

FACULTY OF ENGINEERING

B.E. 2/4 (M/P / CSE) II – Semester (Main) Examination, May 2013

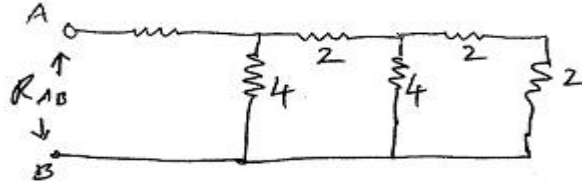
Subject: Electrical Circuits & Machines

Time: 3 Hours

Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.**PART – A (25 Marks)**

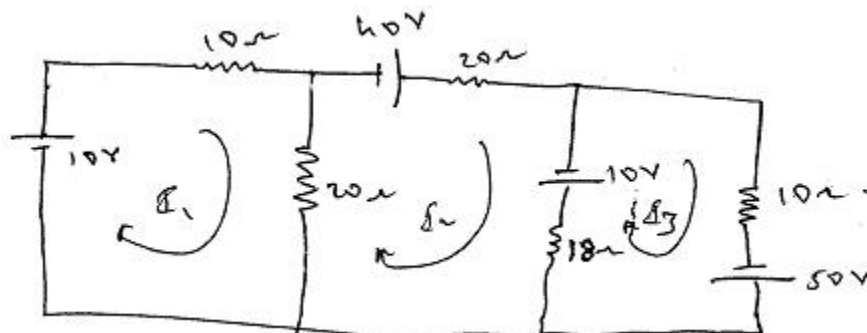
1. Define average and rms values of current. (3)
- 2.



- For the circuit shown above calculate equivalent resistance R_{AB} . (2)
3. What do you understand by 3-phase balanced circuit? (3)
 4. Define regulation of the transformer. (2)
 5. What is the function of back emf in a D.C. motor? Under what conditions it would be zero. (3)
 6. Mention different types of D.C. generators. (2)
 7. Mention various losses in a 3-phase induction motor. (2)
 8. Define slip and rotor current frequency. (3)
 9. How brushless D.C. motor is differ from conventional D.C. motor. (3)
 10. What is meant by slip in a 3-phase induction? (2)

PART – B (50 Marks)

- 11.(a) Derive the expression for energy stored in inductance. (5)
- (b)



- For the circuit shown above find I_1 , I_2 and I_3 using loop-current method. (5)
- 12.(a) From fundamentals obtain the equivalent circuit diagram of transformer. (6)
 - (b) Explain about autotransformer with necessary diagram. (4)
 13. Three similar coils, each of resistance 20Ω and inductance of 0.5 H are connected with (a) star (b) delta to a 3-phase, 50 Hz , 400 V supply. Calculate for the both cases phase and line currents, phase and line voltages, total power absorbed and p.f. Comment on power absorbed by circuit in star and delta connection. (10)

- 14.(a) Explain various speed control method of D.C. motor. (5)
(b) Derive emf equation of a D.C. machine. (5)
- 15.(a) Explain star-delta starting of 3-phase induction motor with neat schematic diagram. (5)
(b) Explain constructional details and principle operation of 3-phase induction motor. (5)
16. Explain the following motors with neat schematic diagrams.
a) Stepper motor
b) Capacitor start motors. (10)
- 17.(a) List out the applications of D.C. shunt and series motor. (4)
(b) Explain about any two:
Speed control methods of 3- ϕ induction motors. (6)
