

Code No: 07A3EC19

R07**Set No. 2**

II B.Tech I Semester Examinations, May 2011

ELECTRICAL ENGINEERING

Common to Chemical Engineering, Metallurgy And Material Technology

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions

All Questions carry equal marks

1. (a) Which part of the DC machine offers iron losses? How do you minimize them.
(b) Draw the Speed - Torque characteristics of differential compound and Cumulative compound motors. [8+8]
2. (a) What is chording factor? Discuss its role on the performance of the alternator.
(b) Distinguish between salient pole and cylindrical rotor synchronous generator. [8+8]
3. A 4 KVA, 200/400V, 50Hz single phase transformer gave the following test results:
No-load : Low voltage data : 200V, 0.7A, 60W
Short Circuit : High voltage data : 9V, 6A, 21.6W
Calculate:
(a) the magnetizing current and the component corresponding to iron loss at normal frequency and voltage
(b) the efficiency on full load at unity power factor
(c) the secondary terminal voltage on full load at power factors of unity, 0.8 lagging and 0.8 leading. [16]
4. (a) What are Kirchhoff's Laws? Prove these laws with the help of suitable circuits.
(b) What are the limitations of Kirchhoff's Laws. [8+8]
5. (a) Derive the expression for the torque under running conditions.
(b) A 3- ϕ , 50 Hz, 8 pole induction motor has full load slip of 2%. The rotor resistance and stand still rotor reactance per phase are 0.01 Ω and 0.05 Ω respectively. Find the ratio of maximum to full load torque and the speed at which the maximum torque occurs. [8+8]
6. (a) Explain the difference between the excitation system of a DC shunt generator and that of a DC series generator?
(b) What do you mean by self excitation mode of DC machine? Discuss the merits and demerits of self excitation over separately excitation. [8+8]
7. Why is controlling torque necessary in analog indicating instruments? What happens in the absence of controlling torque? [16]
8. (a) A 400 V balanced three phase supply is connected to a star connected load of 900 Watts at a power factor of 0.9 leading. Calculate the line current and per phase load impedance.

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- (b) A balanced load of $10 + j 5$ ohm per phase is connected to the three phase 230 Volt supply. Find the line current, power and power factor. [8+8]

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R07**Set No. 4**

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- (b) A balanced load of $10 + j 5$ ohm per phase is connected to the three phase 230 Volt supply. Find the line current, power and power factor. [8+8]

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8. (a) What is chording factor? Discuss its role on the performance of the alternator.
(b) Distinguish between salient pole and cylindrical rotor synchronous generator.

[8+8]

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R07**Set No. 3**

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