11508/21508

Roll No. _____ Total No. of Pages: 3

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B. Tech. I - Sem. Main/Back & II–Sem. Back Exam., March – 2021

1FY3-08 /2FY3-08 Basic Electrical Engineering

Time: 2 Hours **Maximum Marks: 80**

Min. Passing Marks:

Instructions to Candidates:

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

Part – B: *Analytical/Problem solving questions 4 × 10 marks = 40 marks. Candidates have to answer **four** questions out of **six**.*

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

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

1. NIL 2. NIL

PART – A

Q.1 Define ideal voltage and current source. [2]

Q.2 Define effective value of A.C. quantity. [2]

Q.3 Write down the components of no load current of a transformer. [2]

Q.4 What is synchronous motor? Classify it on the basis of rotor. [2]

Q.5 What is power transistor? [2]

PART – B

Q.1 Frame and solve the node equations of the network shown in figure1. Find out the current following in each branches. [10]

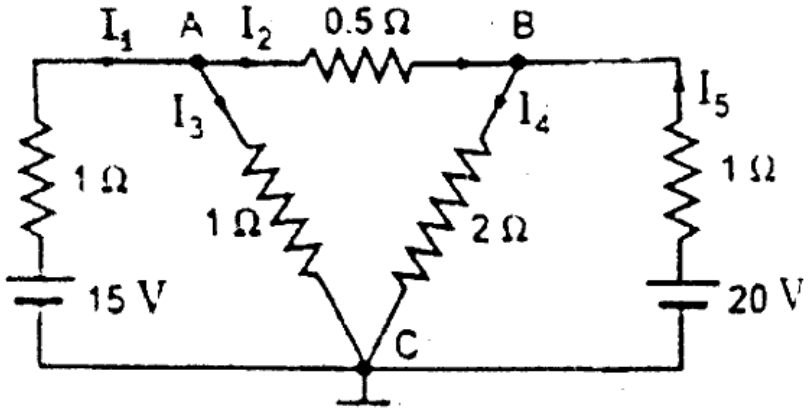

Figure 1

Q.2 Find the RMS value, average value and the form factor of the voltage waveform shown in figure2. [10]

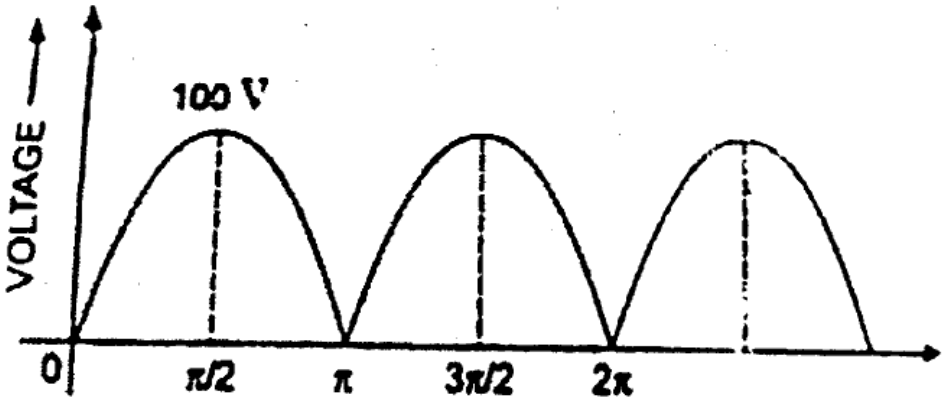

Figure 2

Q.3 Draw and explain simplified equivalent circuit diagram of transformer. [10]

Q.4 Explain Double Revolving Field theory. [10]

Q.5 What is chopper? Classify it and differentiate it with inverter. [10]

Q.6 How power is measured in electrical installation? Describe different methods in brief. [10]

PART – C

Q.1 (a) Find the current following through 2 Ω resistor across branch AB in the circuit, shown in figure 3 using Thevenin's theorem. [9]

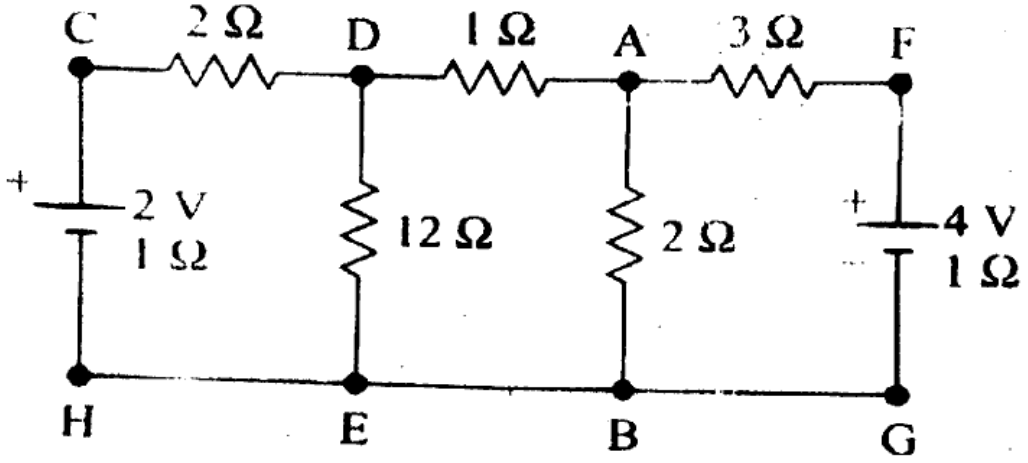

Figure 3

(b) Derive the expression for EMF equation of the transformer. [6]

Q.2 (a) Explain acceptor and rejector circuit and compare them. [9]

(b) What is IGBT? Draw and explain its VI characteristics. [6]

Q.3 (a) Explain speed control methods of separately excited DC motor. [5]

(b) A 50kW, 400V, three phase synchronous machine is operating at full load with an efficiency of 92%. If the field current is adjusted to make its power factor 0.8 leading, estimate the armature current. [5]

(c) Compare SFU, MCB and MCCB. [5]
