

Code No: RT21023

**R13****SET - 1****II B. Tech I Semester Supplementary Examinations, May/June - 2017****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 **THREE** Questions from **Part-B**

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**PART -A**

1. a) Compare different performance parameters of a HWR, FWR and Bridge rectifier (3M)
- b) Compare conductors, Insulators and semiconductors with help of energy band diagrams (3M)
- c) Explain the need of biasing a BJT. (4M)
- d) Compare BJT and FET. (4M)
- e) Compare of avalanche breakdown and Zener breakdown (4M)
- f) Define the condition for oscillations? (4M)

**PART -B**

2. i) Derive the conductivity of a semiconductor (10M)  
ii) Derive mass action law (6M)
3. Explain the VI characteristics of a tunnel diode with the help of the energy band diagram (16M)
4. a) Explain the operation of a series and shunt BJT based regulator. (8M)  
b) Derive the expressions of ripple factor, conversion efficiency and PIV of a half wave rectifier. (8M)
5. a) Explain about BJT based voltage self bias. (8M)  
b) Derive h-parameter model of a BJT. (8M)
6. a) Explain about Transfer characteristics of JFET with the suitable figures (8M)  
b) Prove that  $\mu = g_m r_d$  in a Field effect Transistor. (8M)
7. a) Explain the operation of class A push pull power amplifier and derive its conversion efficiency (12M)  
b) Mention the advantages of negative feedback. (4M)