JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year II Semester Examinations, August/September - 2017
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CE, ME, MCT, MMT, MIE, 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)	Define Independent and dependent sources.	[2]
b)	What is complex power? Explain.	[3]
c)	What is Q-factor? Explain.	[2]
d)	State and explain Norton's theorem.	[3]
e)	Define Forward and Reverse Resistances of a diode.	[2]
f)	What are the advantages of bridge rectifier?	[3]
g)	Substantiate the need of biasing a BJT.	[2]
h)	Explain how a BJT acts as an current amplifier.	[3]
i)	Compare BJT and JFET.	[2]
j)	Explain Zener Breakdown mechanism.	[3]

PART-B

(50 Marks)

2.a)   Write short notes on Star – Delta transformation.
    b)   Find the equivalent resistance across the terminals A-B as shown in Figure 1.   [5+5]
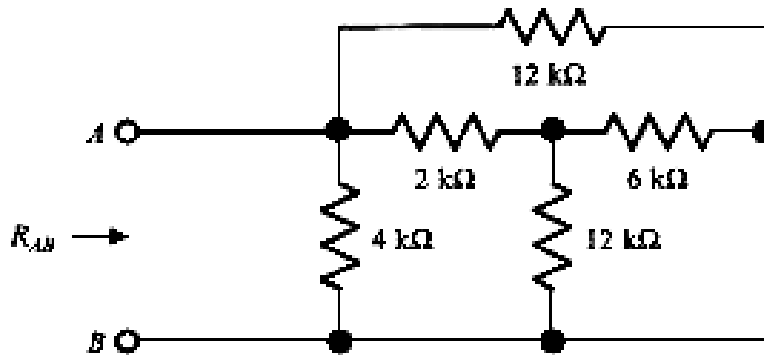

Figure: 1
OR

3.a)   Illustrate following terms:
       i) Impedance   ii) Reactance   iii) Phase deference   iv) Power factor.
    b)   Find the impedance of series R-L-C circuit with R=100Ω, X_L=50Ω and X_C=20Ω. [6+4]

4.a)   What is parallel resonance? Explain.
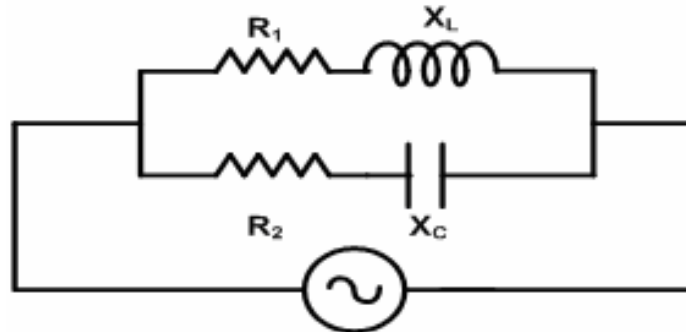 b)   Derive an expression for the resonant frequency for a parallel circuit shown in below Figure 2.   [4+6]

Figure: 2

OR

5.a)   State and Explain Tellegen's theorem.
  b)   Find the value of R_L that will absorb the maximum average power for the circuit shown in Figure 3. Calculate that power.   [4+6]
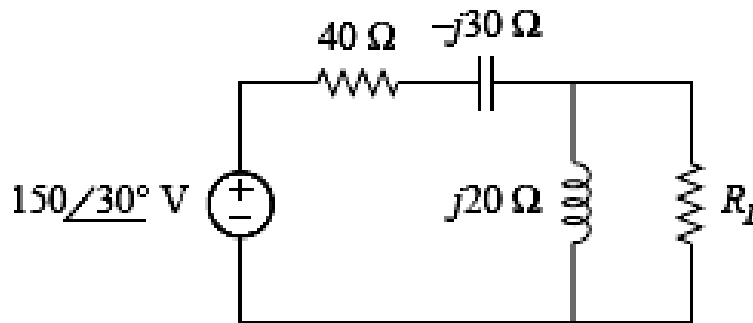

Figure: 3

6.a)   Draw load line on the V-I characteristics of a PN junction diode and highlight its significance in diode operation.
  b)   Differentiate between transition and diffusion capacitances of a diode.   [6+4]

OR

7.a)   Compare the characteristics of L section, capacitor and π-filters.
  b)   Derive an expression for the ripple factor of a full-wave rectifier using Induction filter.   [3+7]

8.a)   Explain about Fixed Bias Circuit. List its deficiencies.
  b)   Derive the expression for the stability "S" of a voltage divider bias Circuit.   [5+5]

OR

9.a)   Determine the h-parameters from the characteristics of BJT in CB configuration.
  b)   Compare the performance of a transistor in different configurations.   [6+4]

10.a)   Draw JFET small signal model. Establish a relation between μ, g_m and r_d.
  b)   Explain the significance of pinch-off voltage on JFET operation.   [5+5]

OR

11.a)   Explain the operation of Tunnel diodes with the help of its V-I characteristic curve.
  b)   Justify the statement 'A zener diode can be used as a voltage regulator'.   [6+4]

---ooOoo---