

Code No: RT21041

R13**SET - 1****II B. Tech I Semester Supplementary Examinations, May/June - 2016****ELECTRONIC DEVICES AND CIRCUITS**

(Com. to ECE, EIE, ECC)

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) Define the terms conductivity and mobility in a semiconductor. (4M)
- b) Explain Avalanche breakdown and Zener break down (4M)
- c) Compare the performance of L-section and π -section filters. (4M)
- d) What is meant by amplification? Define faithful amplification? (3M)
- e) What are the effects on the output signal if the operating point is not properly chosen? (3M)
- f) Draw the low frequency hybrid equivalent circuit for CE,CB amplifier. (4M)

PART -B

2. a) Prove that the conductivity of a semiconductor is given by $\sigma = q(p\mu_p + n\mu_n)$ (8M)
- b) The energy gap of Si is 1.1 eV. Its electron and hole mobility's at room temperature are 0.13 and 0.05 m^2/Vs respectively. Evaluate its conductivity. (8M)
3. a) A Si PN junction is formed from P-material doped with 10^{22} acceptors/ m^3 and n-material doped with 1.5×10^{21} donors/ m^3 . Find the thermal voltage and barrier voltage at $25^\circ C$ (8M)
- b) Draw the V-I Characteristic of Zener diode and explain its operation. (8M)
4. a) Derive an expression for ripple factor, rectification efficiency and TUF for the Bridge rectifier. (8M)
- b) Calculate the value of inductance to use in the inductor filter connected to a full wave Rectifier operating at 60Hz to provide a d.c output with 4% Ripple for a 100 Ω load (8M)
5. a) Define α , β and γ of a transistor and also derive the relation among these. (8M)
- b) Why does the CE configuration provide large current amplification while CB does not? (8M)
6. a) What is meant by stabilization? Define the different stability factors. (8M)
- b) Explain the criteria for fixing operating point. (8M)
7. a) Draw the circuit diagram of CE amplifier with emitter resistance and obtain its equivalent hybrid model and derive expressions for A_i, A_v, R_i , and R_o .use approximate analysis. (10M)
- b) Why Hybrid parameters are called so? Define them. (6M)

