Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – December 2023

Programme Name: B. Tech. (M.E.)

Semester: VI

Subject Code: UG11T3604

Subject Name: Marine Auxiliary Machinery II

Date: 16.11.2023 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

Choose the correct answer as applicable. Each MCQ carries 1 marks. [10 x 1 = 10 marks]

1. Which of the following process is used in winter air conditioning?
A. Cooling and Dehumidification
B. Heating and Humidification
C. Dehumidification
D. Humidification

2. Most of the domestic refrigerators work on the following refrigeration system
A. Vapour compression
B. Vapour absorption
C. Carnot cycle
D. Electrolux refrigerator

3. One ton of refrigeration is equal to the refrigeration effect corresponding to melting of 1000 kg of ice
A. in 1 hour
B. in 1 minute
C. in 24 hours
D. in 12 hours

4. Which of the following is an example of live cargo?
A. Electronics equipment
B. Fresh fruits and vegetables
C. Building materials
D. Clothing and textiles

5. In refrigeration system, the refrigerant absorbs the latent heat of vaporization in the -
A. Compressor
B. Condenser
C. Receiver
D. Evaporator

6. Which of the following is the purpose of heating and humidification systems in indoor environments?
A. Enhancing lighting conditions
B. Improving air quality
C. Controlling noise levels
D. Regulating temperature and moisture levels

7. Which type of vibration primarily travels through solids, such as building structures or machinery?
A. Airborne vibration
B. Surface vibration
C. Structure-borne vibration
D. Atmospheric vibration

8. What is the goal of overhauling a compressor?
A. To increase energy consumption
B. To reduce its lifespan
C. To maintain or restore its performance
D. To maximize noise levels

9. Which of the following is a common additive in engine oil, primarily used to reduce friction and wear between moving engine parts?
A. Antifreeze
B. Antioxidant
C. Detergent
D. Anti-wear additive

10. What is the characteristic of residual fuels used in the maritime industry?
A. Low viscosity
B. High sulphur content
C. Quick ignition properties
D. Low energy density

Section B

Answer all questions. Each question carries 2 marks. [5 x 2 = 10 marks]

11. Define the principle of refrigeration.
12. Appraise the micro-organism control in live cargo.
13. Give the Technical Specification of a Ball Bearings.

14. What is meant by "Critical Speed" or "Barred Speed Range" in a Marine Diesel Engine?
15. State the advantage of Emulsified Fuels.

Section C

Answer any 5 questions. Each question carries 10 marks.

16. (a) Illustrate the refrigeration cycle with the graph of Temperature–Entropy diagram of the vapor-compression cycle. (4 marks)
(b) Appraise the various factors that contribute to cryogenics' exceptional qualities to comprehend why it is the best material for cryogenic tank insulation in LNG and LPG carriers? (3 marks)
(c) List the numerous elements that affect a refrigerant's suitability for use in refrigeration. (3 marks)

17. a) Draw and Explain the Construction & Working of ship's Domestic Refrigeration Plant. (5 Marks)
b) Draw and Explain the Construction and Working of a Thermostatic Expansion valve. (5 Marks)

18. (a) Demonstrate with a sketch the Zone control system of air conditioning system. (4 marks)
(b) Describe the principles of marine air conditioning system. (3 marks)
(c) Explain how the air is cleaned before being introduced to the air-conditioned space of merchant vessels. (3 marks)

19. (a) Illustrate Ventilation of engine and boiler rooms with sketch. (4 marks)
(b) Summarize the cargo pump-rooms mechanically ventilated system.(3 marks)
(c) Write the Ventilation in CO_2 room and battery room. (3 marks)

20. (a) Illustrate the free, forced, transverse, axial, torsional mode of vibration causes and its effects. (4 marks)
(b) Describe noise sources on ships and noise suppression techniques. (3 marks)
(c) Appraise anti vibration mountings of machineries for reduction effects of forced vibration. (3 marks)

21. (a) Formulate the Overhauling procedure of purifier. (4 marks)
(b) Write the Planning for overhaul of Purifier overhaul including stand by equipment, tools, manpower and spares. (3 marks)
(c) Write short notes on filter cleaning procedure. (3 marks)

22. a) What is Hydrodynamic lubrication? How it is generated in journal bearing? (5 Marks)
b) List the additives in a crankcase L.O of a 4 stroke Marine I.C. Engine and explain why they are used. (5 Marks)

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