

1E2005	Roll No. _____	Total No of Pages: 4
1E2005		
B. Tech I Sem. (Main/Back) Exam. Jan. 2016		
105 Basic Electrical & Electronics Engineering		
Common to all Branch		

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. NIL

2. NIL

UNIT-I

Q.1 (a) Find the current in branch AB in the unbalanced bridge using nodal analysis, as shown in Fig 1.1(a) [8]

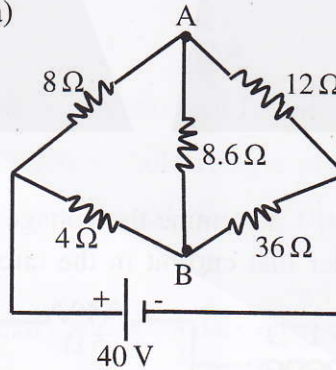
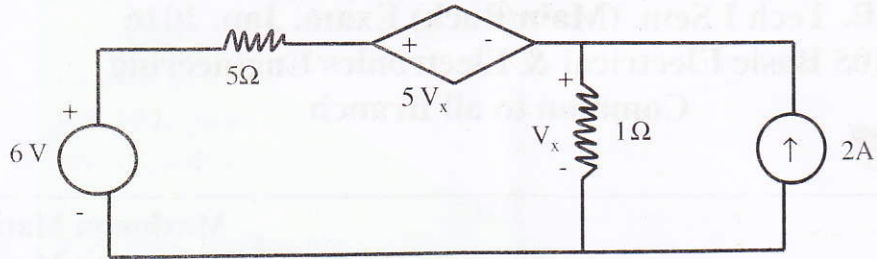


fig 1.1(a)

(b) State and explain Thevenin's theorem with suitable example. [8]

OR

Q.1 (a) Find current in 5Ω resistance using superposition theorem in Fig 1.1 (b) [8]



(b) Find the values of unknown currents I_1 , I_2 , I_3 and unknown resistances R_1 and R_2 , as shown in Fig 1.(b) [8]

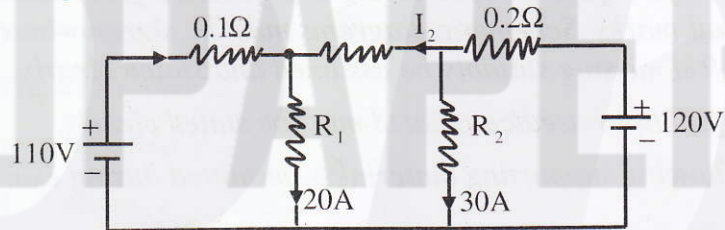


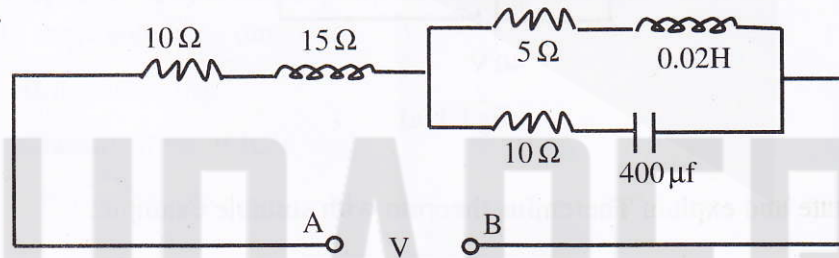
fig 1(b)

UNIT-II

Q.2 (a) Define the following with suitable diagram: [6]

- (i) RMS values
- (ii) Form factor
- (iii) Peak factor
- (iv) Phase angle

(b) In the act shown in fig (2). 1 determine the voltage at a frequency of 50Hz to be applied across AB in order that current in the circuit is 10A. Draw the phases dia. [10]



OR

Q.2 (a) Three sinusoidal voltages acting in series are given by:

$$V_1 = 10 \sin 440 t$$

$$V_2 = 10\sqrt{2} \sin (440 t - 45^\circ)$$

$$V_3 = 20 \cos 440 t$$

find :

(a) The expression for resultant voltage

(b) frequency and RMS value of resultant voltage

[8]

(b) How power can be measured using two wattmeter method for balance load?

Derive an expression – $\tan \phi = \sqrt{3} \frac{(w_1 - w_2)}{(w_1 + w_2)}$

[8]

UNIT-III

Q.3 (a) Derive the EMF equation for a single phase transformer and deduce the expression for transformation ratio. [6+2=8]

(b) Explain the principle of operation of 3- phase induction motor.

[8]

OR

Q.3 (a) Explain in detail the Applications of DC Machines. [8]

(b) A 200 KVA, 6600/400 v, 50Hz single phase transformer has 80 turns on the secondary and cross sectional area of the core is 80sq.cm. Neglect losses, calculate: [8]

(i) Full load primary and secondary current

(ii) The no. of primary turns

(iii) Peak flux density

(iv) Maximum flux value in the core

UNIT-IV

- Q.4 (a) Explain the working of a transistor as an amplifier. [8]
(b) Explain the following gates: [8]
(i) AND gate
(ii) OR gate
(iii) NOT gate
(iv) EX-OR gate

OR

- Q.4 (a) Write short on (any one) [8]
(i) Photovoltaic cell
(ii) Rectifiers
(b) Solve the following: - [8]
(i) $(1057)_{10} = (X)_2$ find X
(ii) $(375)_{10} = (Y)_8$ find Y
(iii) $(11011.110)_2 = (Z)_{10}$ find Z

UNIT-V

- Q.5 (a) Derive the mathematical expression of modulation index for frequency modulated wave. Compare FM with AM [6+2=8]
(b) Write short on: - [8]
(i) RTD
(ii) Strain Gauges

OR

- Q.5 (a) A sinusoidal carrier wave of frequency 2 MHz and amplitude 20mv is amplitude modulated by a sinusoidal wave of frequency 5 KHz. Determine the frequency and amplitude of side bands. Consider modulation index as 0.8. [8]
(b) Write short note on: - (any one) [8]
(i) Bimetallic strip
(ii) Classification of IC's
(iii) Thermo couple