

Code No: 53025

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, February/March - 2016

BASIC ELECTRICAL ENGINEERING

(Common to CSE, IT)

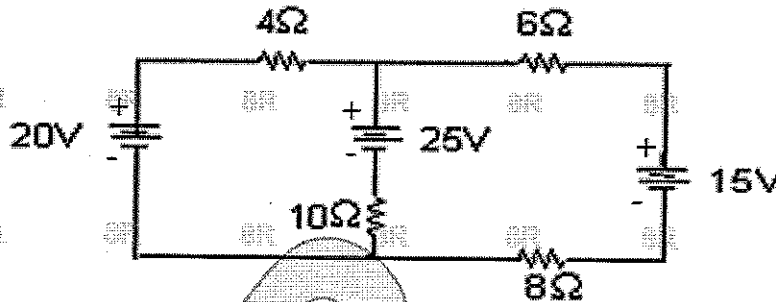
Time: 3 hours

Max. Marks: 75

Answer any five questions  
All questions carry equal marks

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- 1.a) State and explain Ohms law.  
b) By applying Kirchoff's law, find the current through all the elements in the circuit as shown in the figure. [6+9]



- 2.a) State and explain Superposition theorem.  
b) What is meant by star-delta transformation? If  $R_{ab}$ ,  $R_{bc}$  and  $R_{ca}$  are connected in delta, derive the expressions for equivalent star connection. [7+8]
- 3.a) Explain vector notation of alternating quantity and its significance.  
b) Find the total impedance of a series R-L circuit with  $R = 9$  ohms and  $X_L = 12$  ohms. Also calculate the power factor of the circuit.  
c) Define average value, RMS value and form factor of a sinusoidally quantity. [4+5+6]
- 4.a) Derive the emf equation of a single phase Transformer.  
b) In 25KVA, 2000/200V, single phase Transformer, the iron and full-load copper losses are 50 W and 400 W respectively. Calculate the efficiency at unity power factor of:  
i) Full load and ii) Half full-load. [7+8]
- 5.a) A short shunt compound generator supplied 7.5 KW at 230 V. The shunt field, series field and armature resistances are 100, 0.3 and 0.2 respectively. Calculate the induced emf and the load resistance.  
b) Write down the similarities and dissimilarities between motors and generators. [7+8]
- 6.a) Why the starting current of DC motors is very high? How this current can be limited?  
b) Derive torque equation of DC motor. [7+8]
- 7.a) Explain the working principle of a 3-phase induction motor.  
b) Give the applications of 3-phase induction motor. [10+5]
- 8.a) Discuss the classification of electrical instruments.  
b) Explain the significance of controlling torque and damping torque relevant to the operation of indicating instruments. [7+8]