

**1E3108**

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

Total No. of Pages: **3****1E3108****B. Tech. I - Sem. (Main / Back) Exam., - 2023**  
**1FY3 – 08 Basic Electrical Engineering****Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:**Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five from Part C.**Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.**Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*1. NIL2. NIL**PART – A****[10×2=20]****(Answer should be given up to 25 words only)****All questions are compulsory**

- Q.1 Explain the phasor representation of power.  
Q.2 State Kirchoff's voltage law.  
Q.3 What is fuse?  
Q.4 State the torque-slip characteristics of induction motor.  
Q.5 Discuss the transformer EMF equation.  
Q.6 What are the transformer losses?

- Q.7 What is BJT?
- Q.8 Explain working principle of induction motor.
- Q.9 Explain MCB.
- Q.10 What is resonance?

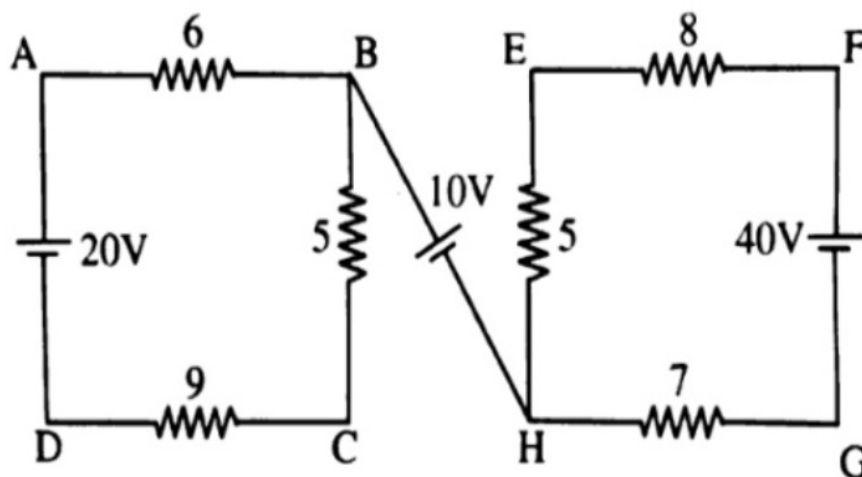
## PART – B

[5×4=20]

### (Analytical/Problem solving questions)

#### Attempt any five questions

- Q.1 State maximum power transfer theorem.
- Q.2 For the circuit shown in Fig. find  $V_{CE}$  and  $V_{AG}$



- Q.3 An alternating voltage is given by  $V=230\sin 314t$ . Calculate frequency and maximum average & RMS value of voltage.
- Q.4 Describe the construction details of single phase transformer.
- Q.5 With a neat circuit diagram, explain the construction and principle of operation of DC machine.
- Q.6 Explain IGBT in detail with neat diagrams.
- Q.7 With suitable example, explain the calculations for energy consumption.

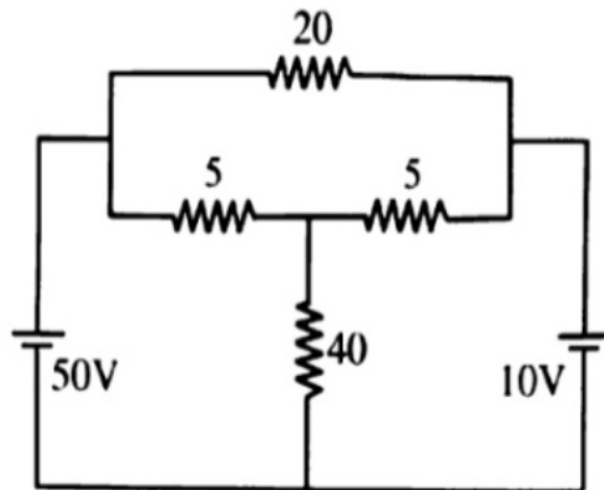
## PART – C

[3×10=30]

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any three questions

- Q.1 Use Superposition Theorem to find the current in 40 ohm, in the network shown:



- Q.2 Explain about Star and Delta connected three phase balanced circuits.
- Q.3 Explain the tests on a single phase transformer and develop an equivalent from the above tests.
- Q.4 Explain the different characteristics of DC Motor.
- Q.5 Explain different types of Earthing with suitable diagram.
-

**11N507**

Roll No

Total No of Pages: **3****11N507**

**B. Tech. I - Sem. (New Scheme) Main Exam., July – 2022**  
**1FY2 – 07 Basic Electrical Engineering**  
**Common to all Branches**

**Time: 2 Hours****Maximum Marks: 70****Min. Passing Marks:****Instructions to Candidates:**

*Part – A: Short answer questions (up to 25 words)  $5 \times 3$  marks = 15 marks. Candidates have to answer 5 questions out of 10.*

*Part – B: Analytical/Problem Solving questions  $3 \times 5$  marks = 15 marks. Candidates have to answer 3 questions out of 7.*

*Part – C: Descriptive/Analytical/Problem Solving questions  $2 \times 20$  marks = 40 marks. Candidates have to answer 2 questions out of 5.*

*Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)*

1. NIL2. NIL**PART– A**

Q.1 What are Kirchhoff's laws?

Q.2 Write down different types of energy sources.

Q.3 What are the various values defined for a.c. quantity?

Q.4 Write down the relationship for line current and phase current and line voltage and phase voltage for star connection of 3- $\phi$  system.

Q.5/ What are the different parts of DC machine?

Q.6 What is an ideal transformer?

Q.7/ What are different types of transistors?

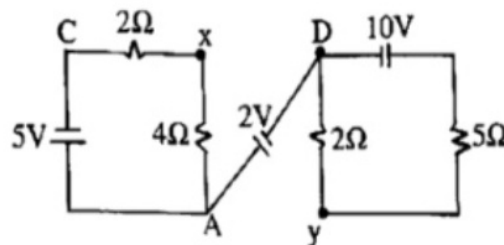
Q.8/ Write down the different types of rectifiers?

Q.9 What is Silicon Controlled Rectifier (SCR)?

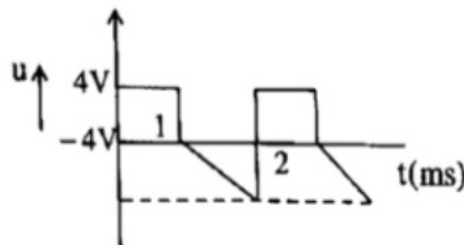
Q.10 What is modulation in communication system?

### PART-B

Q.1 Find voltage  $V_{xy}$  in the given network -



Q.2 Calculate the RMS and average value of the voltage wave shown in figure below.



Q.3 How power can be measured using single wattmeter method? Derive the relation for power factor.

Q.4/ What is the construction and working principle of transformer? .

Q.5/ Explain construction and working principle of DC Machines? .

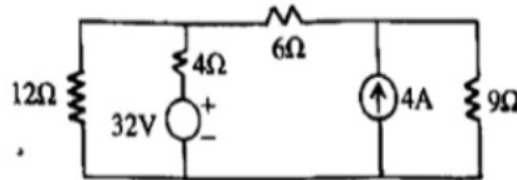
Q.6/ Write short note on SCR, TRIAC and UJT.

Q.7 Discuss the amplitude modulation in detail. Derive the voltage equation of amplitude modulation.



## PART-C

- Q.1 (a) State and explain Thevenin's Theorem.  
(b) Compute the power dissipated in  $9\Omega$  resistor using superposition theorem.



- Q.2 A 3-phase motor operating on a 400 V balanced system develops 18.65 kW at an efficiency of 0.87 per unit and a power factor of 0.85. Calculate the line current and phase current if the windings are delta connected.
- Q.3 (a) An 8 pole DC machine has a wave winding containing 600 conductors. Calculate the generated emf when the flux per pole is 0.08 wb and speed is 215 rpm. If the flux per pole is made 0.05 wb. At what speed should the armature be drawn to generate 500V?  
(b) A 200 kVA, 3300/240V, 50Hz single phase transformer has 80 turns on the secondary winding. Assume an ideal transformer calculate:  
(i) Primary and secondary current on full load  
(ii) The maximum value of flux  
(iii) The no. of primary turns
- Q.4 Compare CB, CE and CC configuration of a transistor. For CE configuration prove that  $I_c = \beta I_B + (\beta + 1) I_{CO}$
- Q.5 Describe the different types of communications in details.

**1E3108****1E3108**

**B.Tech. I Sem. (Main) Examination, April/May - 2022**  
**1FY3-08 Basic Electrical Engineering**

**Time : 3 Hours****Maximum Marks : 70****Instructions to Candidates:**

*Attempt all ten questions from Part A, five questions out of Seven questions from Part B and three questions out of Five questions Part C.*

*Schematic diagram 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.  
(Mentioned in form No.205)*

**PART - A**

(Answer should be given up to 25 words only)

**All questions are compulsory**

**(10×2=20)**

1. State and explain the Kirchhoff's Current Law.
2. Explain the RMS Value and peak value?
3. Discuss the classification of DC Generator.
4. What is the use of circuit breaker?
5. Define the transformer losses.
6. How does a transformer works.
7. What are the advantage and disadvantage of 3 - phase Induction Motor.
8. What are the advantage and disadvantage of DC Motor.
9. What is the different method to turn on the Thyristor.
10. What are the different types of earthing?

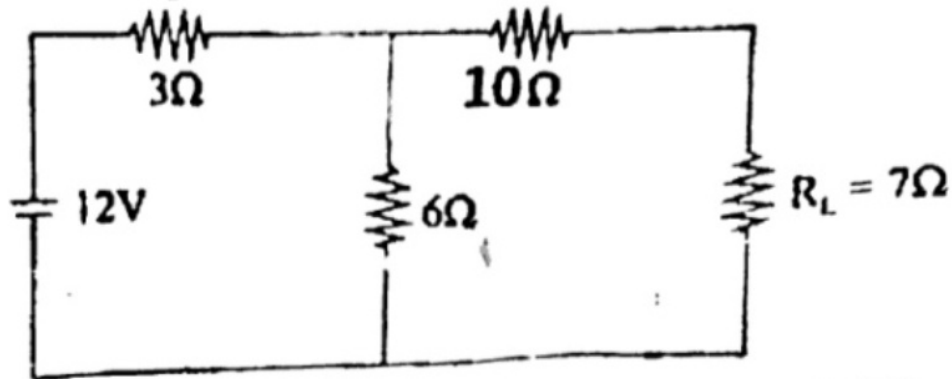
**1E3108/2022****(1)****[Contd....]**

## PART - B

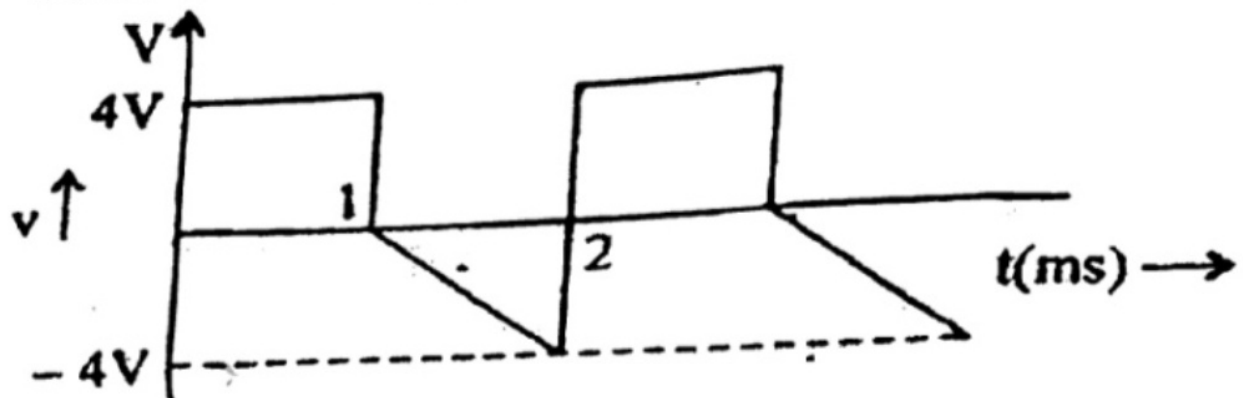
Attempt any **five** questions

(5×4=20)

1. Find the current in  $R_L = 7 \text{ ohm}$  resistor using Thevenin's theorem.



2. Calculate the RMS and average value of the voltage wave shown below.



3. A voltage  $e = 200 \sin(\pi t)$  is applied to a coil having resistor  $R = 200 \text{ ohm}$  and  $L = 0.38 \text{ H}$ . Find the expression for current and power taken from the supply.
4. Explain in detail the construction, working principle and emf equation of a single phase transformers.
5. Briefly discuss the types of dc motors. What is the difference between differential compound and cumulative compound DC motor. <https://www.rtuonline.com>
6. What is a SCR? Sketch static V-I characteristic of a thyristor. Label the various voltages, current and operating modes on this sketch.
7. What are the different types of Earthing systems used in Electrical Installation explain in details?

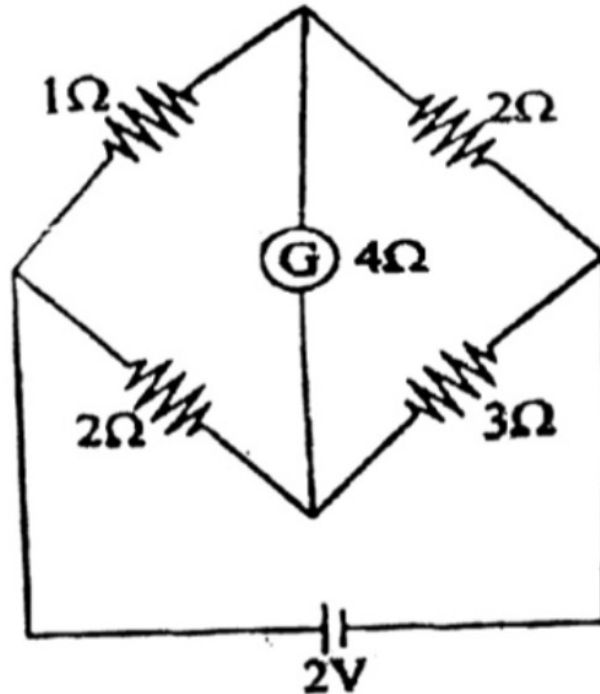


### PART - C

Attempt any **Three** questions

(3×10=30)

1. Calculate the **current** through the **galvanometer**. (using Mesh analysis)



2. Explain two wattmeter method of measuring power of 3 - phase star connected load with the help of necessary phasor diagram and circuit diagram.
3. Explain in detail the construction and principle of working of a three - phase Induction motor.
4. Write short notes on :
- i. MCB.
  - ii. Layout of LV Switchgear.
5. Two coils A and B having 1200 and 800 turns respectively are placed near to each other. 60% of the flux of each coil is linked with the other coil. A current of 5A in coil a produce a flux of 0.25 mWb while the same current in coil B produce a flux of 0.15 mWb. Determine the mutual inductance and coefficient of coupling between the two coils.