

**R13**

Code No: 113AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year I Semester Examinations, November - 2015

**ELECTRICAL AND ELECTRONICS ENGINEERING**

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

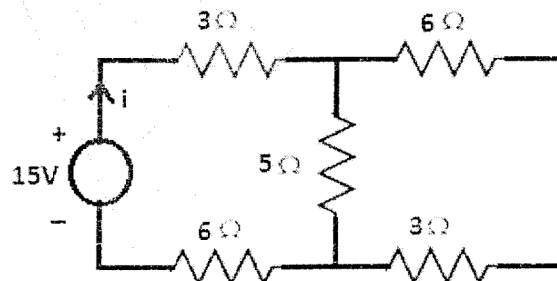
Each question carries 10 marks and may have a, b, c as sub questions.

**PART-A****[25 Marks]**

- 1.a) Define Ohm's law. [2M]
- b) Define KVL with an example. [3M]
- c) What is armature reaction? [2M]
- d) What is the construction of DC shunt motor? [3M]
- e) What are the eddy current losses in transformers? [2M]
- f) What is slip in Induction motors? Explain. [3M]
- g) What is reverse bias? [2M]
- h) Explain the operation of full wave rectifier. [3M]
- i) What are the basic components of a CRT? [2M]
- j) Write short notes on magnetic deflection. [3M]

**PART-B****[50 Marks]**

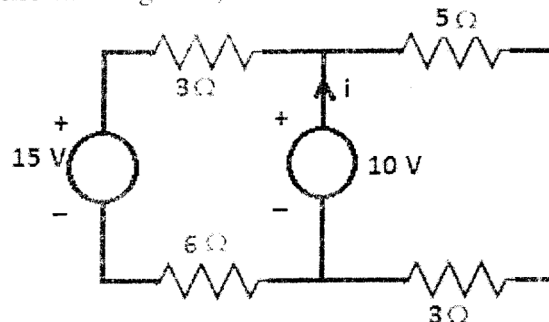
2. a) What is the equivalent resistance of series connection of resistors? Explain.
- b) Determine 'i' in the circuit shown in figure 1.

**Figure: 1**

- c) What are the differences between Moving coil and Moving iron instruments? [2+4+4]

**OR**

- 3.a) What is current division rule?
- b) In the circuit shown in figure 2, find the current 'i'.

**Figure: 2**

- c) Explain the working principle of moving iron instruments. [2+4+4]

- 4.a) Explain the Principle of operation of DC motor in detail.  
b) Derive the EMF equation of DC shunt generator. [5+5]

**OR**

- 5.a) Explain different types of DC generators.  
b) What are the applications of DC series motors? Explain. [5+5]

- 6.a) Calculate the regulation of a transformer in which the percentage resistance drop is 2% and the percentage reactance drop is 6% when the power factor is 0.9 lagging, 0.9 leading and unity.

- b) Draw the slip torque characteristics of induction motor and explain. [5+5]

**OR**

- 7.a) A 10 KVA, 1000/250 V single phase transformer has its maximum efficiency of 96% when delivering 90% of its rated output at unity power factor. Calculate its efficiency when delivering its full load output at 0.8 lagging power factor.

- b) Explain the principle of operation of alternators. [5+5]

- 8.a) Explain different applications of a diode.

- b) Explain different modes of operation of a transistor. [5+5]

**OR**

- 9.a) Derive the expression for the average output voltage of a diode half wave rectifier.

- b) Explain the differences between PNP and NPN transistors. [5+5]

- 10.a) Explain the operation of CRT with neat sketch.

- b) Explain about the phase angle measurement using CRO. [5+5]

**OR**

- 11.a) Explain the functions of Horizontal and vertical amplifiers in CRT.

- b) What are the applications of CRO? Explain. [5+5]

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