

R16

Code No: 131AK

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]

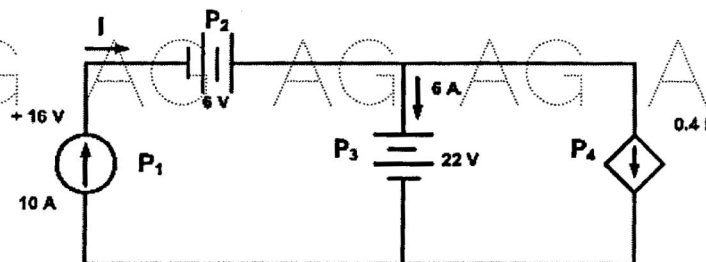


Figure: 1

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]

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- 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 $V = 50\angle 0^\circ$ 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]

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- 5.a) State and explain Thevenin's theorem. OR
- b) Using Thevenin's theorem, find the voltage 'V' in the circuit shown in Figure 2. [4+6]

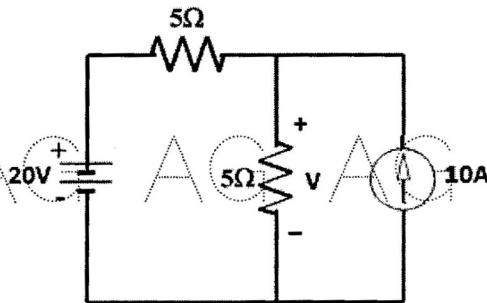


Figure: 2

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- 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]