

Code No: 113AP

**R13**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B.Tech II Year I Semester Examinations, November/December - 2016**

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**(Common to CE, ME, AME, PTE, 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**

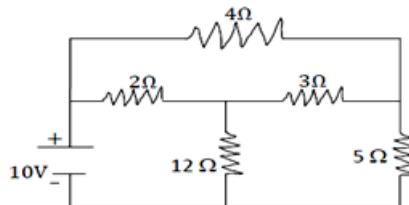
**(25 Marks)**

- 1.a) State Kirchoff's laws. [2]
- b) What are the disadvantages of moving coil instruments? [3]
- c) What are the functions of commutator and brushes in a DC machine? [2]
- d) List out few applications of d.c shunt motor and compound motor. [3]
- e) Define transformation ratio of transformer. Write the expression. [2]
- f) On what factors does hysteresis loss of a transformer depends upon? [3]
- g) What are the advantages of Bridge rectifier when compared to half wave rectifier? [2]
- h) What are the advantages of SCR over PN junction diode? [3]
- i) What is the function of electron gun? [2]
- j) Why is phosphor used in CRT? [3]

**PART- B**

**(50 Marks)**

- 2.a) Find the current supplied by 10 V battery by using star-delta transformation for the following network shown in figure 1

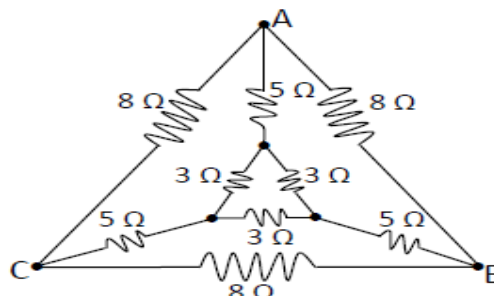


**Figure: 1**

- b) What are passive and active elements? Explain the volt-current relationship of passive elements with examples. [5+5]

**OR**

- 3.a) Obtain the equivalent resistance between A and B terminals as shown in figure 2.



**Figure: 2**

- b) Discuss the principle of operation of moving iron instrument. [5+5]

- 4.a) Derive the EMF equation of DC generator.  
b) Explain about the different types of DC motors. [6+4]

**OR**

- 5.a) Discuss in detail the working of Three point starter used in a d.c motor.  
b) Derive torque equation of a d.c motor. [5+5]

- 6.a) Derive the emf equation of a transformer.  
b) Discuss about the principle of operation of alternators. [5+5]

**OR**

- 7.a) Discuss about the various losses that occur in a transformer.  
b) Discuss how regulation can be calculated using synchronous impedance method. [5+5]

- 8.a) Draw the forward bias and reverse bias characteristics of PN junction diode and explain.  
b) Discuss the working of PNP and NPN transistors. [4+6]

**OR**

9. Draw the circuit diagram and explain the working of half wave and full wave bridge rectifier and derive the expression for average output current and rectification efficiency. [10]

10. Discuss the principle of working of CRO by explaining the function of every component in the block diagram. [10]

**OR**

- 11.a) Derive the expression for electric field deflection sensitivity of CRT.  
b) Discuss the various applications of CRO. [6+4]

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