FirstRanker.com
Firstranker's choice
www.FirstRanker.com www.FirstRanker.com

Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. Electronics Engg (E-1 2012 Onwards) (Sem.–6)

ELECTRICAL MACHINE DESIGN

Subject Code : BTEEE-603A

Paper ID : [72842]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly:

a. Why flux density in rotor teeth is more compared to average flux density in a dc machine?

b. State the advantages of lap winding in a dc machine.

c. Define commutation in a dc machine.

d. In high voltage dc machines we should use small value of electric loading—justify.

e. Which types of windings are used in core and shell type transformer?

f. What is the function of breather in transformer?

g. Define specific loading of electrical machine.

h. Write output equation of dc machine.

i. What is peripheral speed of rotating machine?

j. What do you mean by closed and open type windings?

www.FirstRanker.com

www.FirstRanker.com

FirstRanker.com
Firstranker's choice
www.FirstRanker.com www.FirstRanker.com

SECTION-B

2. What are the design considerations taken to effectively bring down the temperature rise of a transformer?

3. Discuss the type of windings used in core type and shell type transformers.

4. Discuss the major factors for optimum design of a transformer. Derive the condition for design of minimum cost in a transformer.

5. Prove that power developed by the armature of a dc machine is proportional to specific magnetic loading, specific electric loading.

6. Discuss the factors affecting size of a dc machine.

SECTION-C

7. Determine the core dimensions, number of stator slots, number of stator conductors for a 11 KW, 460V, 3-Ph, 6 pole, 50 Hz. Motor. Assume winding factor 0.955, full load efficiency 0.84, power factor 0.82. For the machine B_{av} = 0.36 Wb/ $m^{2'}$ ac = 23000 A/m. Output coefficient C_o= 87.2, L/τ = 0.815.

8. Calculate the approximate overall dimensions for a 300 KVA, 6000/440V, 50 Hz. 3-Ph core type transformer. E_t = 10V, B_m = 1.3 Wb/ m^2, δ = 2.5 A/ m^2, K_w = 0.3, Overall height = overall width, stacking factor 0.9. Use a 3-stepped core.

9. Find the main dimensions of a 2500KVA, 187.5 RPM, 50Hz, 3-phase, 3 KV, salient pole synchronous generator. The generator is to be a vertical water wheel type. The specific magnetic loading is 0.6 Wb/ m^2 and the specific electric loading is 34000 A/m. Use circular poles with ratio of core length to pole pitch = 0.65. Specify the type of pole construction used if the run-away speed is about 2 times the normal speed.

www.FirstRanker.com

www.FirstRanker.com