SAMPLE QUESTION PAPER 2
Class – XII
PHYSICS

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

General Instructions:

   a) All questions are compulsory.

   *b) Questions **1 to 5** are **one marks** questions.*

   *c) Questions **6 to 10** are **two marks** questions.*

   *d) Questions**11 to 22** are **three marks** questions.*

   *e) Question **23** is **four marks** question.*

   *f) Question **24 to 26** are **five marks** questions.*

   g) There is no overall choice in the question paper, but internal choice here.

   h) Use of calculator is not permitted.

Section A
Question number 1 to 5 carry 1 mark each

1. What is the cause of charging? (1)

2. A wire is carrying a current. Is it charged? (1)

3. Why is a neutron most effective as a bull et in nuclear reactions? (1)

4. Define for bidden gap.(1)

5. Name two elementary particles which have almost infinite lifetime. (1)

Section B
Question number 6 to 10 carry 2 mark each

6. Whatdoyoumeanbyanidealdipoleandwhatisthenatureofelectricfieldsymmetryofthe dipole?   (2)

7. What is the magnetic moment of an electron or biting in a circular orbit of radius with a speed v?   (2)

8. Velocity of light in a liquid is1.5×10^8m/sandinairitis3×10^8m/s .Ifaray of light passes from liquid into the air, calculate the value of critical angle. (2)

9. Name a device that converts the change in intensity of illumination in to changes in electric current. Give three applications of this device. (2)

10. Define Hertz antenna and Marconi antenna. (2)

11. What do you mean by a capacitor? Derive an expression for the capacitance of a parallel plate capacitor. (3)

12. What do you mean by super conductors? Give three applications of super conductors. (3)

13. State and explain Biot Savart's law. Give its features also. (3)

14. Explain the Rayleigh's law of scattering. Why the colour of sky appears to be blue? (3)

15.   (a)What is the principle of electron microscope?   (3)

(b)A photon and electron have got same de Broglie wave length(10-10m),which has greater kinetic energy? Explain

16. Give reasons for the following: (3)

(a) Lighter elements are better moderators for a nuclear reactor than heavier elements.

(b)In a natural uranium reactor, heavy water is preferred moderator to ordinary water.

(c)Cadmium rods are provided in a reactor.

17. What do you mean by doping? Give three methods of doping.(3)

18. In a silicon transistor, a change of 7.89mA in the emitter current produces a voltage of 7.8mA in the collector current. What voltage in the base current is necessary to produce the equivalent change in the collector current? (3)

19. Define the root mean square value of alternating current and derive its expression.(3)

20 .Discuss the energy loses of a transformer. (3)

21. How Xrays are produced ?Give four uses of Xrays. (3)

22. A (sinusoidal) carrier wave   (3)

C(t) = AC sin ωc t is amplitude modulated by a (sinusoidal) message signal m(t) = Am sin ωm t

Write the equation of the (amplitude) modulated signal.

Use this equation to obtain the values of the frequencies of all the sinusoidal waves present in the modulated signal.

Section D

Question number 23 carry 4 mark each

23. In the birthday party of Vishal, he gave bigs linki esasa return gifts to all of his friends. In the next day,in the class of Physics, the teacher explained the concept of production of magnetic fields using current carrying coils and also said that they can make permanent magnets, using such coils by passing high currents through them .Ram, the friend of Vishal asked his father about the coils, and their shape .His father asked him to bring thes linky that his friend gave and explained the uses of to roid and sole noid. (4)

(i)What values did Ram's father exhibit towards his son?

(ii)What is the difference in the fields produced by the sole noid and to roid?

Section E
Question number 24to 26 carry 5 mark each

24. (a) Derive the expression for the torque on an electric dipole placed in a uniform electric field.

(b)A pendulum bob of mass80 mg carrying a chargeof2×10^{-8}Cisatrest in a horizontal uniform electricfieldof2×10^4V/m.Find the tension in the thread of the pendulum and the angle it makes with the vertical. (5)

25. (a) Write the laws of electromagnetic induction. (5)

(b) Anexpresstraintakes16hourstocoverthedistanceof960km.Therailsareseparatedby 130 cm and the vertical component of the earth's magnetic field is 4×10^{-5}T.(i)Find the induced emfa cross the width of the train.(ii)If the leak age resistance between the rail sis100ohm, find the retarding force on the train due to the magnetic field.

26. (a) A paper is divided into squares each of size1mm2is being viewed at a distance of 9cmthrough A magnifying glass of focal length 10cm held close to the eye. (5)

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

(ii) What is the angular magnification of the lens?

(iii) Is the magnification in(i)equal to the magnifying power in (ii)Explain.

(b)(i)At what distance should the lens be held in the question above, in order to view the squares distinctly with the maximum possible magnifying power?

(ii)What is the magnification in this case?

(iii) Is the magnification equal to magnifying power in this case? Explain.