



15ELE15/25

Module-3

- 5 a. Prove that in a purely inductive circuit, the current lags the voltage by $\pi/2$ radius. (05 Marks)
b. Clearly differentiate between fuse and MCB. (05 Marks)
c. A parallel circuit comprise a 20Ω resistor in series with an inductive reactance of 15Ω in one branch and a 30Ω resistor in series with a capacitive reactance of 20Ω in the other branch. Determine the current and power dissipated in each branch if the total current drawn by the circuit is $10\angle -30^\circ$ A. (06 Marks)

OR

- 6 a. Define : i) Wave form ii) Frequency iii) Amplitude
iv) Form factor v) Peak factor. (05 Marks)
b. An AC current is given by $c = 10 \sin wt + 2 \sin wt + 2 \sin wt$. Find the rms value of the current. (05 Marks)
c. What is the necessity of Earthing? Explain plat Earthing. (06 Marks)

Module-4

- 7 a. What is a polyphase system? List the advantages of the polyphase system over single phase system. (05 Marks)
b. Obtain an expression for the frequency of the induced emf in an alternator. (05 Marks)
c. A balanced 3ph, Y connected load draws power from 440V supply. The two wattmeters connected to measure the input power reads 5KW and 1.2KW respectively, the latter being obtained after reversing the current coil. Calculate : i) Total power ii) Power factor iii) Current in the circuit. (06 Marks)

OR

- 8 a. Draw the power triangle for the 3 ϕ load obtain the relationship between phase and line values of current in a 3ph balanced delta connected system. (06 Marks)
b. A 3ph, 6pole, Y connected, AC generator rms at 1000rpm the stator has 90 slots and 8 conductors/slot the flux/pole is 0.05wb. Calculate the generated line voltage if the $K_w = 0.96$. (05 Marks)
c. There coils each of impedance $20\angle 60^\circ \Omega$ are connected in Y across a 3ph, 400V, 50Hz supply. Find the readings on each of the two wattmeters connected to measure the input power. (05 Marks)

Module-5

- 9 a. Explain what happens when a transformer is connected to a DC supply. Compare core type and shell type transformers. (05 Marks)
b. The primary winding of a transformer is connected to a 240V, 50Hz supply. If the maximum value of the flux in the cone is 0.00207Wbs, determine :
i) Secondary induced emf
ii) Number of turns in the primary
iii) Cross sectional area of the cone if the maximum flux density in the core is 0.465 tesla. (06 Marks)
c. Explain the working principle of 3 phase induction motor. (05 Marks)

OR

- 10 a. A 600KVA transformer has an efficiency of 92% both at full load and half full load, upf. Calculate its efficiency at 75% full load, 0.9pf. (06 Marks)
b. Explain why an induction motor needs starter is the neat sketch, explain star-delta starter for a 3 phase induction motor. (05 Marks)
c. If a 6 pole induction motor supplied from a 3ph, 50Hz supply has a rotor frequency of 2.3Hz, calculate the percentage slip and the speed. (05 Marks)