PHYSICS 2017

Time : 3 Hours] Class : 12th [M. M. : 75

Instructions:

(i) All questions are compulsory, Internal options are given in each question nos. 5 to 20.

(ii) Each question from question no. 1 to 4 carry 5 marks and each subquestion carries 1 marks.

(iii) Each question from question no. 5 to 8 carry 2 marks and word limit for each answer is approx. 30 words.

(iv) Each question from question 9 to 12 carry 3 marks and word limit for each answer is approx 75 words.

(v) Each question from question 13 to 17 carry 4 marks and word limit for each answer is approx. 120 words.

(vi) Fach question from question 18 to 20 carry 5 marks and word limit for each answer is 150 words.

(vii) Draw neat and labelled diagram wherever necessary.

Q. 1. Select and write the correct option from the options given in each question: $5 \times 1 = 5$

(a) Optical Detector is:

(i) Diode Laser (ii) Laser

(iii) LED (iv) Photo Diode
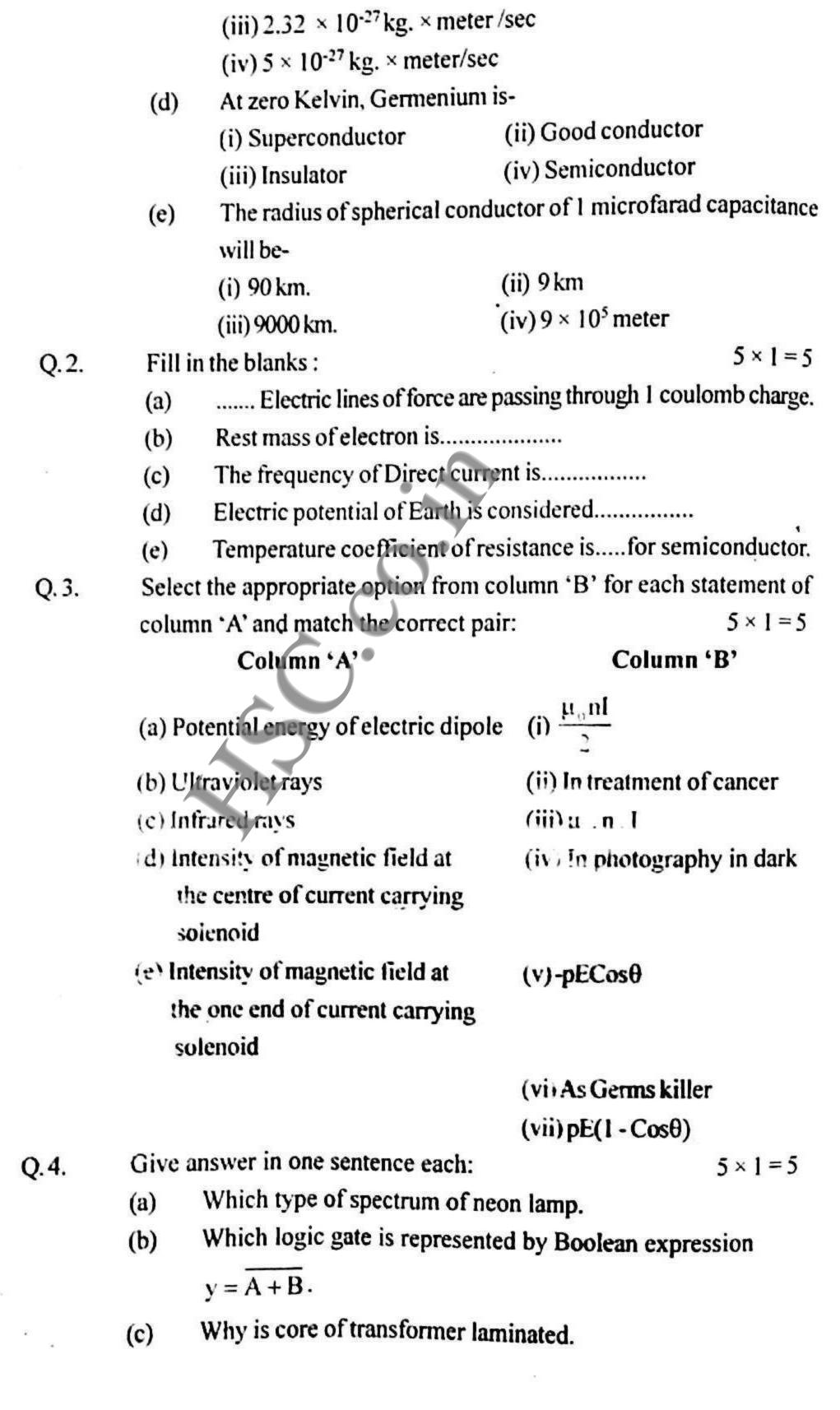
(b) The value of current gain β is -

(i) $\dfrac{\Delta I_b}{\Delta I_c}$ (ii) $\dfrac{I_b}{I_c}$

(iii) $\dfrac{\Delta I_c}{\Delta I_b}$ (iv) $\dfrac{I_c}{I_b}$

(c) The wavelength of a photon is 5000 $\overset{\circ}{A}$. Its momentum will be-

(i) 1.32×10^{-27} kg. $\times$ meter/sec

(ii) 1.5×10^{-27} kg. $\times$ meter/sec

(iii) 2.32×10^{-27} kg. $\times$ meter /sec

(iv) 5×10^{-27} kg. $\times$ meter/sec

(d) At zero Kelvin, Germenium is-

(i) Superconductor   (ii) Good conductor

(iii) Insulator   (iv) Semiconductor

(e) The radius of spherical conductor of 1 microfarad capacitance will be-

(i) 90 km.   (ii) 9 km

(iii) 9000 km.   (iv) 9×10^5 meter

Q. 2.   Fill in the blanks : $5 \times 1 = 5$

(a) .... Electric lines of force are passing through 1 coulomb charge.

(b) Rest mass of electron is....................

(c) The frequency of Direct current is.................

(d) Electric potential of Earth is considered................

(e) Temperature coefficient of resistance is.....for semiconductor.

Q. 3.   Select the appropriate option from column 'B' for each statement of column 'A' and match the correct pair: $5 \times 1 = 5$

Column 'A'	Column 'B'
(a) Potential energy of electric dipole	(i) $\dfrac{\mu_0 nI}{2}$
(b) Ultraviolet rays	(ii) In treatment of cancer
(c) Infrared rays	(iii) $\mu . n . I$
(d) Intensity of magnetic field at the centre of current carrying solenoid	(iv) In photography in dark
(e) Intensity of magnetic field at the one end of current carrying solenoid	(v) $-pE\cos\theta$
	(vi) As Germs killer
	(vii) $pE(1 - \cos\theta)$

Q. 4.   Give answer in one sentence each: $5 \times 1 = 5$

(a) Which type of spectrum of neon lamp.

(b) Which logic gate is represented by Boolean expression $y = \overline{A + B}$.

(c) Why is core of transformer laminated.

(d) Which microscope is also called reading lens.

(e) How does the resolving power of microscope depends on the wavelength of light used.

Q. 5. Write two conditions for two optical sources to become coherent source.

2

(OR) Define remote sensing.

Q. 6. What is parallex?

2

(OR) Define conjugate focci.

Q. 7. Write the two laws of photo electric effect.

2

(OR) What is cut off potential.

Q. 8. Why modulation is necessary? Explain.

2

(OR) Give two characteristics of laser rays.

Q. 9. Establish the relation between electric current and drift velocity. 3

(OR) If length of a conducting wire becomes twice, when stretched. Then how many times, resistance will increase. calculate?

Q. 10. What is thermistor, write with uses.

3

(OR) What is superconductor, write with uses.

Q. 11. Establish the relation between critical angle and refractive index of medium.

3

(OR) Write the reason for twinkling of stars.

Q. 12. Deduce the formula for refractive index of material of prism. 3

(OR) Give the reason, any lens is dipped inside the liquid, then its focal length increases; why?

Q. 13. With the help of Biot-Severts' law, obtain an expression for intensity of magnetic field near a straight, long current carrying conductor.

(OR) Derive the expression of resultant intensity of magnetic field at a point, which is equidistant from poles of a small bar magnet.

Q. 14. Prove that : $I_{rms} = \dfrac{I_o}{\sqrt{2}}$ where I_{rms} & I_o have usual meaning.

(OR) What are eddy currents, explain with experimental demonstration.

Q. 15. What are electromagnetic waves. Write their characteristics (any six)

4

(OR) Define -

(a) Plane of vibration (b) Plane of polarization

Q. 16. Deduce the expression for magnifying power of terrestrial telescope, when final image is formed at least distance of distinct vision. 4

(OR) Derive the expression for magnifying power of simple microscope when image is formed at least distance of distinct vision.

Q. 17. What is optical fibre. What are main parts of it. Explain. 4

(OR) What is communication system. What are main parts of it, explain with block diagram.

Q. 18. Explain OR gate and AND gate on the basis of following points: 4
(i) Symbol (ii) Truth Table (iii) Boolean expression

(OR) Explain flow of current in P-N junction diode as forward biasing.

Q. 19. Explain RC alternating circuit on the basis of following points. 4
(i) Resultant potential difference
(ii) Impedanc of circuit
(iii) Phase difference between resultant voltage and current.

(OR) How many types of energy loss in transformer, explain.

Q. 20. Deduce the electric potential at any point due to point charge. 5

(OR) State and prove Gauss's theorem.

CHEMISTRY 2017