

Code No:131AK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year I Semester Examinations, December - 2018

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) For the circuit shown in figure 1. Find the relation between v_1 and v_2 . [2]

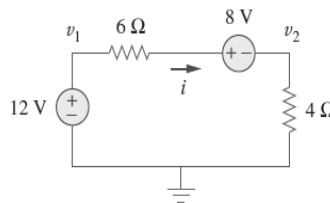


Figure: 1

- b) Explain Source transformation with the help of neat diagrams. [3]
- c) Write the statement of Super Position Theorem. [2]
- d) What is Q-Factor and explain its significance? [3]
- e) How does a diode appear as in its forward region of its characteristic? Explain. [2]
- f) How does junction capacitance of a linearly graded junction varies with the applied reverse voltage V_R ? [3]
- g) Differentiate between the terms h_{FE} and h_{fe} . Write the relationship between them. [2]
- h) Draw the h-parameters model of transistor. [3]
- i) Give different regions of operation of JFET. [2]
- j) What is pinch-off voltage? Give its equation. [3]

PART - B

(50 Marks)

2.a) Find V_o in the circuit, shown in figure 2.

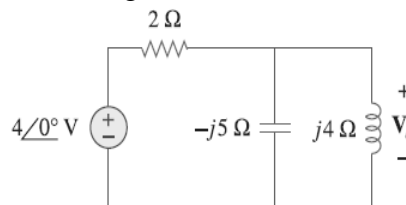


Figure: 2

- b) Define and give symbols of the following:
 - i) Dependent sources
 - ii) Independent Sources
 - iii) Practical Sources
 - iv) Ideal Sources

[6+4]

OR

3.a) If $R_{eq}=50 \text{ ohm}$, in the circuit shown in figure 3 find R?

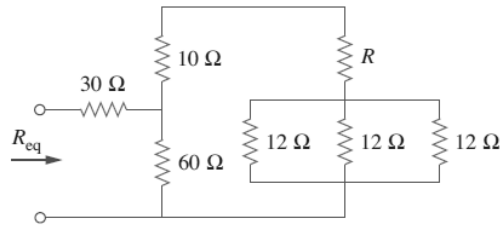
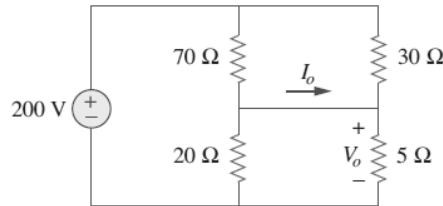


Figure: 3

b) Calculate V_o and I_o in the circuit shown in figure 4.



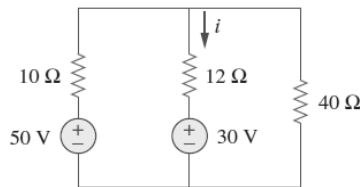
[5+5]

Figure: 4

4.a) A parallel Resonant circuit has $R=5\text{K}\Omega$, $L=8\text{mH}$, and $C=60\mu\text{F}$. Determine:

- i) Resonant frequency
- ii) The band width
- iii) The Quality Factor

b) Solve for ' i ' using Norton's Theorem in the circuit shown in figure 5.



[5+5]

Figure: 5

OR

5.a) Find v_o using super position theorem in the circuit shown in figure 6.

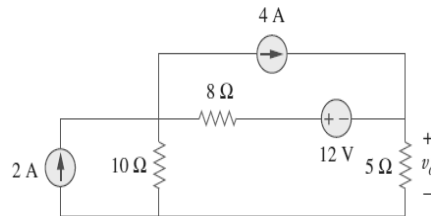
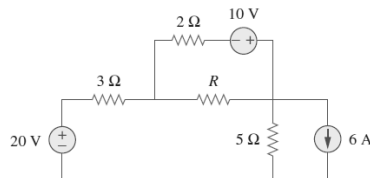


Figure: 6

b) Find the Maximum power that can be delivered to R in the circuit shown in figure 7.



[5+5]

Figure: 7

- 6.a) Compare C, L, L-Section, Π -Section (CLC and CRC) Filters in all respects.
b) Explain the operation of Half wave Rectifier with the help of neat diagrams. [6+4]
- OR**
- 7.a) Obtain different equivalent Circuits of a PN Junction diode.
b) Explain the VI characteristics of PN Junction diode with neat diagrams and explain. What is Static Resistance and Dynamic Resistance? [5+5]
8. Draw CE Configuration with Voltage – divider bias and then analyze Q - point and stability factors. [10]
- OR**
9. Illustrate the input and output characteristics of BJT in three configurations. [10]
- 10.a) Compare BJT and JFET devices in all respects.
b) Obtain the expression for the pinch off voltage V_p in case of n-channel JFET. [5+5]
- OR**
11. Describe the principle of operation and V-I characteristics with the help of energy band diagrams. Highlight negative resistance region on the V-I characteristics. [10]

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