

11508

Roll No. \_\_\_\_\_

Total No. of Pages: 4

11508

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

ESC

1FY3 - 08 Basic Electrical Engineering

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 suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

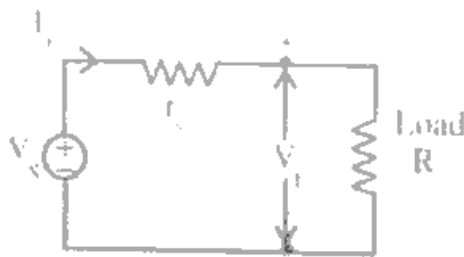
Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL \_\_\_\_\_

2. NIL \_\_\_\_\_

**PART - A**

Q.1



[2]

Figure - (1)

For the circuit of figure - (1),  $V_s = 12$  Volt,  $r_s = 0.3$  ohm and load current ( $I_L$ ) = 10 Ampere. Calculate total power supplied by the practical source.

- Q2 Define bandwidth of series resonance circuit. [2]
- Q3 Describe Hysteresis and eddy current loss in a transformer. [2]
- Q4 Draw torque-slip characteristics of an induction motor for combinations of rotor resistance and leakage reactance. [2]
- Q5 Among which parameters output characteristic of common base bipolar junction transistor is drawn. Name the three distinct regions of this characteristic. [2]

**PART - B**

Q1

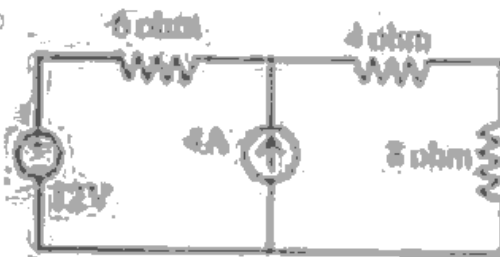


Figure - (1)

Determine the current in the 3 ohm resistor in the circuit of figure-1 by superposition theorem. [10]

Q2 Find the period of the wave form of figure (2) [10]



[2000]

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Q3. A single phase transformer has primary voltage of 230 Volt. No-load primary current is 5 Ampere. No-load power factor is 0.25. Number of primary turns is 200 and frequency is 50 Hz.

Calculate

- (i) Maximum value of flux in the core (4)
- (ii) Core loss (3)
- (iii) Magnetizing current (3)

Q.4 Describe torque-speed characteristics of separately excited DC motor and also explain how the speed control of this motor is done. (10)

Q.5 Describe the basic circuit of single phase rectifier with R load and DC-DC converter. <http://www.rtuonline.com> (10)

Q.6 Describe the pipe and plate section types with neatly drawing diagrams. (10)

### PART - C

Q.1 (a) By mesh analysis, find the current through 2 ohm resistor in the circuit of figure (4). (5)



(b) Explain the advantages and efficiency of transformer

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- Q.2 (a)** A voltage of 150 Volt, 50 Hz is applied to a coil of negligible resistance and inductance 0.2 Henry. Write the time equation for voltage and current. **[9]**
- (b)** Describe the working of synchronous generator explaining its principle. **[6]**
- Q.3 (a)** What is meant by power transistor? Explain it in detail and also describe IGBT with their applications. **[9]**
- (b)** Describe any of pipe and plate earthing types drawing neat diagram. **[6]**
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