

21508/11508	Roll No. _____	Total No of Pages: <span style="border: 1px solid black; padding: 2px;">3</span>
<b>21508/11508</b> <b>B. Tech. I/II Sem. (Main/Back) Exam., Dec. - 2019</b> <b>ESC</b> <b>2FY3-08 Basic Electrical Engineering</b>		

Time: 2 Hours

Maximum Marks: 80

**Instructions to Candidates:**

**Part – A:** Short answer questions (up to 25 words)  $5 \times 2$  marks = 10 marks. All five questions are compulsory.

**Part – B:** Analytical/Problem Solving questions  $4 \times 10$  marks = 40 marks. Candidates have to answer four questions out of six.

**Part – C:** Descriptive/Analytical/Problem Solving questions  $2 \times 15$  marks = 30 marks. Candidates have to answer two questions out of three.

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitable be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting materials is permitted during examination. (Mentioned in form No. 205)*

1. NIL 2. NIL

**PART - A**

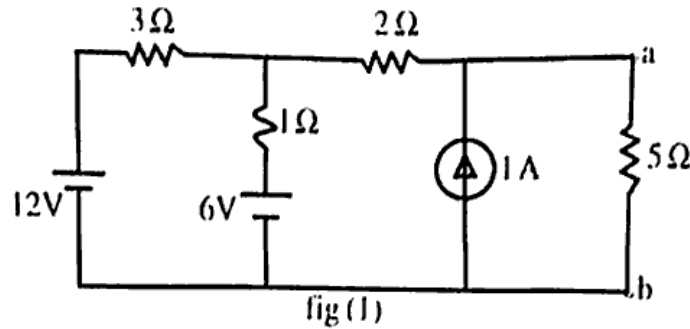
- Q.1 Define Kirchhoff's laws with examples. [2]
- Q.2 What is resonance in series RLC circuit and what is the condition of series resonance? [2]
- Q.3 What are the conditions of an Ideal Transformer? [2]
- Q.4 What do you mean by rotating magnetic field? [2]
- Q.5 Why earthing is important in electrical installations? [2]

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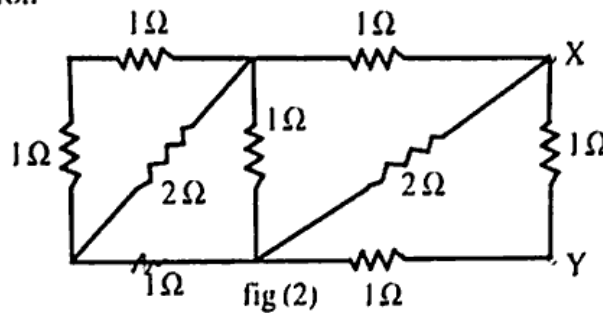
**PART - B**

Q.1 Obtain Thevenin's equivalent circuit across 'a b' of figure (1) - [10]



Q.2 (a) Draw and explain circuit of a transformer. [5]

(b) Obtain equivalent resistance across 'XY' in the figure (2) by star delta transformation- [5]



Q.3 (a) Describe speed control methods of 3 - phase Induction motor. [5]

(b) Draw and explain torque - slip characteristic of a 3 - phase Induction motor. [5]

Q.4 (a) Draw and explain DC - DC converter with neat sketches. [5]

(b) Draw and explain V - I characteristic of SCR. [5]

Q.5 Draw and explain type of Earthing. [10]

Q.6 (a) Write short note on MCB, ELCB and MCCB. [6]

(b) Write steps to obtain a Norton's equivalent circuit. [4]

**PART - C**

- Q.1 Write the constructional features and working principle of operation of a Three phase Induction Motor with suitable diagrams. [15]
- Q.2 (a) Draw and explain the characteristics of IGBT. [9]
- (b) Explain working principle and different parts of a synchronous generator in brief. <http://www.mgsuonline.com> [6]
- Q.3 (a) What do you mean by active, reactive and apparent power? [6]
- (b) Explain method of power measurement in an electrical circuit. [6]
- (c) What is the operating principle of a single phase Inverter? [3]
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