BTS -III-11.17-1453 Reg. No. | | | | | | | | |

A

B. Tech. Degree III Semester Examination November 2017

IT/ME 1302 ELECTRICAL TECHNOLOGY

(2012 Scheme)

Time: 3 Hours Maximum Marks: 100

PART A

(Answer *ALL* questions) (8 × 5 = 40)

I. (a) Derive the emf equation of a transformer.
(b) Distinguish distribution and power transformers.
(c) Explain the types of dc generators.
(d) Describe the speed control of dc motors.
(e) Explain synchronous capacitor.
(f) What are the losses occurring in induction machines? Explain with power flow diagram.
(g) Explain the factors for the selection of site for hydro-electric stations.
(h) Explain corona and skin effect.

PART B

(4 × 15 = 60)

II. (a) Explain the working principle of a transformer. (5)
(b) Explain the various losses occurring in a transformer. (5)
(c) Explain open circuit and short circuit test in transformers. (5)

OR

III. Test results on a 1ϕ, 50 Hz, 115/230 V, 3 kVA transformer is as follows. (15)

O C Test	:	115 V	0.40 A	50 W
S C Test	:	23 V	13.04 A	200 W

Calculate (i) Equivalent circuit referred to HV side.
(ii) Efficiency of the transformer at half load, 0.8 pf lagging.

IV. Explain the constructional details of DC machines, with neat diagram. (15)

OR

V. (a) What is meant by armature reaction in DC machines? (5)
(b) What are the losses occurring in DC machines? (5)
(c) A 220 V DC shunt motor has $R_a = 0.2\Omega$ and $R_{sh} = 110\Omega$. The motor draws 5 A at 1500 rpm at no load. Calculate the speed, if the motor draws 52 A at rated voltage. (5)

VI. (a) Explain the types of alternators. (5)

(b) A given 3 MVA, 50 Hz, 11 kV, 3ϕ, Y – connected alternator when supplying 100 A at zero power factor leading has a line-to-line voltage of 12370 V. When the load is removed, the terminal voltage falls down to 11000 V. Assume an effective resistance of 0.4 Ω per phase. Using EMF method, find the voltage regulation of the alternator when supplying full load at 0.8 pf lagging. (10)

OR

(P.T.O.)

VII. (a) Explain the working principle of induction motors. (5)

(b) The power input to a 500 V, 50 Hz, 6-pole, 3ϕ induction motor running at 975 rpm is 40 kW. The stator losses are 1 kW and the friction and windage losses total 2 kW. (10)

Calculate (i) slip (ii) rotor copper loss
(iii) shaft power (iv) the efficiency.

VIII. Explain in detail about hydro-electric power stations. (15)

OR

IX. Explain the following. (15)

(i) Electrical equipments in power stations.
(ii) Methods of transmission.
(iii) Substation.

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