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

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
I–B.TECH–II–Semester End Examinations (Supply) - February- 2024
BASIC ELECTRICAL ENGINEERING
(Common for CSM, ECE, AI&DS)

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

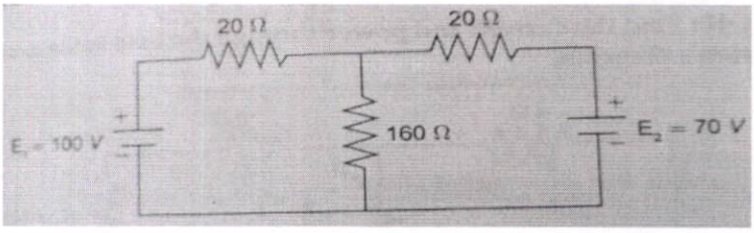
Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(20 Marks)**

1. a) State and Explain Kirchhoff's laws. [2M]
   b) State Thevenin's Theorem. [2M]
   c) Define: 1) Cycle 2) Amplitude of an alternating Quantity. [2M]
   d) Derive the expression for RMS Value. [2M]
   e) Draw equivalent circuit diagram of Transformer when quantities referred to primary. [2M]
   f) Define the Regulation of a transformer. [2M]
   g) Explain about types of losses in a DC Machine. [2M]
   h) Explain about back EMF. [2M]
   i) Write the differences between squirrel cage and slip ring induction motors. [2M]
   j) What are the applications of three-phase induction motor? [2M]

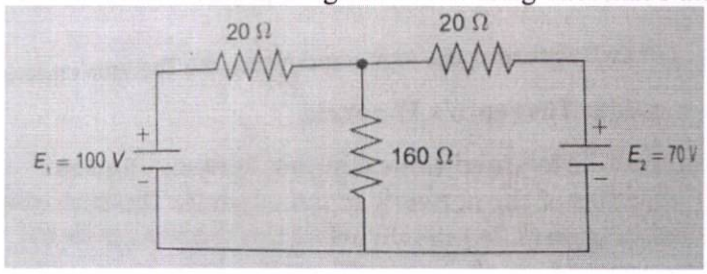
PART-B **(50 Marks)**

2. Find current in 160Ω in the given circuit using Norton's theorem. [10M]



OR

3. Find current in 160Ω in the given circuit using Thevenin's theorem. [10M]



4.a) Explain Single phase AC generation in detail. [5M]
   b) Write about Impedance triangle and Power Triangle. [5M]

OR

5. A series circuit consisting of 10 ohms resistor, 100 micro farad capacitance and 10 milli henry Inductance is driven by a 50hz AC voltage source of maximum value 110V. Calculate the equivalent impedance, current in the circuit, power factor. [10M]

6.a) Explain in detail Construction, Working Principle of operation of transformer. [5M]

b) Derive EMF Equation of Transformer. [5M]

OR

7. The no load current of a transformer is 5A at 0.3p.f. When supplied at 230V, 50Hz. The number of turns on the primary winding is 200. Calculate i) Max. Flux in the core ii) Magnetizing current. iii) Iron losses in the transformer. [10M]

8.a) With the help of a neat sketch, Explain the construction and working principle of a DC Generator. [5M]

b) A 6 pole lap wound DC Generator has 720 conductors, a flux of 40mWb per pole, is driven at 400 RPM. Find the generated EMF. [5M]

OR

9.a) A 4 pole lap wound DC shunt generator supplies 50 lamps of 100 watts, 200V each. The field and armature resistance are 50 Ohms and 0.2 Ohms respectively. Allowing a brush drop of 1V each brush, calculate the generated EMF [5M]

b) Draw the various characteristics of D C shunt motor. [5M]

10.a) Explain the working of a 3-phase induction motor with a neat sketch. [5M]

b) The stator of a 3-phase, 4 pole induction motor is connected to a 50Hz supply. The rotor runs at 1455 rev/min at full load. Determine (i) Synchronous speed and (ii) Slip at full load. [5M]

OR

11. Explain the construction and working of synchronous generator. [10M]

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