

POKHARA UNIVERSITY

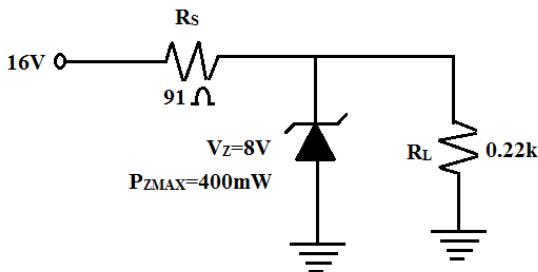
Level: Bachelor Semester – Spring Year : 2010
Programme: BE Full Marks: 100
Course: Electronic Devices Pass Marks: 45
Time : 3hrs.

Candidates are required to give their answers in their own words as far as practicable.

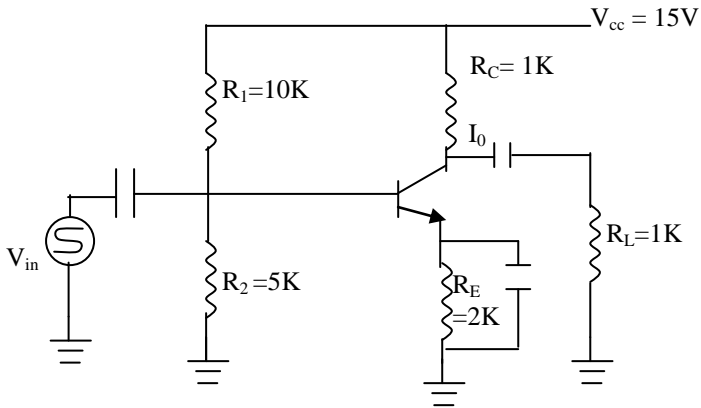
The figures in the margin indicate full marks.

Attempt all the questions.

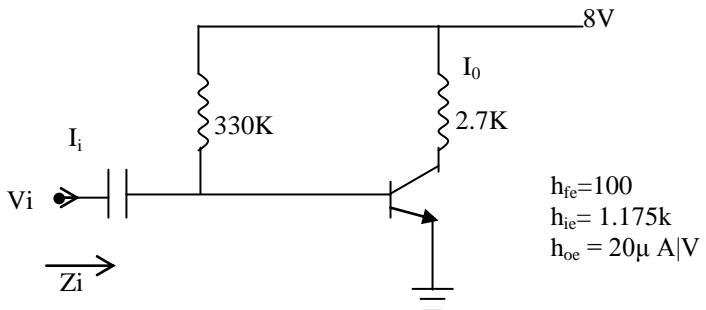
1. a) Define properties of non-linear elements. Draw a piecewise linear equivalent circuit of a diode. 7
- b) Draw V-I characteristics of zener diode. Determine the range of input voltage V_i that will maintain load voltage at 8V without exceeding the maximum power rating of the Zener diode. 8



2. a) Differentiate between intrinsic and extrinsic semiconductor. A silicon diode has a saturation current of 5 nanoampere at 25 degree centigrade. What is the saturation current at 100 degree centigrade. 3+4
- b) Explain the common base configuration of a bipolar junction transistor with its characteristic curves. Also, define transistor α and show the relationship between α and β . 8
3. a) For the transistor shown below, find the Operating Point. Assume missing data if any. 8

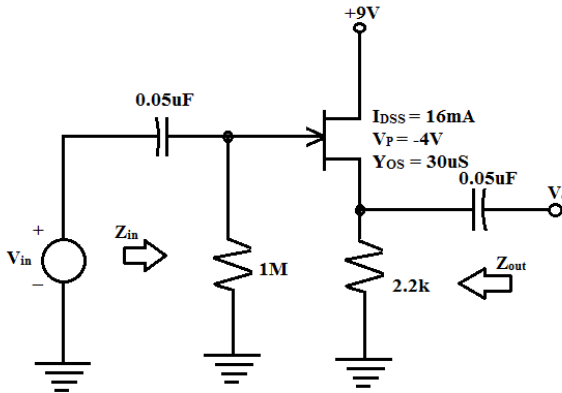


- b) Find A_i , A_v , Z_o , Z_{in} of the following circuit diagram using h-parameter. Assume missing data if any. 7

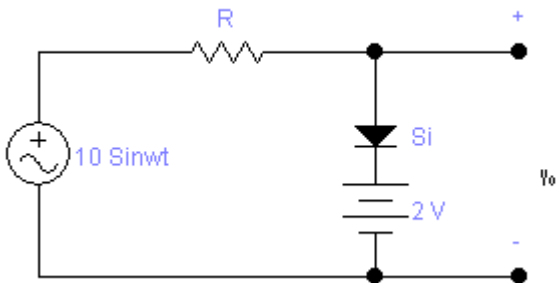


4. a) Identify the basic differences between JFET and BJT. Define pinch-off voltage and I_{DSS} current with a neat diagram. 7
- b) For the following source-follower configuration of JFET the DC biasing conditions are: 8

$V_{GSQ} = -2.86V$ and $I_{DQ} = 4.56mA$. Determine (i) g_m , (ii) r_{ds} , (iii) Z_{in} , (iv) Z_o with and without r_{ds} , and (v) A_v with and without r_{ds} .



5. a) Explain Depletion- type N-channel MOSFET with necessary diagrams. 5
- b) Derive the stability factor of a Base- bias with collector feedback biasing circuit. 5
- c) Describe the transistor as an amplifier with neat circuit diagram. 5
6. a) Define clipper and clamper circuits with suitable examples. Sketch bias series clipper circuit and show its output for the sinusoidal input signal (assume suitable values of input signal and circuit elements). 7
- b) Draw the output waveform for the circuit shown below. 8



7. Write short notes on **any two**:

2×5

- a) Stabilization
- b) T- model of BJT
- c) High frequency current gain