

**Indian Maritime University**  
**(A Central University, Govt of India)**  
**End Semester Examinations – June 2023**  
**Programme Name: B Tech (ME)**  
**Semester: IV**  
**Subject Code: UG11T4405**  
**Subject Name: Electro Technology**

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Date: 05.06.2023

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

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General Instructions

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

Section A

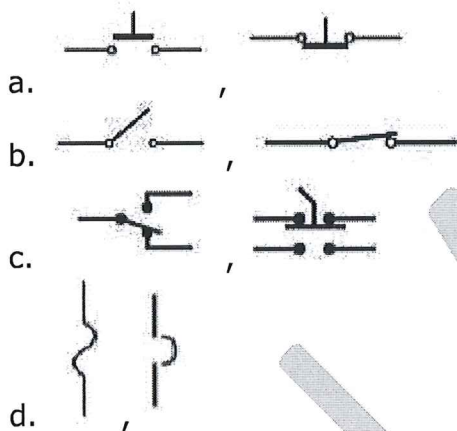
01 Mark each – Choose the correct answer as applicable.

1. When skin is dry the body resistance to electric shock is \_\_\_\_ ohm, when wet body resistance is around \_\_\_\_ ohm?
  - a. 10,000ohm, 1000ohm
  - b. 1,00,000ohm, 300ohm
  - c. 50,000ohm, 500ohm
  - d. 10,000ohm, 500ohm
2. Severity of shock depends on which factor
  - a. Supply system DC or AC
  - b. Resistance of body
  - c. Voltage and current strength of system
  - d. All of the above
3. When alternators running parallel and load can be shifted on one alternator. When load is shifted and other alternator has to cut off but still it carrying small amount of load its breaker trips and prime mover cuts off. The CB trips because
  - a. CB has operated at normal condition, it is faulty
  - b. Earth fault has occurred
  - c. Reverse power relay operated
  - d. Under-voltage protection operated
4. Emergency generator should be automatically started within how much sec
  - a. 45 Sec
  - b. 50 Sec

- c. 60 Sec
- d. 90 Sec

5. An \_\_\_\_\_ is provided to prevent simultaneous closing of MSB breaker and ESB breaker.
- a. Interlock
  - b. Isolator
  - c. Fuse
  - d. Relay

6. Which given symbols indicate NO push button and NC push button



7. For successful parallel operation of two alternators, it is necessary that
- a. They are synchronized using synchroscope and dark and bright lamp method of synchronization
  - b. Their phase sequence, voltage, frequency, and phase angle be the same
  - c. Both (a) and (b)
  - d. None of these
8. While taking shore supply, which Circuit breakers must be interlocked
- a. Main circuit breaker and shore supply circuit breaker
  - b. Main circuit breaker and emergency circuit breaker
  - c. Main circuit breaker and alternator ACB
  - d. Shore supply breaker and closing switch of shore supply
9. Air used in air blast circuit breaker
- (a) must have least carbon dioxide
  - (b) must have ionized
  - (c) must have oil mist
  - (d) must be free from moisture.
10. Which of the following circuit breakers has the lowest operating voltage?

- a. SF6 circuit breaker
- b. Air break
- c. Air blast
- d. Minimum oil circuit breaker

### **Section B**

(Each Question of 02 Marks)

11. What is the meaning of the term flame retardant.
12. How to maintain value of insulation resistance of cables exposed to damp surroundings?
13. What is the purpose of interlocks fitted to circuit breakers.
14. Why voltage above 1000V said to be high voltage? What voltages are mostly used as high voltage on board ships?
15. What is the use of isolators during the fault occurrence in electrical power system.

### **Section C**

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

16. a. Describes how to adjust, the load sharing of two generators running in Parallel. [6]
- b. What would be the ohmic value of NER to limit the earth fault current to the full load rating of a 2MW, 0.8 power factor, 3.3 KV, 3 Phase a.c generator. [4]
17. a. Describe the dangers which may exist in a battery compartment and explain how they are overcome. [5]
- b. What are steps to minimize the risk of an electrical shock on board? [5]
18. a. What is significance of an earth fault indicator onboard? Explain indicator with lamps using suitable diagram? [6]
- b. State safety precautions that should be strictly followed to prevent accidents when working on high-voltage electrical equipment. [4]
19. a. Sketch a block diagram of an automatic voltage regulator, naming the main

components and explaining the purpose of each block. [7]

b. Explain the purpose of switches, circuit breakers and fuse in power distribution systems. [3]

20. a. How megger test done on 3 phase Induction motor? Draw megger simple diagram. [6]

b. Write note on electronic steering control. [4]

21. a. Show flow chart/block diagram for automatic/manual starting of an emergency generator? [6]

b. What is preferential tripping and its significance? [4]

22. a. Describe working of air circuit breaker. [5]

b. What is intrinsically safe circuit? Draw a circuit and explain operation. [5]

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