

1E1006

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

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1E1006

B. Tech. I-Sem. (Reback) Exam., Feb. 2013  
 Electrical & Electronics Engg.  
 (Common to all branches of Engg.)

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.

Use of following supporting material is permitted during examination.

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

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

UNIT - I

Q.1 (a) State and explain the superposition theorem with examples. [6]

(b) Find the voltage at the three non - reference nodes in the circuit shown in figure (1). [10]

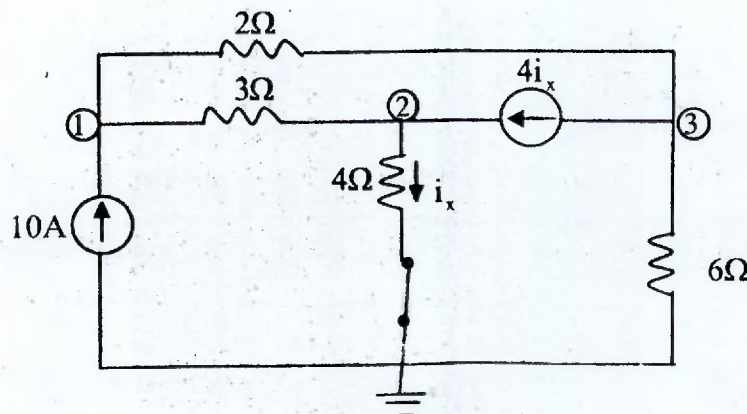


Figure (1)

OR

Q.1 (a) Explain the different type of network elements used in electrical circuits. [6] Q.2

(b) Find the Thevenin equivalent of the circuit shown in figure (2). [10]

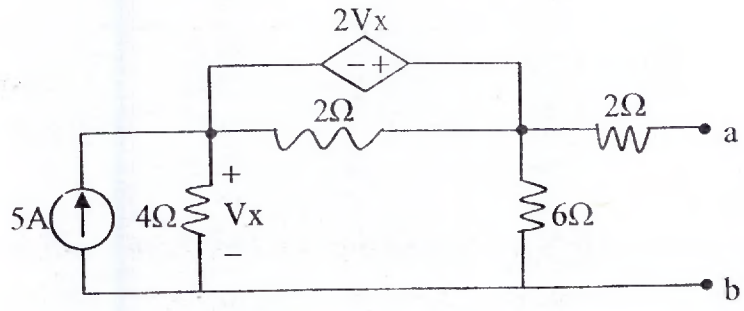


Figure (2)

UNIT - II

Q.2 (a) An AC voltage  $v(t) = 141.4 \sin 120t$  is applied to a series R-C circuit. The current through the circuit is obtained as  $i(t) = 14.14 \sin 120t + 7.07 \cos (120t + 30)$

- Determine
- (i) Value of resistance and capacitance
  - (ii) Power factor
  - (iii) Power developed by the source [8]

(b) Determine the rms value of voltage and form factor of given wave form shown in figure (3). [8]

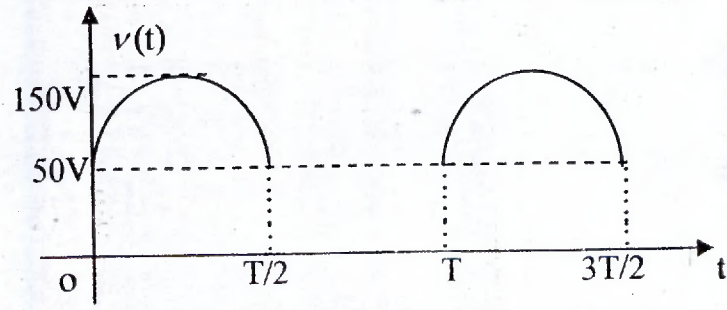


Figure (3)

OR

- Q.2 (a) Describe the merits and demerits of poly phase system over single phase system. [6]
- (b) Each phase of a star – connected load consists of a resistance of  $100\Omega$  in parallel with a capacitance  $31.8\mu\text{F}$ . Calculate the line current, power absorbed, total kVA and power factor of the load, when connected to a 416 V,  $3\Phi$ , u wire, 50 Hz supply. [10]

UNIT – III

- Q.3 (a) Explain the working of a transformer, also derive its Electro-motive-force equation. [8]
- (b) The no – load current of a transformer is 5A at 0.25 power factor, when supplied at 235V, 50Hz. The number of turns on the primary winding is 200. Calculate:
- The maximum value of flux in the core
  - The core loss
  - The magnetizing component [8]

OR

- (a) Explain the working principle of DC motor and generator, which is a most suitable type of DC motor used for different purpose. [8]
- (b) A 25 kW, 250V dc generator has armature and field resistance of  $0.06\Omega$  and  $100\Omega$  respectively. Determine the total armature power developed when -
- As generator delivering 25kW output and
  - As a motor taking 25 kW input. [8]

UNIT – IV

- Q.4 (a) Explain how transistor works as an amplifier. Is transistor a current or voltage controlled device? [8]
- (b) Draw & explain the working of TRIAC controlled light lamp or light dimmer circuit. [8]

OR

- (a) Draw and explain the working of Silicon Controlled Rectifier (SCR) and also describe its turn – off methods. [8]
- (b) Describe the working of UJT ( Uni Junction Transistor) as a relaxation oscillator. Also draw its equivalent circuit for finding intrinsic standoff ratio. [8]

UNIT – V

- Q.5 (a) Define modulation and its need in communication system. Draw & explain the working of frequency modulation techniques. [8]
- (b) Explain the working principle of optical fiber. Also describe its merits and demerits over other communication medium. [8]

OR

- (a) Draw the block diagram of super heterodyne radio receiver and explain its each block. [8]
- (b) Draw & explain the working of satellite with its components. [8]
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