

**GANPAT UNIVERSITY**  
**B.TECH SEM-III (MARINE)**  
**REGULAR EXAMINATION NOV-DEC 2013**  
**2MR305 - ELECTRICAL MACHINES**

TIME:-3 HOURS

TOTAL MARKS-70

- INSTRUCTION:-
1. Attempt all questions.
  2. Make suitable assumptions wherever necessary.
  3. Figures to the right indicate full marks.

## Section-I

- Que-1 (a) Draw the typical power supply A.C. scheme. (06)  
 (b) Compare the DC and AC transmission system by their advantages and disadvantages. (06)

## OR

- Que-1 (a) Derive the equation of required volume of the conductor for 1- $\Phi$  two wire and 1- $\Phi$  three wire AC overhead system. (06)  
 (b) Explain radial system and primary distribution system. (06)

- Que-2 (a) List out the types of DC distributors? Explain the Distributor fed at one end and Distributor fed at both ends (06)  
 (b) Derive the E.M.F. equation of the transformer. (05)

## OR

- Que-2 (a) Classification of distribution system. (06)  
 (b) Explain transformer on load condition with necessary phasor diagram. (05)

- Que-3 **Attempt any three.** (12)  
 (a) Explain current transformer.  
 (b) Explain oil circuit breaker.  
 (c) Derive the condition for maximum efficiency of the transformer.  
 (d) Explain open circuit test for the transformer.

## Section-II

- Que-4 (a) What is fuse? Need of fuse? Write down advantages and disadvantages of the fuse. (06)  
 (b) Derive the equation for equivalent circuit for transformer with necessary circuit diagram. (06)

## OR

- Que-4 (a) Explain autotransformer. (06)  
 (b) Compare the core and shell type transformer. (06)

- Que-5 (a) Explain methods of speed control of DC Series motor. (06)  
 (b) A Shunt generator delivers 450 A at 230 V. & the resistance of shunt field & armature are 50  $\Omega$  & 0.03  $\Omega$  respectively. Calculate the generated emf. (05)



OR

- Que-5 (a) Draw and Explain internal & external characteristics of DC shunt Generator. (06)  
(b) A 250V, 4-pole, wave wound d.c. series motor has 782 conductors. It has (05)  
armature and series field resistance of  $0.75\Omega$ . It takes current of 40A.  
Calculate it's speed and gross torque developed, if flux per pole is 25mwb.

- Que-6 Attempt any three. (12)  
(a) Derive the emf equation of dc generator for lap and wave winding.  
(b) Sketch and explain the speed-current, speed-torque, and torque-current characteristics of a dc series motor.  
(c) Explain Armature Reaction in D.C Machine.  
(d) Condition for maximum efficiency of dc generator.

-----END OF PAPER-----

Best of Luck