No. of Printed Pages : 3

ET-202(B)

B.Tech. Civil (Construction Management) / B.Tech. Civil (Water Resources Engineering)

Term-End Examination

00615

June, 2017

ET-202(B) : PRINCIPLES OF ELECTRICAL SCIENCES

Time : 3 hours *Maximum Marks : 70*

Note : *Question no. 1 is* ***compulsory****. Attempt* ***four*** *more questions from the remaining. Use of scientific calculator is allowed. Missing data (if any) may be suitably assumed.*

1. (a) State the Superposition theorem.

(b) Define active and reactive powers.

(c) Explain the working of J-K flip-flop.

(d) Write the applications of autotransformer.

(e) Discuss the principle of PMMC instrument.

(f) What is precision rectifier ?

(g) Why is a single phase motor not self-starting ? *7×2=14*

2. (a) State Norton's theorem. Find the current I_L in the circuit as shown in Figure 1 using the theorem. *3+4=7*

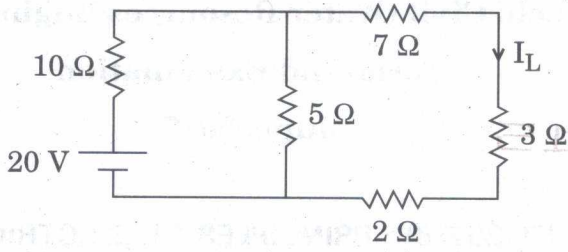

Figure 1

(b) Find the Thevenin's equivalent at terminals AB of the network shown in Figure 2. 7

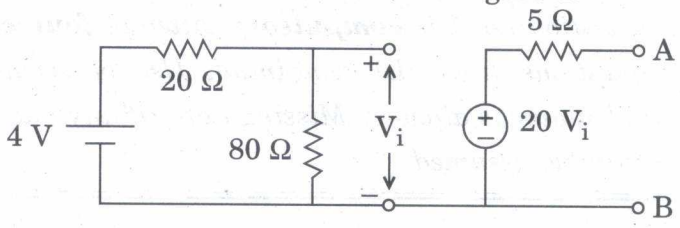

Figure 2

3. (a) Explain open and short circuit tests for finding losses in a transformer. 7

(b) Explain the working of an audio frequency transformer and discuss its applications. 7

4. (a) Explain the torque – speed characteristics of a 3-phase induction motor. 7

(b) Explain the working of the following : $2 \times 3\frac{1}{2} = 7$

(i) Half wave rectifier

(ii) Voltage multiplier

5. (a) Explain the working of a transistor as : $2 \times 3\frac{1}{2} = 7$

(i) A controlled switch

(ii) An Amplifier

(b) Explain OP-AMP as integrator and differentiator. 7

6. (a) Discuss the working principles and applications of the following : $2 \times 5 = 10$

(i) Successive Approximation type ADC

(ii) Microcomputers

(b) Find the ending address of an 8 K byte memory if the starting address is '0'. 4

7. Write short notes on any ***two*** of the following : $2 \times 7 = 14$

(a) Digital Counters

(b) Instrumentation Amplifier

(c) Phase Shift Oscillators

(d) Speed Control of DC Motors

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