



EE101/EE201

USN	1	M	S						
-----	---	---	---	--	--	--	--	--	--

M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)

BANGALORE - 560 054

SEMESTER END EXAMINATIONS - JANUARY 2016

Course & Branch : **B.E.- Common to all branches**

Semester : **I/II**

Subject : **Basic Electrical Engineering**

Max. Marks : **100**

Subject Code : **EE101/EE201**

Duration : **3 Hrs**

Instructions to the Candidates:

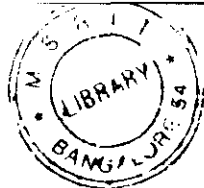
- Answer one full question from each unit.

UNIT - I

1. a) What is fuse ? Explain its advantages & disadvantages. CO3 (05)
b) Two batteries A and B are connected in parallel to supply a load resistance of 1.2 ohms . Draw the circuit arrangement . Calculate the current in the load and the current supplied by each battery if the emfs of A and B are 12.5 Volt and 12.8 Volt respectively. The internal resistance of A being 0.05 Ohms and that of b is 0.08 Ohms. CO1 (06)
c) Two resistors A and B are connected in n series across a constant of 100 volt supply . A voltmeter of resistance 10kilo Ohms reads 70 volt when connected across A and reads 20 Volt when connected across B. Find the values of A and B using KCL CO1 (06)
d) What are the limitations of Ohm's law. CO1 (03)
2. a) Compare electric and magnetic circuit. CO1 (04)
b) Obtain the expression for coefficient of coupling in terms of self inductance and mutual inductance for coupled coils. CO1 (06)
c) Two identical 1000 turns coils X & Y lie in parallel plains such that 60% of the magnetic flux produced by one links with another . A current of 5 amps in X produces a flux of 0.05 mWebers. if the current in X changes from +6 Amps to -6Amps in 0.01 seconds. What will be the magnitude of emf induced in Y. Find the self inductance of each coil and mutual inductance. CO1 (08)
d) State Lenz's law. CO3 (02)

UNIT - II

3. a) Prove that Average power consumed in pure capacitor is zero. CO2 (06)
b) An inductance coil connected in series with a resistance of 50 Ohms across 230 Volt, 50HZ A.C. Supply. The voltage across the coil is 180 V and across the resistance is 130 V. i) Calculate the resistance and inductance of the coil ii) Power dissipated in the coil iii) Draw the phasor diagram. CO2 (10)
c) Define the form factor and peak factor and write their value for a sinusoidal waveform. CO2 (04)



EE101/EE201

4. a) Two circuits of Impedances $Z_1=10+j15$ ohms and $Z_2=6+j8$ Ohms are connected in parallel. If the total current is 15 Amps what is the power taken by each branch. CO2 (07)
- b) Two coils A & B are connected in series across 240V, 50 Hz Supply. The resistance of the coil A is 5 Ohms and the inductance of the coil B is 0.015 H. The input active & reactive powers are 3Kw and 2 KVAR. Draw the Power triangle. Calculate the Inductance of the coil A and Resistance of the coil B. CO2 (08)
- c) Resistor R in series with capacitor C is connected to 50Hz, 240V supply. Find the value of C so that R absorbs 300Watts at 100V. CO2 (05)

UNIT - III

5. a) Explain how three phase power and power factor can be measured using Two wattmeters in a three phase balanced system. CO2 (08)
- b) The power of three phase inductive load on 400 Volts, 50 HZ supply was measured by wattmeters which read 3KW and -1KW. Find the i) power ii) p.f iii) Line current iv) impedance per phase if the load is delta connected. CO2 (07)
- c) List any five advantages of three phase systems. CO2 (05)
6. a) Explain the working principle of induction type energy meter with a neat sketch. CO3 (08)
- b) Two wattmeters are used to measure power input to a three phase balanced system. What is the Power Factor when i) both wattmeters reads equal ii) one of the wattmeters reads zero iii) one read twice the other. CO2 (06)
- c) A 500 volt three phase motor has output of 50 HP and operating at p.f of 0.85 with efficiency of 90%. Find the readings of the two wattmeters used to measure power. CO2 (06)

UNIT - IV

7. a) Explain with a neat sketch the constructional features of a D.C. Machine. CO4 (10)
- b) Derive the Torque equation of a D.C. Motor. CO4 (06)
- c) An 8 Pole lap connected armature driven at 350rpm is required to generate 260Volts. The useful flux/pole is 0.05Webers. If the armature has 120 slots, Calculate the suitable number of conductors/slot. CO4 (04)
8. a) Why D.C. Series Motor is considered as a variable speed motor. CO4 (04)
- b) Differentiate between Salient and Non salient Pole alternator. CO4 (04)
- c) Obtain the EMF equation of an Alternator with usual notations. CO4 (06)
- d) Find the number of armature conductors in series per phase required for the armature of a 3phase, 50HZ, 10pole alternator with 90 slots. The winding is to be star connected to give a line voltage of 11,000volts. The flux per pole is 0.16 webers. CO4 (06)

UNIT - V

9. a) Explain with a sketch the working principle of a transformer. CO4 (06)



EE101/EE201

- b) A 12 pole 3phase alternator is driven by 440Volts ,3 phase 6 pole CO4 (06)
Induction Motor running at a slip of 3%.Find the frequency of EMF
generated by the alternator.
- C) A single phase 2300/230 Volts ,2KVA transformer has full load copper CO4 (08)
loss of 100 watts and iron loss of 50 Watts .Calculate
i) The Efficiency of the transformer at half load at 0.6 p.f
ii) Load at which maximum efficiency occurs.
iii) Find maximum Efficiency at 0.9 p.f ,
10. a) Mention the merits and demerits of Squirrel cage and Slip ring Induction CO4 (08)
motors and mention its applications.
- b) In a 6 pole ,50 Hz 3phase Induction Motor running on full load the rotor CO4 (06)
EMF makes 90 completes Cycles/Minute, Find the Slip and full load
speed.
- c) Obtain the EMF equation of transformer with usual notations. CO4 (06)
