

AU – 2510

Third Semester B. E. (Electronics and Telecommunication Engg.) Examination

ELECTRICAL DRIVES AND MEASUREMENT

Paper – 3 XT 04/3 XN 04

(USC – 10594)

P. Pages : 3

Time : Three Hours]

[Max. Marks : 80

- Note :** (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.
(2) Answer **Three** questions from Section A and **Three** questions from Section B.
(3) Due credit will be given to neatness and adequate dimensions.
(4) Assume suitable data wherever necessary.
(5) Illustrate your answer wherever necessary with the help of neat sketches.
(6) Use pen of Blue/Black ink/refill only for writing the answer book.

SECTION A

1. (a) Explain the principle of operation and working of Megger with diagram. 6
(b) Determine the insulation resistance of a short length cable in which voltage falls from 125 volts to 100 volts in 25 sec. The capacity of condenser is 600×10^{-12} f 7

OR

2. (a) Explain Maxwell's bridge with phasor diagram. 6
(b) Hays bridge has $R_2 = R_3 = 1000 \Omega$, $R_4 = 8120 \Omega$, $C_4 = 980$ pF and frequency is 400 Hz. Calculate R_1 and L_1 . 7
3. (a) Explain how three phase power can be measured with the help of two wattmeters for a balanced star connected load. 6

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- (b) The total power drawn by a 3 phase system is 1500 watt measured by two Wattmeter method, if
- (i) p. f. is unity, find W_1 and W_2
 - (ii) p. f. is 0.5 lag, find W_1 and W_2
 - (iii) p. f. is zero, find W_1 and W_2 7

OR

4. (a) Explain digital energy meter with neat block diagram. 6
- (b) Write short note on errors in Wattmeter. 7
5. (a) A 250 volt shunt motor with armature resistance of 0.5Ω runs at 600 rpm on full load and takes an armature current of 20 A. If the resistance of 1Ω is placed in the armature circuit, find the speed at
- (i) Full load torque
 - (ii) Half load torque. 7
- (b) Explain Speed control of D. C. Shunt motor with relevant diagrams. 7

OR

6. (a) Draw and explain the electrical characteristics of D. C. shunt and D. C. series motor. 7
- (b) What do you understand by "electrical braking" ? Explain any one method of D. C. motor braking with neat sketch. 7

SECTION B

7. (a) Explain resistance braking and regenerative Braking in 3-phase induction motor. 7
- (b) Draw and explain the Torque-slip characteristic of 3-phase induction motor, with its stable and unstable region. 7

OR

8. (a) Derive an equation of starting torque of 3-phase induction motor. 7
(b) A 3-phase, 400 V induction motor is wound for 4 poles and is supplied from 50 Hz supply. Calculate N_s and speed of motor N when slip is 4%. 7
9. (a) Explain open-delta connection of 3-phase Transformer and prove that its VA rating is 58% of Δ - Δ rating. 6
(b) Explain briefly the following three phase Transformer connections :
(i) Star/Delta
(ii) Delta/Star
(iii) Star/Star. 7

OR

10. (a) Explain Scott connection for transformer in detail. 6
(b) A small industrial plant draws an average load of 122 A at 0.73 pF, lagging from the secondaries of its 2300/204 V, 60 kVA, Y - Δ Transformer bank. Find :
(i) The power used by the plant in KW
(ii) The total KVA used
(iii) The rated line current available from the transformer bank. 7
11. (a) Explain the construction, characteristic's and principle of working of universal motor. 7
(b) Explain in detail, split phase induction motor with phasor diagram. 6

OR

12. (a) Write a short note on A. C. servo motor. 6
(b) Explain briefly D. C. Tachogenerator. 7

