Code No: 132AJ **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year II Semester Examinations, August - 2018
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CE, ME, MCT, MMT, AE, MIE, PTM, CEE, MSNT)

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) Write the VI relationship for R, L, C elements. [2]
b) Draw wave forms for voltage, current, power for a pure capacitance when excited by a sinusoidal voltage. [3]
c) State super position theorem. [2]
d) Define bandwidth and quality factor for RLC series resonant circuit and give expression. [3]
e) Write diode current equation and mention how it supports reverse bias condition. [2]
f) Draw the circuit of full wave bridge rectifier with load. [3]
g) Define h-parameters in CE configuration of BJT. [2]
h) Compare CE and CB characteristics of a transistor. [3]
i) Draw the symbols of SCR and varactor diode. [2]
j) What is pinch-off voltage for a JFET? [3]

PART-B

(50 Marks)

2.a) State and explain Kirchoff's laws.
b) Using node voltage method to find the current in the 10Ω resistance of the following circuit shown in figure1. [5+5]

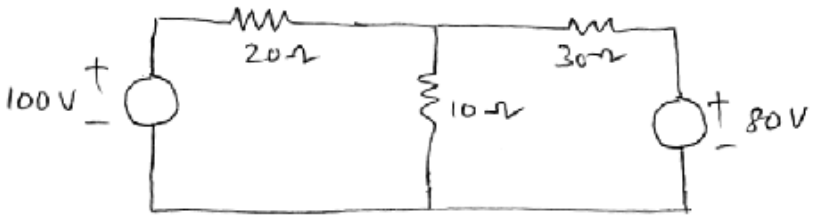

Figure: 1

OR

3.a) Derive the expressions for average value, RMS value crest factor and form factor for a sinusoidal wave form.
b) A resistance of 60Ω is connected in series with a pure inductor of 350 mH. The circuit is connected across a 50 Hz sinusoidal supply and the voltage across resistance is 150V. Calculate the supply voltage. [5+5]

4.a) Derive the expressions for resonant frequency, half power frequencies for a RLC series circuit.

b) An RLC circuit comprising of a 10Ω resistance is to have a bandwidth of 100 rad/s. Determine the value of capacitance to make the system to resonate at 400 rad/s. [7+3]

OR

5.a) Use Thevenins theorem to find the current in the load resistance R_L of the following circuit shown in figure 2.

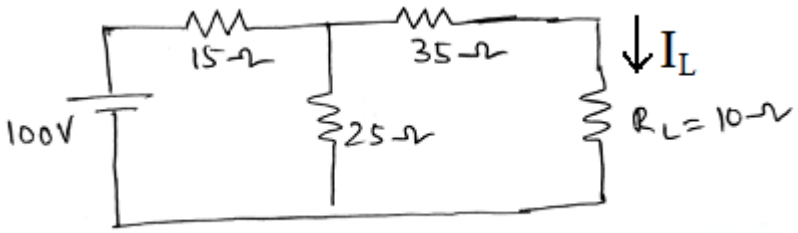

Figure: 2

b) Calculate the load current in the following circuit shown in figure 3 using Millman's Theorem. [5+5]

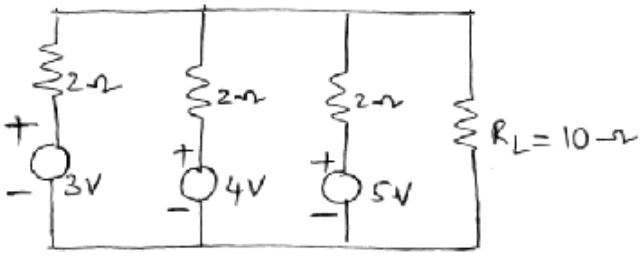

Figure: 3

6.a) Draw volt-Ampere characteristic of a PN junction diode and explain.

b) Define 'Ripple Factor' and derive an expression for ripple factor of a full wave rectifier. [5+5]

OR

7.a) Differentiate between static and dynamic resistances of a diode.

b) Explain how a centre tapped transformer type full wave rectifier works with suitable schematic and waveforms. [5+5]

8.a) Draw the h-parameter equivalent circuit of BJT in CC configuration. Derive expressions for A_v and Z_i.

b) Derive expression for stability factor(s) of voltage divider bias configuration. [5+5]

OR

9.a) Explain the Emitter feedback bias method with relevant diagram and mathematical expression.

b) Draw h-Parameter equivalent circuits of BJT in complete and simplified CB configuration. [5+5]

10.a) Explain how zener breakdown Occurs. Indicate breakdown region zener-diode characteristics.

b) Compare BJT and FET. [5+5]

OR

11. Explain the construction and principle of operation of

a) JFET b) Tunnel diode. [5+5]

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