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

Term-End Examination

June, 2007

ET-202(B) : PRINCIPLES OF ELECTRICAL SCIENCES

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any **five** questions in all.*

1. (a) Explain working principle of a transformer and calculate the r.m.s. value of the induced emf in the secondary winding of a transformer when a sinusoidal flux 0·2 Wb (max.) links with 55 turns of a transformer secondary winding. 6

(b) What do you understand by 'armature reaction' ? What is the effect of armature reaction in a d.c. generator ? 6

(c) Mention the relative advantages and disadvantages of using a digital indicating instrument over an analog instrument. 2

2. (a) Explain resonance in series RLC circuit and draw resonance curve. 6

(b) What is KVL ? Given that E_1 = 15 V, E_2 = 10 V, V_S = 20 sin 500 t, find current i in the circuit of figure 1. 6

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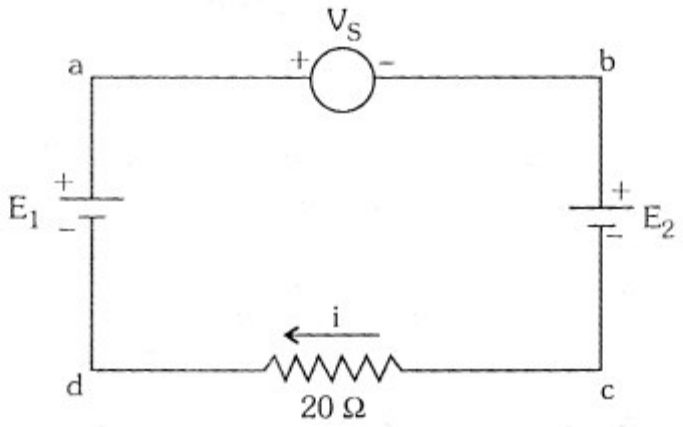

Figure 1

(c) A practical voltage source can be converted into an equivalent practical current source. Draw an equivalent circuit diagram for this. *2*

3. (a) Explain how diodes operate as AC to DC converter, with the help of circuit diagrams. *6*

(b) What is the basic principle of a CRO ? Explain its two applications. *6*

(c) Draw characteristic of an ideal operational amplifier. *2*

4. (a) What are different flip-flops ? Explain any two of them. *6*

(b) What is the difference between a compiler and an assembler ? Describe ROM and RAM. *6*

(c) What is analog output voltage of a D-to-A converter corresponding to an input 1101 ? *2*

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5. (a) Explain the working of a dual slope integrating type ADC. 6

(b) Explain any four applications of Op-Amps with relevant circuit diagram. 6

(c) Write a brief note on FET. 2

6. (a) A 3-phase induction motor is wound for 4 poles and is supplied from a 50 Hz system. Calculate 6

(i) Actual speed of the motor when running at 4% slip.

(ii) Frequency of emf induced in the rotor.

(b) Explain briefly the various methods for controlling speed of DC shunt motor. 6

(c) For any two terminal networks draw Thevenin equivalent circuit. 2

7. (a) What is a multiplexer ? Draw the symbol of a 4-to-1 multiplexer showing the various inputs and outputs and write its truth table. 6

(b) Name different types of single phase induction motors. Explain any one of them. 6

(c) Write down the relationship between phase and line voltages, and phase and line currents for star connections in a 3-phase supply. 2

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