POKHARA UNIVERSITY

Level: Bachelor | Semester: Fall | Year : 2021
Programme: BE | Full Marks: 100
Course: Electronic Devices and Circuits | Pass Marks: 45
Time : 3hrs.

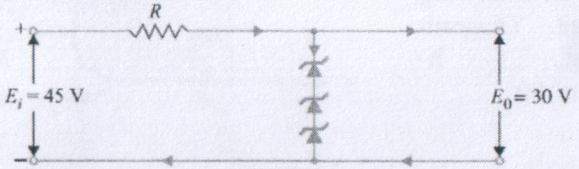
Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Attempt all the questions.

1. a) Describe in your own words the conditions established by forward- and reverse-bias conditions on a p–n junction diode and how the resulting current is affected. 8

   b) What value of series resistance (R) is required when three 10-W, 10V, 1000 mA Zener diodes are connected in series to obtain a 30V regulated output from a 45 volt d.c. power source ? 7



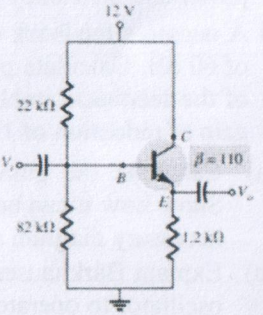
2. a) Explain the input and output characteristic curve for common emitter configuration with neat and labeled diagram. Explain the phenomenon of early effect. 8

   b) For the emitter follower network of figure below: 7

   i) Find I_B , I_C , and I_E .

   ii) Determine V_B , V_C , and V_E .

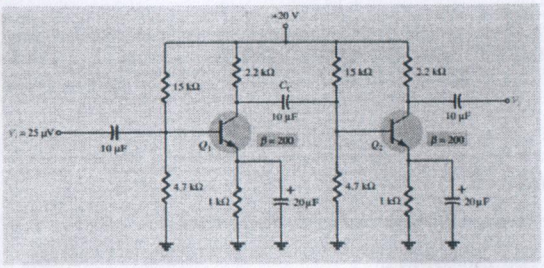
   iii) Calculate V_{BC} .



3. a) Explain the block diagram of regulated dc power supply with the waveform at each point. 7

   b) Explain the construction and working principle by MOSFET. Point out difference between DMOSFET and EMOSFET. 8

4. a) For the RC -coupled transistor amplifiers of figure given below: 7

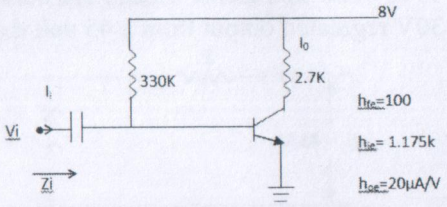


i) Calculate the no-load voltage gain and output voltage

ii) Calculate the overall gain and output voltage if a 4.7 k-Ohms load is applied to the second stage, and compare to the results of part (i).

iii) Calculate the input impedance of the first stage and the output impedance of the second stage.

b) Find A_{vs}, A_v ,Z_0, Z_{in} of following circuit. Diagram using h-parameter. 8



5. a) "Large signal amplifier is also called power amplifier" explain. For a class B amplifier providing a 10 V peak signal to the 20Ω load and a power supply of V_{cc}=20V. Find input and output power and efficiency of that amplifier. 8

b) A negative feedback of 0.2% is applied to an amplifier with gain of 60 dB. Calculate percentage change in the overall voltage gain of the feedback amplifier if the internal amplifier is subjected to gain of reduction of 15%. 7

6. a) Calculate the gain of inverting amplifier using an op-amp. Show how it can be used to build an adder circuit. Explain with necessary diagram and expression. 7

b) Explain Barkhausen criteria of oscillation. Design Wein-bridge oscillator to operate at a frequency of 25KHz. 8

7. Write short notes on: (**Any two**) 2×5

a) Super Beta

b) Crystal Oscillator

c) Properties of non linear device