PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech., Summer 2017 - 18 Examination

Semester: 1,2   Date: 19/05/2018
Subject Code: 03106101   Time: 2:00pm to 4:30pm
Subject Name: Fundamentals of Electrical Engineering   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Objective Type Questions - (All are compulsory) (Each of one mark)   **(15)**
    1. If supply frequency is increase, what is effect on X_L
      (A) Increase   (B) Decrease   (C) same   (D) All of above.
    2. Average Power of pure inductive circuit is ………….
      (A) Zero   (B) Unity   (C) Infinite   (D) None of these
    3. The resistivity of the conductor depends on
      (A) Area of the conductor.   (B) Length of the conductor.
      (C) Type of material.   (D) None of these.
    4. 1 F is theoretically equal to
      (A) 1 ohm of resistance   (B) ratio of 1 C to 1 V
      (C) ratio of 1 V to 1 C   (D) none of these
    5. Which quantity should be measured by the wattmeter?
      (A) Voltage   (B) Current   (C) Electrical Energy   (D) Power
    6. The Form factor value of sine wave is_____.
    7. For the RC series circuit the power factor is _____(Leading/Lagging).
    8. In three phase star connected balanced load, line voltage is equal to_____phase voltage.
    9. Magnetic flux SI unit is_____.
    10. For symmetrical wave form average value of one full cycle is_____.(Zero/One)
    11. What is Power factor?
    12. In series RL circuit R=10 Ω and X_L=10 Ω then, what is value of phase angle?
    13. Write a unit of resistivity.
    14. State Coulomb's first law of electrostatics.
    15. If the frequency is 50Hz what is time require completing one cycle?

Q.2 Answer the following questions. (Attempt any three)   **(15)**
    A) State and explain Kirchoff's voltage and current laws.
    B) Define the following; 1) Voltage 2) Current 3) Power 4) Energy 5) Frequency.
    C) Give the comparison between electric and magnetic circuit.
    D) Derive an expression for energy stored in capacitor.

Q.3 A) State and explain ohm's law. Derive the expression for the equivalent resistance of resistor **(07)**
    connected (i) in series (ii) in parallel.
    B) Explain the method of transforming a delta network of resistances into star network and vice **(08)**
    versa.

<div align="center">OR</div>

    B) Derive equation for charging of capacitor. Also define time constant of circuit.   **(08)**

Q.4 A) Explain series R-L circuit in brief. Draw phasor diagram and the wave forms of voltage, current **(07)**
    and instantaneous power.

<div align="center">OR</div>

    A) A R-C series circuit having Resistance R=5.77 Ω and reactance X_c=3.33 Ω is connected across **(07)**
    230 V, 50 Hz AC supply. Find (a) Current   (b) Power Factor   (c) Average power.
    B) Explain Two-wattmeter method to find power and power factor in 3ph Star connected load.   **(08)**