PHYSICS (Theory)

Time allowed : 3 hours ***Maximum Marks : 70***

General Instructions :

(i) All questions are compulsory.

(ii) There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks and one question of five marks. You have to attempt only one of the choices in such questions.

(iii) Question numbers 1 to 5 are very short answer type questions, carrying one mark each.

(iv) Question numbers 6 to 12 are short answer type questions, carrying two marks each.

(v) Question numbers 13 to 24 are also short answer type questions, carrying three marks each.

(vi) Question numbers 25 to 27 are long answer type questions, carrying five marks each.

(vii) Use of calculators is not permitted. However, you may use log tables, if necessary.

(viii) You may use the following values of physical constants wherever necessary :

$c = 3\times10^{8}\ ms^{-1}$

$h = 6.6\times10^{-34}\ Js$

$e = 1.6\times10^{-19}\ C$

$\mu_0 = 4\pi\times10^{-7}\ T\ m\ A^{-1}$

$m_e = 9.1 \times 10^{-31}\ Kg$

$\frac{1}{4\pi\varepsilon_0} = 9\times10^{9}\ N-m^2/C^2$

Mass of neutron $m_n \cong 1.6\times10^{-27}\ kg$

Boltzmann's constant $k = 1.38\times10^{-23}\ J\ K^{-1}$

Avogadro's number $N_A = 6.023\times10^{23}$ / mole

QUESTION PAPER CODE 55/1/1

1. An electric dipole of dipole moment 20×10^{-6} C.m is enclosed by a closed surface. What is the net flux coming out of the surface ? 1

2. An electron beam projected along + X-axis, experiences a force due to a magnetic field along the + Y-axis. What is the direction of the magnetic field ? 1

3. The power factor of an a.c. circuit is 0.5. What will be the phase difference between voltage and current in this circuit ? 1

4. Electrons are emitted from a photosensitive surface when it is illuminated by green light but electron emission does not take place by yellow light. Will the electrons be emitted when the surface is illuminated by (i) red light, and (ii) blue light ? 1

5. What should be the length of the dipole antenna for a carrier wave of frequency 3×10^8 Hz ? 1

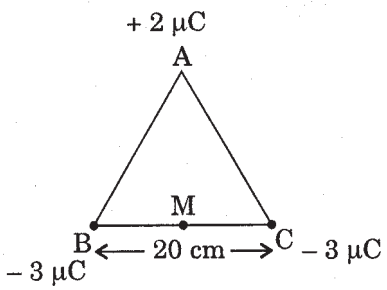
6. Define 'electric line of force' and give its two important properties. 2

7. (a) Why does the electric field inside a dielectric decrease when it is placed in an external electric field ?

   (b) A parallel plate capacitor with air between the plates has a capacitance of 8 pF. What will be the capacitance if the distance between the plates be reduced by half and the space between them is filled with a substance of dielectric constant K = 6 ? 2

OR

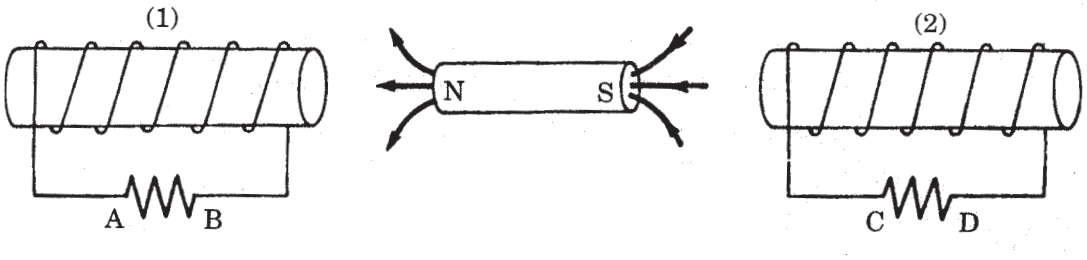
Three point charges of $+2\mu C, -3\mu C$ and $-3\mu C$ are kept at the vertices, A, B and C respectively of an equilateral triangle of side 20 cm as shown in the figure. What should be the sign and magnitude of the charge to be placed at the mid-point (M) of side BC so that the charge at A remains in equilibrium ? 2



8. Draw V—I graph for ohmic and non-ohmic materials. Give one example for each. 2

9. Define the terms 'Magnetic Dip' and 'Magnetic Declination' with the help of relevant diagrams. 2

10. In the figure given below, a bar magnet moving towards the right or left induces an e.m.f. in the coils (1) and (2). Find, giving reason, the directions of the induced currents through the resistors AB and CD when the magnet is moving (a) towards the right, and (b) towards the left. 2



11. (i) Draw the graphs showing variation of inductive reactance and capacitive reactance with frequency of applied a.c. source.

(ii) Can the voltage drop across the inductor or the capacitor in a series LCR circuit be greater than the applied voltage of the a.c. source ? Justify your answar. 2

12. The image of a candle is formed by a convex lens on a screen. The lower half of the lens is painted black to make it completely opaque. Draw the ray diagram to show the image formation. How will this image be different from the one obtained when the lens is not painted black ? 2

13. An electric dipole is held in a uniform electric field. (i) Using suitable diagram, show that it does not undergo any translatory motion, and (ii) derive an expression for the torque acting on it and specify its direction. 3

14. A galvanometer with a coil of resistance 120 ohm shows full scale deflection for a current of 2.5 mA. How will you convert the galvanometer into an ammeter of range 0 to 7.5 A ? Determine the net resistance of the ammeter. When an ammeter is put in a circuit, does it read slightly less or more than the actual current in the original circuit ? Justify your answer. 3

15. Define the term 'resistivity' and write its S.I. unit. Derive the expression for the resistivity of a conductor in terms of number density of free electrons and relaxation time. 3

OR

State the principle of potentiometer. Draw a circuit diagram used to compare the e.m.f. of two primary cells. Write the formula used. How can the sensitivity of a potentiometer be increased ?

16. Explain, with the help of diagram, the principle and working of an a.c. generator. Write the expression for the e.m.f. generated in the coil in terms of its speed of rotation. 3

17. Give reasons for the following : 3

(i) Long distance radio broadcasts use short-wave bands.

(ii) The small ozone layer on top of the stratosphere is crucial for human survival.

(iii) Satellites are used for long distance TV transmission.

18. A figure divided into squares, each of size 1 mm^2, is being viewed at a distance of 9 cm through a magnifying lens of focal length 10 cm, held close to the eye.

(a) Draw a ray diagram showing the formation of the image.

(b) What is the magnification produced by the lens ? How much is the area of each square in the virtual image ?

(c) What is the angular magnification of the lens ? 3

19. Ultraviolet light of wavelength 2271 from a 100 W mercury source radiates a photo cell made of molybdenum metal. If the stopping potential is 1.3 V, estimate the work function of the metal. How would the photo cell respond to high intensity red light of wavelength 6328 $\mathring{A}$ produced by a He - Ne laser ?

Plot a graph showing the variation of photoelectric current with anode potential for two light beams of same wavelength but different intensity. 3

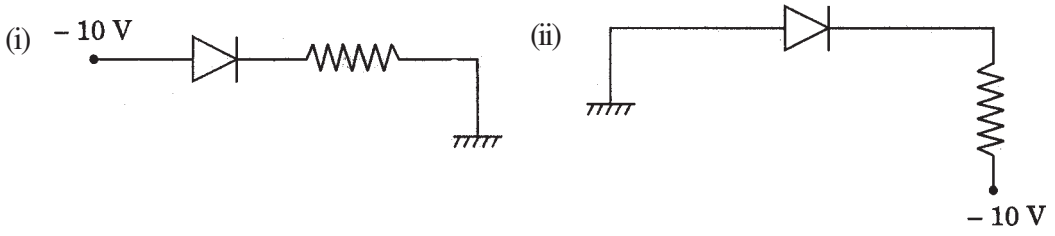
20. (a) Draw a graph showing the variation of potential energy of a pair of nucleons as a function of their separation. Indicate the regions in which nuclear force is (i) attractive, and (ii) repulsive.

(b) Write two characteristic features of nuclear force which distinguish it from the coluomb force. 3

21. (a) Show that the decay rato 'R' of a sample of a radionuclide is related to the number of radioactive nuclei 'N' at the same instant by the expression

(b) The half life of against α – decay is 1.5×10^{17} s. What is the activity of sample of having 25×10^{20} atoms ? 3

22. Explain, with the help of a circuit diagram, how the thickness of depletion layer in a p-n junction diode charges when it is forward biased. In the following circuit which one of the two diodes is forward biased and which is reverse biased ? 3



23. Distinguish between analog and digital communication. Write any two modulation techniques employed for the digital data. Describe briefly one of the techniques used. 3

24. Draw a schematic diagram of a single optical fibre structure. Explain briefly how an optical fibre is fabricated. Describe in brief, the mechanism of propagation of light signal through an optical fibre. 3

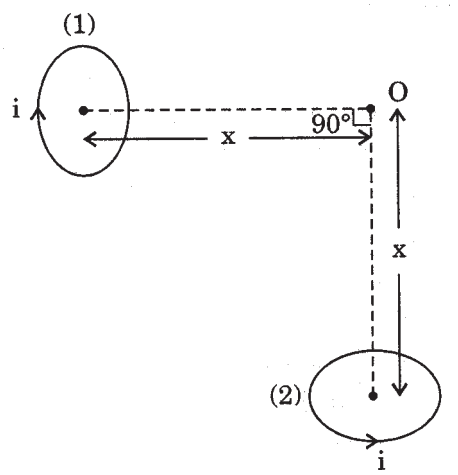
25. (a) With the help of a labelled diagram, explain the principle and working, of a moving coil galvanometer.

(b) Two parallel coaxial circular coils of equal radius 'R' and equal number of turns 'N', carry equal currents 'I' in the same direction and are separated by a distance '2R'. Find the magnitude and direction of the net magnetic field produced at the mid-point of the line joining their centres. 5

OR

(a) State Biot-Savart's law. Using this law, derive the expression for the magnetic field due to a current carrying circular loop of radius 'R', at a point which is at a distance 'x' from its centre along the axis of the loop.

(b) Two small identical circular loops, marked (1) and (2), carrying equal currents, are placed with the geometrical axes perpendicular to each other as shown in the figure. Find the magnitude and direction of the net magnetic field produced at the point O.



26. (a) How is a wave front different from a ray ? Draw the geometrical shape of the wave fronts when (i) light diverges from a point source, and (ii) light emerges out of a convex lens when a point source is placed at its focus.

(b) State Huygens' principle. With the help of a suitable diagram, prove Snell's law of refraction using Huygens' principle. 5

OR

(a) In Young's double slit experiment, deduce the conditions for (i) constructive, and (ii) destructive interference at a point on the screen. Draw a graph showing variation of the resultant intensity in the interference pattern against position 'x' on the screen.

(b) Compare and contrast the pattern which is seen with two coherently, illuminated narrow slits in Young's experiment with that seen for a coherently illuminated single slit producing diffraction.

27. (a) Distinguish between metals, insulators and semiconductors on the basis of their energy bands.

(b) Why are photodiodes used preferably in reverse bias condition ? A photodiode is fabricated from a semiconductor with band gap of 2.8 eV. Can it detect a wavelength of 6000 nm ? Justify. 8

OR

(a) Explain briefly, with the help of circuit diagram, how V-I characteristics of a p-n junction diode are obtained in (i) forward bias, and (ii) reverse bias. Draw the shape of the curves obtained.

(b) A semiconductor has equal electron and hole concentration of $6\times10^{8}/m^{3}$. On doping with certain impurity, electron concentration increases to $9\times10^{12}/m^{3}$.

(i) Identify the new semiconductor obtained after doping.

(ii) Calculate the new hole concentration.

QUESTION PAPER CODE 55/1

1. An electrostatic field line cannot be discontinuous. Why ? 1

2. Two wires of equal lengths are bent in the form of two loops. One of the loops is square shaped whereas the other loop is circular. These are suspended in a uniform magnetic field and the same current is passed through them. Which loop will experience greater torque ? Give reasons. 1

3. A bulb and a capacitor are connected in series to an a.c. source of variable frequency. How will the brightness of the bulb change on increasing the frequency of the a.c. source ? Give reason. 1

4. Ultraviolet light is incident on two photosensitive materials having work functions W_1 and W_2 ($W_1 > W_2$). In which case will the kinetic energy of the emitted electrons be greater ? Why ? 1

5. What is the function of 'cladding' in a typical optical fibre ? 1

6. Define electric field intensity. Write its S.I. unit. Write the magnitude and direction of electric field intensity due to an electric dipole of length 2a at the mid-point of the line joining the two charges. 2

7. A parallel plate capacitor is to be designed with a voltage rating 1 kV using a material of dielectric constant 3 and dielectric strength about 10^7 Vm^{-1}. For safety we would like the field never to exceed say, 10% of the dipole strength. What minimum area of the plates is required to have a capacitance of 50 pF ? 2

OR

4 μF capacitor is charged by a 200 V supply. The supply is then disconnected and the charged capacitor is connected to another uncharged capacitor. How much electrostatic energy of the first capacitor is lost in the process of attaining the steady situation ?

8. How does the resistivity of (i) a conductor and (ii) a semiconductor vary with temperature ? Give reason for each case. 2

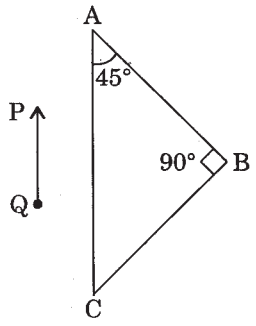
9. Write two characteristic properties to distinguish between diamagnetic and paramagnetic materials. 2

2 μF

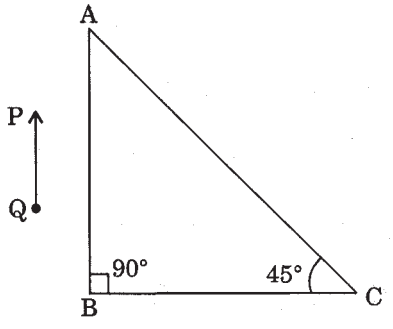
10. A circular coil of radius 8 cm and 20 turns rotates about its vertical diameter with an angular speed of 50 s^{-1} in a uniform horizontal magnetic field of magnitude 3×10^{-2} T. Find the maximum and average value of the emf induced in the coil. 2

11. State the condition under which the phenomenon of resonance occurs in a series LCR circuit. Plot a graph showing variation of current with frequency of a.c. source in a series LCR circuit. 2

12. A right-angled crown glass prism with critical angle 41° is placed before an object, PQ, in two positions as shown in the figures (i) and (ii). Trace the paths of the rays from P and Q passing through the prisms in the two cases. 2



(i)



(ii)

13. State Gauss' theorem. Apply this theorem to obtain the expression for the electric field intensity at a point due to an infinitely long, thin, uniformly charged straight wire. 3

14. Two cells of emf 1.5 V and 2 V and internal resistance 1 ohm and 2 ohm respectively are connected in parallel to pass a current in the same direction through an external resistance of 5 ohm.

(a) Draw the circuit diagram.

(b) Using Kirchhoff's laws, calculate the current through each branch of the circuit and potential difference across the 5 ohm resistor. 3

15. What is Seebeck effect ? Plot a graph showing the variation of thermo emf with temperature of the hot junction (keeping the cold junction at 0°C) of a thermocouple. How will the (a) neutral temperature and (b) inversion temperature of the thermocouple change when the temperature of the cold junction is increased ? 3

OR

State Faraday's laws of electrolysis. How does one infer from these laws that the charge per ion of any chemical element (species) is an integral multiple of e, where e is the charge on an electron ?

16. Define self-inductance and give its S.I. unit. Derive an expression for self-inductance of a long, air-cored solenoid of length *l,* radius r, and having N number of turns. 3

17. Name the constituent radiation of electromagnetic spectrum which 3

(a) is used in satellite communication.

(b) is used for studying crystal structure.

(c) is similar to the radiations emitted during decay of radioactive nuclei.

(d) has its wavelength range between 390 nm and 770 nm.

(e) is absorbed from sunlight by ozone layer.

(f) produces intense heating effect.

18. (a) Draw a labelled ray diagram to show the formation of an image by a compound microscope. Write the expression for its magnifying power.

(b) How does the resolving power of a compound microscope change, when (i) refractive index of the medium between the object and the objective lens increases; and (ii) wavelength of the radiation used is increased ? 3

19. Mention the significance of Davisson-Germer experiment. An α-particle and a proton are accelerated from rest through the same potential difference V. Find the ratio of de-Broglie wavelengths associated with them. 3

20. (a) Draw the energy level diagram showing the emission of -particles followed by -rays by a nucleus.

(b) Plot the distribution of kinetic energy of β -particles and state why the energy spectrum is continuous. 3

21. A radioactive sample contains 2.2 mg of pure which has half life period of 1224 seconds. Calculate

(i) the number of atoms present initially.

(ii) the activity when 5 μg of the sample will be left. 3

22. On the basis of the energy band diagrams distinguish between metals, insulators and semiconductors. 3

23. Distinguish between analog and digital communication. Write any two modulation techniques employed for the digital data. Describe briefly any one of the techniques used. 3

24. A ground receiver station is receiving a signal at (a) 5 MHz and (b) 100 MHz, transmitted from a ground transmitter at a height of 300 m located at a distance of 100 km. Identify whether it is coming via space wave or sky wave propagation or satellite transponder.

$^{60}_{27}Co$

(Given the value of radius of the earth is 6400 km and

maximum electron density, $N_{max} = 10^{12}\ m^{-3}$) 3

25. Explain the principle and working of a cyclotron with the help of a labelled diagram.

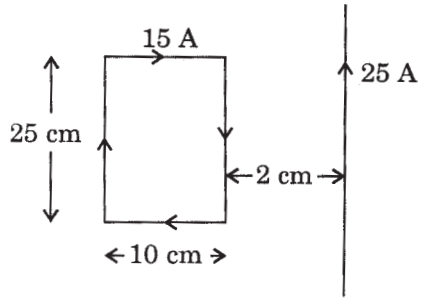
A cyclotron's oscillator frequency is 10 MHz. What should be the operating magnetic field for accelerating protons ? If the radius of its 'dees' is 60 cm, what is the kinetic energy of the proton beam produced by the accelerator ? Express your answer in units of MeV.

($e = 1.6\times10^{-19}$ C, $m_p = 1.67\times10^{-27}$ kg, 1 MeV = 1.602×10^{-13} J). 5

OR

Depict the magnetic field lines due to two straight, long, parallel conductors carrying currents I_1 and I_2 in the same direction. Hence deduce an expression for the force acting per unit length on one conductor due to the other. Is this force attractive or repulsive ?

Figure shows a rectangular current-carrying loop placed 2 cm away from a long, straight, current-carrying conductor. What is the direction and magnitude of the net force acting on the loop ?



26. Using Huygens' principle, draw a diagram to show propagation of a wave-front originating from a monochromatic point source.

Describe diffraction of light due to a single slit. Explain formation of a pattern of fringes obtained on the screen and plot showing variation of intensity with angle in single slit diffraction. 5

OR

What is meant by a linearly polarised light ? Which type of waves can be polarised? Briefly explain a method for producing polarised light.

Two polaroids are placed at 90° to each other and the intensity of transmitted light is zero. What will be the intensity of transmitted light when one more polaroid is placed between these two bisecting the angle between them ? Take intensity of unpolarised light as I_o.

27. (a) With the help of a circuit diagram explain the working of transistor as oscillator.

(b) Draw a circuit diagram for a two input OR gate and explain its working with the help of input, output waveforms. 5

OR

(a) Explain briefly with the help of a circuit diagram how V-I characteristics of a p-n junction diode are obtained in (i) forward bias, and (ii) reverse bias.

(b) A photodiode is fabricated from a semiconductor with a band gap of 2.8 eV. Can it detect wavelength of 6000 nm ? Justify.

Marking Scheme — Physics

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6. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.

7. Deduct ½ mark for writing wrong units or missing units in all numerical problems.

8. Formula must be implied from the calculations if not explicitly written.

9. In short type answers asking for two features/characteristics/ properties, if a candidate writes three features / characteristics / properties or more, only first two should be evaluated.

10. Full marks should be awarded to a candidate if his/her answer in a numerical problem is close to the value given in this scheme.

11. **Award full marks to the answer of a question if it deserves.**

PAPER CODE : 55/1/1

Q. No.	Expected Answers	Value Points	
1.	Zero	1	1
2.	+Z axis or Z axis For —z axis give ½ mark	1	1
3.	$\frac{\pi}{3}$ radian or 60° If writes cos (award ½ mark only)	1	1
4.	(i) No (ii) Yes	½ ½	1
5.	$\therefore\ \lambda = \frac{\lambda}{2}$ or $\frac{\lambda}{4} = 0.50\text{ m} / 0.25\text{ m} / 1\text{ m}$ $\lambda = \frac{C}{\nu} = 1\text{ m}$	½ ½	1
6.	(i) Definition 1 (ii) Two characterstics/porperties ½ + ½ An electric line of force is a curve drawn in such a way that the tangent at each point is in the direction of the net electric field at that point. or It is a straight/curved path followed by a test charge left free in space. Characterstics/Properties : Continuous curves without any breaks/start from positive charge and terminate at negative charge/two lines can never cross each other/they do not form closed loops/tangent to any point gives the direction of net electric field at that point. Any two	1 ½ + ½	2
7.	(i) Reason 1 (ii) Formula ½ Result ½		

Q. No.	Expected Answers	Value Points

(a) External field induces charges on the surface of the dielectric which produces a field that opposes the external electric field.

or

Due to the polarisation of the dielectric. 1

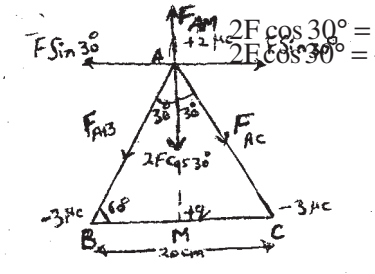
(b) $C = \frac{KA\epsilon_O}{d}$ (Even if formula is written given 1 mark as for writing $\frac{KA}{d}$ give ½ mark ½

$C = \frac{6A\epsilon_O}{d/2} = 12\frac{A\epsilon_O}{d} = 12$ times (Only result ½ Mark) ½ 2

or 96 farad

OR

(i)	Diagram	1
(ii)	Reason	½
(iii)	Correct Substitution	½



$2F\cos 30° = F_{AM}$

$2F\cos 30° = \frac{1}{4\pi\epsilon_0}\frac{2\times10^{-6}\times q}{3\times10^{-2}}$ 1

At equilibrium the intensity of the net electric field at A is zero ½

$|\vec{F}_{AB}| = |\vec{F}_{AC}| = F = \frac{1}{4\pi\epsilon_0}\times\frac{2\times3\times10^{-12}}{4\times10^{-2}}$

Resultant of $\vec{F}_{AB}$ and $\vec{F}_{AC} = 2F\cos 30°$

$\therefore$ For the charge at 'A' to be in equilibrium,

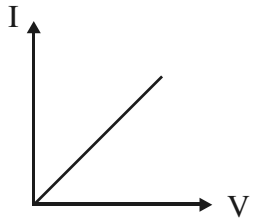
or $2\times\frac{1}{4\pi\epsilon_0}\times\frac{6\times10^{-12}\times\sqrt{3}}{4\times10^{-2}\times2} = \frac{1}{4\pi\epsilon_0}\frac{2\times q\times10^{-6}}{3\times10^{-2}}$

$\therefore\ q = +2.25\sqrt{3}$ μc ½ 2

Q. No.	Expected Answers	Value Points

8.

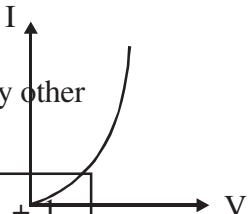
(i)	Graphs	½ + ½
(ii)	Examples	½ + ½



½

Example of ohmic conductor : Metal at constant temperature ½

or Any other correct graph of non-ohmic ½



Example : pn junction or thryristor or any other ½ 2

9.

Two Definitions		1 + 1

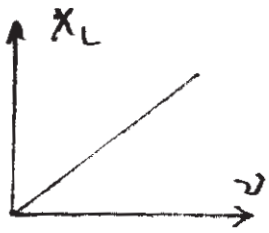
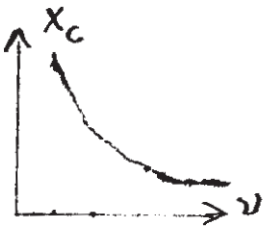
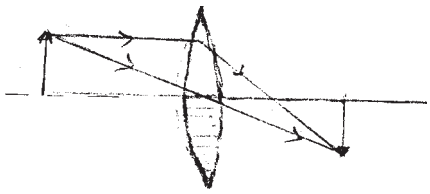
(i) <u>Magnetic Dip</u> : The angle which a compass needle free to turn about a horizontal axis makes with the horizontal axis in magnetic meridian. 1

(ii) <u>Magnetic declination</u> : The angle between the geographic and magnetic meridian planes is called magnetic declination 1 2

OR

Give 2 marks for defn. if there is no diagram. Also give 2 marks for correct diagram, if defn. is not written.

If drawn correct diagram award full marks.

Q. No.	Expected Answers	Value Points	
10.	Directions 4×½=2		
	(a) Through AB : From B to A (clockwise)	½	
	Through CD : From C to D (clockwise)	½	
	(b) Through AB : From A to B (anti-clock wise)	½	
	Through CD : From D to C (anti-clockwise)	½	2
	Award marks if No reason is given		
11.	(i) Graphs ½		
	(ii) Yes ½		
	(i) (a) 	1	
	(b) 	½	
	(ii) Yes,	½	2
12.	(i) Ray diagram 1½		
	(ii) Difference ½		
		1½	
	Reason : The image size will be same but it would be less bright/the intensity of image will be less.	½	2

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Q. No.	Expected Answers	Value Points	
1.	Zero	1	1
2.	+Z axis or Z axis For —z axis give ½ mark	1	1
3.	$\frac{\pi}{3}$ radian or 60° If writes cos (award ½ mark only)	1	1
4.	(i) No (ii) Yes	½ ½	1
5.	$\therefore\ \lambda = \frac{\lambda}{2}$ or $\frac{\lambda}{4} = 0.50\text{ m} / 0.25\text{ m} / 1\text{ m}$ $\lambda = \frac{C}{\nu} = 1\text{ m}$	½ ½	1
6.	(i) Definition 1 (ii) Two characterstics/porperties ½ + ½ An electric line of force is a curve drawn in such a way that the tangent at each point is in the direction of the net electric field at that point. or It is a straight/curved path followed by a test charge left free in space. Characterstics/Properties : Continuous curves without any breaks/start from positive charge and terminate at negative charge/two lines can never cross each other/they do not form closed loops/tangent to any point gives the direction of net electric field at that point. Any two	1 ½ + ½	2
7.	(i) Reason 1 (ii) Formula ½ Result ½		

Q. No.	Expected Answers	Value Points

(a) External field induces charges on the surface of the dielectric which produces a field that opposes the external electric field.

or

Due to the polarisation of the dielectric. 1

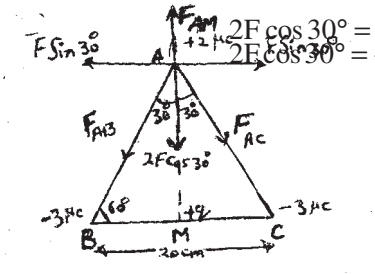
(b) $C = \frac{KA\epsilon_O}{d}$ (Even if formula is written given 1 mark as for writing $\frac{KA}{d}$ give ½ mark ½

$C = \frac{6A\epsilon_O}{d/2} = 12\frac{A\epsilon_O}{d} = 12$ times (Only result ½ Mark) ½ 2

or 96 farad

OR

(i)	Diagram	1
(ii)	Reason	½
(iii)	Correct Substitution	½



$2F\cos 30° = F_{AM}$

$2F\cos 30° = \frac{1}{4\pi\epsilon_0}\frac{2\times10^{-6}\times q}{3\times10^{-2}}$ 1

At equilibrium the intensity of the net electric field at A is zero ½

$|\vec{F}_{AB}| = |\vec{F}_{AC}| = F = \frac{1}{4\pi\epsilon_0}\times\frac{2\times3\times10^{-12}}{4\times10^{-2}}$

Resultant of $\vec{F}_{AB}$ and $\vec{F}_{AC} = 2F\cos 30°$

$\therefore$ For the charge at 'A' to be in equilibrium,

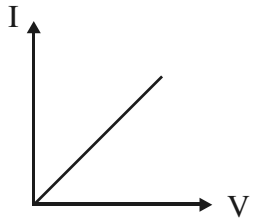
or $2\times\frac{1}{4\pi\epsilon_0}\times\frac{6\times10^{-12}\times\sqrt{3}}{4\times10^{-2}\times2} = \frac{1}{4\pi\epsilon_0}\frac{2\times q\times10^{-6}}{3\times10^{-2}}$

$\therefore\ q = +2.25\sqrt{3}$ μc ½ 2

Q. No.	Expected Answers	Value Points

8.

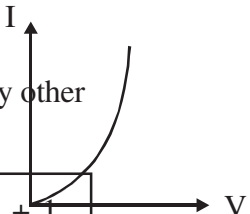
(i)	Graphs	½ + ½
(ii)	Examples	½ + ½



½

Example of ohmic conductor : Metal at constant temperature ½

or Any other correct graph of non-ohmic ½



Example : pn junction or thryristor or any other ½ 2

9.

Two Definitions		1 + 1

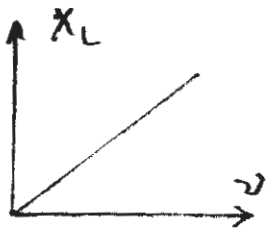
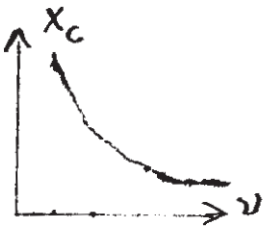
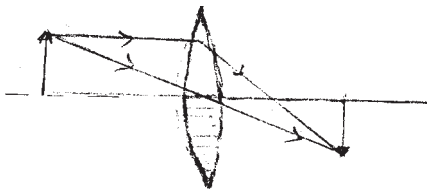
(i) <u>Magnetic Dip</u> : The angle which a compass needle free to turn about a horizontal axis makes with the horizontal axis in magnetic meridian. 1

(ii) <u>Magnetic declination</u> : The angle between the geographic and magnetic meridian planes is called magnetic declination 1 2

OR

Give 2 marks for defn. if there is no diagram. Also give 2 marks for correct diagram, if defn. is not written.

If drawn correct diagram award full marks.

Q. No.	Expected Answers	Value Points	
10.	Directions 4×½=2		
	(a) Through AB : From B to A (clockwise)	½	
	Through CD : From C to D (clockwise)	½	
	(b) Through AB : From A to B (anti-clock wise)	½	
	Through CD : From D to C (anti-clockwise)	½	2
	Award marks if No reason is given		
11.	(i) Graphs ½		
	(ii) Yes ½		
	(i) (a) 	1	
	(b) 	½	
	(ii) Yes,	½	2
12.	(i) Ray diagram 1½		
	(ii) Difference ½		
		1½	
	Reason : The image size will be same but it would be less bright/the intensity of image will be less.	½	2