Printed Pages : 2 **Roll No.** | | | | | | | | | | | **EEE023**

B. TECH.
THEORY EXAMINATION (SEM–VI) 2016-17
CONVENTIONAL & CAD OF ELECTRICAL MACHINES

Time : 3 Hours ***Max. Marks : 100***

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION-A

1 Explain the following: **(10×2=20)**

a) What are the limitations in designing of machines?
b) Write output design equation of core and yoke of a transformer.
c) What is specific electrical loading?
d) Give classification of insulating materials.
e) Write down the factors affecting the size of rotating machines.
f) Give basic difference between single layer and two layer winding.
g) Define standardization.
h) Write down the advantages and limitations of computer aided design.
i) Define electrical specific loading
j) Define dielectric losses.

SECTION-B

2 Attempt any five of the following: **(10×5=50)**

a) Explain the method of determination of full load mmf for a salient pole synchronous generator.
b) Discuss an arrangement of low voltage and high voltage winding on core of 3-phase core type and 3-phase shell type transformers.
c) Show that electrical specific loading of a rotating machine is constant provided that current density, ratio of conductor to slot area, ratio of slot width to the slot pitch and the slot depth area are constant.
d) Explain continuous rating, short time rating and intermittent rating with reference to electrical machines.
e) Derive the output equation for a 3-phhase shell type transformer. State the assumption made. Explain why stepped ore is used in transformers.
f) What is dielectric loss, loss angle and power factor? Explain with the help of equivalent circuit and phasor diagram.
g) (i) What are the desired properties of magnetic materials used in electrical machines?
(ii) What is the effect of class of insulating materials used in electrical machines?
h) Explain Simpson's rule to find out the ampere/turn/m in teeth of the electrical machines.

SECTION-C

Attempt any two of the following: **(15×2=30)**

3 Draw a flow chart and make a program to determine main dimensions, stator slots, conductor per slot, and winding details of a three-phase alternator. Mention the input data required in the programme.

4 Design the stator frame for a 500 KVA, 6600 V, 50 Hz, 12-pole, star connected, three phase salient pole alternator, giving the following information:
(i) Internal diameter and gross lengths of stator frame.

(ii) Number of stator conductors.
(iii) Number of stator slots
Specific magnetic loading = 0.6 tesla
Specific electric loading = 26000 ampere conductor per meter
Assume other data needed if any.

5 (i) What is gap expansion factor? How does it affect the calculation of ampere turns of air gap of induction motor?
(ii) What changes would you suggest in the design of a 3 phase squirrel cage induction motor to achieve increased starting torque?