Reg No:..... K24FY1484(C)
Name :.....

First Semester FYUGP Physics Examination
November 2024 (2024 Admission onwards)
KU1DSCPHY115 (SEMICONDUCTOR PHYSICS AND ELECTRONICS)

(EXAM DATE : 06-12-2024)

Time : 90 min Maximum Marks : 50

Part A (Answer any 6 questions. Each carries 2 marks)

1. How does the total energy of an electron vary with radius of atomic orbit? 2

2. How does the resistance of a semiconductor vary with temperature 2

3. State Bohr's quantisation conditions 2

4. How are the n-type and p- type semiconductors formed? 2

5. How are the co-valent bonds formed? 2

6. Explain the concept of forward biasing in a pn junction. How does it affect the potential barrier? 2

7. List the advantages and disadvantages of a bridge rectifier 2

8. Why is the collector wider than the emitter and base in a transistor? 2

Part B (Answer any 4 questions. Each carries 6 marks)

9. A lead acid battery fitted in a truck develops 24 V and has internal resistance of 0.01 ohm. It is used to supply current to head lights. If the total load is equal to 100 watts, find (i) voltage drop in internal resistance, (ii) terminal voltage 6

10. With relevant figures explain the classification of solids based on energy bands 6

11. With the help of a diagram, explain how the Ge atoms are bonded together in a crystal, Given the atomic number of Ge is 32. 6

12. Explain the significance of the breakdown voltage in a pn junction. How does exceeding this voltage affect the diode's operation? 6

13. A bridge rectifier uses a transformer of turn ratio 4:1 with 230V, 50Hz input a.c signal.Assuming that the diodes are ideal find the d.c out put voltage, peak inverse voltage and out put frequency if the load resistance is equal to 200Ω 6

14. Plot the input characteristics of common base connection and explain the features, how do you calculate the input resistance? 6

Part C (Answer any 1 question(s). Each carries 14 marks)

15. Explain the working of half wave and full wave rectifiers. Find the ripple factor for half wave and full wave rectification. 14

16. With the help of relevant diagrams explain CE, CB and CC connections. 14