

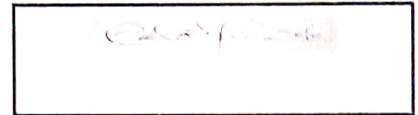


ELIZADE UNIVERSITY, ILARA-MOKIN,

FACULTY: Basic and Applied Sciences  
DEPARTMENT: Physical and Chemical Science  
FIRST SEMESTER EXAMINATIONS  
2018/2019 ACADEMIC SESSION

COURSE CODE: PHY 311  
COURSE TITLE: ELECTRIC CIRCUIT THEORY II  
DURATION: 2 HOURS

Instruction: Attempt any 4 of the 5 questions



### QUESTION ONE

- (a) Explain the following: (i) Impedance of the circuit (ii) admittance (iii) reactive power.
- (b) In a series circuit containing a pure resistance and a pure inductance, the current and voltage are as:  $i(t) = 5 \sin(216t + 2\pi/3)$  and  $v(t) = 15 \sin(216t + 5\pi/6)$ . Calculate (i) the impedance of the circuit (ii) the value of the resistance (iii) the power factor (iv) the average power drawn by the circuit.

### QUESTION TWO

- (a) In a given R-L circuit,  $R = 3.5\Omega$  and  $L = 0.4H$ . Find (i) current through the circuit (ii) power factor if an alternating voltage  $v = 220\sqrt{2}\sin(314t)$  having frequency 50Hz is applied across the circuit.
- (b) A series R-L-C circuit is connected to a 230V, 50Hz single phase ac supply. The value of  $R = 5\Omega$ ,  $L = 13mH$  and  $C = 140\mu f$ . Calculate (i) total reactance (ii) impedance (iii) current drawn by the circuit (iv) power factor of the circuit.

### QUESTION THREE

- (a) (i) Describe four advantages of three – phase system. (ii) With diagram, describe how the three-armature conductor in three-phase generator may be connected in star, and delta.
- (b) A delta connected balanced three-phase load is supplied from a three-phase, 350V supply. The line current is 25A and the total power taken by the load is 10000W. Calculate (i) impedance in each branch (ii) power factor (iii) total power consumed if the same load is connected in star.

### QUESTION FOUR

- (a) A balance three-phase star connected load of 210kw takes a leading current of 160A when connected across a symmetrical 1.1kv, 50Hz supply. Find the load circuit passive parameters per phase.
- (b) A two element series circuit is connected across an a.c source,  $v = 200\sqrt{2} \sin(314t + 20^\circ)V$ . The current in the circuit then is found to be  $I = 10\sqrt{2} \cos(314t - 25^\circ)A$ . Determine the parameters of the circuit.

### QUESTION FIVE

- (a) In a network of unbalanced impedance, what is balanced load? Hence, with diagram, differentiate between balanced and unbalanced load.
- (b) (i) With diagram, differentiate between symmetrical and asymmetrical  $\pi$ - section. (ii) The power input to a three-phase induction motor is read by two wattmeters. The readings 1000w and 350w respectively. Calculate the power factor of the motor.