K25FY4588 Pages: 2 Reg No:.....
Name:.....

First Semester FYUGP Degree (Reg/Sup) Examination November 2025

KU1DSCPHY115 - SEMICONDUCTOR PHYSICS AND ELECTRONICS

2024 Admission onwards

Time : 1.5 hours Maximum Marks : 50

Section A

Answer any 6 questions. Each carry 2 marks.

1. Define a.c forward resistance and reverse resistance of a semiconductor diode
2. Write the expression for efficiency of a half wave rectifier.What is its maximum value?
3. Why is the transistor a low powered device?
4. Why is the base made thin in a transistor?
5. Define a constant voltage source
6. List the features of Bohr atom model
7. Distinguish between intrinsic and extrinsic semiconductors
8. Define maximum power rating of a pn junction

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Section B

Answer any 4 questions. Each carry 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
10. A dry battery developing 12 V has an internal resistance of 10 ohm. Find the output current if load is (i) 100 ohm (ii) 10 ohm (iii) 2 ohm and (iv) 1 ohm
11. With relevant figures explain the classification of solids based on energy bands
12. With relevant examples describe how n type and p type conductivities are obtained in a semiconductor?
13. Explain the significance of the breakdown voltage in a pn junction. How does exceeding this voltage affect the diode's operation?

14. Describe the process of forward and reverse biasing of a pn junction. How do these conditions affect the current flow and the potential barrier?

Section C

Answer any 1 questions. Each carry 14 marks.

15. Make a comparison of halfwave rectifier, full wave centre-tap rectifier and full wave bridge rectifier by including circuit diagram, output waveform, efficiency, ripple factor, output frequency and PIV.

16. Explain the working of npn and pnp transistors

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