**END SEMESTER/RETEST EXAMINATION ,2020**

**SEMESTER: 4th**

**SUBJECT CODE: EL-401**

**SUBJECT: ELECTRICAL CIRCUIT AND NETWORK**

**FULL MARKS : 70( PART A-25+ PART B-45)**

**DURATION: 3 hours**

**Questions on Part A are compulsory.**
**Answer any three questions from Part B.**

**PART A**
**MARK- 25**

1. **Fill in the blanks:** 1x15=15

a) Power factor of a resistive circuit is _____
b) Unit of capacitor is _____
c) At resonance a circuit becomes purely ____
d) For maximum power transfer load resistance should be equal to _____
e) Kirchoff voltage law is applied for _____ circuits.
f) Kirchoff current law states that incoming current is equal to _____ current.
g) In a 3 phase delta connection line current equals to ____.
h) In a bilateral circuit the circuit parameters are independent of _____ of current.
i) At series resonance _____ current flows in a circuit.
j) Time taken in seconds to complete one cycle of an alternating quantity is called ____
k) In a parallel circuit ____ is same for all resistances.
l) The value of j^2 is_____
m) Unit of inductive reactance is_____
n) Unit of admittance is _____
o) Reciprocal of resistance is called _____

2. **State whether true or false** 1x10=10

a) The ratio of real power by apparent power will give us power factor.
b) In Nortons theorem short circuit current flowing through the load resistance is required to found out.
c) Rate of change of charge is called current.
d) In a series circuit voltage is same across all resistances.
e) While applying superposition theorem we take one source at a time and deactivate the other sources.
f) In a resonance circuit inductive reactance is equal to capacitive reactance.
g) In a R-L circuit voltage lags current.
h) In a 3 phase star connection line voltage is equal to phase voltage.
i) The reciprocal of j is –j.

j) The ratio of rms value to average value of an alternating quantity is known as form factor.

## PART-B

**Answer any three questions.**

3 a) State and explain Kirchoffs laws. 5

b) A battery having an emf of 6 volt with internal resistance of 2 ohm is connected in parallel with a current source of 4 ampere. This combination is connected across a load resistance of 10 ohm. Find the current flowing through the load using superposition theorem. 10

4 a) The following phasors are given below: 6

X= 2+ 8j Y= 4+6j , perform the following functions:

i)X*Y ii) X/Y

b) A sinusoidal alternating voltage of 50 Hz has an rms value of 200 V. Write down the equation for instantaneous value. Find the value of voltage at 0.14 seconds. 9

3. a) draw an R-L circuit and R-C circuit and show vector diagram showing relation between voltage and current 6

b) deduce the expression for resonant frequency of an RLC circuit. 9

4 a) State maximum power theorem. 5

b) deduce the relationship that when load resistance is equal to the venins resistance then maximum power occurs in the load. 10

5. **Write short notes on any three:** 3x5=15

a) Bilateral and unilateral circuit
b) Superposition theorem
c) Active and passive network
d) Resonance in parallel circuit



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