**R09**

B.Tech II Year I Semester (R09) Supplementary Examinations June 2017
## BASIC ELECTRICAL ENGINEERING
(Common to CSS, IT & CSE)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks
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1  (a)  Derive the equation for capacitance and hence give the equations for power and energy.
   (b)  Three inductance of 5H, 10H & 15H are connected in parallel and 2H & 4H are connected in series. Find the equivalent inductance of the circuit if the series combination is connected in series with the 10H inductance.

2  (a)  Derive the equivalent capacitance if the capacitors are connected in series.
   (b)  If 4H and 3H are connected in series and that combination is connected to 6H in parallel. Find the equivalent inductance of the circuit. Also find the total current if 30 V is applied across the circuit.

3  (a)  Derive the equation for power in an ac circuit.
   (b)  Derive the equation of impedance and power factor of RL series circuit.

4  (a)  Define voltage regulation of a transformer. Deduce the expression for the voltage   regulation.
   (b)  The numbers of turns on the primary and secondary windings of a single phase transformer are 350 and 35 respectively. If the primary is connected to a 2.2 KV 50 Hz supply, determine the secondary voltage.

5  (a)  Explain the characteristics of DC shunt generator.
   (b)  A 4 – pole compound generator supplies a load of 100 A at a terminal voltage of 400 V. Calculate the generated emf of the machine if the resistance of the armature is 0.02 ohm, the series field resistance is 0.04 ohm and the shunt field resistance is 160 ohm. Neglect the armature reaction.

6  (a)  Explain the generator action in the motor.
   (b)  The armature of a dc machine has a resistance of 0.15 ohm and is connected to a 200 V supply. If the armature current observed when it is acting as a motor is 40 A. Calculate the back emf generated by the armature. Also calculate the generated emf when it acts as generator giving 50 A.

7  (a)  Explain how the rotating magnetic field is developed in a 3-ø induction motor?
   (b)  A 6 pole, 3-ø induction motor runs at 960 rpm on full load when supplied from a 50 Hz supply. Determine the synchronous speed and slip at full load.

8     Explain the construction and working of Permanent Magnet Moving Coil instrument with neat diagram.

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B.Tech II Year I Semester (R15) Supplementary Examinations June 2017
**BASIC ELECTRICAL & ELECTRONICS ENGINEERING**
(Common to CSE & IT)

Time: 3 hours                                                                                    Max. Marks: 70

Answer all the questions
(Use single answer booklet only)
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## PART – A

UNIT – I

1  (a)  Define form factor and peak factor.
   (b)  An alternating current is given by $i = 707\sin(377t)$. Calculate average value, r.m.s value, peak factor and form factor.

**OR**

2  (a)  State Norton's theorem and explain with an example.
   (b)  Three resistors of 30 ohms, 15 ohms and 45 ohms are connected in delta. Find the value of resistors in an equivalent star connection.

UNIT – II

3  Explain the construction and principle of operation of DC generator with neat diagram.

**OR**

4  Describe the various methods of speed control of DC shunt motor and discuss their relative merits and demerits.

UNIT – III

5  (a)  Derive the EMF equation of a transformer.
   (b)  A transformer supplies a load of 32 A at 415 Volts. If the primary voltage is 3320 volts, find the primary current, primary volt-ampere and secondary volt-ampere.

**OR**

6  (a)  Explain the principle of working of three phase induction motor
   (b)  A 2-pole, three phase induction motor runs at 2910 r.p.m on a 50 Hz supply. Find slip and the frequency of rotor emf.

## PART – B

UNIT – I

7  Explain the working of a PN Junction diode and Zener diode and explain their V-I characteristics.

**OR**

8  Draw the circuit diagram and explain the operation of full wave rectifier. Obtain the expression for peak inverse voltage.

UNIT – II

9  Explain the input and output characteristics of a CE transistor configuration. List out the comparisons of CE, CB and CC configurations.

**OR**

10  Explain the operation of N-channel enhancement type MOSFET with the help of its characteristics.

UNIT – III

11  With a neat diagram, explain the construction and working of RC phase shift oscillator.

**OR**

12  With simple schematic of differential amplifier, explain the function of operational amplifier.

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