

B.Tech I Year (R07) Supplementary Examinations, December 2010
BASIC ELECTRICAL ENGINEERING

(Common to Computer Science & Engineering, Information Technology and Computer Science & Systems Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
 All questions carry equal marks

1. (a) State ohms law. What are its limitations?
 (b) Derive an expression for the effective resistance of three resistors connected in series.
 (c) Derive an expression for the effective resistance of three resistors connected in parallel.
2. Explain the following terms
 - (a) Graph
 - (b) Tree
 - (c) Co-tree
 - (d) Oriented graph
 - (e) Sub graph
 - (f) Link
 - (g) Short circuit
 - (h) Open circuit.
3. (a) In a parallel magnetic circuit derive the expression of total mmf required.
 (b) An iron ring 100 sq.cm mean circumference and of cross sectional area 5 sq.cm has a saw cut of 2mm length. It is wound with 500 turns of wire. If 0.5mwb flux exists across the air gap, what will be the value of the exciting current? Take coefficient of leakage=1.26 and relative permeability of iron = 5 00.
4. (a) Explain the behaviour of AC through R-L-C Parallel circuit.
 (b) The applied voltage to an ac circuit is $v = 200\sin 314t$, and the current flowing is $i = 20\sin 314t$. Find the following
 - i. Peak values of voltage and current
 - ii. Frequency of the voltages and current
 - iii. Effective values of voltage and current
 - iv. The circuit element and its value
 - v. Power factor
 - vi. Draw the phasor diagram.
5. (a) State the relationships between the voltages and currents on primary side and secondary side of a single phase transformer.
 (b) A single phase transformer has 500 turns in primary and 1200 turns in secondary. The cross sectional area is 80 sq.cm. If the primary winding is connected to a 50Hz supply at 500V Calculate
 - i. Peak flux density
 - ii. Voltage induced in secondary.
6. (a) Based on the type of excitation classify the dc generators.
 (b) A 4 pole dc generator with a shunt field resistance of 100Ω and armature resistance of 1Ω has 378 wave connected conductors in its armature. The flux per pole is 0.02Wb. If a load resistance of 10Ω is connected across the Armature terminals and the generator is driven at 1000rpm, calculate the power absorbed by the load.
7. A 4-pole,50hz,three phase ,induction motor develops a maximum torque of 115 N-m at 1365 r.p.m. The resistance of the star-connected rotor is 0.2Ω /phase. Calculate the value of resistance that must be inserted in series with each rotor phase to produce a starting torque equal to half the maximum torque.
8. Classify different type of MI instruments and give one example each.
