolet rays

22.(i) In a young double slit experiment 15 fringes are observed within a distance of 20cm where wave length of 5000 \AA was to be used. Calculate no of fringes in the same distance, When wavelength of 6000 \AA is used keeping all other parameter constant.

(ii) Can two independent source of light produce coherent sources?

23. A double convex lens made of glass of refractive index 1.5 has its both surfaces of equal radii of curvature of 20 cm each. An object of 5 cm height is placed at a distance of 10cm from the lens. Find the position, nature and size of the image.

24. Derive an expression for electric field intensity due to an electric dipole at a point on its axial line.

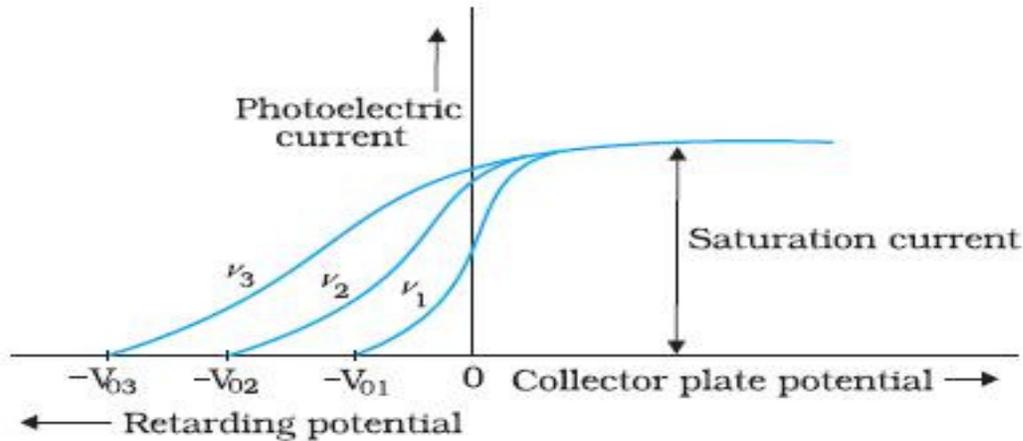
25. How will you convert a galvanometer into an ammeter?

A galvanometer having resistance of 100Ω gives full scale deflection when a current of 1mA is passed through it. Calculate the value of resistance required to convert it into an ammeter of the range 0 – 10 A

26. State radio- active decay laws. Obtain a relation between half life of a radio- active substance with decay constant using this law.

27. Mention the significance of Davisson- Germer experiment.

The graph between collector plate potential and photoelectric current for a metal for three different frequencies of incident radiations has been given. Arrange the frequencies in the increasing order. What remains the same for all these radiations. For which of the radiation the kinetic energy of photo electron is maximum?

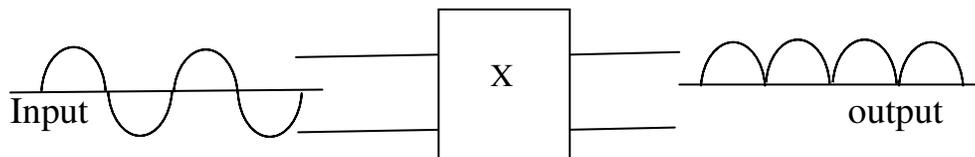


28. State Huygens principle for propagation of light. What type of wave front will form if source of light is cylindrical and far distant from the point of observation? Use Huygens’s principle to prove laws of reflection.

OR

In Young Double Slit Experiment (YDSE), deduce the conditions for constructive and destructive interference at a point on the screen. Draw the intensity distribution curve as well.

29. The device X in box converts the low input voltage into the output voltage waveform as shown in fig. Identify the device X. Draw the circuit diagram and explain its working.



What is to be done here for getting constant output voltage?

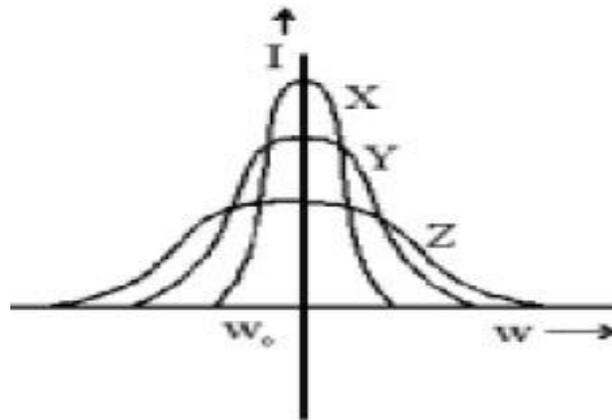
OR

Differentiate between forward biasing and reverse biasing of a PN junction diode. Explain with the help of circuit diagram the reverse and forward V-I characteristics graph of a diode.

30. Derive an expression for power factor in series LCR circuit.

In the given diagram the angular frequency varies with current in series LCR circuit in three different experiments done by students X, Y, and Z. All used same ac source and inductance of same value. Find

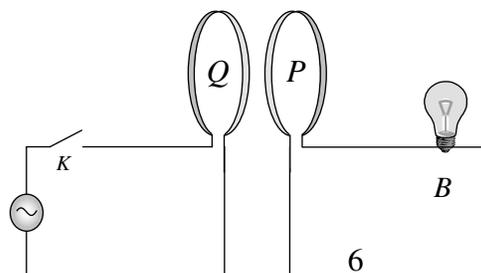
- (i) In which experiment quality factor will be more?
- (ii) What do you conclude about capacitance in the circuit used by students? And
- (iii) In which experiment resistance is maximum?



OR

Deduce an expression for energy stored inside an inductor of inductance L , carrying current I_0 . Using this find energy density of a solenoid.

In the fig, a coil P is connected to a low voltage bulb B and placed parallel to another coil Q as shown.



Explain the following observation: (i) Bulb lights when the key is closed and
Briefly explain how the brightness of the bulb changes when the coil Q is
moved upwards.

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