INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
B.Tech (Marine Engineering)
Semester VI
Jun 2022 End Semester Examination
Marine Auxiliary Machinery II
UG11T3604

Date:07.06.2022 **Max Marks: 70**
Time: 3 hrs **Pass Marks: 35**

PART A (10 x 1 = 10 Marks)

1.(i) In refrigeration system, the refrigerant absorbs the latent heat of vaporization in the_____
(a) compressor
(b) condenser
(c) receiver
(d) Evaporator

(ii) The only means of removing the latent heat of condensation from a refrigerant in the normal refrigeration cycle is by _____
(a) Passing it through the expansion valve
(b) Condensing refrigerant in the system condenser
(c) Passing the gaseous refrigerant through the heat interchanger on the suction side of the compressor
(d) Maintaining a high pressure on the systems' receiver

(iii) The amount of moisture in a given sample of air, when compared with the amount of moisture the air could hold if totally saturated at the existing temperature of the sample, is called _____
(a) Absolute humidity
(b) Specific humidity
(c) Effective humidity
(d) Relative humidity

(iv) Fuels produced in a refinery are generally sterile, however, contamination can occur as fuels are
(a) Store at the refinery
(b) Stored on the vessel
(c) Transported to the distribution sites
(d) All the above are correct

(v) Presence of catalytic fines in fuel oil is significant to engineers on board because
(a) Catalytic fines tend to impair the proper operation of purifiers
(b) Catalytic fines lead to abrasive wear in liners, piston rings, and fuel injection equipment
(c) Catalytic fines necessitate an increase in injection temperature
(d) Catalytic fines necessitate an increase in storage temperature

(vi) Which of the following is an example of a solid bearing?
(a) Piston pin bushing
(b) Turbo-generator turbine bearing
(c) Spring bearing
(d) Thrust bearing

(vii) When a centrifugal pump is overhauled it was found that the shaft had developed grooves on it n no spare is available on board what action can be taken
(a) Order a new spare
(b) Assemble the pump without doing anything n wait for the spare to arrive
(c) Machine the shaft sleeve on the lathe n put back the new packing
(d) Leave the pump as it is

(viii) Modes of vibration in a ship
(a) Free, forced, transverse, axial, torsional
(b) Light, heavy, tough
(c) Simple, oscillatory
(d) None of the above

(ix) Prior to entering a cargo pump room, you should ensure that
(a) The forced ventilation system is operating
(b) The cargo pumps are secured
(c) No mono carbon gases are present
(d) The oily water separator is de-energised

(x) In the refrigeration system vegetable room and meat rooms are maintained at different temperatures by
(a) Different expansion valves
(b) By putting solenoid valves
(c) By boiling the refrigerant at different pressures
(d) By using a smaller evaporator

PART B **(5 x 2 = 10 Marks)**

2. (i) Name the different refrigeration methods.

(ii) What are the properties of air that are altered/modified by an air conditioning system?

(iii) What is meant by Critical Speed or Bared Range in a Marine Diesel Engine?

(iv) What is Residual Fuel Oil (or) Heavy Fuel Oil?

(v) Name some of the desirable properties/characteristics of a good lubricant

PART C (5 x 10 = 50 Marks)

Answer any 5

(3) (a) Sketch and describe the working of a refrigeration system, with automatic controls, used for maintaining the temperature of different provision rooms carrying foodstuffs/provisions for crew members. (6)

(b) What are the desirable properties of a good refrigerant (4)

(4) (a) Explain the functions of the following safety devices fitted on a refrigeration system (6)

1. High Pressure [HP] Cut Out
2. Oil Differential Cut Out
3. Low Pressure [LP] Cut Off

(b) Give the causes for the following troubles in a refrigeration system (4)

1. Compressor short cycles on low-pressure control
2. Discharge pressure too high

(5) (a) Draw & explain the brine system for refrigerated cargo holds (6)

(b) Explain the terms: micro-organisms, dead cargo & live cargo w.r.t. refrigerated cargo (4)

(6) (a) Describe a single duct air condition system with a simple sketch (6)

(b) Discuss the design considerations of the ventilation system for: (4)

1. Battery room
2. CO_2 room

(7) (a) What are the sources of noise in a ship and describe the techniques to suppress it? (4)

(b) What are the various modes of vibration in a ship? What are the sources of vibrations and describe the techniques to suppress them? (6)

(8) (a) Explain the treatment of fuel carried out for its effective combustion in Marine I.C Engines (6)

(b) List the additives in a crankcase L.O of a 4 stroke Marine I.C. Engine and explain why they are used (4)

(9) (a) What are the details given in an L.O analysis report? (4)

(b) What are the different types of Main Bearing used for 2 stoke & 4 stroke Marine Diesel Engine? (6)