DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Summer [redacted] EXAMINATION - [redacted] May 2015

B. Tech Course in Electrical Engineering

SEMESTER - I

26 May 2015 Subject: Introduction to Electrical Engineering

Date: [redacted] Time:3 Hours Max. Marks : 70

INSTRUCTION TO CANDIDATES:

1. Attempt question No. 1
2. Attempt any five questions from the remaining
3. Assume suitable date mentioning clearly if necessary
4. Answer the questions in sequential manner

Q.No.1) **Any Five;** (10)

i) One unit of electric energy means _____

ii) Electrical materials are classified as_____ , _____ and _____ materials.

iii) The unit of mechanical power is_____ and torque is_____

iv) According to steimentz's law the hysteresis loss in a magnetic material is given by the expression _____

v) Transformer is _____ device and works on the principle of _____

vi) For a given load if reactive power is low , power factor will be_____

Q.No.2) (12)

a) Briefly discuss contribution of following scientist to the field of electrical engineering;
   iii. Fleming and the law introduced by him
   iv. Ampere

b) Explain with neat sketch working of solar water heating system

c) Explain with neat sketch working of solar photo voltaic system and its applications

Q.No.3 (12)

a) Obtain an expression for the equivalent resistance of network when it is connected in (i) series and (ii) Parallel

b) Establish relationship between;
   i. Horse power and kW
   ii. kW and kcalories

c) A bulb rated 110V, 60 w is connected with another bulb rated 110 V, 100 W across 220 V mains. Calculate the resistance which is required to be connected in parallel with the first bulb so that both the bulbs may take their rated power.

Q.No4) (12)

a) For a R-L-C series circuit Obtain an expression for resonating frequency. Hence draw resonance curve, define bandwidth and Q factor.
b) A series circuit consists of R=50 Ohm, L=0.1H and C=50μf connected across a single phase 230 V, 50Hz, supply. Calculate current drawn by the circuit , the p.f of circuit and its natue. Also calculate total power consumption and draw phasor diagram.
c) State active, reactive and apparent power. Draw the power triangle stating terms of significance.

Q.No.5 (12)

a) Show that the power supplied by star and delta connected three phase system remains the same
b) Compare the single phase and three phase system of power supply
c) There similar coils each of R=20 ohm, L=0.5H are connected (i) in star (ii) in delta to a three phase 400 V 50 Hz between lines. Calculate the line current and total power absorbed.

Q.No.6 (12)

a) Draw a neat sketch of an ideal magnetic circuit and define the six significant terms related to the circuit.
b) What is magnetic hystersis? Explain an experimental procedure for obtaining hysteresis loop and mark all points on it. (04)
c) A steel ring of 10 cm mean radius and of cross section 1 cm in radius has an air gap of 1mm length. It is wound uniformly with 500 turns carrying current of 3 Amp. Find the total reluctance if air gap takes 60% of total m.m.f.

Q.No.7 (12)

a) What is transformer? Explain construction and working of the single phase transformer, hence show that working flux always remains constant.
b) Name different types of conductors used for power transmission purpose with their properties.
c) Discuss different types of line supports used for power transmission along with their chief requirements.

Q.No.8 (12)

a) Name different soft wares used in engineering design.
b) Briefly discuss important features of MatLab for electrical engineering applications.