Code No: R1621041 **R16** SET - 1

II B. Tech I Semester Supplementary Examinations, May - 2019
ELECTRONIC DEVICES AND CIRCUITS
(Com to ECE, EIE and 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 **FOUR** Questions from **Part-B**

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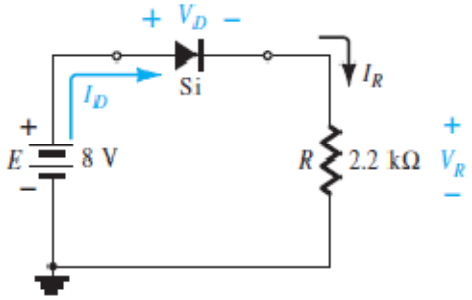
PART –A

1. a) What is meant by mobility? (2M)
   b) Write the law of junction. (2M)
   c) What is peak inverse voltage and write its significance in rectifier circuits. (3M)
   d) What are the advantages of FET when compared to BJT? (2M)
   e) Explain the influence of temperature on operating point. (3M)
   f) Sketch the circuit of source follower. (2M)

PART -B

2. a) Explain about Fermi level in intrinsic and extrinsic semiconductors. (7M)
   b) Find the concentration of holes and electrons in n-type silicon at 300 ^{0}K, if the conductivity is 300 S/cm. Also find these values for p-type silicon. Given that for silicon at 300 ^{0}K, n_i = 1.5 X 10^{10} /cm^3 , μ_n = 1300 cm^2/V-s and μ_p = 500 cm^2/V-s. (7M)

3. a) Explain how the zener diode is used for regulation purpose. (7M)
   b) For the circuit shown below, determine V_D, V_R and I_D. (7M)



4. a) Draw the circuit diagram of half-wave rectifier with inductor filter and explain it. (7M)
   b) Prove that the regulation of both half-wave rectifier and full-wave rectifier is given by (7M)

$$\% \text{ regulation} = \frac{R_f}{R_L} \times 100\%$$

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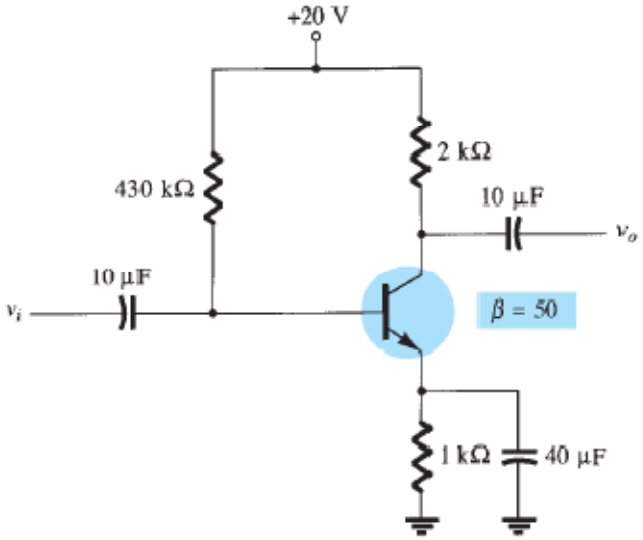
5. a) Explain about input and output characteristics of a transistor when it is connected in common base configuration. (7M)
   b) Write shockley's equation for JFET and hence sketch the transfer curve defined by I_{DSS} = 12 mA and V_P = -6 V. (7M)

6. a) Draw the fixed bias circuit and explain it. Write the draw backs of it. (7M)
   b) For the circuit shown below, determine I_B, I_C and V_{CE}. (7M)



7. Derive the general expressions for current gain, input impedance, voltage gain and output impedance of transistor amplifier using h-parameters. (14M)