Indian Maritime University

(A Central Uaniversity, Govt of India)

Supplementary Examinations – March/April 2025

Programme Name: B Tech (Marine Engineering)

Semester: V

Subject Code: UG11T4508

Subject Name: Marine Electrical Motors: Starters & Drive Controls

Date: 21.04.2025	Max Marks: 70
Duration: 03 Hrs	Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted.
(ii) Options, if any, are specified in respective section.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable. (10x1=10 Marks)

1. Which of the following motors, on removal of load, will run at the highest speed?
A) Shunt motor
B) Series motor
C) Differential compound motor
D) Cumulative compound motor

2.What is the reason for Skew Slot in a rotor of a three-phase induction motor?
A) reducing magnetic humming
B) decrease slot harmonics
C) avoid the locking tendency
D) All of these

3. What is the difference between an overload and a short circuit?
A) An overload involves gradual current increase, while a short circuit is a sudden surge.
B) An overload occurs in faulty equipment, while a short circuit happens outside equipment.
C) An overload causes overheating, while a short circuit results in sparking.
D) All of the above.

4. In servomechanism, feedback control system used to control which of the below?
A)Position
B)Velocity

C) Acceleration
D)All of the above

5. The oscillations in a synchronous motor can be damped out by?
A) maintaining constant excitation
B) running the motor on leading power factors
C) providing damper bars in the rotor pole faces
D) oscillations cannot be damped

6. Windings of star-delta starter while starting and during running are connected in
A) Star, delta
B) Delta, delta
C) Star, star
D) Delta, star

7. Which is the following is not used for making variable frequency design drives?
A) Phase controller
B) Pulse-width modulation
C) Controlled Current source
D)Frequency controller

8. What is the remedy for damaged motor bearing
A) Wash it
B) Grease it
C) Repair it
D) Replace it

9.Advantage of preventive maintenance are
A) It reduces the breakdown to minimum
B) It increases the life of machine
C) It reduces the efficiency of the machine
D) More standby equipment is needed

10. The starting torque of a three-phase induction motor can be increased by
A) increasing slip
B) increasing current
C) both (a) and (b)
D) none of the above

Section B

Five Questions of 02 Marks each (5x2=10)

11. Why Starter Panel Routines and Maintenance are Important?
12. What are the main components of DC servomotor?
13. What is the effect of variation in frequency on ac motor?
14. State factors determining the speed of dc motor.
15. What are the most common causes of failure insulations in electrical motors.

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered. (5x10=50)

16. a) Explain the difference between the following motor enclosure, describing how cooling is achieved in each case: a) Drip-proof b) totally enclosed c) flameproof. [6]

    b) Describe in brief information displayed on motor nameplate. [4]

17. a) Draw & Explain Star Delta method of starting in ac motors. [5]

    b) With equivalent circuit diagrams and equations describe types of DC compound motor. [5]

18. a) Draw & explain the principle of a thermal relay, including the means of its adjustment. [5]

    b) Explain single phasing in electrical motors. What are the causes and effects? [5]

19. a) Describe any 2 electrical braking methods of 3 phase induction motor. [5]

    b) Describe the principle of Ward-Leonard drive with suitable diagram. [5]

20. Describe the application of two-phase ac servomotor, explaining how its characteristics can be varied. [10]

21. a) With suitable diagram describe Why Synchronous motor is not self-starting motor. [5]

    b] With suitable diagram describe why Synchronous motor is called Synchronous condenser. [5]

22. a) Describe the maintenance procedure and the major focus areas for starter. [5]

    b) Give a brief procedure for motor overhauling. [5]