

Code No: R1621023

R16**SET - 1****II B. Tech I Semester Supplementary Examinations, May - 2018****BASIC ELECTRONICS AND DEVICES**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B**

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**PART -A**

1. a) Draw the energy band diagram of an insulator, conductor and semiconductors (3M)
- b) Draw the symbol of a varactor diode and mention its applications. (2M)
- c) Compare the performance of all rectifiers. (3M)
- d) Draw the hybrid model of a transistor. (2M)
- e) Mention the relation between the parameters of FET. (2M)
- f) What is Barkhausen criteria? (2M)

**PART -B**

2. a) Derive an expression for conductivity in a intrinsic semiconductor in terms of electron & hole concentration (7M)
- b) Find the concentration of holes & electrons in the P-type silicon at 300<sup>0</sup>K assuming its resistivity as 0.02Ω-cm,  $\mu_p=475\text{cm}^2/\text{vs}$ ,  $\eta_i=1.45\times 10^{10}/\text{cm}^3$ . (7M)
3. a) Explain the tunneling mechanism with the suitable energy band diagrams in tunnel diode (10M)
- b) Explain V-I characteristics of Zener diode. (M)
4. a) Write a neat diagram and explain working principle of full wave bridge rectifier (7M)
- b) List the types of filters used in rectification & compare various filter circuits in terms of ripple factors. (7M)
5. a) What is the need for biasing? Explain the types of biasing techniques with neat circuit diagrams? (7M)
- b) What is the condition for avoiding thermal runaway problem? (7M)
6. a) Explain working of two transistor model of an SCR and Draw the SCR Characteristics (10M)
- b) Differentiate between JFET and MOSFET (4M)
7. a) Draw the block diagram of a -ve feed back system and explain. (4M)
- b) Mention the advantages of a negative feedback system and derive them. (10M)