



COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)
SHIVAJI NAGAR, PUNE - 411 005

END Semester Examination

(EE101) Basic Electrical Engineering TH

Course: B.Tech

Branch: Applied Science

Semester: Sem I

Year: 2014-2015

Max.Marks:60

Duration: 3 Hours Time:- 10.am to 1.00 pm

Date:27/11/2014

Instructions:

MIS No.

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1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of anything like stationery, calculator is not allowed.
5. Assume suitable data if necessary.
6. Write your MIS Number on Question Paper
7. All questions must be attempted sequentially 1 to 5
8. Sub-questions of each question must be attempted at one place.
9. All the symbols and notations carry their usual meaning unless otherwise stated.
10. Assume suitable data wherever necessary.

Q. 1	A	Determine the potential difference between X and Y in the network shown. Fig.1A	6
	B	Three 60 W, 120 V light bulbs are connected across a 120 V supply shown in Fig. 1B. Find (a) the voltage across each bulb, and (b) the total power dissipated in the three bulbs. Fig. 1B	6
Q. 2	A	Consider the circuit shown in Fig. 2A. Determine the voltage v across 3Ω resistor by applying the principle of superposition.	6

		<p style="text-align: center;">Fig. 2A</p>	
	B	<p>Determine the node voltages for the circuit shown in Figure-2B</p> <p style="text-align: center;">Figure-2B</p>	6
Q. 3	A	Two impedances $Z_1=(12+j15) \Omega$ and $Z_2=(8-j4) \Omega$ are connected in parallel. If the potential difference across this combination is $(230+j0) V$, calculate (a) the phasor current supplied to each branch and the total phasor current, (b) power consumed by each branch (c) power factor of each branch.	6
	B	A balanced three phase load of 3 kW at a power factor of 0.8 lagging is connected across a three phase supply. If the line current is 12.5 A, calculate the resistance and reactance in each branch of the star connected load.	6
Q. 4	A	A single phase, 150 kVA, 5000V/250V, 50 Hz transformer has the full load copper losses of 1.8 kW and core losses of 1.5 kW. Find (a) the efficiency at full rated kVA, with power factor of 0.8 lagging, (b) the efficiency at half the rated kVA, and unity power factor (c) the kVA load for maximum efficiency, if the full-load copper losses are 1800 W and core losses are 1500 W.	6
	B	<p>The magnetic circuit shown in Fig. below is made of iron having a square cross-section of 3 cm side. It has two parts A and B, with relative permeability of 1000 and 1200 respectively, separated by two air gaps, each 2 mm wide. Part B is wound with a total of 1000 turns of wire on the two side limbs and carries a current of 1 A. Calculate (i) reluctance of part A, (ii) reluctance of part B, (iii) the reluctance of the air gaps, (iv) the mmf, (v) total flux, and (vi) flux density.</p>	6
Q. 5	A	Draw and explain torque-speed characteristic of DC series motor. What are the applications of DC series motor?	3
	B	Write precisely the conditions to be met for a transformer to be called as 'ideal transformer'.	3
	C	With the help of neat diagram, explain the working of fluorescent lamp.	3
	D	What do you mean by electrical tariff? What are the different types of tariff? Which tariff is used for domestic consumers?	3