

1E2005

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

1E2005

B.Tech I Sem. (Main & Back) Exam. Jan-Feb 2013  
 105 Basic Electrical & Electronics Engineering  
 Common to all Branches

Time: 3 Hours

Maximum Marks: 80  
 Min. Passing Marks: 24

Instructions to Candidates:

Attempt any **five questions**, selecting **one question** from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

### UNIT - I

- Q.1. (a) Find the current in the ammeter of the  $2\ \Omega$  resistance branch as shown in figure 1(a) using thevenin's theorem. [8]

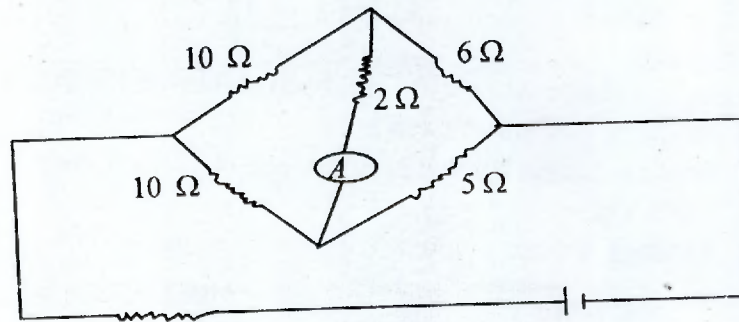


Figure 1 (a)

- (b) Compute the power dissipated in  $9\ \Omega$  resistor by applying superposition in circuit of figure 1(b). [8]

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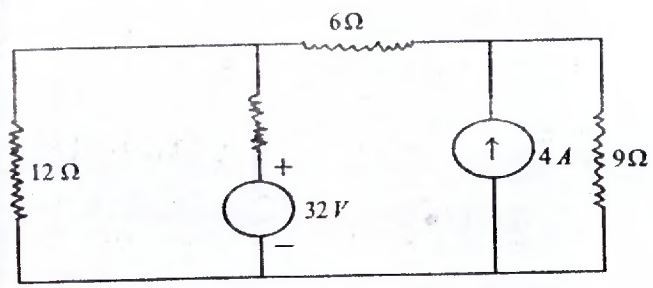
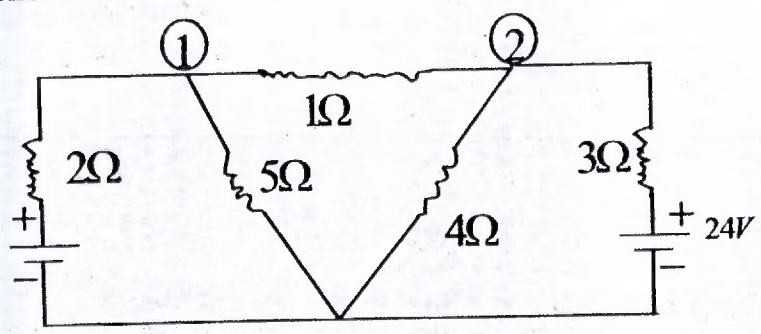


Figure 1 (b)

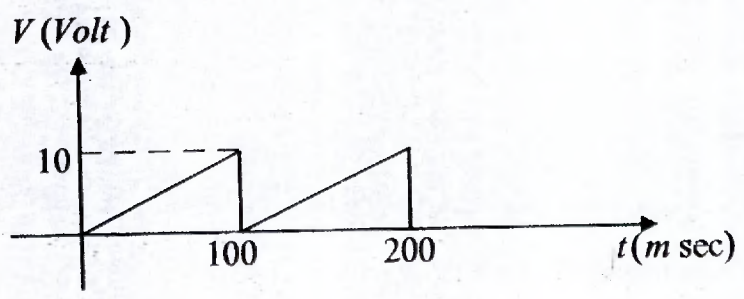
OR

- Q.1. (a) State & explain Thevenin's theorem with suitable example. [8]  
(b) Find the current through the  $1\Omega$  resistor using node voltage method for the circuit shown below. [8]



UNIT - II

- Q.2. (a) A periodic voltage wave form has been shown in figure 2 (a). Determine:  
(i) Frequency of wave from  
(ii) Wave equation for  $0 < t < 100m$  sec.  
(iii) RMS Value.  
(iv) Average Value.



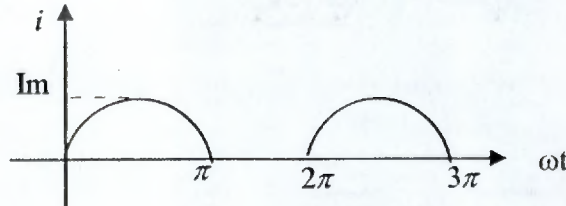
[2x4=8]

Figure 2(a)  
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- (b) Explain the generation of single phase AC Voltage & derive its EMF equation. [8]

OR

- Q.2. (a) Find the average value & RMS Value of a half rectified current wave as shown below. [8]



- (b) Define & determine average value & root mean square value of an alternating sinusoidal quantity. [8]

### UNIT - III

- Q.3. (a) Derive the EMF equation of DC machine. [8]
- (b) Explain the working principle of DC motor and compare its types. [8]

OR

- Q.3. (a) A Separately excited DC generator has an armature emf of 100V when the flux per pole is 20 mwb and the speed is 800 RPM. Calculate the generated emf with the same flux and the speed at 1500 RPM. [8]
- (b) State the basic principle of synchronous motor & briefly explain its working. [8]

### UNIT - IV

- Q.4. (a) How transistor works as an amplifier? Explain its amplification phenomenon. [8]
- (b) A transistor operating in CB configuration has  $I_C = 2.98\text{MA}$ ,  $I_E = 3.0\text{MA}$  and  $I_{CO} = 0.01\text{MA}$ . What current flows in the collector circuit of this transistor when connected in CE configuration with a base current of  $30\mu\text{A}$ ? [8]

OR

- Q.4. (a) Sketch and explain input & output characteristics of a transistor connected in common emitter configuration. [8]
- (b) Define  $\beta$  for a transistor. Derive the relationship between  $\alpha$  and  $\beta$  of a transistor. [8]

UNIT - V

- Q.5. (a) What is the need of modulation? Compare the different types of modulation techniques used in communication. [8]
- (b) Write short notes on:
- (i) Thermocouple.
  - (ii) Strain gauge. [4x2=8]

OR

- Q.5. (a) Define amplitude modulation & analyse frequency spectrum of AM wave. [8]
- (b) Write short notes on:
- (i) R T D.
  - (ii) Load cell. [4x2=8]
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