



## B. Tech. – 1<sup>st</sup> Semester Assignment - II (6/7/2024)

**Course: - Basic Electrical Engineering**

**Section – B**

**Due Date of Submission: 20.7.2024**

*Note:*

*1) Attempt all questions.*

*2) Answer each question to the points and avoid unnecessary lengthy writing.*

Q. No.	Question	CO	BL	PI
1	Three capacitors, each 50 $\mu\text{F}$ , are connected in delta to a 400 V, 3-phase 50 Hz supply. What will be the capacitance of each capacitor such that when connected in star across the same supply, the line current remains the same?	CO3	L5	1.3.1
2	Three similar coils, connected in star, take a total power of 3 kW at a p.f. of 0.8 lagging from a 3-phase, 400 V, 50 Hz supply. Calculate the resistance and reactance of each coil.	CO3	L5	1.2.1
3	An iron ring has a mean diameter of 15 cm, a cross-section of 20 $\text{cm}^2$ and a radial gap of 0.5 mm cut in it. It is uniformly wound with 1500 turns of insulated wire and a magnetizing current of 1 A produces a flux of 1 mWb. Neglecting the effect of magnetic leakage and fringing, calculate (i) reluctance of the magnetic circuit, (ii) relative permeability of iron	CO3	L5	1.2.1
4	Compare the Electrical and Magnetic circuit by describing their similarities and dissimilarities.	CO3	L2	2.1.2
5	Derive the relation between line current and phase current for balanced delta connected load.	CO3	L1	1.1.1
6	Explain the working principle of ideal transformer by mentioning the assumptions made and define transformer ratio and turn ratio	CO4	L5	1.3.1
7	Draw the Phasor diagram of a practical single phase transformer at inductive load. Also explain steps for drawing above phasor diagram.	CO4	L1	1.1.2
8	List out 5 major difference between shell type and core type	CO4	L5	1.1.2
9	Derive the expression of emf induced in a transformer.	CO4	L5	1.1.2
10	A 25kVA, 50Hz, 2000/200V, single phase transformer has iron loss and full load copper loss of 350W and 400W respectively. Calculate the efficiency of the transformer at (i) full load with 0.8 pf lagging (ii) half full load at unity power factor.	CO4	L5	2.1.2
11	From construction point of view discuss the common features of rotating electrical machines.	CO5	L2	1.3.1
12	Deduce the expression for torque developed in a rotating machine.	CO5	L1	1.2.1
13	Derive an expression for the emf generated in rotating electrical machine	CO5	L2	1.1.1
14	Explain the principle of operation of single phase induction motor.	CO5	L1	2.1.2



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15	With the help of neat diagram explain capacitor-start single phase induction motor.	CO5	L2	1.2.1
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**CO – Course Outcomes**

**BL – Bloom's Taxonomy Levels**

(L1-Remembering, L2- Understanding, L3-Applying,

L4- Analysis, L5- Evaluating, L6-Creating)

**PI – Performance Indicator Code**

(Please See: <https://www.aicte-india.org/sites/default/files/ExaminationReforms.pdf>)