Evening
Date: 16/05/2016

Student Exam No:-_____

GANPAT UNIVERSITY
B.TECH SEM-I & II (ALL BRANCHES)
CBCS (NEW) REGULAR/REMEDIAL EXAMINATION APRIL-JUNE-2016
2EE101:-ELEMENTS OF ELECTRICAL ENGINEERING

Time: 3 Hours   Total Marks:-60

Instructions: (1) This Question paper has two sections. Attempt each section in separate answer book.
(2) Figures on right indicate marks.
(3) Be precise and to the point in answering the descriptive questions.
(4) Make suitable assumptions wherever necessary

SECTION-I

Que-1 (A) Derive the equation of transforming star connected network into delta connected network and vice versa. [05]

(B) Discuss voltage and current divider rule. [03]

(C) Explain the factors affecting the resistance of a conducting material. [02]

OR

Que-1 (A) Discuss self-inductance and mutual inductance. [04]

(B) With circuit diagram explain procedure to solve dc circuit using Thevenin's theorem. [04]

(C) Two electric bulbs of 100 W operate 4 hours per day. Calculate KWH per year. [02]

Que- 2 (A) Explain the charging phenomenon of a capacitor through a resistor. [04]

(B) Define capacitance. Derive expression for the capacitance of a parallel plate capacitor with partly air medium. [03]

(C) Discuss statistical and dynamically induced emf. [03]

OR

Que- 2 (A) Draw and explain B-H curve of magnetic material. [03]

(B) What is leakage co efficient? How does it affect magnetic circuit? what are its disadvantages. [03]

(C) Comparison between electric and magnetic circuit. [04]

Que-3 **Attempt the following questions.**

(A) Three capacitors having capacitances of 10 μF, 20 μF and 40 μF are connected in series to a 400 V d.c. source. Find (i) total capacitance (ii) total charge in circuit (iii) energy stored. [03]

(B) A coil having 600 turns is wound uniformly over an iron ring whose mean diameter is 41 cm. The relative permeability of iron is 1200. If a current of 3.2 A flows through the coil. Find the flux density. [03]

(C) Solve the following circuit using the superposition theorem. [04]
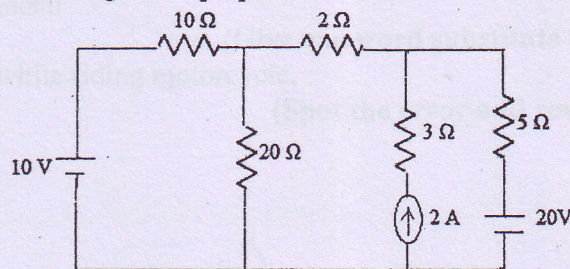
SECTION-II

Que-4 (A) Prove that the average power consumption in a pure inductive circuit is zero. **[04]**

(B) Define (a) frequency (b) phase (c) phase difference (d) time period (e) amplitude. **[03]**

(C) State the condition for parallel resonance and obtain equation for resonant frequency. **[03]**

OR

Que-4 (A) Draw phasor, vector and circuit diagram for series R-L, R-L and R-L-C circuit. **[04]**

(B) Draw and explain admittance triangle methods of parallel circuit. **[03]**

(C) Define r.m.s value and obtain the r.m.s. value for full-wave rectified waveform. **[03]**

Que- 5 (A) Explain two wattmeter method for 3-phase power measurement. **[04]**

(B) What is the relation between (a) line and phase voltages (b) line and phase current for star and delta systems? Derive these relation. **[04]**

(C) Discuss the disadvantage of low power factor. Write the methods for power factor improvement. **[02]**

OR

Que- 5 (A) What do you mean by tariff? Discuss the types of tariff. **[04]**

(B) Explain joule's law of electric heating and discuss thermal efficiency. **[03]**

(C) Discuss the requirement of good lightning. **[03]**

Que-6 **Attempt the following questions.**

(A) A balanced delta connected load of $60 \angle 30^0 \Omega$ per phase is connected across a 3-phase, 400 V, 50 Hz supply. Calculate the line current, power factor and power consumed. **[03]**

(B) A coil is connected to a 230V, 50Hz supply. The coil carries a current of 10 A and consume a power of 500 W. Find its resistance, inductance and impedance . **[03]**

(C) A 10 ohms resistor and 20 mH inductor are connected in series across a 230 V, 50Hz supply. Find the circuit impedance, current, active power, reactive power, apparent power and power factor. **[04]**

END OF PAPER
Best of Luck