Indian Maritime University

(A Central U4niversity, Govt of India)

Sep/Oct'25 SE

Programme Name: B Tech (ME)

Semester: IV

Subject Code: UG11T4405

Subject Name: ELECTRO TECHNOLOGY

Date: 30.09.2025 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.

1. A high voltage measuring potential transformer is a

a) Step up transformer | b) Step Down transformer | c) 3 phase transformer | d) used for measuring current

2. Primary cells are

a) not rechargeable | b) rechargeable | c) lead acid cells | d) Li-ion cells

3. Leakage in lead acid batteries can be found using

a) Rubber bag | b) container | c) slotted supports | d) Lead tape

4. Stroboscopic problem can be overcome by

a) using mixture of incandescent and discharge lighting

b) connecting adjacent discharge lamps to different phases

c) both a and b

d) none of the above

5. As per definition, _____ is any material that inhibits or prevents the flow of electrical current.

6. IR value of a cable is affected by

a) Moisture Ingress

b) Aging and Degradation

c) Contaminants

d) All of the above

7. Which one of the following is **NOT** a standard voltage value on board ships?

a) 3300V

b) 880V

c) 440V

d) 6600V

8. What can happen in high-voltage circuits when they are switched off?

a) They become completely safe

b) They may retain a lethal charge

c) The voltage is reduced to zero

d) They lose all charge.

9. What is the full form of ABS and IRS?

a) American Bureau of Shipping and International Regulatory Standards

b) American Bureau of Surveying and Indian Register of Shipping

c) American Bureau of Shipping and Indian Register of Shipping

d) Automated Bureau of Surveying and Indian Regulatory Standards

10. What type of Protection is normally provided on the doors of switchboard cubicles?

a) Mechanical interlock or lockout

b) Surge protection devices

c) Pressure sensors

d) No need of protection on switchboards

Section B

Five Questions of 02 Marks each

11. Explain the purpose of interlocks fitted to circuit breakers
12. Explain in simple terms, preferential tripping when overload occurs
13. An alternator is synchronised to the bus bar. How can its share of kW and kVAr be adjusted?
14. What are the conditions for paralleling 2 alternators?
15. Define Electrical Interference.

Section C

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

16. With a neat flow chart, show the automatic and manual starting of an emergency generator.

(10)

17. With a neat diagram explain the working of florescent lamp.
Explain the tungsten halogen regenerative cycle using diagrams.

(6+4)

18. Draw and explain the self-excitation AVR system.
In brief, describe the types of charges that can be applied to marine batteries.

(6+4)

19. Two three-phase alternators operate in parallel. The rating of A is 1000 kW and B is 500 kW. The droop setting of each generator is 4%. The load to be shared is 750kW. Find the values of load shared between each of the generators. Assume the no load frequency is 52Hz.
Using a circuit diagram, show how CT and PT are connected in a network and explain the same.

(4+6)

20. With a neat diagram, mark the hazardous areas in a tanker and explain the various zone of hazardous area.
Explain why insulation resistance of large installations is often relatively lower compared to small installations.

(7+3)

21. Explain isolated and earthed neutral systems using diagrams and explain how isolated neutral is dangerous over earthed neutral system.'

(10)

22. Draw and explain a typical high voltage installation for a LNG vessel.

(10)