Code No.: EE204ES | R20 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) - March- 2023
BASIC ELECTRICAL ENGINEERING
(Common for CSM, ECE)

[Time: 3 Hours] **[Max. Marks: 70]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

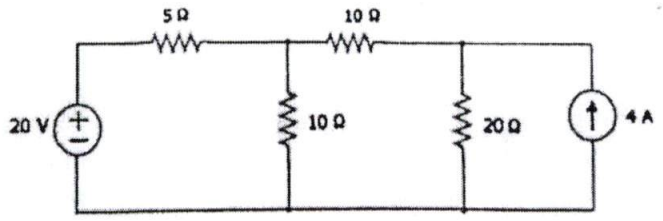
1. a) State and explain Ohm's law? [2M]
   b) Draw the V-I characteristics of ideal and practical voltage sources [2M]
   c) Define peak factor and form factor. [2M]
   d) Write the relationship between apparent power, true power and reactive power. [2M]
   e) Derive the EMF equation of 1-phase Transformer. [2M]
   f) Explain the operation of Auto Transformer. [2M]
   g) State Fleming's left hand rule. [2M]
   h) List out the applications of DC Shunt Motor. [2M]
   i) A 6-pole, 3-phase induction motor is connected to 50 Hz supply. If it is running at 960 rpm, find the slip. [2M]
   j) Draw Torque-Slip characteristics of 3-phase induction motor. [2M]

PART-B **(50 Marks)**

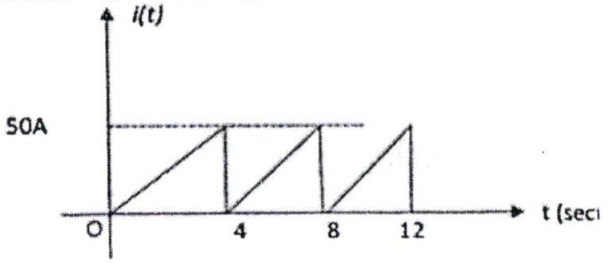
2. State and explain superposition theorem with example & write their limitations. [10M]

OR

3. Find the current flowing through 20 Ω resistor in the following circuit using Nodal analysis. [10M]



4. Calculate the form factor for the saw-tooth waveform shown in below figure. [10M]



OR

5. Derive the expression for RMS value and Average value of alternating current $I = I_m \sin\omega t$. [10M]

6. Determine the expression for EMF equation of single phase transformer. [10M]

OR

7. Draw and explain the different types of phasor diagrams of Transformer on loaded condition. [10M]

8. Derive the expression for EMF generated in a DC Generator. [10M]

OR

9. Describe the principle of operation of the DC Generator. What is back emf in DC motors and explain its effect. [10M]

10. A 3-Φ Induction motor is wound for 6 poles and is supplied from 50 Hz system. Calculate (i) the synchronous speed (ii) the speed of the motor when slip is 3% and (iii) the rotor current frequency when the motor runs at 800rpm. [10M]

OR

11. Explain working of three phase induction motor. [10M]

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