Physics (Second Year)

PAPER – II (MAY – 2011)

Time: 3 Hours Max.Marks : 60

SECTION – A

Note: i) Answer **all** the questions. 10×2=20

ii) Every correct answer carries 2 marks.

iii) All are Very short answer type questions.

1. What are the Fraunhofer lines? State any two of their significances.
2. Mention any two applications of diffraction.
3. Two magnetic poles of strength 40 Am and 10 Am are separated by a distance of 20 cm in air. Find the force between them.
4. The potential of earth is taken as zero. Explain.
5. On what factors does the resistance of a conductor depend?
6. What is a thermo-couple? Write one of its uses.
7. How do you convert a moving coil galvanometer into a voltmeter?
8. What type of transformer is used in a bed lamp?
9. Define modulation. Why is it necessary?
10. Draw the circuit symbols for p – n – p and n – p – n transistors.

SECTION – B

Note: i) Answer any **six** questions. 6×4=24

ii) Every correct answer carries 4 marks.

iii) All are Short answer type questions.

11. Explain the construction and working of a Ramsden's eyepiece with a neat diagram.
12. State and explain the 'Tangent law' in magnetism.
13. Define intensity of electric field E and potential difference V. Derive the relationship between them.
14. Derive the balancing condition of a Wheatstone bridge.
15. Write short notes on the working of a thermopile.

16. Define the terms, work function and threshold frequency.

17. Write a short note on the discovery of a neutron.

18. What are n – type and p – type semiconductors? How is a semiconductor junction formed ?

SECTION – C

Note : i) Answer any **two** of the following questions. $2 \times 8 = 16$

ii) Every correct answer carries 8 marks.

iii) All are Long answer type questions.

19. State the laws of transverse vibrations in stretched strings. Describe and explain the experimental verification of the laws using a sonometer.

A wire length of 1 m and mass 20 g is stretched with a force of 800 N. Find its fundamental frequency.

20. Describe a tangent galvanometer with its necessary theory. Compare it with a moving coil galvanometer.

21. Explain the principle and working of a nuclear reactor with the help of a labeled diagram.

How much ^{235}U is consumed in a day in an atomic power house operating at 400 MW, provided that whole of the mass of the ^{235}U is converted into energy?