Code No: 131AK

R16

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year I Semester Examinations, December - 2017
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to EEE, ECE, CSE, EIE, IT, ETM)
Time: 3 hours   Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each
question carries 10 marks and may have a, b, c as sub questions.

PART- A
(25 Marks)

1.a) Define unilateral and bilateral elements.   [2]
   b) Differentiate Independent and Dependent sources.   [3]
   c) What is parallel resonance?   [2]
   d) State maximum power transfer theorem.   [3]
   e) Define ideal and practical resistances.   [2]
   f) Define ripple factor.   [3]
   g) What is early effect?   [2]
   h) Compare CB and CC Configurations.   [3]
   i) Differentiate between BJT and JFET.   [2]
   j) Give applications of zener diode.   [3]

PART-B
(50 Marks)

2.a) Explain in detail the volt-ampere relationship of R, L and C elements with neat diagrams.
   b) Calculate the power absorbed by each component in the circuit shown in below Figure 1.
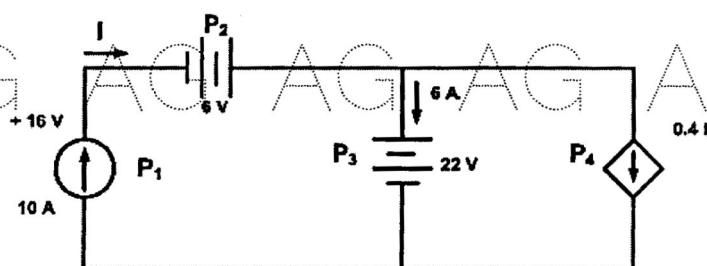   [5+5]

Figure: 1

OR

3.a) Explain in detail about the steady state analysis of a series RL circuit with sinusoidal excitation.
   b) Explain the concept of j-notation.   [7+3]

4.a) Show that the resonant frequency ω_0 of an RLC series circuit is the geometric mean of ω_1 and ω_2, the lower and upper half power frequencies respectively.

b) A voltage $V = 50\angle 0^0$ V is applied to a series circuit consisting of fixed inductive reactance $X_L = 5$ ohms and a variable resistance R. Sketch the current locus diagram.

[5+5]

OR

5.a) State and explain Thevenin's theorem.

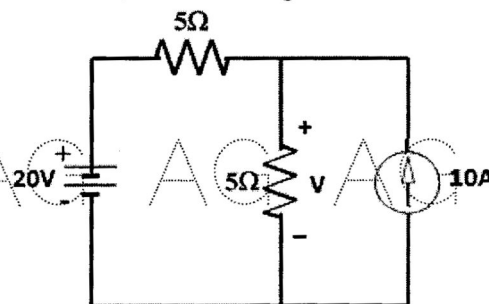b) Using Thevenin's theorem, find the voltage 'V' in the circuit shown in Figure 2. [4+6]

Figure: 2

6.a) Explain about a Fixed Bias Circuit, and derive the necessary DC currents and voltages.

b) Derive the expression for the stability "S" of a fixed bias Circuit.   [6+4]

OR

7.a) Explain the operation of a full wave bridge rectifier with relevant waveforms.

b) Explain the necessity of filter circuit after the rectifier circuit.   [6+4]

8.a) Explain the operation of a transistor with relevant diagrams.

b) Derive the relationship between α and β of a transistor.   [4+6]

OR

9.a) Explain compensation techniques with respect to BJT Biasing.

b) Draw the h-parameter model of a CB amplifier and derive the expressions for its voltage gain, current gain, input impedance and output impedance.   [4+6]

10.a) Draw and explain the typical transfer characteristics of an n-channel JFET.

b) What is pinch-off voltage? Explain.   [6+4]

OR

11.a) Explain the V-I characteristics of Tunnel diode.

b) Discuss the negative resistance property of tunnel diode.   [6+4]

---ooOoo---