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]

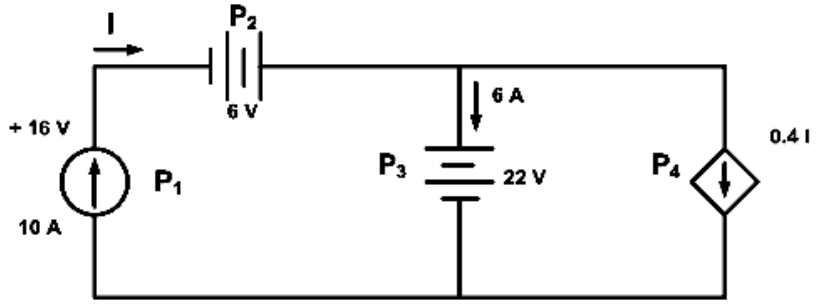

Figure: 1

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]

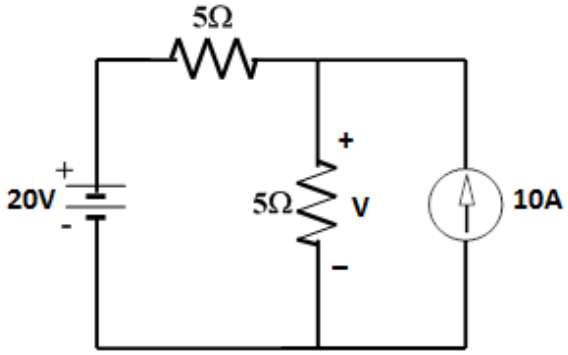

Figure: 2

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]

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