

Code No: R05010501

R05

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech 1 Year Examinations, November/December – 2013

BASIC ELECTRICAL ENGINEERING

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 80

Answer any five questions
All questions carry equal marks

- 1.a) State and prove super position theorem.
- b) Find V_{ab} in the below circuit (shown in Figure.1).

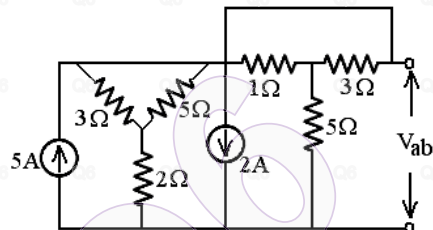


Figure.1

- c) What are the characteristics of Inductance? [5+8+3]
- 2.a) Explain the following terms in magnetic circuits:
 - i) Magneto-Motive force
 - ii) Reluctance
 - iii) Permeance.
- b) A coil of 2000 turns is wound uniformly over a Bakelite insulator ring having a mean circumference of 1 m and a uniform cross-section area of 0.05 cm^2 . If the current through the coil is 1 A, calculate
 - i) The mmf of the circuit,
 - ii) The magnetic field intensity,
 - iii) The flux density and
 - iv) The total flux.
 [8+8]
3. Find the:
 - i) rms value
 - ii) average value
 - iii) form factor
 - iv) peak factor of the wave form shown in below Figure.2
 [16]

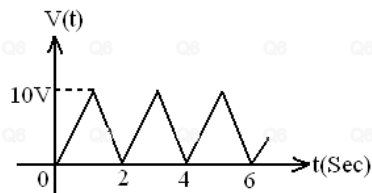


Figure.2

- 4.a) Explain Faraday's laws of electromagnetic induction.
- b) A current of 5A is reduced to 2A in 0.05 seconds in a coil of inductance 1.0H. Calculate the mean value of the EMF induced in the coil.
- c) State and explain KVL and KCL. [5+5+6]
- 5.a) Explain working principle of transformer with a neat diagram.
- b) A 25 KVA transformer has 500 turns on the primary and 50 turns on the secondary winding. The primary is connected to 3000 V, 50Hz supply. Find the full-load primary and secondary currents, the secondary e.m.f. and the maximum flux in the core. Neglect leakage drops and no load primary current. [8+8]
- 6.a) Explain the various types of dc motors with suitable diagrams showing the connection of field coils to armature.
- b) A 20kW, 200 V shunt generator has an armature resistance of 0.05Ω and a shunt field resistance of 200Ω . Calculate the power developed in the armature when it delivers rated output. [8+8]
- 7.a) Explain with neat sketches the principle operation of a synchronous machine.
- b) Explain the working principle of a three-phase induction motor. [8+8]
- 8.a) Discuss the classification of electrical instruments.
- b) Explain the significance of a controlling torque and damping torque relevant to the operation of indicating instruments. [8+8]
