Code No: RT21023 $\boxed{\text{R13}}$ $\boxed{\text{SET - 1}}$

II B. Tech I Semester Supplementary Examinations, May/June - 2016
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**

~~~~~~

PART –A

1. a) List out the differences between Intrinsic semiconductors and Extrinsic (4M)
       semiconductors
    b) Explain and draw different current components in p-n diode   (4M)
    c) Draw the Zener diode voltage regulator circuit and draw the regulation graph. (4M)
    d) What are the reasons for instability of the operating point of the transistor (3M)
    e) Compare FET with BJT.   (4M)
    f) Give the Barkhausen condition for oscillations?   (3M)

PART –B

2. a) State Hall effect? Derive expression for hall voltage.   (8M)
    b) Define conductivity, Mobility and Current density. Also derive   relevant (8M)
       mathematical expressions

3. a) The diode current is 0.6 mA when the applied voltage is 400 mV and 20 mA (8M)
       when the applied voltage is 500 mA. Determine η and assume   K T /q = 25 mV
    b) Draw the construction and explain the working characteristics of Photo diode (8M)

4. a) Draw the Half wave Rectifier with necessary graphs and derive expression for its (8M)
       efficiency, ripple factor, TUF.
    b) A voltage of 300 Cos wt is applied to Half Wave Rectifier with load resistance of (8M)
       2.5KΩ. Define and derive the values of Maximum DC Voltage component,
       R.M.S. current, Ripple Factor, Transformer Utilization Factor, PIV and Rectifier
       Efficiency of the rectifier.

5. a) Analyses the CE transistor amplifier using h-parameters   (8M)
    b) Draw the collector to base bias circuit and derive expression for stability (8M)

6. a) Compare MOSFET and JFET   (8M)
    b) Explain JFET as a Voltage Variable Resistor   (8M)

7. a) Derive the condition for oscillations in an oscillator circuits   (8M)
    b) Draw the circuit and derive expression for frequency of oscillations of RC Phase (8M)
       shift oscillator