

**R09**

Code: 9A02306

B.Tech II Year I Semester (R09) Supplementary Examinations June 2017

**BASIC ELECTRICAL ENGINEERING**

(Common to CSS, IT &amp; 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- $\phi$  induction motor?  
(b) A 6 pole, 3- $\phi$  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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