Printed Page:- 04

Subject Code:- BEC0101

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: I - THEORY EXAMINATION (2023 - 2024)

Subject: Basic Electrical and Electronics Engineering

Time: 3 Hours Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A 20

1. Attempt all parts:-

1-a. Three equal resistances each of 3ohm are connected in star. If this star is converted into equivalent delta, the resistance will be..... (CO1) 1

(a) 9 ohm

(b) 0 ohm

(c) 3 ohm

(d) None of the above

1-b. If the load increases means their equivalent resistance. (CO1) 1

(a) None of these

(b) Remains constant

(c) Decreases

(d) Increases

1-c. Find the effective value of the given equation I = 200 sin (ωt – 30 o) (CO2) 1

(a) 141.4

(b) 100

(c) 200

(d) none of above

1-d. The unit of apparent power is (CO2) 1

(a) KVA

(b) KVAR

(c) KW

(d) Watt

1-e. The no-load current drawn by transformer is usually.(CO3) 1

(a) 0.2% to 0.5%

(b) 2% to 5%

(c) 12% to 15%

(d) 20% to 30%

1-f. For a transformer with primary turns 100, secondary turns 400, if 200 V is applied at primary we will get _____(CO3) 1

(a) 3200 V at secondary

(b) 1600 V at secondary

(c) 800 V at secondary

(d) 80 V at secondary

1-g. A semiconductor has ..... temperature coefficient of resistance (CO4) 1

(a) Positive

(b) Negative

(c) Both may be possible

(d) None of the above

1-h. In a semiconductor, the energy gap between the valence band and conduction band is about_____ (CO4) 1

(a) 5 eV

(b) 10 eV

(c) 15 eV

(d) 1 eV

1-i. What is the ideal voltage gain of an op-amp? (CO5) 1

(a) 0

(b) 1

(c) ∞

(d) It varies depending on the op-amp model

1-j. In an inverting amplifier configuration, if the input voltage is positive, what is the polarity of the output voltage? (CO5) 1

(a) Positive

(b) Negative

(c) Zero

(d) It depends on the op-amp

2. Attempt all parts:-

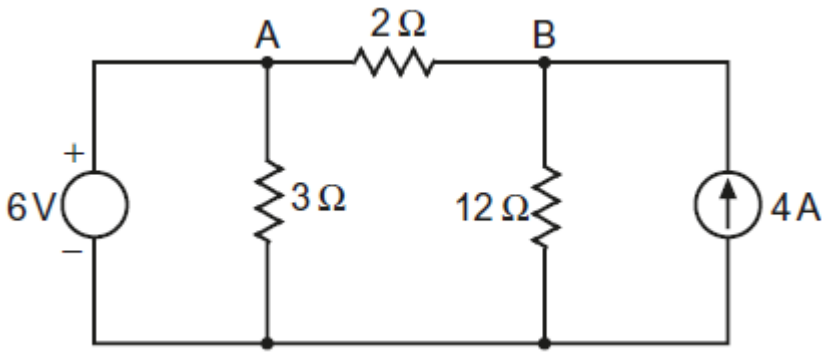
2.a. Two resistor of 4Ω and 6Ω are connected in parallel. If the total current is 30 A. find the curent through each resistor. (CO1) 2

2.b.	What is the power factor of a circuit having impedance of 3+j4 ohms (CO2)	2
2.c.	What is working principle of motor.(CO3)	2
2.d.	What is the PIV for HWR and FWR? (CO4)	2
2.e.	Write down the Ideal characteristics of op-amp. (CO5)	2

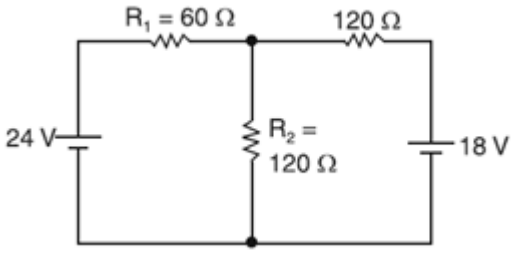
SECTION-B 30

3. Answer any five of the following:-

3-a. Calculate currents in all the resistors of the circuit shown in Figure, using node analysis method. (CO1) 6



3-b. Use the superposition theorem to find the current in R1 (= 60 Ω) in the circuit shown in given Fig. (CO1) 6



3-c. In parallel circuit if R=50 Ω, L=0.1 H and C=140 μF, Calculate-a. Q-factor b. Impedance at resonance c. Band width (CO2) 6

3-d. Calculate the total bill generated for the month of may if the price for one unit is Rs7.The loads are given as follows: (1) five tube light of 40W each working for 6hrs (2) one toaster of 1KW for 15mins (3) 2 AC of 1.5KW for 4hrs (4) Regridgerator of 150W working for 24Hrs (ON for 8Hrs) (5) 750 W Motor for 30Mins. (CO2) 6

3.e. Derive the emf equation of transformer and define transformation ratio.(CO3) 6

3.f. Write short note no (i) Avalanche breakdown (ii) Zener breakdown (CO4) 6

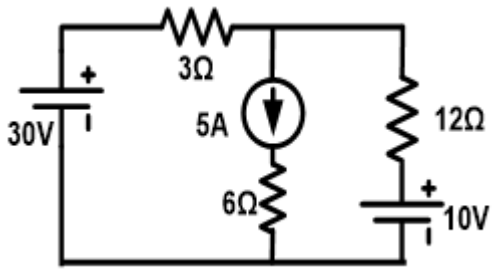
3.g. Explain integrator circuit using Op-Amp. Which type of filter it is?(CO5) 6

SECTION-C 50

4. Answer any one of the following:-

4-a. Derive the expression for Star to Delta transformation. (CO1) 10

4-b. Find the current in 3Ω using Thevenin's theorem in Figure. (CO1) 10



5. Answer any one of the following:-

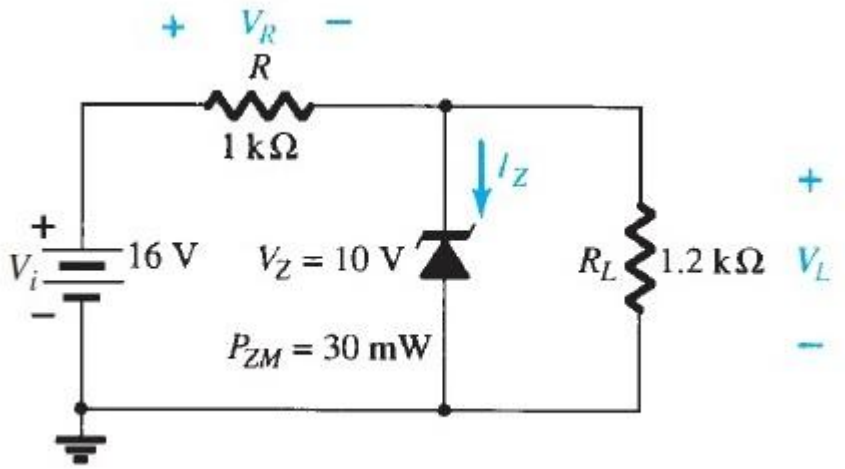
5-a.	Three sinusoidal voltages acting in series are given by V1 = 10 sin 440t, V2 = 105 sin (440t – 450) and V3 = 20 cos 440t. Find the expression of resultant voltage. Also calculate frequency and RMS value of resultant voltage . (CO2)	10
5-b.	Explain the term earthing?What are the advantages of earthing.With physical significance explain the methods to elaborate it (CO2)	10

6. Answer any one of the following:-

6-a.	Compare the conventional and non-conventional energy source based power generating plants along with their advantages and disadvantages.(CO3)	10
6-b.	In a 25 kVA, 2000 V/200 V transformer the iron and copper losses are 350 W and 400W respectively. Calculate the efficiency of half load and 0.8 pf. lagging. Also determine the maximum efficiency and corresponding load KVA.(CO3)	10

7. Answer any one of the following:-

7-a.	Write Short note on : a) LED b) LCD c) OLED. (CO4)	10
7-b.	For the zener diode network of given figure , determine VL, VR, IZ and PZ. (CO4)	10



8. Answer any one of the following:-

8-a.	Define CMMR of a differential amplifier. Design an adder circuit using an op-amp to give the output Vo= -(V1+4V2+8V3); where V1 , V2 and V3 are the three inputs. (CO5)	10
8-b.	Draw the Block diagram of Digital multimeter. Give some aaplication of DMM. (CO5)	10