

Code No: RT21041

R13**SET - 1****II B. Tech I Semester Supplementary Examinations, May/June - 2017**
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) Explain the difference between transition and diffusion capacitances of P-N diode. (3M)
- b) Explain the working of Schottky barrier diode with necessary sketches. (3M)
- c) Compare the performance of L and π - section filters. (2M)
- d) Define the relation among α , β and γ . (3M)
- e) What are the advantages of fixed bias circuit? (2M)
- f) What are the effects on the output signal if the operating point is not properly chosen? (2M)
- g) Define Pinchoff voltage and transconductance in FET. (2M)
- h) Draw and explain the small signal model of JFET. (3M)
- i) Compare BJT and FET amplifiers. (2M)

PART -B

2. a) Explain the semiconductors, insulators and metals classification using energy band diagrams. (10M)
- b) Find the concentration of holes and electrons in a p-type germanium at 300⁰K, if the conductivity is 100 Ω -cm. mobility of holes in germanium $\mu_p = 1800\text{cm}^2/\text{V-sec}$. (6M)
3. a) Explain the working of Tunnel diode and its V-I characteristics. And what is the sufficient condition for tunneling. (10M)
- b) What is the ratio of the current for a forward bias of 0.05V to the current for the same magnitude of reverse bias for a germanium diode? And what are the observations? (6M)
4. a) Explain the operation of full wave rectifier with induction filter with necessary diagrams. (8M)
- b) A diode whose internal resistance is 20 Ω is to supply power to a 100 Ω load from 110V (RMS) Source of supply. Calculate (i) Peak load current (ii) DC load current (iii) AC load current (iv) % regulation from no load to given load. (8M)
5. a) Explain in detail the working of JFET .Draw its drain and transfer characteristics (10M)
- b) Determine the value of the base current of a CB configuration whose current amplification factor is 0.92. Emitter current is 1mA. (6M)
6. a) Obtain S and S'' factors. (8M)
- b) Distinguish Thermal runaway and Thermal stability (8M)
7. a) Derive the CE h-parameters h_{re} and h_{ie} in terms of the CB h-parameters. (9M)
- b) Draw the hybrid parameter equivalent circuit for an NPN common emitter transistor and explain. (7M)