INDIAN MARITIME UNIVERSITY

(A central university , govt of India)

JUNE 22 END SEMESTER EXAMINATION

QUESTION PAPER

B Sc (NS) - UG21T4405 - MARINE ENGINEERING, AUTOMATION & CONTROL SYSTEMS PAPER - II

MAXIMUM MARKS – 70 Marks

Pass Marks – 35

Date – 08.06.2022

Duration – 03 Hours

Part A – Each question carries 01 mark

i) Engine pistons are usually made of aluminium alloy because
   a) Is lighter
   b) Wear is less
   c) Absorbs shock
   d) Is stronger

ii) In propeller shafting of ship which bearing transmits the propeller thrust to ship's hull
   a) Stern tube bearing
   b) Thrust block
   c) Plummer bearing
   d) Cylindrical bearing

(iii)Reciprocating air compressor is best suited for

   a) Low flow rate and low pressure
   b) Low flow rate and high pressure
   c) high flow rate and low pressure
   d) high flow rate and high pressure

(iv) centrifugal pumps transfer energy from

   a) Rotor to fluid
   b) Fluid to rotor
   c) Draft to rotor
   d) Rotor to draft

(v)Reciprocating pumps are also known as

   a) Emulsion pump
   b) Diaphragm pump
   c) Positive displacement pump
   d) Negative displacement pump

(vi) Theoretical power produced from all cylinders of a diesel engine is called

a) Brake power
b) Propulsive power
c) Effective power
d) Indicated power

(vii)Bow thrusters provide movement to ship in

a) Athwartship direction
b) Aft direction
c) Forward direction
d) None of the above

(viii)Thermostat in refrigeration system senses

a) Pressure of gas in circuit
b) Flow of gas in circuit
c) Temperature of the room
d) Liquid gas level in receiver

(ix)Emergency steering gear as per regulation is to be tested

a) Once in five years
b) Every six monthly
c) Once in a year
d) Minimum once in three months

(x)The purpose of turbo charger in a diesel engine is

a) To exhaust out the foul gases from engine cylinder
b) To supply fresh air to engine at higher pressure than atmospheric
c) To cool the air delivered to engine
d) To cool jacket cooling water

Part B – Each question carries 02 Marks

(i) What is valve overlap in a 4-stroke diesel engine cylinder?
(ii) What is function of capstan fitted on ships deck?
(iii) What is real and apparent slip?
(iv) Explain working of screw down non return valve?
(v) What is function of connecting rod in a diesel engine?

Part C – Each question carries 10 Marks – solve any 05 question

(i) (a) Neatly sketch and describe working of a 4-stroke diesel engine. (5 marks)

(b) Write down 05 differences between a diesel engine working on 2 stroke and 4 stroke cycle. (5 marks)

(ii) (a) Sketch and describe working of an oily bilge water separator fitted in engine room of a vessel. (5 marks)

(b) Draw a neat sketch showing arrangement of a ships propeller, stern tube, tail shaft, intermediate shaft, thrust shaft and supporting bearings and thrust block with their names at right location. (5 marks)

(iii) (a) With help of a line diagram explain main diesel engine lube oil system of a ship. (5 marks)

(b) With the help of a simple diagram explain working of a deck seal in an inert gas system fitted on board a tanker vessel. (5 marks)

(iv) (a) With help of diagram explain open loop and close loop system in automation system of a ship. (5 marks)

(b) Sketch and describe working of a pneumatic draft gauge. (5 marks)

(v) (a) Sketch and describe a safe Matic design (single failure criterion – fail safe) of a steering gear system using 4 ram or vane type arrangement. (5 marks)

(b) With simple sketch explain function of hunting gear used in steering gear system of a ship. (5 marks)

(vi) (a) List the precautions taken (before and during) for main propulsion machinery for heavy weather condition on board a vessel at sea. (5 marks)

(b) Sketch and describe bow thruster fitted on board a sea going vessel and their uses on board. (5 marks)

(vii) (a) With help of simple drawing explain working of a reciprocating pump used on ship. What arrangement is fitted to over come pulsating discharge from these pumps. (5 marks)

(b) With reference to refrigeration system used on ship explain function of compressor, condenser , expansion valve, evaporator and thermostat. (5 marks)