

**FACULTY OF ENGINEERING****B.E. (ECE/MECH/PROD/AE/AI&DS/AI&ML/IoT/IT) (AICTE) I – Semester****(Main & Backlog) Examinations, March / April 2022****Subject: Basic Electrical Engineering****Time: 3 Hours****Max. Marks: 70**

**Note:** (i) First question is compulsory and answer any four questions from the remaining six questions. Each Question carries 14 Marks.

(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.

(iii) Missing data, if any, may be suitably assumed.

1.

(a) State Kirchhoff's laws.

(b) What do you understand by 3-phase balanced circuit?

(c) Explain Faradays laws and Lenz's Law.

(d) Will the transformer draw any current from the source when secondary is open?

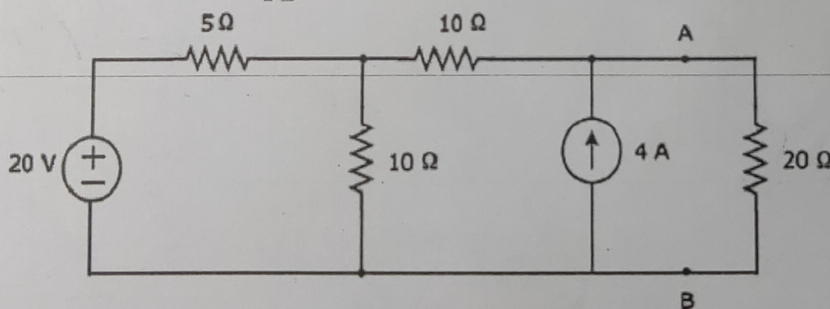
Explain why transformer rating is in KVA.

(e) Compare squirrel cage and slip ring three phase induction motors.

(f) A 4 pole 1200 rpm generator with lap winding armature has 65 slots and 12 conductors per slot and flux per pole is 0.02 webers. Calculate the emf induced in the armature.

(g) What are the disadvantages of Low Power Factor?

2. (a) Find the current flowing through  $20\ \Omega$  resistor by using Norton's Theorem.



(a) State and explain superposition theorems. What are the limitations of Superposition theorem?

3. (a) A series RLC circuit consisting of a resistance of  $20\Omega$ , an inductance of  $0.2\text{ H}$ , and a capacitance of  $150\text{ }\mu\text{F}$  is connected across a  $400\text{ V}$ ,  $50\text{ Hz}$  source. Calculate (a) impedance (b) current (c) voltage drops  $V_R$ ,  $V_L$  and  $V_C$  (d) power factor (e) average power.
- (b) Derive the Voltage and Current relations in Star and Delta connected systems.
4. (a) Explain in detail about the Ideal and Practical Transformer and draw its phasor diagrams.
- (b) Explain how rotating magnetic field is produced in three phase induction motor.
5. (a) Draw the internal and external characteristics of different types of DC generators and explain them.
- (b) Explain principle of operation of DC Motor and write the significance of back EMF in DC Motors.
6. (a) What are the different types of Batteries? State some of the important characteristics of Batteries.
- (b) What is MCB? What are the parts of MCB? Explain its operation.
7. Write a short notes on the following:
- (a) Auto Transformer
- (b) Capacitor Start and Capacitor Run Motor