www.aktuonline.com

Printed pages: 02 Sub Code:NEE023

Paper Id: 120620 Roll No: | | | | | | | | | | |

B.TECH.

(SEM–VI) EVEN SEM.THEORY EXAMINATION, 2017-18
COVENTIONAL & CAD OF ELECTRICAL MACHINE

Time: 3 Hours *Max. Marks: 100*

SECTION – A

1. Attempt all parts of the following. (10*2=20)

(a) Explain hybrid method of computer aided design**.**
(b) Discuss philosophy of computer aided design.
(c) What do you mean by "SPECIFIC ELECTRIC" and "MAGNETIC LOADING" of rotating machines**?**
(d) What do you mean by "INSULATING MATERIALS"? What are the properties associated with insulatingmaterials?
(e) Explain the working principal of 3-Φ induction motor with diagram.
(f) Explain leakage reactance in 3-Φ core type transformer**.**
(g) Explain the different type rotor used in a synchronous generator with suitable diagram.
(h) Write advantage and limitation of computer aided design**.**
(i) Explain the eddy current loss and hysteresis loss in a transformer. Write their equations.
(j) Explain different type magnetic materials with examples**.**

SECTION – B

2. Attempt any three parts of the following: (5*10=50)

(a) Explain the power developed by the armature (P_a) in a dc machine and show that:
(i) $P_a = P/ή$ (ii) $P_a = P\ \{(1+2\ ή)/3\ ή\}$
Where P= output power and ή efficiency
(b) What do you mean by "INSULATING MATERIALS"? What are the properties associated with insulating materials? Enlist any five applications of insulating materials. Write different type of insulating materials**.**
(c) Show that the output equation for a 3-phase core type transformer is given as:

$$Q = 3.33 f B_m Kw Ai \times 10^{-3} kVA$$

(d) Discuss an arrangement of low voltage and high voltage winding on core of 3-phase core type and 3-phase shell type transformers.
(e) What is dielectric loss, loss angle and power factor? Explain with the help of equivalent circuit and phasor diagram.
(f) Write short notes on the following:
i. Concept of Optimization and its general procedure.
ii. Computer aided design approaches analysis.

www.aktuonline.com
http://www.aktuonline.com

www.aktuonline.com

(g) Explain Simpson's rule to find out the ampere/turn/m in teeth of the electrical machines.

(h) Explain continuous rating, short time rating and intermittent rating with reference to electrical machines.

SECTION – C

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

3. (a) Draw the flow chart and make a program to determine main dimensions stator slot, conductor per slot and winding details of three phase alternator.

(b) Estimate the main core dimensions, the number of turns in the two windings and the conductor sections in a 25 kVA 3-phase, 6600/400 volts, delta/star, 50 Hz, core type. Transformer with the following data

Stepped core for which area factor = 0.56,

Space factor for window = 0.25, volt per turn = 2.1V

Current density = 2.36 A/mm^2 Maximum Flux density = 1.1 Tesla**.**

4. (a) Explain the following in details.

(i) Explain the different type cooling and ventilation of electric machine with suitable diagram.

(ii) Derive the equation for total MMF for a magnetic circuit.

(b) Explain the method of determination of full load mmf for a salient pole synchronous generator.

5. (a) Derive the output equation for 3 phase induction motor.

(b) Calculate the main dimensions, turn per phase and number of slots, conductor cross-section and slot Area of 250-h.p.

6. What is gap expansion factor? How does it affect the calculation of ampere turns of air gap of induction motor?

www.aktuonline.com

http://www.aktuonline.com

www.aktuonline.com

17.05.18 EVENING CORRECTION

NEE023

KINDLY READ Q.2 AS

Section B

Q.2. Attempt ANY FIVE

www.aktuonline.com

http://www.aktuonline.com