(i) Printed Pages : 3 Roll No. .....

(ii) Questions : 7 Sub. Code : 0 4 4 9

Exam. Code : 0 0 0 5

B.A./B.Sc. (General) 5th Semester

(2123)

PHYSICS

Paper–B : Electronics & Solid State Devices–I

Time Allowed : Three Hours] [Maximum Marks : 44

Note :— (1) Attempt *five* questions in all, including Question No. 7 (Unit–III) which is compulsory and selecting *two* questions each from Unit I–II.

(2) Use of non-programmable calculator is allowed.

UNIT—I

1. Discuss the various parts of cathode ray tube along with diagram in detail and explain the importance of aquadag coating. 9

2. (i) State and explain Thevenin's theorem with example. 6

(ii) The reverse saturation current at room temperature (27 °C) of germanium diode is 3μ A. Find the magnitude of the voltage to be applied across the junction to get a forward current of 30 mA. 3

3. (i) Derive an expression for position of fermi level in an intrinsic semiconductor and how does its position change when acceptor atoms are being added to it ? 6

(ii) Explain principle, construction and working of a LED. Write its applications and uses. 3

UNIT—II

4. (i) Draw a circuit diagram for full wave rectifier with C-filter and explain its working. Discuss its ripple factor. 6

(ii) Explain the working of bridge rectifier. 3

5. (i) Define stability and stability factor. Explain the factors responsible for the shift of operating point of the transistor and define transistor biasing. 6

(ii) A transistor with common base having $\alpha = 0.98$ gives reverse saturation current $I_{CBO} = 10\mu A$ when used in CE mode. It gives the base current of 0.1 mA. Calculate total collector current in CE mode. 3

6. What are the three transistor configurations ? Explain the input and output characteristics of common base transistor circuit. 9

UNIT—III

7. Attempt any ***eight*** :—

(i) What is time base circuit ? 1

(ii) What is a voltage multiplier circuit ? 1

(iii) What is the h-parameters in the circuit ? 1

(iv) Why does half-wave rectifier have lower efficiency than full-wave rectifier ? 1

(v) Define thermal run-away. 1

(vi) Explain the need of doping in the transistor. 1

(vii) Explain a good rectifier should have a low ripple factor. 1

(viii) Define reverse saturation current. 1

(ix) Define peak inverse voltage (PIV). 1

(x) Transistor is a current controlled device. Explain. 1