Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – December 2023

Programme Name: B Tech(ME)

Semester: IV

Subject Code: UG11T4405

Subject Name: Electro Technology

Date: 24.11.2023	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.

1. The output voltage of a 440 volt, 60 hertz, AC generator is controlled by the
   a. prime mover speed
   b. exciter output voltage
   c. load on the alternator
   d. number of poles
2. The number of cells in a 12 volt lead-acid battery is
   a. three cells
   b. four cells
   c. six cells
   d. twelve cells
3. A semiconductor that decreases in resistance with an increase in temperature is known as a
   a. resistor
   b. thermistor
   c. diode
   d. thyristor
4. Any electric motor can be constructed to be
   a. short proof
   b. ground proof
   c. explosion proof
   d. overload proof
5. Electrical leads and insulation on a motor should be painted with

a. heat-resisting acrylic
b. heat-resisting aluminium
c. insulating varnish
d. insulating white lead

6. _____ batteries can be discharged 100%, considered as very deep cycle batteries and used in tropical areas
a. Gel cell battery
b. Lead acid battery
c. Lithium battery
d. AGM battery

7. when this step is taken 'Open the shore supply breaker at the main switchboard'
a. when shore supply connected to vessel
b. when shore supply needs to be disconnected
c. when main supply needs to be disconnected
d. when emergency supply needs to be connected

8. The error in _____ of incoming machine is compared with bus-bar is shown by the rate at which the lamps darken or brighten.
a. phase sequence
b. voltage value
c. frequency

9. Analog Megger is used for insulation resistance measurement has scale given as
a. zero to some megaohm value
b. zero to infinity
c. infinity to some megaohm value
d. infinity to zero

10. An electric tachometer receives the engine speed signal from a
a. small generator mounted on the engine
b. bimetallic sensing device
c. stroboscopic sensing device
d. vibrating reed meter generating a voltage proportionate to engine speed

Section B

Five Questions of 02 Marks each

11. Define the terms Insulation resistance and dielectric strength.

12. If synchroscope fails, then which method will be used for paralleling of an alternators?

13. What is the role of deck winch on the ship? Classify them.

14. Can main power supply run parallel with emergency power supply? Explain your answer.

15. What is lamp efficacy?

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

16. a) Explain protection provided on motors against temperature rise? [5]
b) Which are different types of fuses used on ship. Describe the procedure for replacing an open fuse? [5]

17. a) What is isolated neutral system? Give its advantages and disadvantages [5]

b) Explain kW and kVAR load sharing of two alternators running parallelly? [5]

18. a) Draw a circuit diagram of 8 number of batteries each 12V, 100mA specified must be arranged in series-parallel to obtain following results;
i. 48V, 200mA, ii. 12V, 800mA. [5]
b) Write a note on navigational lighting. [5]

19. a) List down how system restarts after blackout? [6]
b) What protection is provided against short circuits and small overloads for low voltage systems? [4]

20. a) Explain construction of cable with suitable diagram. Explain different layers of insulation used with their purpose of use? [5]
b) Give purpose and working of gyro compass [5]

21. a) List down 'What are the effects of electric shock on the human body due to macroshock'. [5]
b) Explain Vacuum circuit breaker with neat diagram. [5]

22. a) What is the need to AVR. Explain the operation of AVR with neat and clean block diagram. [6]

b) Compare HV system and LV system on board ship. [4]

****