CINEC
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Faculty of Marine Engineering
Department of Marine Electrical Engineering
PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING
COURSE CODE : EED -2465/ B015 & 016 /M1

EXAMINATION QUESTION PAPER
MEASUREMENT & INSTRUMENTATION

- *This question paper consist 06 questions.*
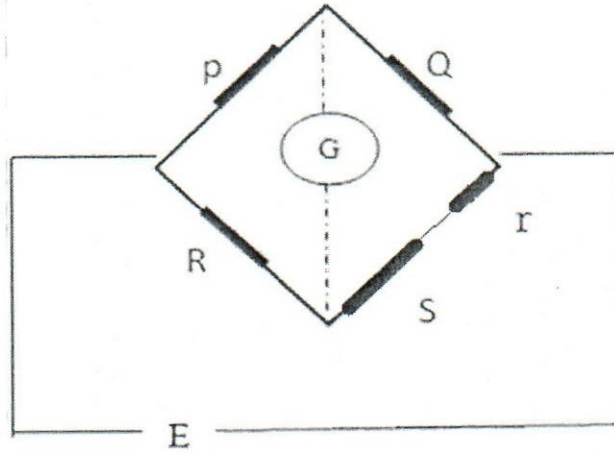- *Answer any five (05) Questions.*

Date:2023.03.19   Pass mark 50%   Time allocated: 03Hrs

01. a. List types of electrical measuring instruments?   (03 Marks)
    b. Briefly explain above instruments with examples.   (09 Marks)
    c. Describe the following torques in brief.   (08 Marks)
      i. Deflecting torque:
      ii. Controlling torque:
      iii. Damping torque:

02. a. A permanent magnet moving coil instrument gives full-scale deflection with **5mA** and has a resistance of **5Ω**. Calculate the resistance of the necessary components in order that the instrument may be used as
      i. a **2A** ammeter   (07 Marks)
      ii. a 100V voltmeter   (07 Marks)
    b. List the advantages and disadvantages of moving coil instrument.   (06 Marks)

03. a. What are the types of moving iron instruments?   (04 Marks)
    b. Briefly explain them.   (12 Marks)
    c. List the sources of errors of moving iron instrument.   (04 Marks)

04. a. A moving iron instrument gives full scale deflection with 200V. It has a coil of 20000 turns and a resistance 2000Ω. If the instrument is used as an ammeter to give full-scale deflection at 10A, calculate the number of turns required.
                                             (04 Marks)
    b. How do you extend the range of moving iron AC ammeter & voltmeter?   (08 Marks)
    c.   i. Resistance of the ammeter is high or low. Justify your answer.   (04 Marks)
       ii Resistance of the voltmeter is high or low. Justify your answer.   (04 Marks)

05. a. Draw the synchronous scope arrangement with windings diagram.   (10 Marks)
    b. How do you decide the frequency of the incoming alternator is high or low?   (06 Marks)
    c. What are the types of synchronous scope?   (04 Marks)

06. a. Explain the balanced condition of DC whetstone bridge circuit with suitable diagram.

(08 Marks)

b. In Wheatstone bridge $P = 4\Omega$, $Q = 5\Omega$, $R = 12\Omega$ and $S = 7\Omega$. How much resistance must be put in series to the resistance(r)S to balance the bridge.

(12 Marks)

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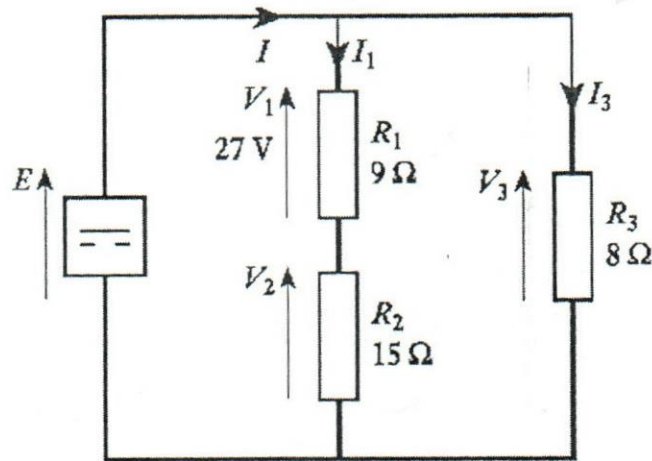EXAMINATION QUESTION PAPER
ELECTRICAL THEORY

- *This question paper consist 06 questions.*
- *Answer all six questions.*

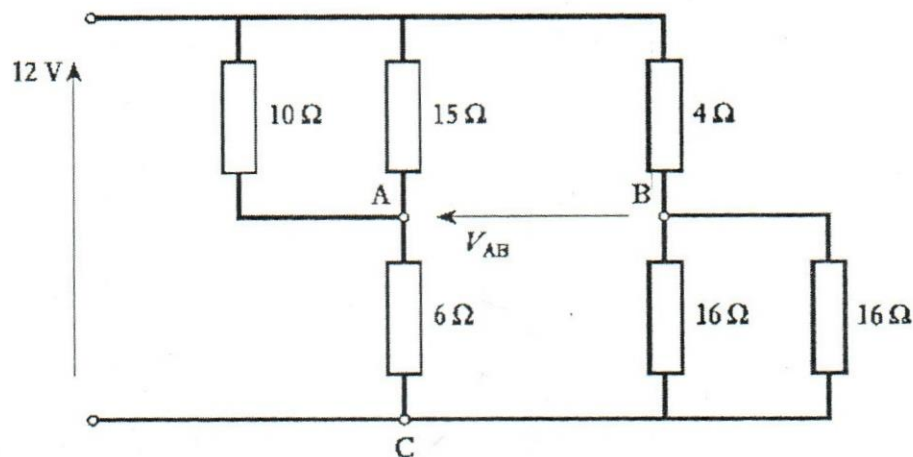Date: 2023.03.14.   Pass mark 50%   *Time allocated: 03Hrs*

01.

    a. State Kirchhoff's Current Law and Voltage Law.   (06 Marks)

    b. Given the network shown in Fig. below, determine I_1, E, I_3 and I.   (07 Marks)

    c. Determine V_{AB} in the network shown in Figure bellow   (07 Marks)

02.

    a. A 230 V lamp is rated to pass a current of 0.26 A. Calculate its power output. If a second similar lamp is connected in parallel to the lamp, calculate the supply current required to give the same power output in each lamp.   (05 Marks)

b. Assuming the lamps to have reasonably constant resistance regardless of operating conditions, estimate the power output if the lamps are connected in series.

(05 Marks)

c. A current of 3 A flows through a 10 Ω resistor. Find: the power developed by the resistor and the energy dissipated in 5 min.

(05 Marks)

03.
a. How can the domain theory of magnetism be verified ? (04 Marks)
b. What three methods can be used to increase the strength of electromagnet?

(02Marks)

c. Explain power in balanced three phase loads (04 Marks)
d. Three resistances of 20Ω each are Y-connected to a 240-V 3-ø line operating at a PF of 0.8 . Find the (a) current through each resistance, (b) line current, and (c) power taken by the three resistances. (05 Marks)
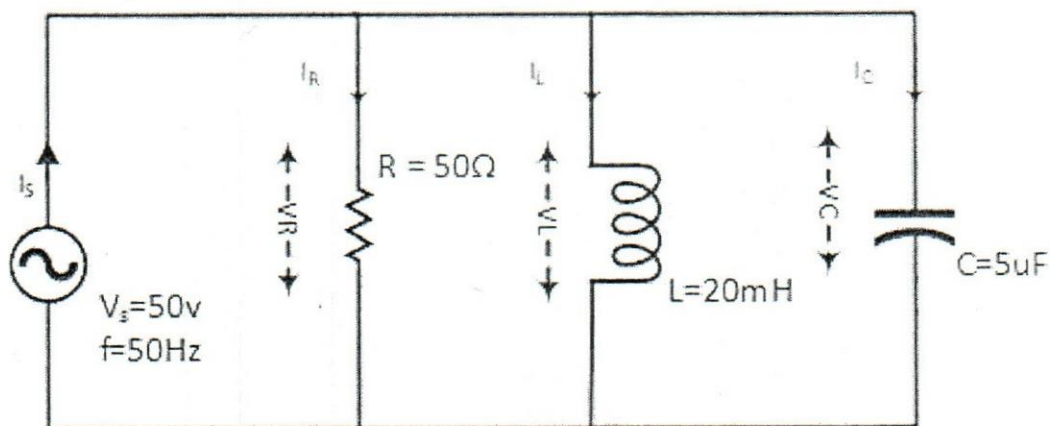
04.
a. Explain generating of A.C with diagram of single coils AC generator . (07 Marks)
b. The equation of an AC voltage is given as V_s = 170 sin (376.8t) Volts. Determine
   i. Maximum Value (02 Marks)
   ii. RMS value (02 Marks)
   iii. Frequency (02 Marks)
   iv. Period (02 Marks)

05.
a. Explain decoupling circuit with suitable diagram (05 Marks)
b. Explain coupling circuit with suitable diagram (05 Marks)

06. Determine following for the provide circuit below
a. Current through resistor, I_R (02 Marks)
b. Current through Inductor, I_L (04 Marks)
c. Current through Capacitor, I_C (04 Marks)
d. True power (Active power, P_T) (03 Marks)
e. Reactive power (P Reactive) (05 Marks)
f. Apparent Power (P Apparent) (05 Marks)
g. Power Factor (P.F) (02 Marks)

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EXAMINATION QUESTION PAPER
Computer Knowledge

- *This question paper consists of 02 parts and 05 questions.*
- *Part A - 01 question is compulsory.*
- *Part B – Answer Any other 03 questions.*

Date: 2023.03.18   Pass Marks 50%   Time allocated: 03 Hrs.

Part 1

01.

   a. What can we identify as Raw Materials?   (4 x 10 = 40 Marks)
      i.   Data
      ii. Information
      iii. Details
      iv. Files

   b. What is an example for ICT application in health sector?
      i.   ATM machines
      ii. e-Channeling
      iii. Web conference meetings
      iv. ECG Scans

   c. What is NOT an example for I/O (Input and Output) device?
      i.   Touch screen monitor
      ii. Scanner
      iii. Computer mouse
      iv. Printer

   d. Permanent memory of the computer is knowing as _____?
      i.   Random Access Memory
      ii. Read Only Memory
      iii. Hard Disk Drive
      iv. USB Pen Drive

   e. Controlling hardware, software and other components of the computer done by _____ part of the CPU.
      i.   Cache memory
      ii. ALU
      iii. CU
      iv. Hard Drive

f. Average data reading speed of SSD hard drive is _____?
   i.   150Mbps
   ii. 650MBps
   iii. 650Mbps
   iv. 3500MBps

g. What is the best MS office application for sums and calculations?
   i.   MS Word
   ii. MS PowerPoint
   iii. MS Access
   iv. MS Excel

h. What is NOT an example for desktop Operating System?
   i.   Android
   ii. Microsoft Windows
   iii. MacOS
   iv. Linux

i. Identify the cloud storage which owns by Apple Incorporation company.
   i.   OneDrive
   ii. Google Drive
   iii. iCloud
   iv. Samsung Cloud

j. What is the smallest storage device among below devices?
   i.   Pen Drive
   ii. Compact Disk (CD)
   iii. Floppy Drive
   iv. Memory card

Part 2

02.

a. State the difference between Data and Information with examples.   (04 Marks)
b. Write down 3 applications of ICT and describe one of it.   (05 Marks)
c. What are the basic functionalities of a computer?   (04 Marks)
d. State the difference between CU and ALU of CPU.   (04 Marks)
e. What are 3 major components need to operate a computer?   (03 Marks)

03.

a. What are I/O devices?   (03 Marks)
b. Provide 2 examples with its' purpose for each I/O device.   (04 Marks)
c. Identify the difference between RAM and ROM.   (04 Marks)
d. Provide 3 techniques we can use to make speed up a computer.   (06 Marks)
e. Identify 3 types of ports we can use for video transfers.   (03 Marks)

04

a. What are main 2 types of softwares? (02 Marks)
b. What is an Operating System? (03 Marks)
c. Write down 5 components of an Operating System. (05 Marks)
d. Provide 2 examples for each desktop and mobile operating systems. (04 Marks)
e. What is an Antivirus software? Provide 2 anti-virus softwares in the market. (04 Marks)
f. What are symptoms of a computer virus? (02 Marks)

05.

a. How to insert a page border to a MS word file? Write down steps. (04 Marks)
b. Where we use MS PowerPoint? (02 Marks)
c. How to add an animation to a PowerPoint presentation? (02 Marks)
d. Provide another name for MS Excel worksheet? (02 Marks)
e. Write MS Excel formulas for given sums using below table. (2 x 5 = 10 Marks)

	A	B	C	D	E	F	G	H	I
1		IT	Maths	Science	Religion	History	Tech.	Health	English
2	Amal	25	45	66	33	47	86	12	47
3	Chamara	36	48	56	26	43	14	23	98
4	Namal	13	36	69	98	75	45	22	36
5	Sampath	14	89	66	44	12	36	11	47
6	Kalpa	78	64	58	55	49	14	69	07
7	John	48	69	63	44	81	36	63	41

i. Calculate total marks for Namal.
ii. Calculate Average marks for science.
iii. Find the maximum value of the data set.
iv. Calculate the minimum marks for Kalpa and John.
v. Find the number of subjects ONLY using 1st row.

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EXAMINATION QUESTION PAPER
BASIC ELECTRICAL POWER & MACHINES

- *This question paper consist of 07 questions.*
- *Answer Q 01 and any other 05 questions.*   Pass mark 50%

Date : 2023.03.18
Time allocated : 03Hrs

01. a. Draw Electrical Power circuit diagram of Direct on line three phase Motor starter and clearly name each components and functions   (09 Marks)

    b. Draw Electrical control circuit diagram of Direct on line three phase Motor starter and clearly name each component (Include Indicators for Mains Power, Motor run "ON", OCR fault in your drawing)   (11 Marks)

02. a. Draw diagram of D.C Series, shunt and Compound motors and name all components of each motor   (06 Marks)

    b. List one application of D.C series & two applications of D.C shunt motors?   (03 Marks)

    c. How would you reverse the direction of rotation of dc shunt motor? Explain with the help of sketch and terminal marks   (04 Marks)

    d. Briefly Explain the purpose of starting resistance for DC motor.   (03 Marks)

03. a. Which DC motor has the same thickness of Field winding as its Armature winding & terminals. Explain reason for the same thickness winding   (03 Marks)

    b. Sketch and explain armature reaction of D.C. Motor.   (04 Marks)

    c. Explain disadvantages by armature reaction   (04 Marks)

    d. Explain ways to minimize the effect of Armature reaction?   (05 Marks)

04. a. Sketch construction of power Transformer and name each sections   (04 Marks)

    b. What are the general applications of Power transformer   (03 Marks)

    c. Sketch equivalent circuit of transformer and name each sections   (05 Marks)

    d. Explain method to reduce eddy current loss of power transformer.   (04 Marks)

05. a. Explain purposes of Power Transformer & Instrument transformer (06 Marks)

b. Specification of Single-phase Transformer given as 11 KVA 60 hz-440/230V.
   i. Calculate rated current of Primary and secondary. (05 Marks)
   ii. Turns ratio (05 Marks)

06. a. List two different types Enclosures of three phase Motors (04 Marks)

b. Compare Squirrel cage rotor & Wound rotor. (08 Marks)

c. List four names of three phase motor starters (04 Marks)

07. a. List Minimum Protections required for a Three phase motor (06 Marks)

b. Write six Technical parameters printed on the name plate of 3 phase motor (06 Marks)

c. Why all fins at the external motor surface to be maintained clean state (02 Marks)

d. What are the purposes of cable glands, rubber packing at the motor power Terminal box and cover (02 Marks)

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COURSE CODE : EED -2465/ B013 & 014 /M2

EXAMINATION QUESTION PAPER
Computer Knowledge, PC - Networking / Interfacing

- This question paper consists of 02 parts and 05 questions.
- Part A - *No. 1 question is compulsory.*
- Part B – Answer Any *other 03* questions.

Date: 2023.03.14   Pass mark 50%   Time allocated: 03Hrs

Part – A

01. Write the correct answer number answer book.   (04 Marks x 10)

a. In which ICT application, MRI and CT Scans use?
   i.   Military
   ii. Health
   iii. Education
   iv. e-Commerce

b. Identify the main input device.
   i.   Mouse
   ii. Scanner
   iii. Keyboard
   iv. Barcode reader

c. Which component has its own (Separate) power supply?
   i.   Read Only Memory (ROM)
   ii. Random Access Memory (RAM)
   iii. Central Processing Unit (CPU)
   iv. Arithmetic & Logic Unit (ALU)

d. _____ works as a temporary memory of the computer.
   i.   Read Only Memory (ROM)
   ii. Hard Disk Drive (HDD)
   iii. Floppy Disk Drive (FDD)
   iv. Random Access Memory (RAM)

e. What is not being a basic functionality of the computer?
   i.   Input Data
   ii. Process Data
   iii. Output Information
   iv. Data Analysis

f. Processed Data also known as _____.
   i. Information
   ii. Raw Materials
   iii. Details
   iv. Digital Signal

g. How many computers are minimum required for a computer network?
   i. 1
   ii. 2
   iii. 3
   iv. 4

h. What is the main purpose of the Modem?
   i. Working as an alternative to NIC.
   ii. Modulating and Demodulating Analog Signals to Digital Signals and Digital Signals to Analog Signals.
   iii. Ensure the security of the computer network.
   iv. Split the network between a few computers.

i. How many ports are in a standard Network Hub?
   i. 4/12
   ii. 24/28
   iii. 32/28
   iv. 48/52

j. Set of Rules of a Computer Network known as _____?
   i. Network Regulations
   ii. Network Hierarchy
   iii. Network Protocol
   iv. Network Policies

Part – B

02:
   a. Briefly explain where we use MS Word in real life.   (04 Marks)
   b. Write down how to add an animation to a MS PowerPoint Presentation. (04 Marks)
   c. What are Spreadsheet and Excel formulas?   (04 Marks)
   d. Write down what is the formula for each function   (08 Marks)
      i. Addition (Total)
      ii. Minimum Value
      iii. Maximum Value
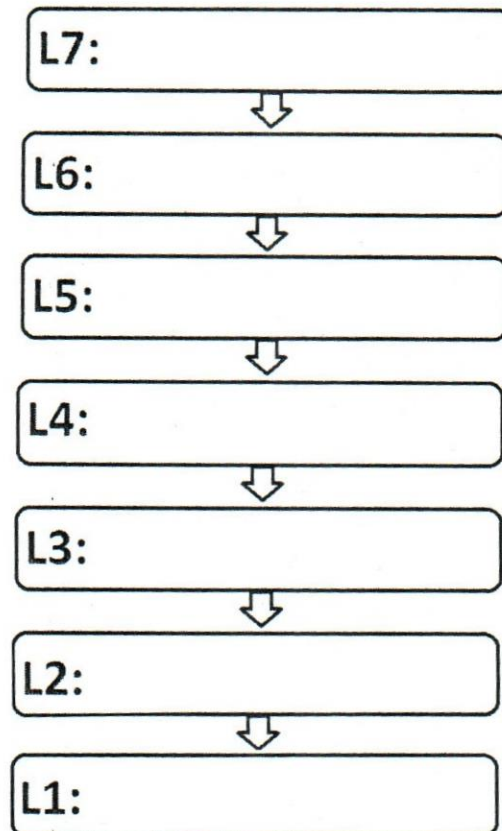   iv. Count of a range

03
    a. Define "Computer Network". (03 Marks)
    b. Identify 3 types of cable we mostly use in networking. (03 Marks)
    c. What are the basic components of a computer network? (05 Marks)
    d. Write down 2 differences between Hub and Switch (04 Marks)
    e. State 4 basic components of a network (05 Marks)

04
    a. Identify 3 types of networks according to the size (Name, size and example for each)
       (09 Marks)

    b. What is the difference between Network Topology and Network Architecture?
       (01 Mark)

    c. Draw the diagrams for any 2 network topologies you have learnt, and provide an advantage
       and disadvantage for each topology. (10 Marks)

05
    a. Fill each layer according to the correct order of OSI model. (07 Marks)

L7:

⇩

L6:

⇩

L5:

⇩

L4:

⇩

L3:

⇩

L2:

⇩

L1:

    b. Write down 2 types of Network Architectures with advantages and disadvantages.
       (04 Marks)

    c. What are the factors we have to consider before implementing a network? (03 Marks)
    d. State the difference between MAC address and IP address. (06 Marks)

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EXAMINATION QUESTION PAPER
BASIC ELECTRICAL POWER & MACHINES

- *This question paper consist 06 questions.*   Date   : 2023.03.13
- *Answer **any (05) Five** questions.*   Pass mark 50%   Time allocated   : 03Hrs

01. a. Draw the simple block diagram with main components of three phase supply for a three-phase motor   (08 Marks)
    b. List the types of motors commonly used on bard ship   (04 Marks)

    c. What are the main on-board applications of three phase motors?   (04 Marks)

    d. Write the names of low voltage three phase induction motors with their applications   (04 Marks)

02. a. What are the four types of motor enclosures available in industry?   (04 Marks)

    b. Briefly explain following motor name plate information.

        i. Horsepower (HP) or Watts(W)   (03 Marks)
        ii. Full load amp. Rating(A)   (03 Marks)
        iii. Voltage(V)   (02 Marks)
        iv. CT / VT   (02 Marks)
        v. Duty   (02 Marks)
    c. Write the starter methods for three phase motors.   (04 Marks)

03. a. What are the exciting methods in alternators?   (04 Marks)

    b. Draw the neat block diagrams with components for followings

        i.   Self excited brushless alternator   (06 Marks)
        ii. Static transformer excitation alternator   (07 Marks)
        iii. State the main functions of AVR   (03 Marks)

04. Draw the neat three phase circuit diagrams (power circuit and control circuit) for followings.

    a.   DOL starter   (10 Marks)
    b.   Auto transformer starter   (10 Marks)

05. a. What is the purpose to request low voltage shore supply (not AMP) in generally?   (05 Marks)

    b. Draw the basic block diagram for shore power arrangement   (07 Marks)

    c. Briefly explain the effects of followings
        i. If shore voltage increases and decreases   (04 Marks)
        ii. If shore frequency increases and decreases   (04 Marks)

06. a. State the conditions for synchronizing an alternator with live bus bar   (04 Marks)

    b. What are the synchronizing methods?   (05 Marks)

    c. Draw the neat circuit diagrams for above any two methods.   (11 Marks)

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FINAL EXAMINATION QUESTION PAPER
MARINE ENGINEERING KNOWLEDGE

- *This question paper consists 06 questions.*
- *Answer only 05 questions.*

Date: 2023.03.07   *Pass mark 50%*   *Time allocated: 03Hrs*

01. Write short notes of the followings.

   a. Bunkering

   b. Sounding

   c. Gross Tonnage

   d. Sewage plant

   e. FWG

   f. OWS

   g. Filter Drier

   h. Demister

   i. Double Bottom

   g. Mooring winch.   (20 Marks)

02.   a. Usage of air compressor.   (07 Marks)

   b. Write down 5 safety devices of air compressor.   (05 Marks)

   c. Air bottle not coming up/toping up. What are the reasons.   (08 Marks)

03.   a. Explain 4/2 stroke cycles with suitable diagram.   (10 Marks)

   b. Named 3 differences between 2 stroke and 4 stroke.   (06 Marks)

   c. Name most popular two kinds of modern engine brands.   (04 Marks)

04.   a. What are the purpose of steam in a ship.   (06 Marks)

   b. What is the meaning of a boiler mounting? Give 06 examples   (06 Marks)

   c. What are the boiler alarms. Give 08 examples   (08 Marks)

05. a. Draw and named Marine Sewage plant.   (16 Marks)

     b. What are the two bacteria in the sewage plant.   (04 Marks)

06. Reference with Reefer Refrigeration system.

     a. Draw a Vapor compression Refrigeration Cycle schematic diagram with the followings:
           i.   Main four (04) components.   (12 Marks)
           ii. Receiver
           iii. Filter Drier
           iv. Quench valve
           v.   King Valve
           vi. Suction Service Valve.
           vii. Discharge Service Valve
           viii. Equalizer Line
           ix. Moisture Indicator

     b. What are the 02 common breakdowns that you find on board in reefer container units?

                                                                               (02 Marks)

     c. What is the meaning of HVAC & basic principles for HVAC?   (06 Marks)

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REPEAT EXAMINATION QUESTION PAPER
MARINE ENGINEERING KNOWLEDGE

- This question paper consists 06 questions.
- Answer only 05 questions.

Date: 2022.12.16   *Pass mark 50%*   *Time allocated: 03Hrs*

01. a. With a diagram explain vapor compression cycle used in shipboard refrigeration systems

               (08 Marks)

    b. Write short notes on the following?   (12 Marks)

       i. Filter Dryer   ii. Condenser   iii. Back Pressure Valve   iv. Expansion Valve.

02. a. State the name and function of FOUR deck machineries fitted onboard a ship?   (05 Marks)

    b. What are the type of hatch covers used onboard a ship.   (06 Marks)

    c. Explain the main function of a Hatch Cover, how it is provided   (09 Marks)

03. a. State with reasons why steam need to be generated onboard ship   (05 Marks)

    b. State FIVE boiler mountings and explain their functions?   (10 Marks)

    c. Explain two types of Boilers used in shipboard practice and their differences?   (05 Marks)

04. a. Explain what benefits ship owner get by installing a Fresh Water generator onboard a ship

               (02 Marks)

    b. With an aid of a diagram explain the function of a Evaporative type Fresh Water generator used onboard a ship.   (12 Marks)

    c. State what type of filters used in a shipboard fresh water system   (06 Marks

05. a. Explain the types and functions of the ships trade in the oceans globally.   (10 Marks)

    b. Draw a cross section of a Container ship naming all the parts   (10 Marks)

06. a . Explain why sewage Treatment plant is required in a ship   (04 Marks)

    b. With a diagram explain the function of a sewage treatment plant   (08 Marks)

    c. Explain what happens if Air Blower stops functioning   (08 Marks)