

PAST PAPERS

<i>Faculty</i>	<i>Department / Section/Division</i>
<i>Not Applicable</i>	<i>Learning Resource Centre</i>

Past Papers

Faculty of Maritime Science
Department of Marine Electrical

**Electro Technical Rating
(ETR)
2014-2022**

Document Control & Approving Authority

Senior Director – Quality Management & Administration

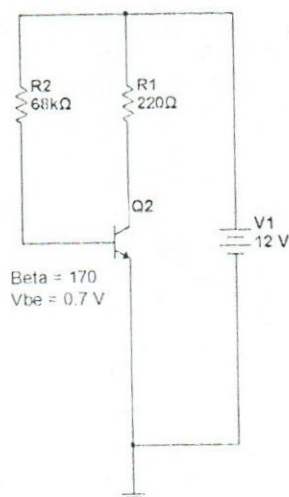
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c. Consider following BJT configuration and find,

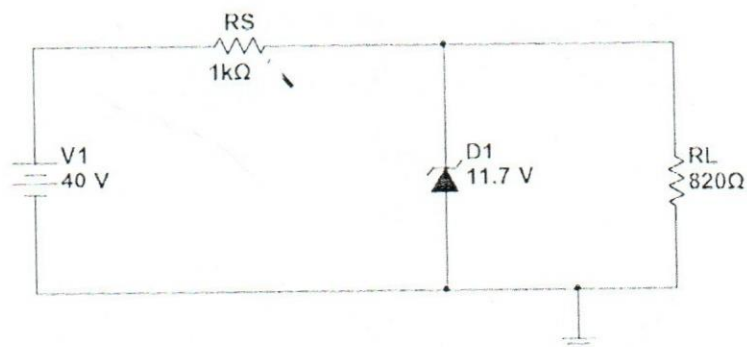


- i. The base current (I_b) (05 Marks)
- ii. The collector current (I_c) (02 Marks)
- iii. The voltage across collector and emitter terminals (V_{ce}) (03 Marks)

4. With regards to the amplifiers,

- a. State the difference between small signal amplifier and a Power amplifier. (06 Marks)
- b. Draw the complete circuit diagram of a common emitter small signal amplifier and name its components. (14 Marks)

5. Consider the following Zener circuit and find,



- i. Find whether the Zener is operating or not (04 Marks)
- ii. Load Voltage (02 Marks)
- iii. Load Current (02 Marks)
- iv. Current through resistor R_s (04 Marks)
- v. Zener current (04 Marks)
- vi. Power dissipation in the Zener diode (04 Marks)



CINEC Campus (Pvt) Ltd
 Faculty of Marine Engineering
 Department of Marine Electrical Engineering
 PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
 COURSE CODE : FED -0465/ B011/M2



FINAL EXAMINATION QUESTION PAPER
 APPLIED ELECTRONICS

- This question paper consist 05 questions.
- Answer all five questions.

Pass mark 50%

Date: 2022.05.31
 Time allocated: 03Hrs

- With regards to the thyristors and their applications,
 - Name 4 components in the thyristor family with indicating their symbols. (04 Marks)
 - What do you mean by firing of thyristors and explain about the firing angle. (06 Marks)
 - State two applications of thyristors in onboard ships. (02 Marks)
 - Draw the circuit diagrams of single phase and a three-phase controlled rectifiers using thyristors. (04 Marks)
 - Draw circuit diagrams for 3 phase AC power control of,
 - Star connected loads
 - Delta connected loads, using thyristors
- With regards to the power supplies,
 - What is the importance of using regulators in DC power supplies. (04 Marks)
 - State the types of regulators used in DC power supplies. (02 Marks)
 - What is the purpose of using a DC power supply in electronic circuits. (02 Marks)
 - Draw a complete circuit diagram of a single phase conventional DC power supply. (12 Marks)
- With regards to the transistors,
 - What are the two operation modes of Transistors. (02 Marks)
 - State the meaning of abbreviations and draw the symbols with pin names of following type of transistors, (08 Marks)
 - BJT
 - JFET
 - MOSFET
 - IGBT.

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FINAL EXAMINATION QUESTION PAPER
AWARENESS TO QUALITY, ENVIRONMENT & SAFETY MANAGEMENT SYSTEM

- This question paper consists of 05 questions.
- Answer all the questions.

Date: 2022.05.31

Pass mark 50%

Time allocated: 03Hrs

01. Write short notes of the following.

- IMO
- Convention
- Protocol
- EEBD
- International Shore Connection

(04 x 5 Marks)

02. Explain all FIVE elements of "5S Concept" giving examples for each element.

(20 Marks)

03. a. State 04 pillar conventions of the maritime law

(04 Marks)

b. State any 04 committees of IMO

(04 Marks)

c. State 04 emissions that are regulated by MARPOL annex VI

(04 Marks)

d. State 03 requirements to release CO2 fixed fire extinguishing system

(03 Marks)

e. Name 05 Life saving appliances (LSA) or Fire fighting appliances (FFA) that you find onboard

(05 Marks)

04. With regard to MARPOL,

a. Write down the 6 Annexes

(12 Marks)

b. State the regulations to discharge food waste outside and inside the special areas

(08 Marks)

05. a. State 04 most commonly used portable fire extinguishers and their colour code

(10 Marks)

b. State work/rest hours requirements according to MLC 2006

(10 Marks)

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FINAL EXAMINATION QUESTION PAPER
ADVANCED ELECTRICAL POWER & MACHINES

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

Pass mark 50%

Date: 2022.05.27

Time allocated: 03Hrs

01. a. Draw and name each part of Brush less Alternator (07 Marks)
b. Explain how voltage and Frequency of a Single generator operation, controlled with rapid change of load (06 Marks)
c. Write down Electrical Protections required of All Auxiliary Alternators (06 Marks)
d. Draw block diagram of an Auto Voltage regulator (04 Marks)
02. a. What is the function of a Fuse ? (04 Marks)
b. What do the term "HRC "stands from an abbreviation of HRC Fuse? (03 Marks)
c. Describe the thermistor- based motor protection (03 Marks)
d. Describe the preferential - trip safety mechanism with a suitable diagram and Explain its purpose (06 Marks)
03. a. Sketch & Write four types of D.C. Motors (06 Marks)
b. Briefly explain one type of D.C. Motor with a suitable sketch (04 Marks)
c. Explain purpose of Inter-poles in a DC Motor with basic connection of it (04 Marks)
04. a. What is the difference between three phase induction motor and three phase synchronous motor? (04 Marks)
b. List the applications of three phase induction motors commonly used. (04 Marks)
c. What is the purpose of using wound rotor three phase motor, and explain how? (04 Marks)
05. a. Why shore power is required for the ships? (04 Marks)
b. Sketch shore power supply panel arrangement onboard. (04 Marks)
c. If shore supply may have a different frequency or voltage, what will happen to the rotating machineries on board? (08 Marks)
06. a. Describe the basic operating principle of a transformers (05 Marks)
b. Describe why transformer cores are laminated (04 Marks)
c. State what is meant by step down & step up action of transformers. (05 Marks)
d. Draw single phase transformer equivalent Circuit and name each section (05 Marks)

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Department of Marine Electrical Engineering
PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
COURSE CODE : EED -0465/ B011/M2



FINAL EXAMINATION QUESTION PAPER
MARINE ELECTRICAL SYSTEM

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

Date: 2022.05.27

Pass mark 50%

Time allocated: 03Hrs

01. a. How does the charging capacity of a storage battery is measured? (05 Marks)
- b. How does the concentrated sulphuric-acid is dialuted to make electrolyte? (07 Marks)
- c. When you visit a battery shop to buy a battery without sample, what are the details you think are important in order to buy the correct battery. (08 Marks)
02. a. Define the term "Power Factor" (04 Marks)
- b. What is used to adjust power factor? (03 Marks)
- c. What is the maximum time a synchro scope should be online for? (03 Marks)
- d. What happens when there is a loss of excitation in a parallel alternator system? (04 Marks)
- Which alternator trip and why?
- e. Explain paralleling of alternators using a synchro scope. (06 Marks)
03. a. Briefly explain following terms. (01 x 06 Marks)
- Port side
 - Starboard side
 - Ahead
 - Stern
 - Overboard
 - Wheel house or bridge.
- b. What are the equipments and machineries on the wheelhouse? (Give 10 items) (10 Marks)
- c. Name the Locations & types of fire detection sensors onboard. (04 Marks)
04. a. What are the essential requirements to be satisfied for synchronizing of alternators? (06 Marks)
- b. Draw the sequence lamp circuit diagram for synchronizing. (09 Marks)
- c. What are the emergency loads onboard using with the emergency generator? (05 Marks)
05. a. Draw the earth fault lamp system and earth fault monitoring system. (10 Marks)
- b. What are the disadvantages of earth fault lamp system? (04 Marks)
- c. How do you locate and rectify an earth fault? (06 Marks)
06. With reference to fire alarm system on board.
- What are the requirements for fire detection system? (05 Marks)
 - List the types of detectors onboard. (06 Marks)
 - Write the locations for above detectors (09 Marks)

04. a. Draw a wiring diagram to show the essential parts cables of single fluorescent lamp.

(08 Marks)

b. Figure show a rating plate of an electric of an electric machine. Give the following value.

- i. Type of machine ?
- ii. Winding connection ?
- iii. Full load phase current ?
- iv. Hourse power (Output) ?
- v. Power factor ?
- vi. Synchronous speed ?
- vii. Slip ?
- viii. Apparent power ?

-ELECTMOT Δ-		
3~ Mot.	CE 278-E	
Δ 440V	10.5A	
5.5kW	Cos. φ - 0.87	
1440 r.p.m.	50Hz	
Ins. Cl. F	S1	IP54
VDE 0530/7		

(12 Marks)

05. a. A single phase transformer has voltage as 440/230V at a power of 100VA.

i. What is the ratio ?

(03 Marks)

ii. What are the primary and secondary current

(05 Marks)

b. i. When an electrical cable is expressed as

Cu/ XLPE /PVC - 25mm² - 7/2.14 mm - 600/1000V. What does it mean?

(08 Marks)

ii. What is the purpose of the insulation and sheath of a cable.

(04 Marks)

06. Draw POWER and CONTROL circuit for the forward-revers magnetic contactor starter circuit.
(Name the all terminal number and equipment identification letters with numbers).

Specification : Electrical Supply : 3- 440V-60Hz (Insulated neutral system)

Induction motor : 3- 440V/7.5kW - 60Hz ,(3520r.p.m.)

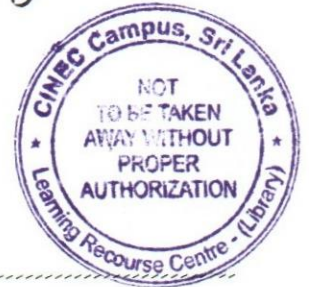
Control voltage : 24V - 60Hz

Indicating lamp : " Green" for forward running

" Yellow" for reverse running

"Red" for motor over O/L

(20 Marks)



FINAL EXAMINATION QUESTION PAPER
ELECTRICAL PRACTICE

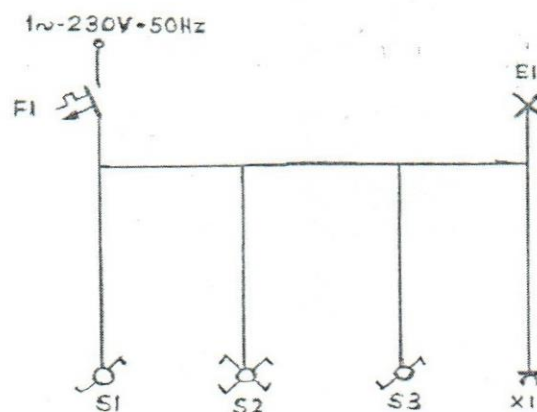
- This question paper consist 06 questions.
- Answer all six questions.

Date: 2022.05.26

Pass mark 50%

Time allocated: 03Hrs

01. a. State the five safety rules for working with electrical maintenance. (05 Marks)
- b. How will you remove a person who has received an electric shock from an electric appliance? (05 Marks)
- c. How do you check the insulation resistance of a three phase 6 terminal induction motor. (10 Marks)
02. a. What are the various types of electric diagram? (08 Marks)
- b. Draw the wiring diagram for the following single line diagram (12 Marks)



03. a. Three 44Ω heating resistors are connected to a 440V three phase electric power supply by a star delta (Y/ Δ) switch. Calculate the following for both connections. (for Star & Delta arrangements)
- The phase voltage & the phase to phase voltage. V (04 Marks)
 - The phase current and phase to phase current (04 Marks)
 - The phase power and the total power (03 Marks)
 - What is the power ratio of the star and delta connection. (03 Marks)
- b. Draw the phase relationship graph in a three-phase voltage generating system. (06 Marks)

Faculty of Marine Engineering
Department of Marine Electrical Engineering
PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
COURSE CODE : EED -0465/ B012/MI

EXAMINATION QUESTION PAPER
ELECTRICAL THEORY

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

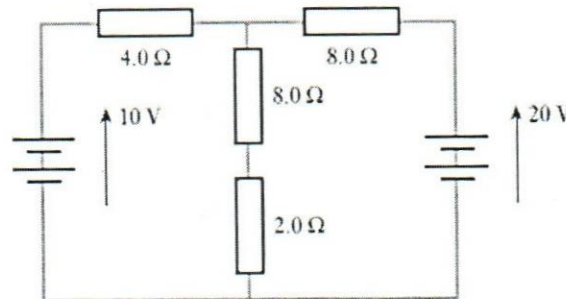
Date: 2022.03.12.

Pass mark 50%

Time allocated: 03Hrs

01.

- a. State Kirchhoff's Current Law and Voltage Law. (06 Marks)
- b. A resistor network connected to two batteries is given below. Find the value of current through each battery and state whether the batteries are charging or discharging? (12 Marks)



02. A series AC circuit is comprised of one 10 mH inductor and one 4 Ohm resistor. The power supply is 100V, 50Hz. Find
 - a. Circuit Impedance (03 Marks)
 - b. Input Current (03 Marks)
 - c. Voltage across Inductor (03 Marks)
 - d. Voltage across Resistor (03 Marks)
 - e. Power factor of the circuit (04 Marks)

03. A capacitance of 100 μ F is connected in series with a non-inductive resistance of 50 Ohm across 80V 50 Hz supply. Find
 - a. Total Impedance (03 Marks)
 - b. Current (03 Marks)
 - c. Phase angle (03 Marks)
 - d. Equation for the instantaneous value of current. (04 Marks)
 - e. Power factor of the circuit (03 Marks)

04.
 - a. Draw Impedance Triangle and name all components. (04 Marks)
 - b. Draw Power Triangle for a 3-phase system, and name all components, with units (06 Marks)
 - c. Give two methods that will improve power factor. (02 Marks)
 - d. Give 4 disadvantages of low power factor (04 Marks)

- e. A generator load has 10kVAr reactive power. If this is reduced to 5kVAr using a capacitor what will happen to the circuit current, increase or decrease? What will happen to the active power? (02 Marks)
05. A balanced 3-phase Delta connected load is connected to a 400V,50Hz AC supply. Line current is 17.32A at Power Factor 0.8 lagging. Calculate
- a. Active power (04 Marks)
 - b. Phase Current (04 Marks)
 - c. Reactive Power (04 Marks)
 - d. Impedance per phase (04 Marks)
06. The equation of an AC current is given as $28.28 \sin (376.8 t - \pi/4)$ Amperes. Determine
- a. Maximum Value (03 Marks)
 - b. RMS value (03 Marks)
 - c. Frequency (03 Marks)
 - d. Average value over one cycle (03 Marks)
 - e. If this current is flowing through a resistor of 10 Ohms, power consumed by the resistor (04 Marks)

Faculty of Marine Engineering
 Department of Marine Electrical Engineering
 PRE-SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING
 COURSE CODE: EED -0465/ B012/M1



EXAMINATION QUESTION PAPER
 WORKSHOP THEORY

- This question paper consists 06 questions.
- Answer all the Questions.

Date: 2022-03-10

Pass marks 50%

Time allocated: 03Hrs

01. a. What is "thread"? (06 Marks).
 b. Draw thread parameters on a diagramme. (06 Marks).
 c. Draw Isometric thread & name all details? (06 Marks).
02. a. Why safety is so important while working in a workshop. (04 Marks).
 b. Define the term "PPE", what are they and the use of each. (06 Marks).
 c. What does the most essential item need to be kept in the workshop other than the PPE which is helpful after the injury. (04 Marks).
03. a. Draw and explain the temperatures and uses of three types of Oxy -Acetylene flames. (08 Marks).
 b. Briefly explain about "Stick welding". (06 Marks).
04. a. What is the meaning of welding? (03 Marks).
 b. What are the principals of fusion welding? (04 Marks).
 c. What is the meaning of weld metal protection? (06 Marks).
 d. Briefly explain functions of fluxes with examples. (08 Marks).
05. a. Name the types of holes. (04 Marks).
 b. What are the types of drilling machines? (06 Marks).
 c. What is the mostly used cutting tool in drilling operation? (05 Marks).
 d. What is the cutting angle of a twist drill? (04 Marks)
06. a. What is "fitting" (06 Marks).
 b. Name 08 tools use for fitting (04 Marks).
 c. Write 06 safe working practices of fitting. (04 Marks).

Faculty of Marine Engineering
 Department of Marine Electrical Engineering
 PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
 COURSE CODE : EED -0465/ B012/M1

EXAMINATION QUESTION PAPER
 MEASUREMENTS & INSTRUMENTATION

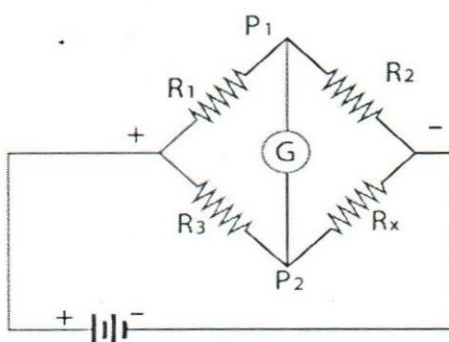
- This question paper consist 06 questions.
- Answer all six questions.

Date: 2022.03.14

Pass Marks : 50%

Time allocated: 03Hrs

- 01.
- a. Sketch a moving coil instrument and name all important parts. (10 Marks)
 - b. Name 3 advantages and 3 disadvantages of a Moving Coil meter. (06 Marks)
- 02.
- a. Sketch a basic DC multimeter circuit which uses a Moving Coil Instrument. (10 Marks)
 - b. Show with a sketch how it is possible to use a Moving Coil meter for AC measurements (02 Marks)
 - c. What are the two types of Moving Iron Meters and give two advantages of the same. (04 Marks)
 - d. Sketch symbols of moving coil meter and moving iron meter (02 Marks)
03. A moving coil meter has a full-scale deflection of 1mA at 50mV potential difference.
- a. Show how it can be used as an Ammeter to read 10A (08 Marks)
 - b. Show how it can be used as a 0-250V Voltmeter (08 Marks)
04. Figure below is a Wheatstone Bridge
- a. Write the equation for the balance condition (06 Marks)
 - b. If $R_1=10\ \Omega$, $R_2=20\ \Omega$, $R_3=15\ \Omega$, $R_x = 10\ \Omega$ what is the value of series resistance that is required to be connected to R_x for the Galvanometer to indicate zero current. (10 Marks)



05.

- a. Sketch a Dynamometer type Wattmeter and name important parts. (10 Marks)
- b. Sketch the circuit diagram showing current and voltage coil clearly. (04 Marks)
- c. Which coil is of lower resistance and which coil is of higher resistance? (02 Marks)

06.

- a. State 2 advantages of Induction type wattmeter (02 Marks)
- b. State 2 advantages of Dynamometer type wattmeter (02 Marks)
- c. Sketch a 3-phase star connected AC power supply and a star connected balanced load.
 - i. Show how two ammeters and two voltmeters can be connected to indicate line current and line voltage of R and B phases using two CTs and Two PTs.
AND one more ammeter and one more voltmeter are connected to R phase using same CTs and PTs to indicate at a remote location.
 - ii. What type of meters Moving Coil or Moving Iron are suitable for such applications? (14 Marks)

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PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
COURSE CODE : EED -0465/ B011/M1

REPEAT EXAMINATION QUESTION PAPER
ELECTRONICS

- This question paper consist of 05 Questions
- Answer all the questions.

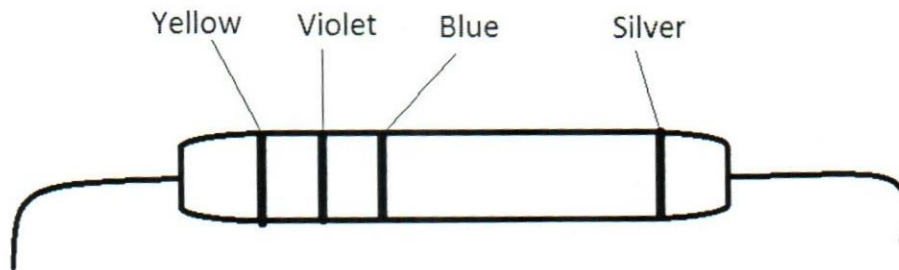
Date: 2022..03.12

Pass Marks 50%

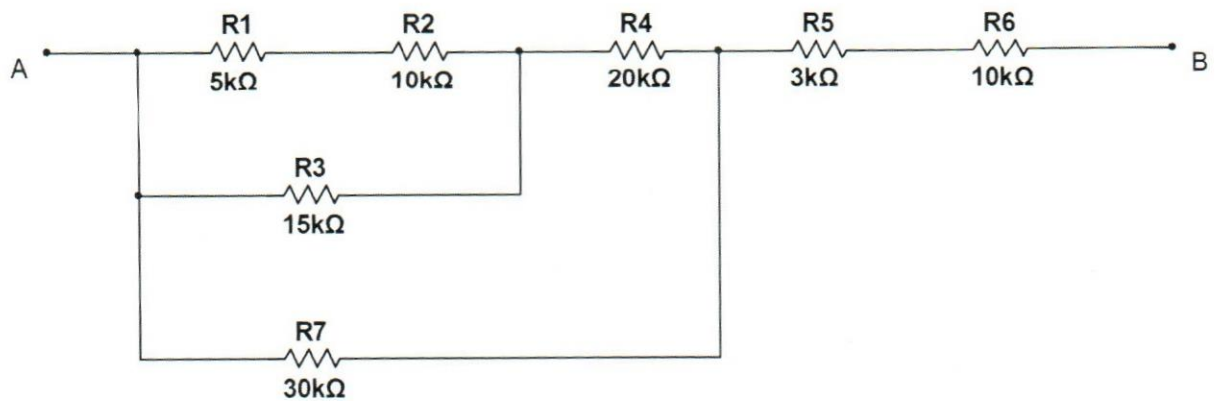
Time allocated: 03 Hrs.

01. With regards to the resistors,

- a. Read the color coding of the following resistor as per the resistor color table and find followings.

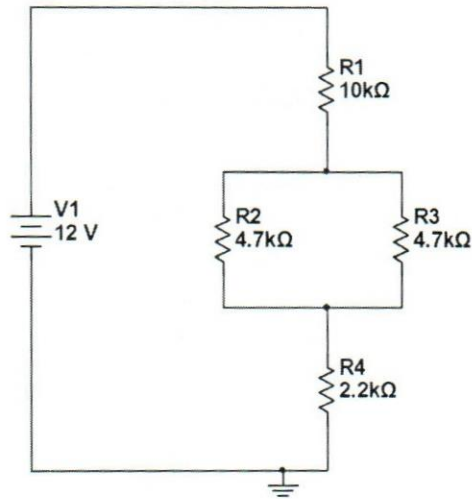


- The value of the resistor (01 Mark)
 - The percentage tolerance of the value (01 Mark)
 - The range of the value that can be exist practically (02 Marks)
- b. Find the equivalent resistance of the following resistor network (08 Marks)



c. By using the voltage divider rule, find the value of the voltage across resistor R4.

(08 Marks)



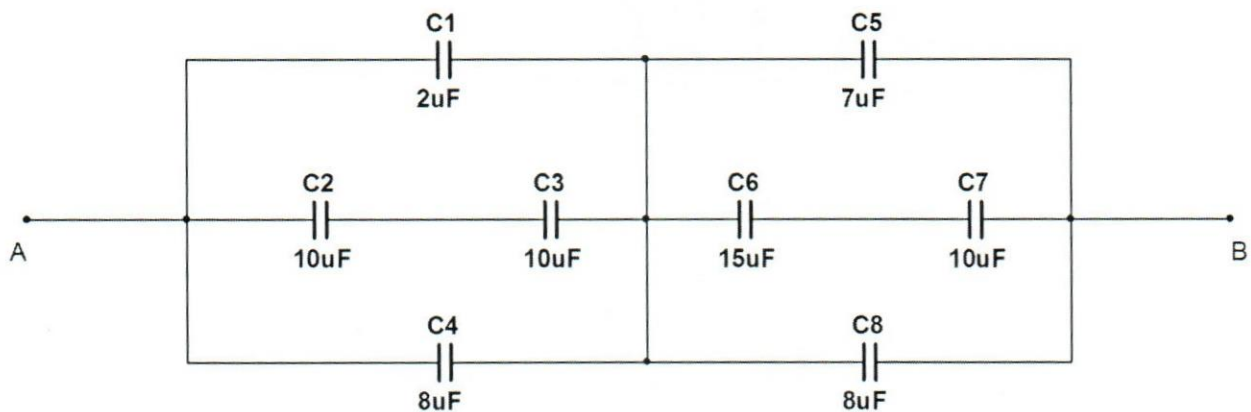
02. With regards to the capacitors,

a. What are the different types of capacitors used in electronic circuits?

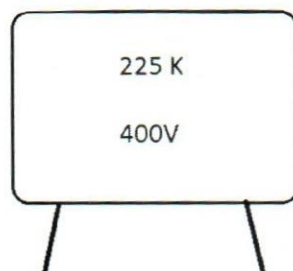
(04 Marks)

b. Find the equivalent capacitance of the following capacitor network.

(12 Marks)



c. Read following capacitor nameplate, and write down,



i. The value of the capacitor

(02 Marks)

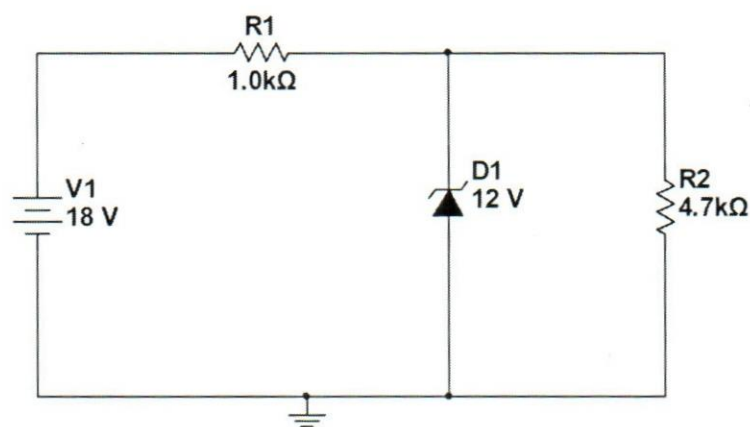
ii. Rated Voltage

(01 Mark)

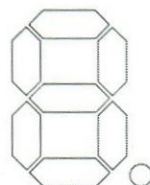
iii. Meaning of the letter "K"

(01 Mark)

03. With regards to the Zener diodes,
- Explain the purpose of using a Zener diode. (04 Marks)
 - In below Zener circuit, find
 - Operating status of the Zener (04 Marks)
 - Load current - I_L (02 Marks)
 - Supply current - I_s (03 Marks)
 - Zener current - I_z (03 Marks)
 - Power dissipation in the load resistor (02 Marks)
 - Power dissipation in the Zener Diode (02 Marks)

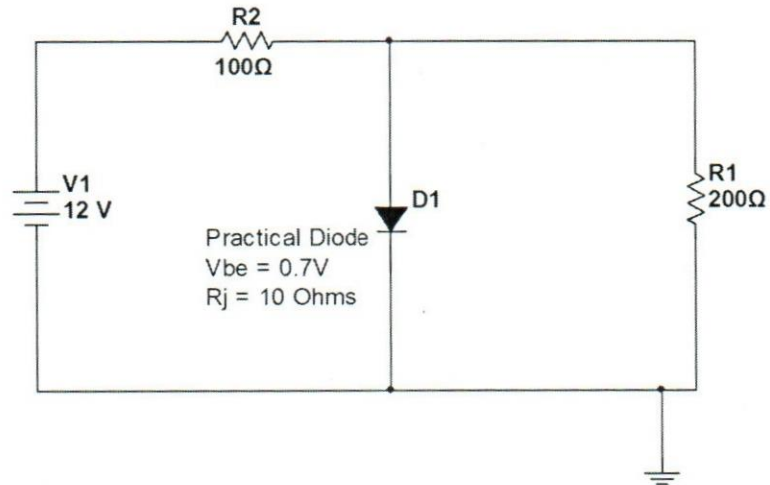


04. With regards to the LEDs,
- A 2.5 V LED has to be powered by a 32 V battery using a current limiting resistor (R). the LED draws rated current of 45mA under normal operation. Find suitable ratings for the resistor (R). (08 Marks)
 - What are the main advantages of using 7 segment displays in onboard ships? (03 Marks)
 - In following 7 segment display, name the segments as per the standards (03 Marks)



- Describe the structure of Common Anode (C.A) and Common Cathode (C.C) with the aid of sketches. (06 Marks)

05. With regards to the power diodes,
- Sketch the characteristic curve of a P.N Junction Diode and indicate all important points on the curve. (06 Marks)
 - Draw a complete circuit diagram of a conventional power supply. (08 Marks)
 - In following practical diode circuit , find the voltage and current between resistor R1. (06 Marks)



Resistor color code

Color	Digit	Multiplier	Tolerance (%)
Black	0	10^0 (1)	
Brown	1	10^1	1
Red	2	10^2	2
Orange	3	10^3	
Yellow	4	10^4	
Green	5	10^5	0.5
Blue	6	10^6	0.25
Violet	7	10^7	0.1
Grey	8	10^8	
White	9	10^9	
Gold		10^{-1}	5
Silver		10^{-2}	10
(none)			20

library



Faculty of Marine Engineering
Department of Marine Electrical Engineering
PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
COURSE CODE : EED-0465/ B012/M1

EXAMINATION QUESTION PAPER
BASIC MATHEMATICS

- This question paper consist 06 questions.
- Answer all the questions.

Date: 2022.03.11

Pass Marks : 50%

Time allocated: 03Hrs

01. a. Simplify and give in the simplest form.

i. $2(x^2 \cdot y^4)(8x^{-3} \cdot y^2)\left(\frac{1}{4} \cdot xy^{-3}\right)$ (08 Marks)

ii. If $A = 10, B = 15, C = 49$, find P
 $3A\left(\frac{B}{3} + 2A + 2C^2\right) - 3(2\sqrt{C} - 2B) = P$ (08 Marks)

02. Evaluate each of the following

(06 x 3 Marks)

i. $(-3)^{-3}$

ii. $4(x^2 + y^2)^0$

iii. $\frac{4^2 \cdot (-2)^3}{8 \cdot 2^{-4}}$

03. A copper wire of resistance R_0 is stretched till its length is increased 4 times of its original length. Prove the its resistance will now be $16R_0$.
(Hint - $R = \rho \frac{l}{A}$)

(16 Marks)

04. a. Solve the following x

(02 x 2 Marks)

i. $\left(\frac{1}{3}\right)^x = 27$

ii. $(216)^{\frac{1}{3}} = 6^x$

b. If $\cos\theta = \frac{x-y}{x+y}$, evaluate $\tan\theta$ and $\sin\theta$

(06 Marks)

c. Prove the followings.

i. $\sin^2(30^\circ) - \sin^2(45^\circ) - \sin^2(60^\circ) = -1$ (04 Marks)

ii. $\sin(30^\circ) \cdot \cos(60^\circ) - \cos(30^\circ) \cdot \sin(60^\circ) = \frac{1}{2}$ (04 Marks)

05. Let $Z_1 = 2 + i3$, $Z_2 = -3 + i2$. Find

i $Z_1 \cdot Z_2$

(05 Marks)

ii $\frac{Z_1}{Z_2}$

(06 Marks)

iii Express Z_1 in polar coordinates and draw an argand diagram.

(05 Marks)

06. Open tank is 2m diameter and 4m high. How many liters of paint will be required for the tank inside to paint it at $2\text{m}^2/\text{liter}$?

(16 Marks)



EXAMINATION QUESTION PAPER
Computer Knowledge

- This question paper consists of 06 Questions
- Answer any 05 questions.

Date: 2022.03.09

Pass Marks 50%

Time allocated: 03 Hrs.

01: Regarding Basics of Computers.

- What is the difference between IT and ICT? (04 Marks)
- Write down four applications of ICT. (04 Marks)
- Explain one application of ICT. (04 Marks)
- What is a computer? (04 Marks)
- Write four functionalities of a computer. (04 Marks)

02: Regarding Computer Hardware (Input and Output devices)

- What is an input device of a computer? (02 Marks)
- Give four examples for input devices. (04 Marks)
- Briefly explain the usage of two input devices. (04 Marks)
- What are output devices of a computer? (02 Marks)
- Write down four examples for output devices. (04 Marks)
- Is 'Computer Mouse' an input or output device? Explain your answer. (04 Marks)

03: Regarding Computer Hardware (CPU and Storage Devices)

- What is the computer CPU? Explain with its components. (04 Marks)
- Write the different functionalities between CU and ALU of CPU. (04 Marks)
- What is RAM? (02 Marks)
- What is ROM? (02 Marks)
- Give four examples for secondary storages of a computer. (04 marks)
- Briefly explain what is a Hard Drive and give two examples for types of Hard Drives. (04 Marks)

04: Regarding Computer Software.

- Briefly explain what are two types of computers softwares with an example for each. (04 Marks)
- What is an Operating System (OS)? (04 Marks)
- Write down four examples for Desktop OS and Mobile OS. (Two examples for each) (04 Marks)
- What is an Anti-Virus software? (04 Marks)
- Give four examples for Anti-Virus softwares. (04 Marks)

05: Regarding MS Word and MS PowerPoint.

- a. Why do we use MS Word? Give two examples. (02 Marks)
- b. How to open a MS Word? (02 Marks)
- c. Write down the steps, how to put a Page Border to a MS Word file. (04 Marks)
- d. How to save MS Word file as a PDF file? (04 Marks)
- e. Where do we use MS PowerPoint? Give two examples. (04 Marks)
- f. How to put an animation to a MS PowerPoint presentation? (04 Marks)

06: Regarding MS Excel.

- a. Why do we use MS Excel in our day-to-day life? (02 Marks)
- b. What is a spread sheet? (02 Marks)
- c. How to freeze the top row of a spreadsheet? (04 Marks)
- d. Answer the following questions from MS Excel formulas.

	A	B	C	D	E	F	G	H
1		Religion	Science	History	IT	Maths	Sinhala	Health
2	Chamari	26	54	65	78	45	14	96
3	Kisali	45	26	12	63	63	69	64
4	Mohammed	65	33	36	35	98	35	22
5	Namal	14	47	11	47	35	47	14
6	Perera	98	63	47	77	16	66	47
7	Kelum	14	65	12	83	44	17	13
8	Silva	36	11	34	14	35	23	66
9	Ruwani	41	78	25	69	65	14	21

- i. Find the total marks of Namal. (02 Marks)
- ii. What is the highest mark for Maths? (02 Marks)
- iii. What is the lowest mark for science? (02 Marks)
- iv. How to find the number of subjects? (02 Marks)
- v. What is the average mark for Kelum? (02 Marks)
- vi. Find the minimum mark of all subjects. (Minimum mark of the table) (02 Marks)

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EXAMINATION QUESTION PAPER
WORK SHOP THEORY

- This question paper consists 06 questions.
- Answer all the Questions.

Date: 2022-01-08

Pass marks 50%

Time allocated: 03Hrs

- 01). a. What is "thread"? (06 Marks).
b. Draw thread parameters on a diagramme. (06 Marks).
c. Draw Isometric thread & name all details? (06 Marks).
- 02). a. Why safety is so important while working in a workshop. (04 Marks).
b. Define the term "PPE", what are they and the use of each. (06 Marks).
c. What does the most essential item need to be kept in the workshop other than the PPE which is helpful after the injury. (04 Marks).
- 03). a. Draw and explain the temperatures and uses of three types of Oxy -Acetylene flames. (08 Marks).
b. Briefly explain about "Stick welding". (06 Marks).
- 04). a. What is the meaning of welding? (03 Marks).
b. What are the principals of fusion welding? (04 Marks).
c. What is the meaning of weld metal protection? (06 Marks).
d. Briefly explain functions of fluxes with examples. (08 Marks).
- 05). a. Name the types of holes. (04 Marks).
b. What are the types of drilling machines? (06 Marks).
c. What is the mostly used cutting tool in drilling operation? (05 Marks).
d. What is the cutting angle of a twist drill? (04 Marks).
- 06). a. What is fitting ? (06 Marks)
b. Name 08 tools use for fitting. (04 Marks)
c. Write 06 safe working practices of fitting (04 Marks)



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 COURSE CODE: EED-0465/B011/MI

EXAMINATION QUESTION PAPER
 MEASUREMENTS & INSTRUMENTATION

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

Date: 2022.01.07

Pass Marks : 50%

Time allocated: 03Hrs

01. a. What are the type of electrical measuring instruments according to their functions? (03 Marks)
 b. Briefly explain them. (06 Marks)
 c. What are the essential torques of indicating instrument? (03 Marks)
 d. Describe the operation of above torques. (06 Marks)
02. a. A permanent magnet moving coil instrument gives full-scale deflection with 10mA and has resistance of 5Ω . Calculate the resistance of the necessary components in order that the instrument may be used as
 i a 1A ammeter
 ii a 20V voltmeter (08 Marks)
 b. List the advantages and disadvantages of moving coil instrument. (08 Marks)
03. a. State the types of moving iron instruments (04 Marks)
 b. Briefly explain them. (06 Marks)
 c. List the sources of errors of moving iron instrument. (06 Marks)
04. a. What are the advantages, disadvantages & applications of induction wattmeter (08 Marks)
 b. Draw the principles parts of a single phase induction wattmeter (06 Marks)
 c. List the errors of induction wattmeter. (04 Marks)
- 05 In the circuit shown in fig.01, reading of the voltmeter is 230V and that of ammeter is 2.5A. The resistances of the meters are as follows:
 Voltmeter circuit = 2000Ω , Wattmeter current coil = 0.46Ω , Wattmeter voltage coil = 8000Ω ,
 Ammeter circuit = negligible. Calculate
 i the power expended in the load (10 Marks)
 ii the reading of the wattmeter (06 Marks)

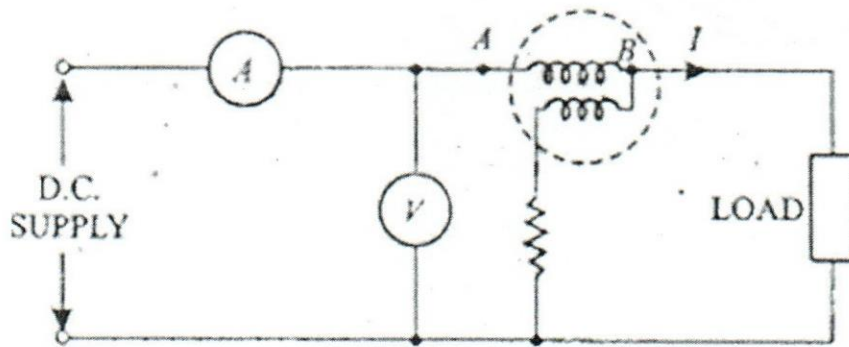


Fig. 01

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

(08 Marks)

(04 Marks)

(04 Marks)

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EXAMINATION QUESTION PAPER
Electronics

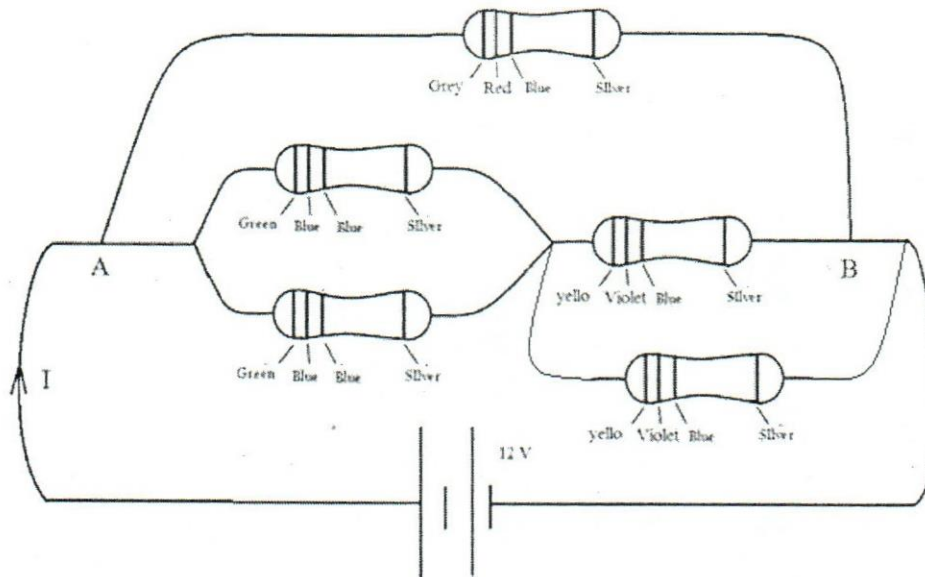
- This question paper consist of 05 Questions
- Answer all the questions.

Date: 2022.01.07

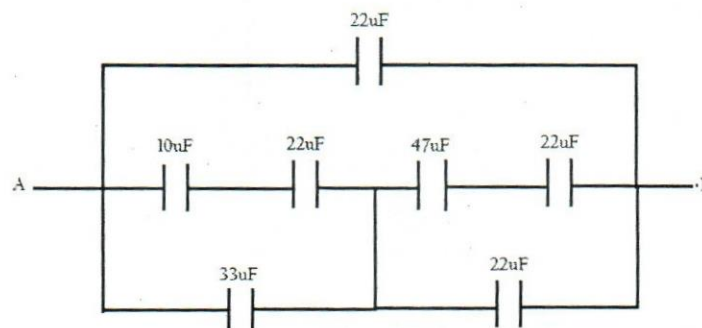
Pass Marks 50%

Time allocated: 03 Hrs.

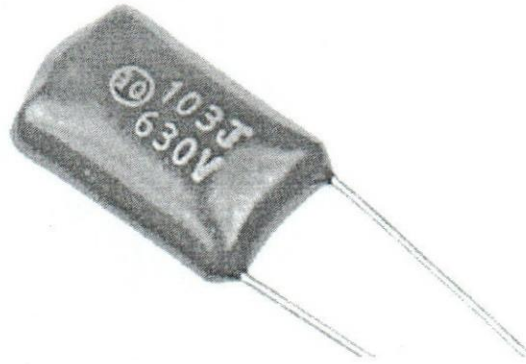
01. Find all the values of all resistors in following network and answer below questions.
(Resistor Color code is attached to the end of this paper)



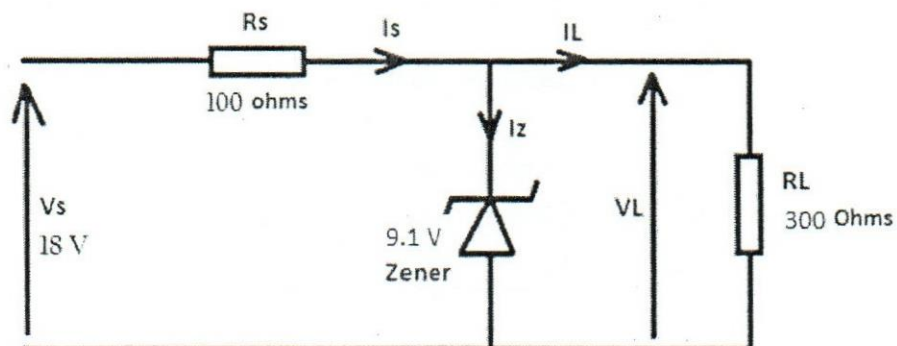
- The value of all resistors (10 Marks)
 - The equivalent resistance between Points A and B (06 Marks)
 - The value of current (I) (04 Marks)
02. a. State 4 types of capacitors used in electronic circuits (04 Marks)
b. Find the equivalent capacitance of the following capacitor network (10 Marks)



- c. Read following capacitor nameplate, and write down,
- The value of the capacitor (02 Marks)
 - Rated Voltage (02 Marks)
 - Meaning of the letter "J" (02 Marks)



- 03 a. Sketch the characteristic curve of the P-N junction diode and name its important points. (06 Marks)
- b. Sketch the circuit diagram of a single-phase rectifier circuit by using a center tapped transformer. (06 Marks)
- c. Draw a complete circuit diagram of a conventional power supply. (08 Marks)
04. a. Explain the function of a Zener diode. (04 Marks)
- b. In below Zener circuit, find
- Operating status of the Zener (04 Marks)
 - Load current - I_L (02 Marks)
 - Supply current - I_s (02 Marks)
 - Zener current - I_z (02 Marks)
 - Power dissipation in the load resistor (03 Marks)
 - Power dissipation in the Zener Diode (03 Marks)



05. With regards to LEDs and 7-segment displays,

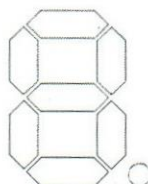
- a. A 2.5 V LED has to be powered by a 28 V battery using a current limiting resistor (R). the LED draws rated current of 20mA under normal operation. Find suitable ratings for the resistor (R).

(06 Marks)

- b. State the advantages of using 7 segment displays in onboard ships? (04 Marks)

- c. In following 7 segment display, name the segments as per the standards.

(04 Marks)



- d. Describe the structure of two types of 7-segment displays available in electronic applications.

(06 Marks)

Resistor color code

Color	Digit	Multiplier	Tolerance (%)
Black	0	10^0 (1)	
Brown	1	10^1	1
Red	2	10^2	2
Orange	3	10^3	
Yellow	4	10^4	
Green	5	10^5	0.5
Blue	6	10^6	0.25
Violet	7	10^7	0.1
Grey	8	10^8	
White	9	10^9	
Gold		10^{-1}	5
Silver		10^{-2}	10
(none)			20

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EXAMINATION QUESTION PAPER
 ELECTRICAL THEORY

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

Date: 202201.06

Pass mark 50%

Time allocated: 03Hrs

01. a. State the Kirchoff's Current law(KCL) and Kirchoff's Voltage law(KVL). (08 Marks)
- b. Using above laws, find the current in 3Ω resistors in the circuit shown figure.01 (08 Marks)

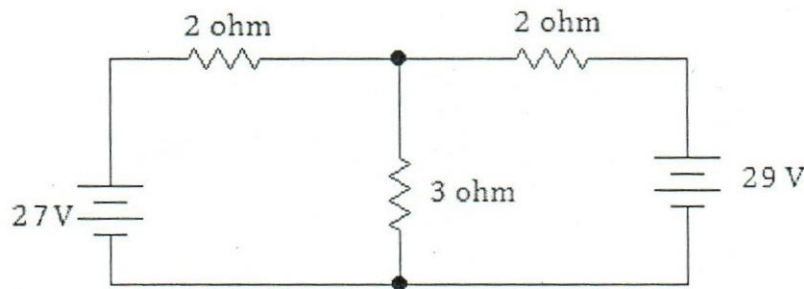


Figure. 01

02. a. An alternating current I is given by $I = 110 \sin 314t$. Determine (02 Marks)
- i. Maximum value (02 Marks)
 - ii. Frequency and (02 Marks)
 - iii. Time period (02 Marks)
- b. An ac circuit consists of a pure resistance of 23Ω and is connected across an ac supply of $230V, 50Hz$. Calculate (03 Marks)
- i. Current (03 Marks)
 - ii. Power consumed and (03 Marks)
 - iii. Equation for voltage and current (04 Marks)
03. A choke coil takes a current of $10A$ when connected across $220V, 50Hz$ mains and consumes 200 watts. Find (06 Marks)
- i. The power factor (04 Marks)
 - ii. Resistance of the coil (04 Marks)
 - iii. Inductance of the coil (04 Marks)
 - iv. Equation for voltage and current (04 Marks)

04. A capacitor of capacitance $60\mu\text{F}$ is connected in series with a non-inductive resistance of 20Ω across 200V , 50Hz supply. Find

- a. Impedance (04 Marks)
- b. Current (04 Marks)
- c. Phase angle and (04 Marks)
- d. Equation for the instantaneous value of current. (04 Marks)

05. Three 40Ω similar resistors are connected in delta across 400V , 3-phase supply. The line current is 20A . Calculate the power taken from the mains. If one of resistance is disconnected, what would be the power taken from the mains? (16 Marks)

06. a. Draw the power triangle for three phase and write the equations with their units. (10 Marks)
- b. List the disadvantages of low power factor in power system? (04 Marks)
 - c. How do you improve the power factor in power system? (04 Marks)



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EXAMINATION QUESTION PAPER

Computer Knowledge

- This question paper consist of 05 Questions
- Answer all the questions.

Date: 2022.01.06

Pass Marks 50%

Time allocated: 03 Hrs.

Q1 Regarding Basics of computers

- What is the difference between IT and ICT? (04 Marks)
- What are the main applications of ICT and describe two of them. (04 Marks)
- Briefly describe the following ports by indicating the usage of them. (04 Marks)
 - RJ45 port
 - VGA port
 - Parallel port
 - HDMI port
- What is a computer and what are the basic functionalities if it? (04 Marks)
- Write down the classification of computers according to the size? (04 Marks)

Q2 Regarding Basics of computers

- What are the two types of computer software and describe one of them? (04 Marks)
- What are INPUT devices and OUTPUT devices? Give examples. (04 Marks)
- What are the main parts of Central processing unit (CPU)? (04 Marks)
- What is referred by computer HARDWARE and SOFTWARE? (04 Marks)
- What is an Uninterruptible power supply? (04 Marks)

Q3 Regarding MS Word

- How to open a MS Word file? (Steps) (04 Marks)
- How to save a word file in PDF format. (04 Marks)
- What is the importance of nonprinting characters and list down three of them (04 Marks)
- Write down the steps for following operations. (08 Marks)
 - Text to speech,
 - Shrink one page
 - Calculate
 - Filter

Q4 Regarding MS Excel

00014
(02 Marks)

- What are the advantages of using MS Excel?
- Answer the following questions.

	A	B	C	D	E	F	G	H
1	Column1	Column	Column	Column	Column	Column	Column	Column8
2	Name	Subject						Average
3								
4		Maths	Sinhala	English	Tamil	Science	Art	
5	Nalaka	75	ab	ab		54	45	85
6	Ajith	56	56	57	15	ab		85
7	Semal	48	53	85	25	56		95
8	Chathuranga	57	ab		95	85	ab	65
9	Amila	85	65	84	95	57		35
10	Sumith	95	85	65	65	ab		25
11	Chameera	85	64	58	42	85		75
12								
13	Maximum							
14	Minimum							
15	Total							
16	Count							
17								

- What is a work sheet? (03 Marks)
- Write the formula to get the Average Marks of Nalaka and Amila? (03 Marks)
- Write the formula to get the Maximum marks for Maths? (03 Marks)
- Write the formula to get the Minimum marks for Sinhala? (03 Marks)
- What is the formula to get the total marks for English? (03 Marks)
- What is the formula to get the Number of students who faced the Science exam? (03 Marks)

Q5 Regarding MS PowerPoint

- Write down the main procedure of creating a presentation by using MS power point. (04 Marks)
- How to apply a theme to a slide. (04 Marks)
- How to insert a text to a slide. (04 Marks)
- How to change layout of a slide. (04 Marks)
- How to insert a picture to a slide. (02 Marks)
- How to save a presentation in PDF format? (02 Marks)

Q6 Regarding operating systems and antivirus systems

- What is an operating system? (04 Marks)
- What is an antivirus system? (04 Marks)
- Write down four types of antivirus software. (04 Marks)
- Write down three types of operating software. (04 Marks)
- How to install an antivirus software to your PC (Steps). (04 Marks)



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BASIC MATHEMATICS

- This question paper consist 05 questions.
- Answer all five questions.

Date: 2022.01.04

Pass Marks : 50%

Time allocated: 03Hrs

01. Simplify each of the following expressions. Write the answers using only positive components for (i).

(i) $\frac{1}{6}(x^3 \cdot y^3)(24 \cdot x^{-3} \cdot y^2)\left(\frac{1}{4} \cdot xy^{-3}\right)$ (09 Marks)

(ii) If $A = 1, B = 10, C = 8$, find P
 $A^3 \left(\frac{B}{5} + 2A + 2C^2\right) - 3(\sqrt[3]{C} - 2B) = P$ (11 Marks)

02. Find the area of dark portion of the figure - 01.

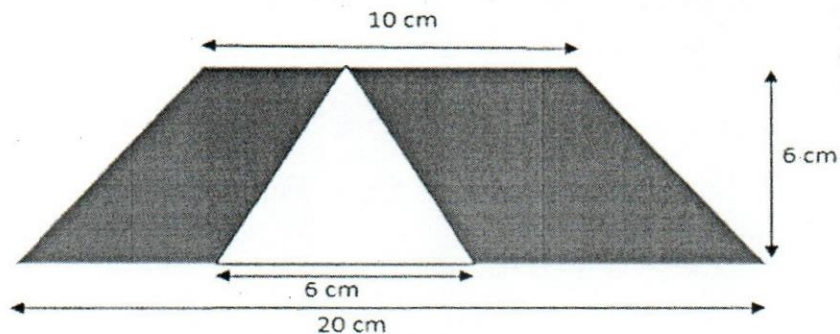


Figure - 01

03. A copper wire of diameter **1cm** had a resistance of **0.5Ω**. it was drawn under pressure so that its diameter was reduced **75%**. What is the new resistance of the wire?

(20 Marks)

$$\left\{ \text{Hint : } R = \frac{\rho \times l}{A} \right\}$$

where R - Resistance of the wire material

ρ - resistivity of the wire material (Constant)

l - Length of wire

A - Cross section of the wire

04. (a) $\triangle ABC$ is the rectangular triangle as shown in figure - 02. $AB = \sqrt{4} \text{ cm}$, $AC = \sqrt{5} \text{ cm}$

- (i) Find BC length (03 Marks)
 (ii) Write the expression for $\sin\theta$ & $\cos\theta$ (06 Marks)

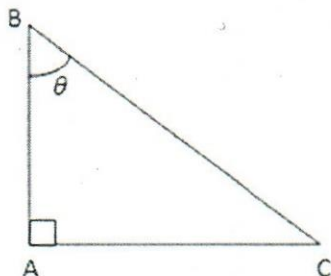


Figure. 02

(b) If $\cos\theta = \frac{a-b}{a+b}$, evaluate $\tan\theta$ and $\sin\theta$ (10 Marks)

(c) Prove the followings.

(i) $\sin^2(90^\circ) - \sin^2(45^\circ) - \cos^2(45^\circ) = 0$ (03 Marks)

(ii) $\sin^2(30^\circ) \cdot \cos(0^\circ) - \cos(30^\circ) \cdot \sin(60^\circ) = -\frac{1}{2}$ (03 Marks)

05. Let $Z_1 = 1 - 3i$, $Z_2 = 3 - 2i$, $Z_3 = 3 + 4i$. Find

(i) $Z_1 \cdot Z_2$ (05 Marks)

(ii) $Z_3 \cdot Z_2$ (05 Marks)

(iii) $\frac{Z_1}{Z_2}$ (05 Marks)

(iv) $\frac{Z_2}{Z_3}$ (05 Marks)



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EXAMINATION QUESTION PAPER
 BASIC ELECTRICAL POWER & MACHINES

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

Pass mark 50%

Date: 2022.01.04

Time allocated: 03Hrs

01. a. Sketch a tree diagram to show branches with all electrical motors (06 Marks)
 b. List losses of Electrical motors (04 Marks)
 c. List twelve common parts of DC compound motor. (12 Marks)
02. a. Draw full diagram of Series, shunt and Compound, & name all components of each motor (12 Marks)
 b. Which DC motor Field coil has the same thickness winding as the Armature & terminals (02 Marks)
 Explain why it has to be the same thickness
 c. Sketch a DC shunt motor connected with DC motor starting resistor (04 Marks)
03. a. List Eight technical Specification of Fuses and Circuit breakers (08 Marks)
 b. List Eight technical Specification of three phase Induction motor (08 Marks)
 c. List Four technical Specification of Power Transformer (04 Marks)
04. a. Explain the meaning of IP code and purpose of first, second and third digits (06 Marks)
 b. List type of Electrical Enclosures for Electrical lights, Motor, control switches (06 Marks)
 i. Required for electrical motor of anchor windlass
 ii. Required for Battery room & Paint store
05. a. Draw a tree diagram and show all transformers in each branches (04 Marks)
 b. Sketch construction of Power transformer and name each part clearly (02 Marks)
 c. Sketch Symbols of PT & CT (02 Marks)
06. Sketch and Name each and every components of a DOL STARTER of an 3phase Induction motor
 a. Sketch Power Circuit and mark all the components clearly (07 Marks)
 b. Control Circuit with Transformer, separate fuse for three Indicators (Power, Motor Run, OCR Failure indicators) (07 Marks)
 c. List minimum three common Protection available in the DOL starter for motor (06 Marks)

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FINAL EXAMINATION QUESTION PAPER
ADVANCED ELECTRICAL POWER & MACHINES

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

Pass mark 50%

Date: 2021.09. 29

Time allocated: 03Hrs

01. a. List Six Electrical Protections which protects Ship's Main switch board (MSB) (12 Marks)
b. How many core cable is used to connect Generator and ship MSB (03 Marks)
c. What is the purpose of the Individual DC injection (IRM) Systems are installed at the 440 & 220 V Switch boards. (04 Marks)
02. a. Draw full diagrams of self excited Brushless AC Generator and name all components (12 Marks)
b. Draw a block diagrams of AVR and name all components (06 Marks)
c. What are the Control Elements of the Diesel Generator (Alternator) responsible for Maintaining Own Out put frequency and the Out put Voltage regardless of the Load (04 Marks)
03. a. What are the four parameters required to be matched to synchronize two generators (08 Marks)
b. Which generators are generally allowed to brief parallel to change load without blackout (04 Marks)
c. Explain purpose of Check synchronizer and Auto synchronizer (04 Marks)
04. a. List Generator Protections of Aux Generator s & Shaft generator (08 Marks)
b. List type of Electrical Enclosures for Electrical lights or Motor control switches (04 Marks)
i. Required for electrical motor of anchor windlass
ii. Required for Battery room & Paint store
05. a. List names of three starters of reduced voltage starting methods of larger 3 phase Motor (06 Marks)
b. List one speed control (two fixed speeds) methods of 3 phase motor starters (02 Marks)
c. List two speed control (variable speed) methods of 3 phase motor starters (02 Marks)
06. Sketch and Name each and every components of a both direction DOL of an Induction motor (Forward & Reverse starter)
a. Sketch Power Circuit and mark all the components clearly (08 Marks)
b. Control Circuit with Transformer, three Indicators (Power, Motor Run, OCR Failure) (07 Marks)
c. List minimum three common Protection available in the DOL starter for motor (06 Marks)



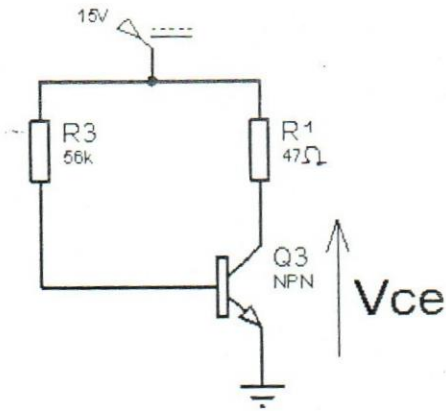
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FINAL EXAMINATION QUESTION PAPER
APPLIED ELECTRONICS

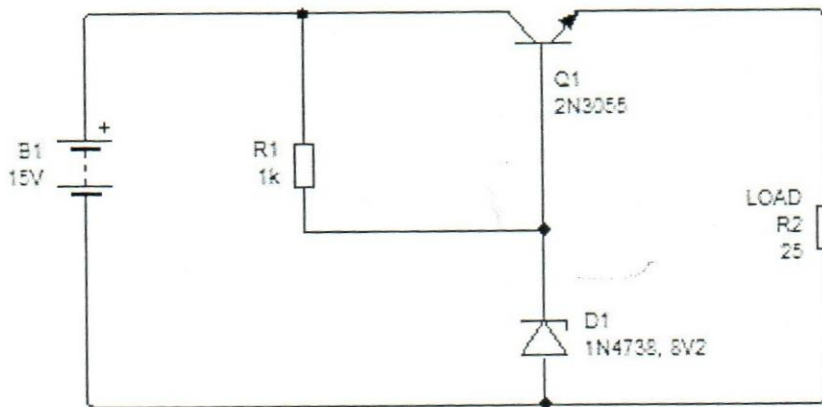
- This question paper consist 06 questions. Date: 2021.09. 28
- Answer all six questions. Pass mark 50% Time allocated: 03Hrs

- Describe the difference between SCR and TRIAC (05 Marks)
 - Draw the symbols of following power electronic components and name its terminals (2x05 Marks)
 - SCR
 - BJT
 - TRIAC
 - DIAC
 - MOSFET
 - Sketch the circuit diagram of three phase full-wave controlled rectifier circuit using SCRs. (05 Marks)
- With regards to the DC power supplies,
 - What is a DC power supply? (04 Marks)
 - Draw a complete circuit diagram of a single phase conventional DC power supply using centre-tap transformer. (08 Marks)
 - What is the function of a "Regulator circuit" used in power supplies. (04 Marks)
 - What are the types of regulators used in DC power supplies. (04 Marks)
- With regards to the Transistors,
 - State four different kinds of transistors used in electronic circuits. (04 Marks)
 - Consider following BJT arrangement and find (Consider the V_{BE} of transistor as 0.7V and β as 70)
 - The base current (04 Marks)
 - The collector current (04 Marks)
 - The emitter current (04 Marks)
 - The voltage across collector and emitter terminals (04 Marks)



4. a. Describe the function of zener regulator (05 Marks)

b. Consider following Regulator Circuit, and find (the Zener diode is 8.2V, Consider $V_{be} = 0.6V$,



- i. The value of the output voltage (V_o). (03 Marks)
- ii. The load current (I_L) (03 Marks)
- iii. The Supply current (I_s) (03 Marks)
- iv. The power dissipation in the load (100Ω) (03 Marks)
- v. The power dissipation in the transistor (03 Marks)

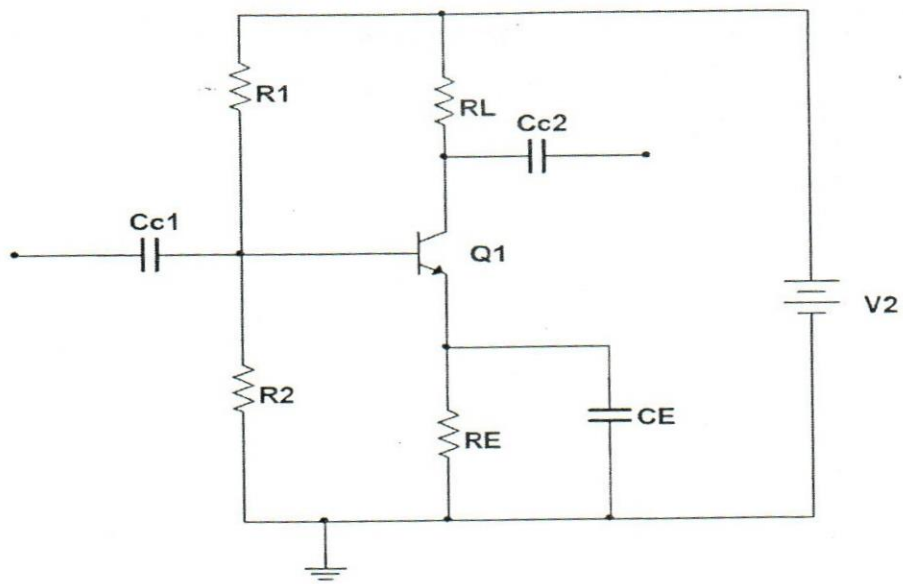
5. With regards to the amplifiers,

a. Describe the usage of amplifiers? (05 Marks)

b. Describe the difference between the pre-amplifier and the power amplifier. (05 Marks)

c. Identify the type of following amplifier. Also describe following components, (10 Marks)

- i. R_1 and R_2
- ii. R_E
- iii. CE
- iv. C_{c1} and C_{c2}



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FINAL EXAMINATION QUESTION PAPER
AWARENESS TO QUALITY, ENVIRONMENT & SAFETY MANAGEMENT SYSTEM

- This question paper consists of 06 questions.
- Answer all the questions.

Date: 2021.09.29

Pass mark 50%

Time allocated: 03Hrs

01. Write Short notes of the following topics. (30 Marks)
- IMO
 - Flag State.
 - Port State.
 - Maritime Convention
 - Exclusive Economic Zone.
 - Territorial Waters.
 - MARPOL Annex I
 - MARPOL Annex 6
 - National Legislation.
 - Engine room resource Management
02. Briefly explain what Classification Societies are. Explain how they confirm ships are safe for voyeges in high sea. (14 Marks)
03. Explain fully, what are the Four pillers of Maritime law. (14 Marks)
04. a. State what are the basic principles of Engineroom resource management and briefly explain how they help ships management. (06 Marks)
- b. State FOUR importnt certificates require for a ship to sail at sea, briefly explain their purpose. (08 Marks)
05. a. The purpose of MARPOL Annex IV Sewage pumping out system. (04 Marks)
- b. Explain what are life saving and firefighting appliances expalining ate lest 6 items in each catogory. (10 Marks)
06. a. Under MARPOL Annex I explain under what conditions oil can be pumped out from the engine room bilges. (07 Marks)
- b. Explain what important electrical work are carried out in a Dry Dock (7 Marks)

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Faculty of Marine Engineering
Department of Marine Electrical Engineering
PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
COURSE CODE : EED -0465/ B010/M2

FINAL EXAMINATION QUESTION PAPER
MARINE ENGINEERING KNOWLEDGE

- This question paper consists 06 questions.
- Answer all the questions.

Date: 2021.09.30

Pass mark 50%

Time allocated: 03Hrs

01. a. What do you understand by a "STROKE" of an engine? (02 Marks)
- b. Briefly explain the working of a 2-stroke marine engine with respect to crankshaft revolution. (04 Marks)
- c. Write short notes for the following.
- i. Exhaust gas turbocharger.
 - ii. Scavenge air cooler.
 - iii. Scavenge fire.
 - iv. Stuffing box. (4 x 02 Marks)
- d. With a sketch briefly explain the operation of exhaust valve of Sulzer engine. (03 Marks)
- e. Briefly explain common fuel rail system. (03 Marks)
- f. Write 04 advantages of 2 stroke marine engine over 4 stroke engines. (03 Marks)
02. a. Name the foreword anchor windlass all related parts. (04 Marks)
- b. Name the various types of hatch covers. (04 Marks)
- c. What are the 2 main purposes of hatch covers? (04 Marks)
- d. Write down different types of water tight doors and their usage on board. (04 Marks)
03. a. Write 04 purposes of steam in a tanker ship. (04 Marks)
- b. Name the major constructional types of oil fired boilers. (02 Marks)
- c. Briefly explain the boiler burner unit. (05 Marks)
- d. What is the difference between boiler mountings and boiler accessories, give examples for both? (05 Marks)

04. a. What are "Engine room bilges" and how do you manage this? (02 Marks)
- b. Briefly explain the construction & operation of an oily water separator. (05 Marks)
- c. What is the maintenance works to be carried out for 15 ppm monitor as well as oily water separator. (05 Marks)
05. a. Briefly explain the sewage treatment plant with "MARPOL" annex. (05 Marks)
- b. What are the routine checks to be carry out to ensure sewage treatment plant is functioning properly? (04 Marks)
- c. How does the anaerobic and aerobic decomposition occurs? What are the products of each? (05 Marks)
06. a. Draw and explain vapor compression refrigeration cycle briefly. State all physical conditions of the refrigerant at various places. (04 Marks)
- b. Briefly explain construction and working of the thermostatic expansion valve with external equalizer in a refrigeration system? (05 Marks)
- c. Write short notes for the following.
- i. Filter drier.
 - ii. Pump down.
 - iii. Flash gas.
 - iv. Flood back.
 - v. Degree of super heat. (5 x 02 Marks)

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COURSE CODE : EED -0465/ B010/M2

FINAL EXAMINATION QUESTION PAPER
MARINE ELECTRICAL SYSTEM

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

Date: 2021.09.27

Pass mark 50%

Time allocated: 03Hrs

01. With reference to Navigational light and Navigational aids
- Draw the neat basic block diagram for operating of navigational lights. (05 Marks)
 - List the alarms for above lights panel (04 Marks)
 - Briefly explain the purpose or function of followings. (3 x 03 Marks)
 - AIS
 - Speed log
 - Echo sounder
02. With reference to Main switchboard
- What is the purpose of preferential tripping system? (04 Marks)
 - List the essential loads. (06 Marks)
 - What are the non essential loads on board? (05 Marks)
 - How is the reverse power activated and what type of failures occurred for that? (03Marks)
03. With reference synchronizing of alternators onboard
- What are the essential requirements to be satisfied for synchronizing of alternators? (03 Marks)
 - list the synchronizing methods (05 Marks)
 - Draw the neat block diagrams for above any two methods (08 Marks)
- 04 With reference to shore power
- Why shore power is required for the ships? (04 Marks)
 - Sketch a shore power supply panel arrangement on board. (06 Marks)
 - If shore supply may have a different frequency and or voltage. What will happen to the Rotating machineries onboard? (05Marks)
05. With reference to alternators
- Draw the neat block diagrams and name the each components for the followings
 - Self excited brushless – alternator (06 Marks)
 - Static transformer excitation – alternator (06 Marks)
 - List the alternator protections. (04 Marks)

00013

06. With reference to onboard maintenance , routine works and duties

- a. What are the types of maintenance? (04 Marks)
- b. How do you plan and manage the maintenance works? (05 Marks)
- c. Briefly explain the maintenance for followings. (3 x 02 Marks)
 - i Three phase induction motor
 - ii Power circuit of the above motor
 - iii Control circuit of the above motor
- d. List the major routine works and duties on board for an Electrician. (05 Marks)

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COURSE CODE: EED -0465/ B010/M1

EXAMINATION QUESTION PAPER
Electronics

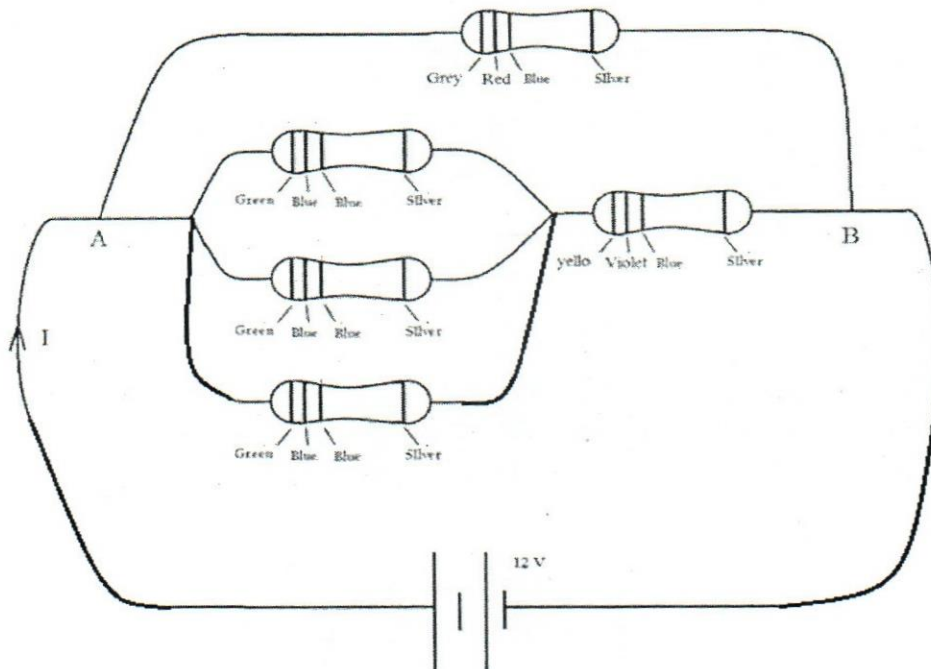
- This question paper consist of 05 Questions
- Answer all the questions.

Date: 2021.01.21

Pass Marks 50%

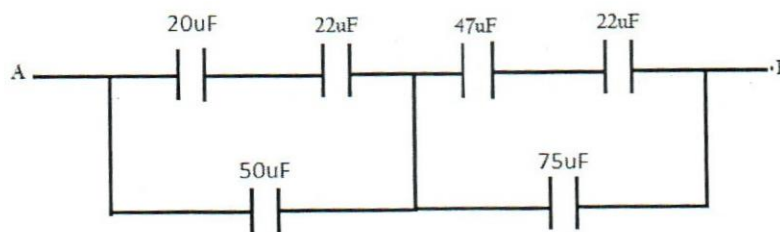
Time allocated: 03 Hrs.

1. Get the values of all resistors in following network and answer below questions.
(Resistor Color code is attached to the end of this paper)



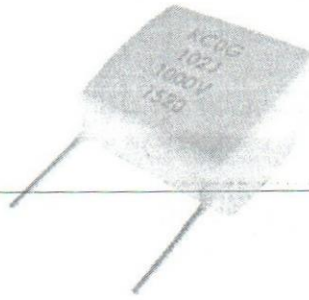
- The value of all resistors (08 Marks)
- The equivalent resistance between Points A and B (06 Marks)
- The value of current (I) (06 Marks)

2. With regards to the capacitors,
- State applications of fixed and variable capacitors in electronic circuits (04 Marks)
 - Find the equivalent capacitance of the following capacitor network (10 Marks)



- c. Consider following capacitor, and write down all important parameters.
(Hint: voltage, value and tolerance)

(06 Marks)

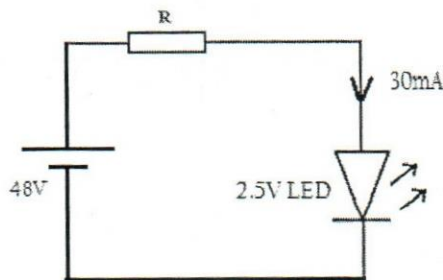


3. With regards to the PN junction diodes,

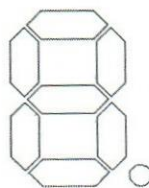
- Sketch the characteristic curve of a P.N Junction Diode and indicate all important points on the curve. (04 Marks)
- Draw and explain the operation of a single phase full-wave rectifier circuit with,
 - Bridge rectifier (04 Marks)
 - 2 Diodes and center tapped Transformer (04 Marks)
- What is the method that can be used to minimize the ripples in the output? (02 Marks)
- Draw a complete circuit diagram of a conventional power supply. (06 Marks)

4. With regards to LEDs and &-Segment displays,

- A 2.5 V YELLO LED has to be powered by a 48 V battery using a current limiting resistor (R). The LED draws rated current of 30mA under normal operation. Find suitable ratings for the resistor (R). (06 Marks)



- What are the advantages of using 7 segment displays in onboard ships? (04 Marks)
- In following 7 segment display, name the segments as per the standards. (04 Marks)



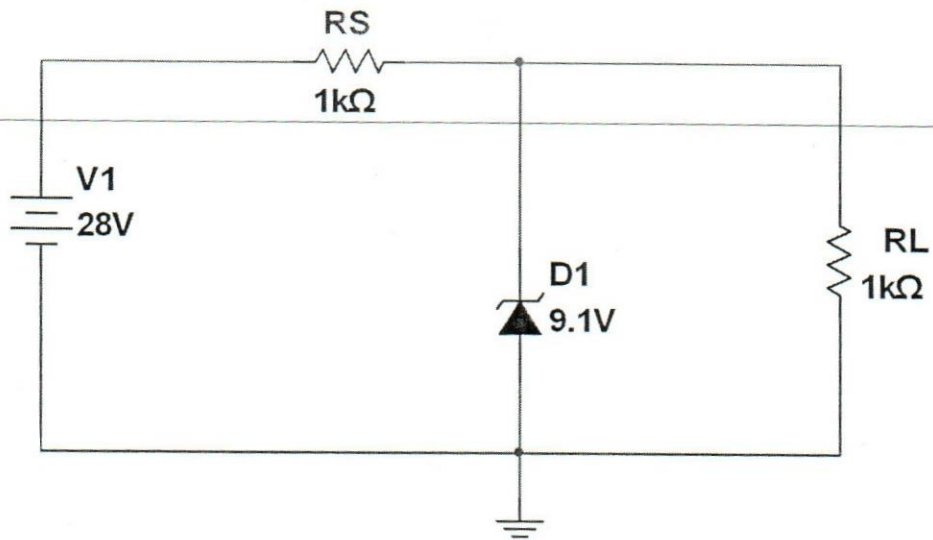
- Describe the structure of two types of 7-segment displays available in electronic applications. (06 Marks)

5. a. Explain the importance of using Zener diodes in electronic circuits.

(04 Marks)
00012

b. In below Zener circuit, find the functionality of the zener diode.

(03 Marks)



Also find,

- (i) Load voltage - V_L
- (ii) Load current - I_L
- (iii) Supply current - I_s
- (iv) Zener current - I_z
- (v) Power dissipation in the Zener Diode

(2 Marks)

(2 Marks)

(4 Marks)

(2 Marks)

(3 Marks)

Resistor colour code

Color	Color	1st Band	2nd Band	3rd Band Multiplier	4th Band Tolerance
Black		0	0	$\times 1\Omega$	
Brown		1	1	$\times 10\Omega$	$\pm 1\%$
Red		2	2	$\times 100\Omega$	$\pm 2\%$
Orange		3	3	$\times 1k\Omega$	
Yellow		4	4	$\times 10k\Omega$	
Green		5	5	$\times 100k\Omega$	$\pm 0.5\%$
Blue		6	6	$\times 1M\Omega$	$\pm 0.25\%$
Violet		7	7	$\times 10M\Omega$	$\pm 0.10\%$
Grey		8	8	$\times 100M\Omega$	$\pm 0.05\%$
White		9	9	$\times 1G\Omega$	
Gold				$\times 0.1\Omega$	$\pm 5\%$
Silver				$\times 0.01\Omega$	$\pm 10\%$

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COURSE CODE: EED -0465/ B010/M1

EXAMINATION QUESTION PAPER
WORKSHOP THEORY

- This question paper consists 06 questions.
- Answer all the Questions.

Date: 2021.01.21

Pass marks 50%

Time allocated: 03Hrs

- 01). a. Name the types of holes. (04 Marks).
b. What are the types of drilling machines? (06 Marks).
c. What is the mostly used cutting tool in drilling operation? (05 Marks).
d. What is the cutting angle of a twist drill? (04 Marks).
- 02). a. What is "fitting"? (06 Marks).
b. Name 08 tools use for fitting. (04 Marks).
c. Write 6 safe working practices of fitting. (04 Marks).
- 03). a. What is "thread"? (06 Marks).
b. Draw thread parameters on a diagram. (06 Marks).
c. Draw Isometric thread & name all details? (06 Marks).
- 04). a. Draw and explain the temperatures and uses of three types of Oxy -Acetylene flames. (08 Marks).
b. Briefly explain about "Stick welding". (06 Marks).
- 05). a. What is the meaning of welding? (03 Marks).
b. What are the principals of fusion welding? (04 Marks).
c. What is the meaning of weld metal protection? (06 Marks).
d. Briefly explain functions of fluxes with examples. (08 Marks).
- 06). a. Why safety is so important while working in a workshop. (04 Marks).
b. Define the term "PPE", what are they and the use of each. (06 Marks).
c. What does the most essential item need to be kept in the workshop other than the PPE which is helpful after the injury. (04 Marks).

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 COURSE CODE : EED -0465/ B010/M1

EXAMINATION QUESTION PAPER
 ELECTRICAL THEORY

Date: 2021.01.20

Time allocated: 03Hrs

01. Thirty two cells are arranged in rows of eight in series and each of these rows are connected in parallel. The e.m.f. of each cell is 2V and internal resistance of each cell is 2Ω . Determine
- the current supplied to an external resistance of 8Ω and (08 Marks)
 - the maximum power that can be delivered to the load. (08 Marks)
02. a. State the Kirchhoff's Current law(KCL) and Kirchhoff's Voltage law(KVL). (08 Marks)
- b. Using above laws, find the current in 5Ω resistors in the circuit shown figure.01 (10 Marks)

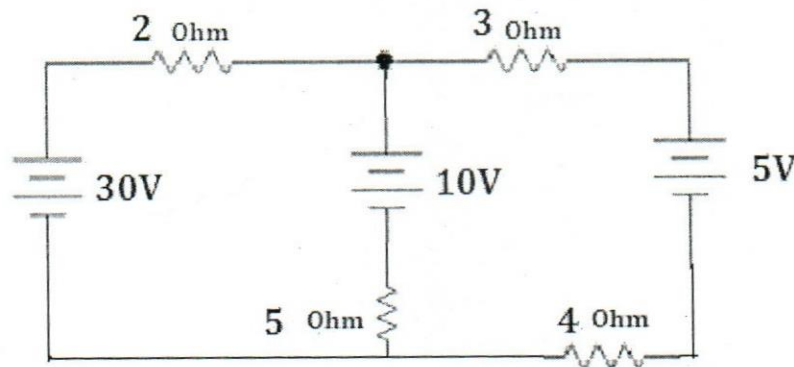


Figure. 01

03. a. An alternative voltage $V = 320 \sin 314t$. Calculate
- Peak to peak value (02 Marks)
 - Average value (03 Marks)
 - R.M.S. value (03 Marks)
- b. An alternating current $I = 110.4 \sin 314t$. Find
- R.M.S. current (02 Marks)
 - Frequency (02 Marks)
 - Instantaneous value of current t is 3.6mS (04 Marks)

04. A 200V, 50Hz inductive circuit takes a current of 10A, lagging 30° . Find
- a. the resistance (05 Marks)
 - b. reactance and (05 Marks)
 - c. inductance of the circuit (06 Marks)
-
05. A 10Ω resistor and $400\mu\text{F}$ capacitor connected in series to a 60V sinusoidal supply. The circuit current is 5A. Calculate
- a. the supply frequency and (08 Marks)
 - b. phase angle between the current voltage (08 Marks)
06. Three similar coils are connected in star, take a total power of 1.5 kW at a power factor of 0.2 lagging from 3-phase, 400V, 50Hz supply. Calculate
- a. the resistance and (09 Marks)
 - b. inductance of each coil. (09 Marks)

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 COURSE CODE : EED -0465/ B010/M1

EXAMINATION QUESTION PAPER
MEASUREMENT & INSTRUMENTATION

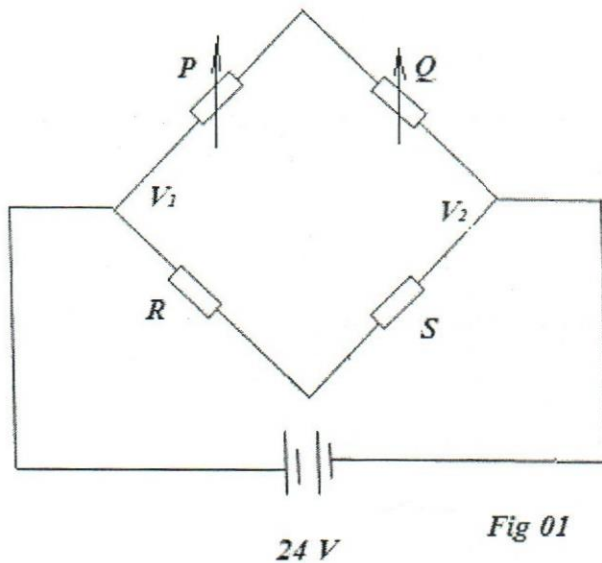
- This question paper consist 06 questions.
- Answer all six questions.

Pass mark 50%

Date : 2021.01.19
 Time allocated: 03Hrs

- 01) a). Explain the balance condition of the Wheatstone bridge with suitable circuit diagram. (06 marks)
- b). List two Main applications of Wheatstone bridge used in Electrical Measurement Circuits (06 Marks)
- c) In Wheatstone bridge (Fig. 01) consist of three known resistances and unknown resistance
 $P = 500 \Omega$, $Q = 20 \Omega$, $R = 2 \Omega$, $S = X \Omega$

Calculate the value of X When the bridge is at balance or $V_1 = V_2$.



- 02) a). List the all basic / simple types of electrical measuring instruments generally in use. (04Marks)
- b). Draw the construction diagrams of moving Coil instrument and Name each components (07 Marks)
- c). List 3 advantages and 3 disadvantages of moving coil instrument. (04Marks)

02. a). A permanent magnet moving coil instrument gives full-scale deflection with 10 mA DC current when a potential difference across its terminals is 100 mV. (09 marks)
- i) Show with circuit diagrams how it can be used as an ammeter for a range of 0 - 200 A
 - ii) Show with circuit diagrams how it can be used as a voltmeter for a range of 0 - 500 V
- b). List applications to make use of measuring Range extension of Electrical Measurements. (05 marks)
- c) Sketch & Show how only one Ampere meter can be used to measure all three phase currents (03 marks)
04. a). What are the other Electrical parameters can be measured by moving iron instruments (04 Marks)
- b). Explain with a sketch of circuit, how Moving Iron meter is used to measure AC voltage.. (07 Marks)
- c). List advantages and disadvantages of moving iron instrument. (06 Marks)
05. Draw the following instrument and one (CT) Current transformer and (PT) Potential Transformer to measure a Heavy Electrical Load (R_L)
- a). How One Volt meter and frequency meter Connected to (PT) Potential Transformer (05 Marks)
 - b). How Two analog ampere meters, one digital Power meter are connected (07 Marks)
 - c). What are the safety steps taken to remove only ampere meter of the Q 05 section (b) while watt meter should work normally (03 Marks)
06. a). Draw the construction diagram of Synchro scope with all connections of Instrument Transformer. (09 Marks)
- b). What is the main purpose of Synchro scope in ships (03Marks)
- c). What are the safety and protections required for a Synchro scope (03 Marks)

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EXAMINATION QUESTION PAPER
 COMPUTER KNOWLEDGE

- This question paper consist of 05 Questions
- Answer all the questions.

Date: 2021.01.18

Pass Marks 50%

Time allocated: 03 Hrs.

Q1

- What is the difference between Hardware and Software? (03 Marks)
- Write down the main two types of software and describe them (03 Marks)
- What are INPUT devices and OUTPUT devices? Explain giving examples (03 Marks)
- What is the difference between IT and ICT? (03 Marks)
- State four applications of ICT and describe one of them (04 Marks)
- What is cache memory? (04 Marks)

Q2

- State the difference between RAM and ROM (03 Marks)
- What is an operating system? (03 Marks)
- State four commonly used operating systems in the market (03 Marks)
- What are the important functionalities of an operating system? (03 Marks)
- How to install an antivirus software into your computer? (04 Marks)
- State four commonly used antivirus softwares in the market (04 Marks)

Q3

- Write down the steps to start MS Word (04 Marks)
- State three applications of MS Word (04 Marks)
- What is the importance of nonprinting characters and list down three of them (03 Marks)
- How to save a MS Word document(Steps) (03 Marks)
- Write down the steps for following operations (02 x 3 Marks)

- i. Calculate
- ii. Shrink one page
- iii. Filler/ Rand text

Q4

- a. How to start MS PowerPoint and save the document as "ETR-10 END EXAM" (04 Marks)
- b. What are the basic applications of MS PowerPoint? (03 Marks)
- c. How to apply a theme in PowerPoint? (03 Marks)
- d. Write down the main steps to create a PowerPoint presentation (03 Marks)
- e. What is the difference between MS Access and MS Excel? (03 Marks)
- f. What are the advantages of using MS Access? (04 Marks)

Q5

	A	B	C	D	E	F	G	H
1		subject						
2	Name	sinhala	English	Tamil	Maths	Science	History	Average
3								
4	Shashi	42	54	45	85	88		32
5	Edirisooriya	65	15	ab	58	56		39
6	Malaka	45	85	85	65	74	ab	
7	Eshan	85	59	25	ab	25		67
8	Nishan	29	65	93	35	95		78
9	Hashith	75	35	71	15	ab		85
10	Dilan	84	52	83	ab	85		96
11	Bandara	65	57	85	94	62		64
12								
13								
14	Minimum							
15	Maximum							
16	Total							
17	Count							
18								

- a. What is a work sheet? (02 Marks)
- b. Write the formula to get the Average marks of Shashi and Eshan? (03 Marks)
- c. Write the formula to get the Minimum marks for Sinhala? (03 Marks)
Marks)
- d. Write the formula to get the Maximum marks for English? (03 Marks)
- e. What is the formula to get the Number of students who faced the Maths exam? (03 Marks)
- f. What is the formula to get the total marks for Tamil? (03 Marks)
- g. Write down the steps for following operations (03 Marks)
 - i. Filter
 - ii. Transpose
 - iii. Insert a tabl



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 COURSE CODE: EED-0465/B010/M1

EXAMINATION QUESTION PAPER
 BASIC MATHEMATICS

- This question Paper Consist of 06 Questions.
- Answer all the questions.

Date: 2021.01.18

Time allocated: 03Hrs

01. Simplify each of the following expressions. Write the answers using only positive components for (i).

a. $\frac{1}{4}(x^3 \cdot y^3)(4x^{-3} \cdot y^2)\left(\frac{1}{4} \cdot xy^{-3}\right)$ (09 Marks)

b. If $A = 1, B = 10, C = 8$, find P

$$A^3 \left(\frac{B}{5} + 2A + 2C^2 \right) - 3 \left(\sqrt[3]{C} - 2B \right) = P$$
 (09 Marks)

02. a. Open tank is **2m** diameter and **4m** high. How many liters of paint will be required for the tank inside to paint it at **2m² /liter** (08 Marks)

b. Diameters of the circle **A**, **B** and circle **C** are **4 cm**, **2cm** and **1cm** respectively as shown in Figure - 01. Find the area of dark portion. (08 Marks)

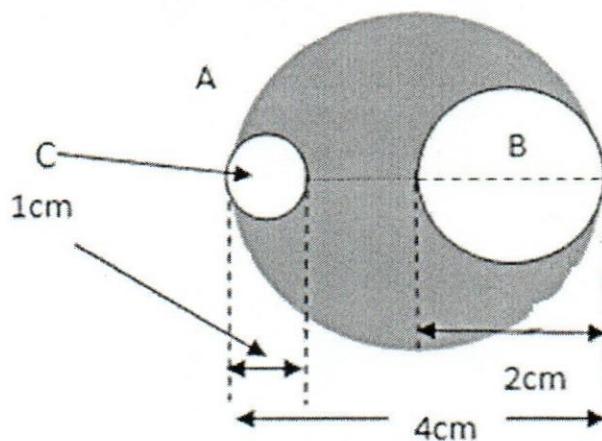


Figure - 01

03. a. A length of wire has a resistance of **2 ohms**. Find the resistance of another wire of the same material **three times as long and twice the cross-section area**.

(16 Marks)

{Hint : $R = \frac{\rho \times l}{A}$ } where R - Resistance of the wire material

 ρ - resistivity of the wire material (Constant) l - Length of wire

A - Cross section of the wire

04. a. There is a generator in a factory. If generator supplying voltage is **415V** and factory main power system receiving voltage is **410.25 V** what is the voltage drop & percentage of voltage drop.

(06 Marks)

- b. Multiplication of two numbers is equal to **24**. Addition of these numbers is equal to **-10**. What are the numbers?

(06 Marks)

- c. Given that $x : y = 1 : 2$ and that $3x + 4y = 11$. Find x and y

(04 Marks)

05. a. ABC is the rectangular triangle as shown in figure - 02. $AB = \sqrt{6} \text{ cm}$, $AC = \sqrt{8} \text{ cm}$

- i. Find BC length

(04 Marks)

- ii. Write the expression for $\sin\theta$ & $\cos\theta$

(06 Marks)

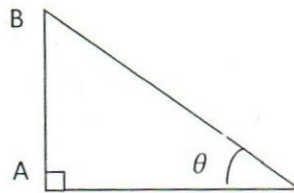


Figure. 02

- b. If $\sin\theta = \frac{x}{x+y}$, evaluate $\tan\theta$ and $\cos\theta$

(08 Marks)

06. Let $Z_1 = 3 + 3i$, $Z_2 = 7 + 2i$, $Z_3 = 3 - 4i$. Find

a. $Z_1 \cdot Z_2$

(05 Marks)

b. $Z_3 \cdot Z_2$

(05 Marks)

c. $\frac{Z_1}{Z_2}$

(06 Marks)



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 COURSE CODE : EED -0465/ B 009 & B010/MI

REPEAT EXAMINATION QUESTION PAPER
 BASIC ELECTRICAL POWER & MACHINES

- This question paper consist 06 questions. Date : 2021.07.05
 - Answer all six questions. Time allocated : 03Hrs
- Pass mark 50%

- Q1 a. Sketch a simple three main branch tree diagram to show Electrical Motors (DC , 3 ϕ AC & other)
 In this diagram show all 5 types of DC motors in one branch. All kind of 3 ϕ AC motors in the second branch (12 Marks)
- b. Sketch a diagram to show all mechanical and electrical losses in the AC and DC motors (06 Marks)
02. a. Draw the diagrams with all field windings, armature circuit for all three types of DC motors.
 (Make a clear drawings with thick and thin lines, names all the components for full marks) (10 Marks)
- b. List at-least one application or the purpose of six types of DC motors (06 Marks)
03. a. List the different types of Three phase motors. (06 Marks)
- b. List All three phase motor starting methods and name of starters (06 Marks)
- c. List All three phase motor speed controlling methods and name of Speed controllers (04 Marks)
04. a. Draw various symbols used for power transformer and instrument transformer (05 Marks)
- b. Explain main purposes of Power transformer and Instrument transformer (06 Marks)
- c. Sketch a construction drawing of power transformer and name each components clearly (05 Marks)
- 05 a. List types of switchboard available onboard ship ? (04 Marks)
- b. List six basic technical specifications of fuses and AC motor. (08 Marks)
- c. Explain Where & Why IP code is required (04 Marks)
06. a. Make a table to compare similar parts and the features of squirrel cage rotor and wound rotor of induction motor (06 Marks)
- b. Explain three types of Enclosure generally used in ships and on deck application (06 Marks)
- c. Explain purpose of using First and second digit of INGRESS PROTECTION CODE (06 Marks)

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 COURSE CODE : EED -0465/B10/MI

REPEAT EXAMINATION QUESTION PAPER
 ELECTRICAL THEORY

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

Date: 2021.07.05

Pass mark 50%

Time allocated: 03Hr

01. a. State the Kirchoff's Current law(KCL) and Kirchoff's Voltage law(KVL). (06 Marks)
- b. Using above laws, find the current in 2Ω resistors in the circuit shown figure.01 (10 Marks)

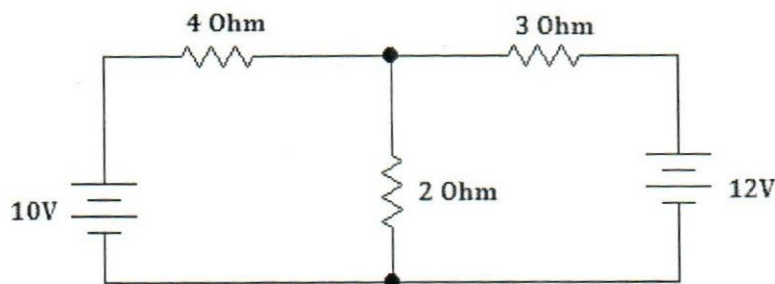


Figure. 01

02. a. An alternative voltage $V = 325 \sin 314t$. Calculate
- i R.M.S. value (02 Marks)
 - ii Frequency and (02 Marks)
 - iii Time period (02 Marks)
- b. An ac circuit consists of a pure resistance of 23Ω and is connected across an ac supply of 230V, 50Hz. Calculate
- i. Current (03 Marks)
 - ii. Power consumed and (03 Marks)
 - iii. Equation for voltage and current (06 Marks)
03. A 200V, 50Hz inductive circuit takes a current of 10A, lagging 30° . Find
- a. the resistance (05 Marks)
 - b. reactance and (05 Marks)
 - c. inductance of the circuit (06 Marks)

05. A 10Ω resistor and $400\mu\text{F}$ capacitor connected in series to a 60V sinusoidal supply. The circuit current is 5A . Calculate
- a. the supply frequency and (08 Marks)
 - b. phase angle between the current voltage (08 Marks)
03. A choke coil takes a current of 20A when connected across 200V , 50Hz mains and consumes 280 watts. Find
- i. The power factor (06 Marks)
 - ii. Resistance of the coil (04 Marks)
 - iii. Inductance of the coil (06 Marks)
06. Three similar coils are connected in star, take a total power of 1.5 kW at a power factor of 0.2 lagging from 3-phase, 400V , 50Hz supply. Calculate
- a. the resistance and (09 Marks)
 - b. inductance of each coil. (09 Marks)

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 Department of Marine Electrical Engineering
 PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
 COURSE CODE : EED-0465/ B009 & 010/MI

REPEAT EXAMINATION QUESTION PAPER
 WORK SHOP THEORY

- This question paper consists of 06 questions.
- Answer all the Questions.

Date: 2021.07.06

Pass marks 50%

Time allocated: 03Hrs

- 01). a. Why safety is so important while working in a workshop. (04 Marks).
 b. Define the term "PPE", what are they and the use of each. (06 Marks).
 c. What does the most essential item need to be keep in the workshop other than the PPE which is helpful after the injury. (04 Marks).
- 02). a. Draw and explain the temperatures and uses of three types of Oxy -Acetylene flames. (08 Marks)
 b. Briefly explain about "Stick welding". (06 Marks)
- 03). a. What is "fitting" ? (06 Marks)
 b. Name 08 tools use for fitting (04 Marks)
 c. Write 6 safe working practices of fitting. (04 Marks)
- 04). a. What is plastic welding? (04 Marks)
 b. What are fusion welding principles? (06 Marks)
 c. What are fluxes and weld metal protection? (08 Marks)
- 05). a. Name the types of holes. (04 Marks)
 b. What are the types of drilling machines? (06 Marks)
 c. What is the mostly used cutting tool in drilling operation? (05 Marks)
 d. What is the cutting angle of a twist drill? (04 Marks)
- 06). a. What is the meaning of welding? (03 Marks)
 b. What are the principals of fusion welding? (04 Marks)
 c. What is the meaning of weld metal protection? (06 Marks)
 d. Briefly explain functions of fluxes with examples. (08 Marks)

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COURSE CODE : EED -0465/ B009/M2

FINAL EXAMINATION QUESTION PAPER
AWARENESS TO QUALITY, ENVIRONMENT & SAFETY MANAGEMENT SYSTEM

- This question paper consists of 06 questions.
- Answer all the questions.

Date: 2021.03.03

Pass mark 50%

Time allocated: 03Hrs

01. Write Short notes of the following (30 Marks)
- IMO
 - Classification Society
 - Flag State.
 - Port State.
 - Maritime Convention
 - Exclusive Economic Zone.
 - Territorial Waters.
 - Maritime law
 - MARPOL Annex 1
 - MARPOL Annex 6
02. That is meant by Balast Water management. Briefly explain why it is necessary. What is the regulation requirement. (14 Marks)
03. Explain fully, what are the Four pillars of Maritime law. (14 Marks)
04. a. Name and briefly explain the components in Engine room bilge pumping system (07 Marks)
b. Briefly explain the concept of 5S system. (07 Marks)
05. a. The purpose of MARPOL Annex IV Sewage pumping out system. (07 Marks)
b. Explain how sewage can be pumped out in different parts of the ocean. (07 Marks)
06. a. Under MARPOL Annex I explain under what conditions oil can be pumped out from the engine room bilges. (07 Marks)
b. Explain how the system prevent oil more than 15 PPM going out. Explain your answer with a diagram (07 Marks)

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EXAMINATION QUESTION PAPER
 APPLIED ELECTRONICS

- This question paper consists of 05 questions.
- Answer all Questions

Date: 2021.03.04

Pass mark 50%

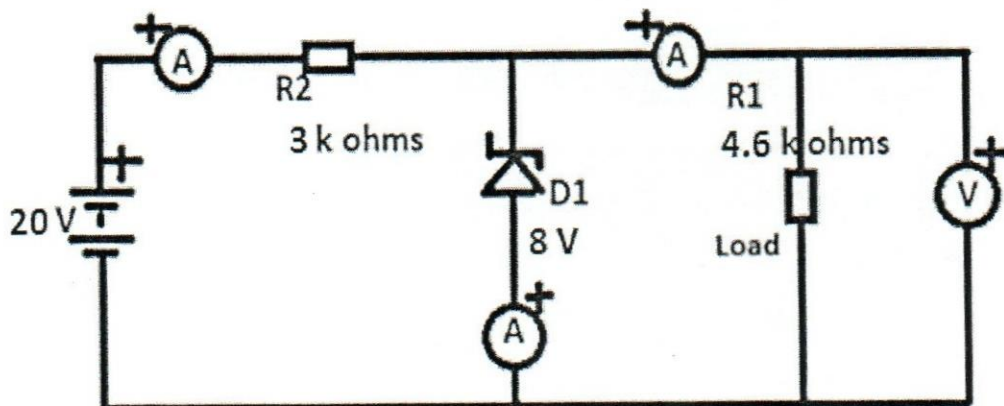
Time allocated: 03Hrs

01. Regarding Thyristors

- a. Expand the following abbreviations and draw the symbols of those Thyristors
 - i. SCR
 - ii. DIAC
 - iii. TRIAC
 - iv. SCS (02 x 4 Marks)
- b. How does conduction occur in a DIAC? (03 Marks)
- c. Draw the VI characteristic curve of a DIAC (03 Marks)
- d. What is the main difference of a SCS compared to DIAC and TRIAC? (03 Marks)
- e. State three applications of Thyristors and describe one of them (03 Marks)

02. Regarding Zener Diodes

- a. Sketch the symbol of a Zener diode and name its terminals (02 Marks)
- b. Draw the VI characteristic curve of a Zener diode (02 Marks)
- c. Briefly describe the operation of a Zener diode and state some applications of it (04 Marks)
- d. Find the values of the followings; (03 x 4 Marks)



- i. Load voltage (V_L)
- ii. Load current (I_L)
- iii. Supply current (I_S)
- iv. Zener current (I_Z)

03. Regarding Regulated and Unregulated Power Supplies

(04 x 5 Marks)

- a. What is a power supply?
- b. Draw the circuit diagram of an unregulated linear power supply with relevant wave forms
- c. What is a linear power supply?
- d. Draw the circuit diagram of a regulated linear power supply with relevant wave forms
- e. Draw the circuit diagram of a half wave rectifier with relevant wave forms

04. Regarding Transistors

- a. Draw a complete circuit of a common emitter small signal voltage amplifier
(03 Marks)
- b. Define the term gain of a transistor and state the relationship between the base current and the collector current
(03 Marks)
- c. List down the differences Between Voltage and Power Amplifiers in tabular form
(03 Marks)
- d. Which types of amplifier circuits are used in audio amplifier output stages to drive loudspeakers?
(03 Marks)
- e. What is the element which has the biggest size in transistors?
(04 Marks)
- f. What are the majority charge carriers in npn and pnp transistors?
(04 Marks)

05. Regarding uninterruptible power supplies, Inverters and Rectifiers

(04 x 5 Marks)

- a. What is an uninterruptible power supply?
- b. Draw the circuit diagram of an uninterruptible power supply
- c. What are the advantages of having an uninterruptible power supply?
- d. State the difference between Inverters and Rectifiers
- e. State the applications of Inverters and Rectifiers separately



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COURSE CODE : EED -0465/ B009/M2

EXAMINATION QUESTION PAPER

ADVANCED ELECTRICAL POWER & MACHINES

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

Pass mark 50%

Date: 2021.03.02

Time allocated: 03Hrs

- 01 a. List different type of Electrical Motors and show by a Tree diagram sketch. (10 Marks)
- b. List (at least 10) technical parameters of Induction motor (10 Marks)
02. a. Draw the diagrams of Brushless Alternator and name all components (12 Marks)
- b. Draw a block diagrams of error operated AVR and name all components (06 Marks)
03. a. What are the 5 Methods commonly used in ships for Synchronizing Generators Draw (06 Marks)
- b. sketch any of the two methods with circuit protections (06 Marks)
04. a. List Protections required for an Aux Generator (08 Marks)
- b. List type of Electrical Enclosures for Electrical lights or Motor control switches
- i. Required on deck (06 Marks)
- ii. Required for Pump room or Battery room
05. a. Sketch a Power (Isolated) transformer construction and name (08 Marks)
- b. Explain How the following losses can be reduced in transformer (06 Marks)
- i. Eddy current losses ii. Hysteresis losses
06. Sketch and Name each and every components of a Star delta Starter required to start an Induction motor
- a. Power Circuit showing all protections required for Motor (14 Marks)
- b. Control Circuit with three Indicators (08 Marks)

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COURSE CODE : EED -0465/ B009/M2

FINAL EXAMINATION QUESTION PAPER
ELECTRICAL PRACTICE

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

Date: 2021.02.25

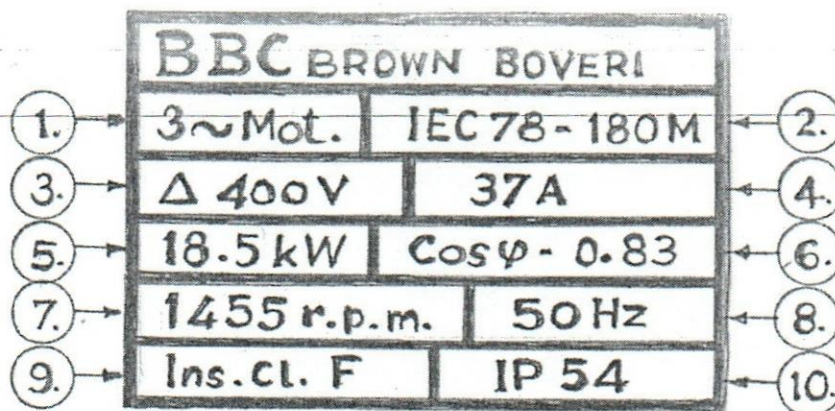
Pass mark 50%

Time allocated: 03Hrs

- 01). a. What are the five rules of the safety process of electrical maintenance. (05 Marks)
- b. What are the three (03) effects of an electric current on the human body. (06 Marks)
- c. What steps should be taken when an electrical accident occurs? (05 Marks)
- 02). a. Briefly explain the following electrical terms.
- | | |
|--|---|
| i. "Fussing factor" of a wire fuse | ii. "Inductance" of a coil |
| iii. "Capacitive reaction" of a A.C. capacitor | iv. "Efficiency" of an incandescent lamp |
| v. "Stroboscopic effect" of a fluorescent lamp | vi. "Single phasing" of a three-phase induction motor |
- (12 Marks)
- b. A 20A motor operates from 220V insulated neutral system. The supply cable have a total impedance of 0.02 Ω. If (i). an open circuit fault, (ii). an earth fault and, (iii). A short circuit fault is occurred, what circuit current would flow in each case. (06 Marks)
- 03). a. When an electrical cable is expressed as 4mm² - 7/0.85 mm - Cu/ XLPE /PVC - 600/1000V
What does it signify? (07 Marks)
- b. Draw a circuit diagram to show the essential parts of a single fluorescent lamp and briefly explain its starting procedure. (08 Marks)
- 04). a. A 440/230V – 50Hz single phase transformer supplied a load of 2.4kW at 0.8 power factor.
Calculate the secondary and primary currents (ignoring losses) (06 Marks)
- b. What are the possible teste to be carried out for the proper functioning of a three phase squirrel cage rotor motor .(Six terminals) . (07 Marks)

- 05). a. Figure shows a name plate data of an electrical machine. Explain the terms for each case from 1 to 10

(10 Marks)



- b. Write the following values according to the given name plate.

(08 Marks)

- Number of magnetic poles
- Synchronous speed
- Slip at full speed
- Apparent power at full load.

- 06). Draw "POWER" and "CONTROL" circuits for D.O.L Forward / Revers magnetic contactor starter circuit. (Mark the all terminal numbers and equipment identification letters)

Specifications :	Power supply voltage	- 3~ 440V / 50Hz-E (Insulated neutral)
	Control circuit voltage	- 24V ~
	Electric motor	- 3~ 440V/5.5kW
	Indicating lamps	- Green for motor running - Red for motor overload - Orange for control circuit supply.

(20 Marks)

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COURSE CODE : EED -0465/B9/M2

EXAMINATION QUESTION PAPER
MARINE ELECTRICAL SYSTEM

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

Date: 2021.02.24

Pass mark 50%

Time allocated: 03Hrs

01. With reference to the Low Voltage and High Voltage alternators.
- State the condition for Synchronizing an alternator with live bus bar. (04 Marks)
 - What are the Synchronizing methods ? (05 Marks)
 - Draw the neat circuit diagram for above any two methods. (09 Marks)
02. a. Draw the neat block diagram for the followings
- Self-excited brushless alternator (05 Marks)
 - Static transformer excited alternator (05 Marks)
- b. Briefly explain the effects in the alternator rotor
- If one diode is open circuit in the rotating rectifier. (03 Marks)
 - If one diode is short circuit in the rotating rectifier (03 Marks)
03. a. What are the important emergency services from the emergency switch board? (04 Marks)
- b. State the emergency loads on board. (05 Marks)
- c. Draw the proper one-line block diagram for emergency switch board, main switch board and shore power (07 Marks)
04. a. What is the purpose of preferential tripping onboard ship? (06 Marks)
- b. State the non-essential loads onboard ship. (04 Marks)
- c. What are the alternator protections? (06 Marks)
05. With reference to shipboard electrical maintenance
- What are the four types of maintenance onboard (04 Marks)
 - Write the duties and routine works related to the electrical maintenance (05 Marks)
 - How do you carry out the inspection or maintenance of following?
 - Motors (03 Marks)
 - Power circuit of motors (03 Marks)
 - Control circuit of motors (03 Marks)
06. With reference to navigation lights and navigational aids on board
- What are the alarms fitted in navigational light panel? (03 Marks)
 - State the requirements of navigation lights. (04 Marks)
 - Briefly describe the purpose of followings.
 - Radar (03 Marks)
 - Steering gear (03 Marks)
 - Gyrocompass and Magnetic Compass (03 Marks)

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PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.

COURSE CODE : EED -0465/ B009/M2

FINAL EXAMINATION QUESTION PAPER
MARINE ENGINEERING KNOWLEDGE

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

Date: 2021.02.22.

Pass mark 50%

Time allocated: 03Hrs

01. a. What is the meaning of a “stroke “of an engine? What are the names of strokes? (04 Marks)
- b. Briefly explain the 2-stroke marine engine. (06 Marks)
- c. Name most popular two kinds of modern engine brands & types. (04 Marks)
02. a. In Sulzer RT Flex engine how does the exhaust valve operate? (06 Marks)
- b. What is the meaning of common fuel rail system? Which are the engines that system used? (08 Marks)
- c. Write 04 reasons why 2 stroke engines are popular than 4 stroke engines? (06 Marks)
03. a. What is the meaning of an engine room bilges? (02 Marks)
- b. Briefly explain an oily water separator including 15 ppm monitor. (08 Marks)
- c. What are the maintenance work to be carried out for an oily water separator? (06 Marks)
04. a. Neatly sketch a sewage treatment plant & labeled all parts. (08 Marks)
- b. What are the products of aerobic decomposition in a sewage treatment plant? (04 Marks)
- c. In the aeration chamber if the air blower suction filter chokes what will happen to the plant? (06 Marks)

05. a. Briefly explain the evaporative type fresh water generator. (08 Marks)
- b. When starting the F.W. generator when you open the feed water to evaporator what is the first sign to indicate that steam is generating? (02 Marks)
-
- c. Write 3 purposes of sea water pump. (06 Marks)
06. a. What are the purposes of steam in a ship? (04 Marks)
- b. What is the meaning of a boiler mountings? Give examples. (06 Marks)
- c. Briefly explain the boiler burner unit. (06 Marks)

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COURSE CODE : EED -0465/ B009/M2

EXAMINATION QUESTION PAPER
Computer Knowledge, PC - Networking / Interfacing

- This question paper consists of 05 questions.
- Answer all Questions.

Date: 2021.02.23

Pass mark 50%

Time allocated: 03Hrs

01. a. What is a protocol?

b. Briefly describe the following ports by indicating the usage of them

- Parallel port
- HDMI port
- Serial port
- USB port

c. What is the difference between Intranet and Extranet?

d. State the difference between UTP and STP

e. State main three types of data transmission modes

(4 x 5 = 20 Marks)

02 Questions Regarding Computer Networks

a. What is a computer network and what are the main types of computer networks?

b. Set the above networks in an order by considering their size

c. How 'LAN' is different from 'CAN' justify your answer

d. What are the advantages and disadvantages of networking?

(4 x 5 = 20 Marks)

03 Questions Regarding Network Topologies

a. What is a network topology?

b. State five network topologies and describe one of them

c. How many network cables are needed to connect 12 computers in a mesh topology?

d. How many cables do we need to connect 5 computers in a star topology?

(4x5=20 Marks)

04. Questions Regarding Network Devices

- a. What is the difference between switch and Hub?
- b. Indicate another three network devices and explain the roles and responsibilities of those devices
- c. State the application of a MODEM
- d. Describe the following modes of data transmission by giving examples
 - i. Simplex mode
 - ii. Half-duplex mode
 - iii. Duplex mode

(4 x 5 = 20 Marks)

05. Questions Regarding network architecture and OSI model

- a. What is a client server architecture?
- b. Define a peer to peer architecture?
- c. What are the layers of an OSI Model?
- d. What is the difference between the OSI model and the TCP/IP model?

(4 x 5 = 20 Marks)

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FINAL EXAMINATION QUESTION PAPER
 ELECTRICAL PRACTICE

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

Date: 2021.09.28

Pass mark 50%

Time allocated: 03Hrs

 01. a. State the full name of the followings.(Electrically) (06 Marks)

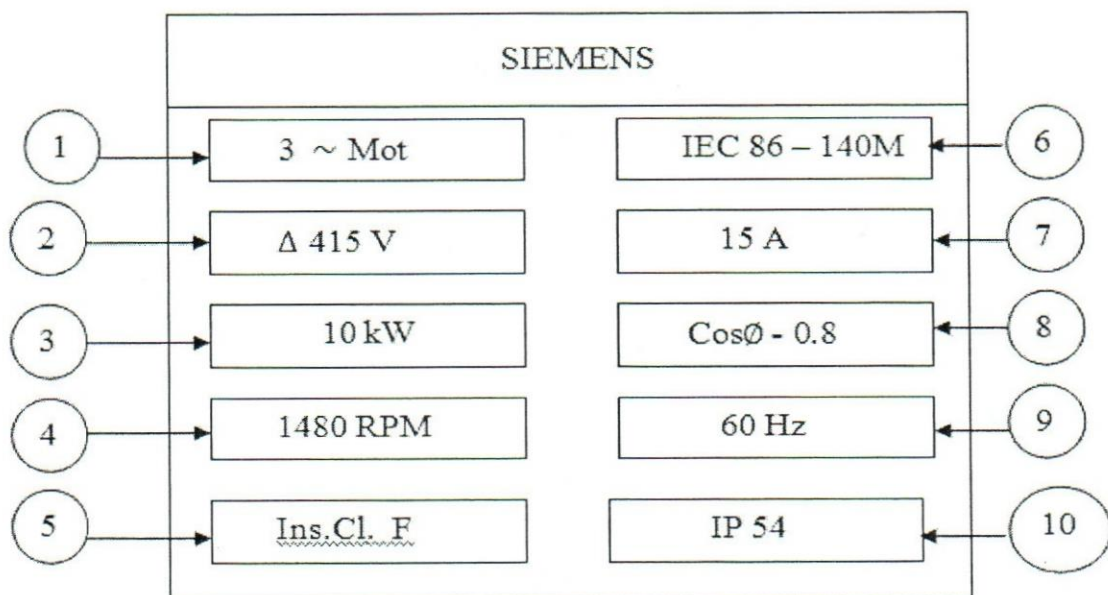
- | | | |
|---------|---------|----------|
| i. XLPE | ii. ACB | iii. HRC |
| iv. OCR | v. MCCB | vi. VCB |

 b. Explain briefly followings (12 Marks)

- | | | |
|------------------|--------------------------|--------------------------|
| i. Resistance | ii. Impedance | iii. Inductive reactance |
| iv. Power factor | v. Magnetic flux density | vi. Capacitive reactance |

02. a. When an electrical cable is expressed as

Cu/ XLPE/PVC- 25mm² – 19/1.35mm - 450/750V what does it signify? (08 Marks)

 b. Following figure shown a name plate data of an electric machine. Explain the terms for each case. (10Marks)


03. a. Three similar resistors are connected in star across 400V, 3-phase supply. The line current is 10A. Calculate the value of each resistance. (08 Marks)
- b. A gang way motor of the ship has been flooded with sea water. What are the steps you are taking before the connecting power supply? (12 Marks)

04. a. Draw a wiring diagram to show the essential parts of TANDEM FLOURESCENT lamp circuit. (07 Marks)

b. Three phase alternator details as follows:

500KVA, 400V, 50Hz, power factor - 0.8. Calculate maximum

i Active power or true power and (03 Marks)

ii Line-current (03 Marks)

05. Draw "POWER" and "CONTROL" circuit for D.O.L. Remote control magnetic contactor circuit. (Mark the all terminal numbers and equipment identification letters)

Specifications :	Power circuit	- 3 ~ 415 V/60Hz (without neutral earth)
	Control circuit voltage	- 230V/ 60Hz
	Three phase motor	- 4.5 kW/ 415 V/60Hz (1480 R.P.M.)
	Indicating lamps	- Green for motor running
		- Red for motor overload
		- Yellow for power voltage

(20 Marks)

06. a. list the starting methods for the three phase motors. (04 Marks)
- b. What are the methods of speed control for the three phase motor? (04 Marks)
- c. State the basic motor protections for a motor starter. (03 Marks)

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COURSE CODE : EED-0465/ B010/M2

EXAMINATION QUESTION PAPER
Computer Knowledge, PC - Networking / Interfacing

- This question paper consists of 05 questions.
- Answer all Questions.

Date: 2021.09.27

Pass mark 50%

Time allocated: 03Hrs

01. Questions Regarding Network Topologies

- a. What is a network topology? (03 Marks)
- b. State five network topologies and describe one of them (03 Marks)
- c. State advantages and disadvantages of star topology (03 Marks)
- d. How many network cables are needed to connect ten computers in a mesh topology? (03 Marks)
- e. State advantages and disadvantages of bus topology (04 Marks)
- f. How many network cables are needed to connect ten computers in a star topology? (04 Marks)

02. Questions Regarding Computer Networks

- a. What is a computer network and what are the main types of computer networks? (05 Marks)
- b. Set the above network types in an order considering their size (05 Marks)
- c. What are the advantages networking? (05 Marks)
- d. What are the disadvantages networking? (05 Marks)

03. Questions Regarding Network Devices

- a. What is the difference between switch and Hub? (05 Marks)
- b. Indicate another three network devices and explain the roles and responsibilities of those devices (05 Marks)
- c. What is a MODEM? (05 Marks)
- d. What is the difference between IP address and MAC address? (05 Marks)

04. Questions Regarding OSI Model

- a. What are the seven layers of an OSI Model? (05 Marks)
- b. What is the difference between OSI Model and the TCP/IP MODEL? (05 Marks)
- c. What is the importance of a protocol? (05 Marks)
- d. State three wireless media with their application (05 Marks)

05. Miscellaneous Questions

- a. Briefly describe the following ports by indicating the usage of them (05 Marks)
- i. PS/2 port
 - ii. VGA port
 - iii. Parallel port
 - iv. HDMI port
- b. What are the main two types of data transmission media? (05 Marks)
- c. What are the advantages of peer to peer architecture compared to client server architecture? (05 Marks)
- d. What is the difference between Intranet and Extranet? (05 Marks)

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COURSE CODE : EED -0465/B9/MI

EXAMINATION QUESTION PAPER
ELECTRICAL THEORY

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

Date: 2020.06.18

Pass mark 50%

Time allocated: 03Hr

01. a. State the Kirchhoff's Current law(KCL) and Kirchhoff's Voltage law(KVL). (10 Marks)
- b. Using above laws, find the current in 2Ω resistors in the circuit shown figure.01 (08 Marks)

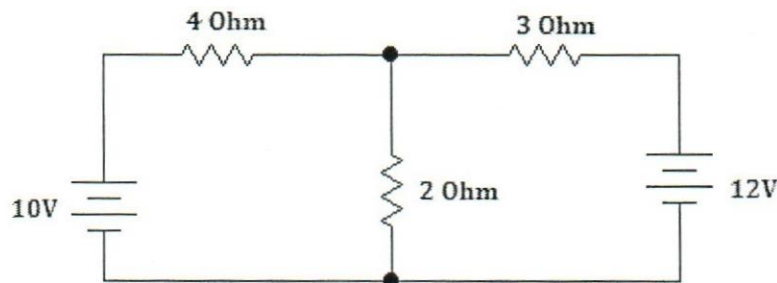


Figure. 01

02. a. An alternating Voltage V is given by $V = 325 \sin 314t$. Determine
- R.M.S. value (02 Marks)
 - Frequency and (02 Marks)
 - Time period (02 Marks)
- b. An ac circuit consists of a pure resistance of 23Ω and is connected across an ac supply of $230V, 50Hz$. Calculate
- Current (03 Marks)
 - Power consumed and (03 Marks)
 - Equation for voltage and current (06 Marks)
03. A choke coil takes a current of $20A$ when connected across $200V, 50Hz$ mains and consumes 280 watts. Find
- The power factor (06 Marks)
 - Resistance of the coil (04 Marks)
 - Inductance of the coil (06 Marks)

04. A capacitor of capacitance $60\mu\text{F}$ is connected in series with a non-inductive resistance of 20Ω across 200V , 50Hz supply. Find
- i. Impedance (04 Marks)
 - ii. Current (04 Marks)
 - iii. Phase angle and (04 Marks)
 - iv. Equation for the instantaneous value of current. (04 Marks)
05. Three similar resistors are connected in star across 400V , 3-phase supply. The line current is 10A . Calculate the value of each resistance. If one resistor is removed from the system what will be the line current? (16 Marks)
06. i. Draw the power triangle for the three phase system and write the equations with their units. (08 Marks)
- ii. What are the disadvantages of low power factor in three phase power system? (04 Marks)
- iii. List the principals to improve power factor in three phase power system (04 Marks)

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COURSE CODE: EED -0465/ B009/M1

EXAMINATION QUESTION PAPER
Electronics

- This question paper consist of 05 Questions
- Answer all the questions.

Date: 2020.06.17

Pass Marks 50%

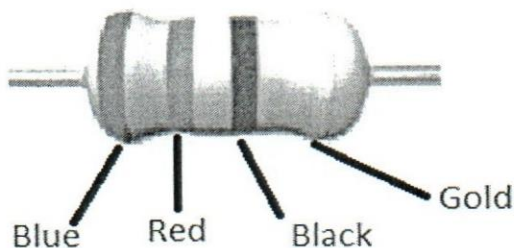
Time allocated: 03 Hrs.

01. Questions regarding Properties of semiconductor crystals

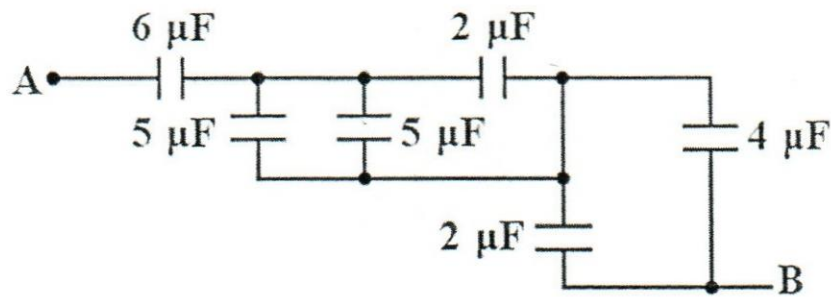
- a. What is the difference between conductors, semiconductors and insulators and give two examples of each? (03 Marks)
- b. What is the effect of temperature on conductivity of semiconductors? (03 Marks)
- c. What is negative temperature coefficient of resistance? (03 Marks)
- d. What is meant by doping and how does it affect a semiconductor? (03 Marks)
- e. Explain the two types of materials that are formed after doping. (04 Marks)
- f. Sketch the characteristic curve of a P.N Junction Diode and indicate all important points on the curve. (04 Marks)

02. Questions regarding Active and passive components (Use the color code chart attached to the paper)

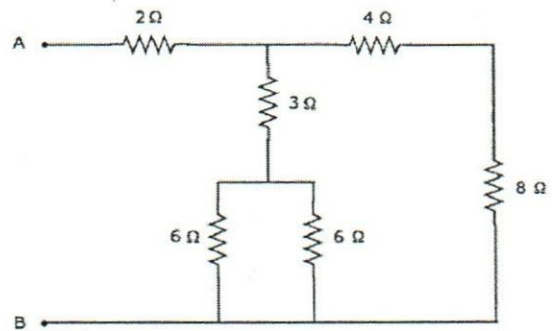
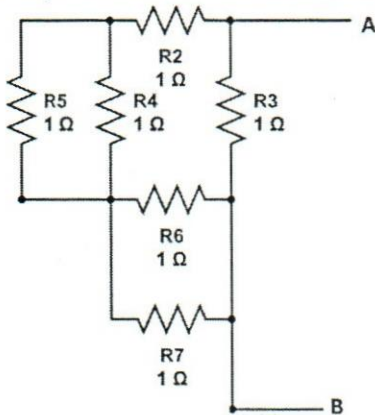
- a. What are Active components (Give examples) (02 Marks)
- b. What are Passive components (Give examples) (02 Marks)
- c. Read the color coding of the following resistor with the help of resistor color code and find followings.
 - i. The value of the resistor (02 Marks)
 - ii. The percentage tolerance of the value (02 Marks)
 - iii. The range of the value that can be exist practically (02 Marks)



d. Find the equivalent capacitance of the following capacitor network

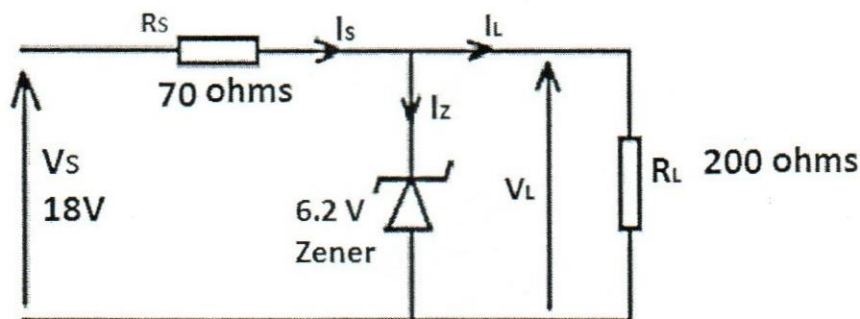


e. Find the equivalent resistance of the following resistor networks



(03 x 2 Marks)

03. Questions regarding Zener diodes.

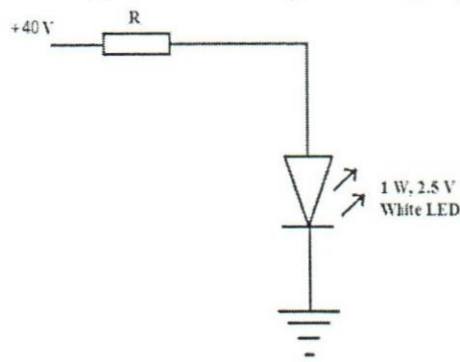


- Load voltage - V_L (03 Marks)
- Load current - I_L (03 Marks)
- Supply current - I_S (03 Marks)
- Zener current - I_Z (03 Marks)
- Power dissipation in the load resistor (04 Marks)
- Power dissipation in the Zener Diode (04 Marks)

04. Question regarding LEDs and seven segment displays

- What are the applications of LEDs? (02 Marks)
- What are the main semiconductor materials used to manufacture LEDs? (02 Marks)
- What are the available colours of LEDs? (02 Marks)
- What is the difference between direct recombination and indirect recombination? (02 Marks)
- What are the conditions to be satisfied to emit light in LEDs? (02 Marks)
- Compare LED displays with LCD displays. (03 Marks)

g. What are the two types of seven segment displays?



h. A 1 W, 2.5 V white LED must be powered by a 40 V dc power supply using a current limiting resistor (R). Find suitable ratings for the resistor (R) (04 Marks)

05. Questions regarding rectifier bridge circuits.

- What is a rectifier (04 Marks)
- States the advantages and disadvantages of bridge rectifiers (04 Marks)
- Draw the circuit diagram of a three-phase full wave rectifier (04 Marks)
- Draw the input and output wave forms of a single-phase half wave rectifier (04 Marks)
- What is the average voltage value of a single-phase half wave and full wave rectifier if the peak supply voltage is 20V? (04 Marks)

Color	Digit	Multiplier	Tolerance (%)
Black	0	10^0 (1)	
Brown	1	10^1	1
Red	2	10^2	2
Orange	3	10^3	
Yellow	4	10^4	
Green	5	10^5	0.5
Blue	6	10^6	0.25
Violet	7	10^7	0.1
Grey	8	10^8	
White	9	10^9	
Gold		10^{-1}	5
Silver		10^{-2}	10
(none)			20



CINEC Campus (Pvt) Ltd
 Faculty of Marine Engineering
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 PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
 COURSE CODE : EED -0465/ B009/MI

EXAMINATION QUESTION PAPER
 BASIC ELECTRICAL POWER & MACHINES

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

Pass mark 50%

Date : 2020.06.17
 Time allocated : 03Hrs

01. a. Sketch a simple three main branch tree diagram to show Electrical Motors (DC , 3 ϕ AC & other)
 In this diagram show all 5 types of DC motors in one branch. All kind of 3 ϕ AC motors in the second branch (12 Marks)
- b. Sketch a diagram to show all mechanical and electrical losses in the AC and DC motors (06 Marks)
02. a. Draw the diagrams with all field windings, armature circuit for all three types of DC motors.
 (Make a clear drawings with thick and thin lines, names all the components for full marks) (10 Marks)
- b. List at-least one application or the purpose of six types of DC motors (06 Marks)
03. a. Why large DC Shunt motors cannot be connected or started without starting resistance (06 Marks)
- b. Sketch and mark starting resistance connection arrangements to the Shunt motor and the precaution to be taken every time while starting Shunt or Compound motor (10 Marks)
- c. Sketch connections of shunt motor with polarity marks to change the direction of rotation (Two clear sketches to show each rotation) (04 Marks)
04. a Explain ways to over come Sparks in DC motors (04 Marks)
- b. Explain armature reaction in DC machines (06 Marks)
- c. Explain with the sketch, how inter-poles are connected in DC Shunt Motor (05 Marks)
05. a. Draw various symbols used for power transformer and instrument transformer (05 Marks)
- b. Explain main purposes of Power transformer and Instrument transformer (04 Marks)
- c. Sketch a construction drawing of power transformer and name each components clearly (05 Marks)
06. a. Make a table to compare similar parts and the features of squirrel cage rotor and wound rotor of induction motor (05 Marks)
- b. Explain three types of Enclosure generally used in ships and on deck application (06 Marks)
- c. Explain purpose of using First and second digit of INGRESS PROTECTION CODE (06 Marks)

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EXAMINATION QUESTION PAPER
WORK SHOP THEORY

- This question paper consists of 06 questions.
- Answer all the Questions.

Date: 2020.06.16

Pass marks 50%

Time allocated: 03Hrs

- 01). a. What is "fitting" ? (06 Marks)
b. Name 08 tools use for fitting (04 Marks)
c. Write 6 safe working practices of fitting. (04 Marks)
- 02). a. Why safety is so important while working in a workshop. (04 Marks).
b. Define the term "PPE", what are they and the use of each. (06 Marks).
c. What does the most essential item need to be keep in the workshop other than the PPE which is helpful after the injury. (04 Marks).
- 03). a. Draw and explain the temperatures and uses of three types of Oxy -Acetylene flames. (08 Marks)
b. Briefly explain about "Stick welding". (06 Marks)
- 04). a. What is plastic welding? (04 Marks)
b. What are fusion welding principles? (06 Marks)
c. What are fluxes and weld metal protection? (08 Marks)
- 05). a. What is the meaning of welding? (03 Marks)
b. What are the principals of fusion welding? (04 Marks)
c. What is the meaning of weld metal protection? (06 Marks)
d. Briefly explain functions of fluxes with examples. (08 Marks)
- 06). a. Name the types of holes. (04 Marks)
b. What are the types of drilling machines? (06 Marks)
c. What is the mostly used cutting tool in drilling operation? (05 Marks)
d. What is the cutting angle of a twist drill? (04 Marks)

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EXAMINATION QUESTION PAPER
MEASUREMENT & INSTRUMENTATION

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

Pass mark 50%

Date : 2020.06.16
Time allocated : 03Hrs

01. a. Sketch and name each components of a Moving Coil meter (10 Marks)
b. What type of measuring instrument fitted in an analog type portable Multi-meter (06 Marks)
02. a. Show how a 10 mA MC ammeter is extended for high measuring current range of 10 A (05 Marks)
(All components to be shown and name clearly)
b. With the aid of neat sketch Find the Shunt resistance value to measure 500 A load by a 0.1 Ohm, 10 mA rated MC Ammeter (08Marks)
c. Draw correct Symbols of Moving coil, moving iron, Vibrating type meter ,Vertical position (06 Marks)
03. a. Sketch of a Dynamometer and Name Each components of it (07 Marks)
b. List Four applications of Dynamometer (04 Marks)
04. a. What is the difference between Power transformer and Instrument transformer (05 Marks)
b. List six most important applications of Instrument transformer in the main panel (06 Marks)
c. Sketch clear symbols of CT (Current transformer) and PT (Potential transformer) (04 Marks)
05. a. Sketch Synchro scope and Name each and every components (07 Marks)
b. Sketch Synchro scope connected to bus-bar, an incoming generator with all protections (10 Marks)
c. Purpose and Precautions to be taken after each and every use of the Synchro scope (04 Marks)
06. a. Sketch electrical connections of a Three phase power circuit comprises of 440 Volts three wire Power system to supply to star connected load of 25.4 Ohms per phase. The following instruments are to be connected to measure Voltage. frequency, and current.
 - One Volt meter 440:110 V,
 - Two Ampere meters of 100: 5A, (One meter will be in remote location)
 - One Frequency meter 50Hz : 110 V),
 - One Current Transformer (CT 100:5 A),
 - One Potential transformer (PT-440 :110 V)
 - One of 1A fuse, One of 2 A fuse and Three of 10 A fuses.,(14 Marks)
- b. How to replace remote ampere meter, what is the suitable type applicable for this purpose (04 Marks)

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EXAMINATION QUESTION PAPER
 COMPUTER KNOWLEDGE

- This question paper consist of 05 Questions
- Answer all the questions.

Date: 2020.06.15

Pass Marks 50%

Time allocated: 03 Hrs.

01 Regarding Basics of computers

- a. What is the difference between IT and ICT? (04 Marks)
- b. What are the main applications of ICT and describe two of them. (04 Marks)
- c. Briefly describe the following ports by indicating the usage of them. (04 Marks)
 - i. RJ45 port
 - ii. VGA port
 - iii. Parallel port
 - iv. HDMI port
- d. What is a computer and what are the basic functionalities if it? (04 Marks)
- e. Write down the classification of computers according to the size? (04 Marks)

02 a. Regarding MS Word

- i How to open a MS Word file? (Steps). (04 Marks)
 - ii How to save a word file in PDF format. (04 Marks)
- b. Write down the steps for following operations.
- i Text to speech (03 Marks)
 - ii Shrink one page (03 Marks)
 - iii Calculate (03 Marks)
 - iv Filter (03 Marks)

03. Regarding MS PowerPoint

- a. How to apply a theme to a slide. (04 Marks)
- b. How to insert a text to a slide. (04 Marks)
- c. How to change layout of a slide. (04 Marks)
- d. How to insert a picture to a slide. (04 Marks)
- e. How to save a presentation in PDF format? (04 Marks)

04. Regarding MS Excel

- a. What are the advantages of using MS Excel? (02 Marks)
- b. Answer the following questions.

	A	B	C	D	E	F	G	H	I
1	Column1	Column	Column	Column	Column	Column	Column	Column8	Column9
2	Name	subject							Average
3		Sinhala	English	Tamil	Maths	Science	History	Music	
4									
5	Sunil	45	86	ab		45	78	58	86
6	Kamal	52	25		56	85	75	75	93
7	Jagath	85	48	ab		95	85	ab	63
8	Nimal	49	75		75	65	45	ab	97
9	Bandara	54	95		84	35	25	ab	84
10	Nimesh	21	86		95	65	95	45	18
11	Janith	15	35		45	45	85	65	76
12	Ajith	48	86		65	42	74	89	90
13	Diluk	75	95	ab		85	56	78	50
14									
15	Maximum								
16	Minimum								
17	Total								
18	Count								

- c. What is a work sheet? (03 Marks)
- d. Write the formula to get the Average Marks of Sunil and Diluk? (03 Marks)
- e. Write the formula to get the Maximum marks for Sinhala? (03 Marks)
- f. Write the formula to get the Minimum marks for English? (03 Marks)
- g. What is the formula to get the total marks for Tamil? (03 Marks)
- h. What is the formula to get the Number of students who faced the Maths exam? (03 Marks)

05. Regarding operating systems and antivirus systems

- a. What is an operating system? (04 Marks)
- b. What is an antivirus system? (04 Marks)
- c. Write down four types of antivirus software. (04 Marks)
- d. Write down three types of operating software. (04 Marks)
- e. How to install an antivirus software to your PC. (04 Marks)



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COURSE CODE : EED -0465/ B008/M2

FINAL EXAMINATION QUESTION PAPER
AWARENESS TO QUALITY, ENVIRONMENT & SAFETY MANAGEMENT SYSTEM

- This question paper consists of 05 questions.
- Answer all the questions.

Date: 2020.03.14

Pass mark 50%

Time allocated: 03Hrs

1. Write short notes of the following.
 - a. Flag State.
 - b. Port State.
 - c. Classification Society.
 - d. Territorial Water.
 - e. IMO
 - f. Exclusive Economic Zone. (24 Marks)
2. Explain all FIVE elements of "5S Concept" giving examples for each element. (15 Marks)
3. Write short notes of all FOUR pillars of Maritime Law, explaining why they are so important to seafarers and Maritime Industry. (16 Marks)
4. a. State FIVE functional requirements of Safety Management system. (18 Marks)
b. Briefly explain THREE duties of DPA. (06 Marks)
5. a. Under Annex SIX regulations, explain what gases from the ships, pollutes the atmosphere how the pollution is reduced by the regulations. (09 Marks)
b. Explain what is the purpose of "Ballast Water Management". What need to be done to minimize the damage done by dirty Ballast water. (12 Marks)

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EXAMINATION QUESTION PAPER
 ADVANCED ELECTRICAL POWER AND MACHINES

This question paper consist 06 questions.
 Answer all the Questions.

Pass mark 50%

Date: 2020.06.10
 Time allocated: 03Hrs

1.
 - a. What are the types of AC motors commonly used on board ships? (04 Marks)
 - b. List the onboard applications for above mentioned motor types. (05 Marks)
 - c. Briefly explain the operating principle of three phase induction motor. (05 Marks)

2.
 - a. List difference between squirrel cage rotor and wound rotor of induction motor? (05 Marks)
 - b. Draw Power circuit of DOL starter suitable for Three phase Induction motor with all important components (06 Marks)
 - c. Draw Control circuit of DOL starter with transformer and name all components (06 Marks)

3.
 - a. Sketch clearly Preferential tripping arrangement onboard. (06 Marks)
 - b. Explain the purpose of Preferential tripping required for ships electrical systems. (04 Marks)
 - c. List most important Six essential loads of commercial ship (06 Marks)

4. With reference to excitation of an alternator.
 - a. List all functions of an Auto Voltage Regulator (04 Marks)
 - b. Draw block diagram of a common basic error operated type AVR (08 Marks)
 - c. Draw block diagram & name all components of a transformer type static exciter (10 Marks)

5. With reference to alternators and main switch board
 - a. Draw the Brushless excitation schematic / block diagram for three phase alternators. Name the each and every component. (10 Marks)
 - b. List required protections related to (i) Switch board and (ii) Alternators. (at least Three most important protections are required for each). (06 Marks)

6.
 - a. Sketch and explain how three Aux generators connected to Main panel (06Marks)
 - b. Sketch and explain how Emergency generator panel connected to Main panel (06 Marks)
 - c. Show in your above drawings, where Reefer container feeder is connected (03 Marks)

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EXAMINATION QUESTION PAPER
APPLIED ELECTRONICS

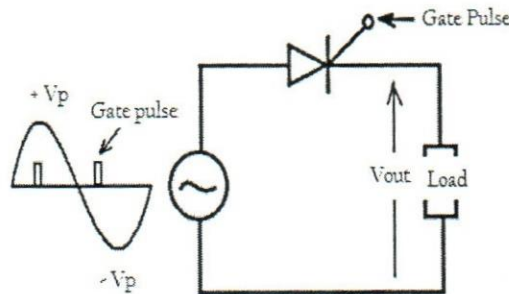
- This question paper consists of 05 questions.
- Answer all Questions

Date: 2020.06.08

Pass mark 50%

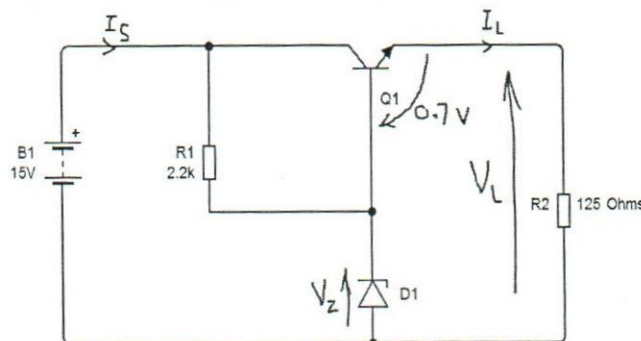
Time allocated: 03Hrs

01. With regards to the thyristors,
- What are the applications of thyristors in ships. (03 Marks)
 - Sketch the symbols and name the terminals of following power electronic components (04 Marks)
 - SCR
 - TRIAC
 - DIAC
 - GTO
 - Consider the following SCR circuit, draw the output voltage waveform according to gate pulse by the angle α . (05 Marks)



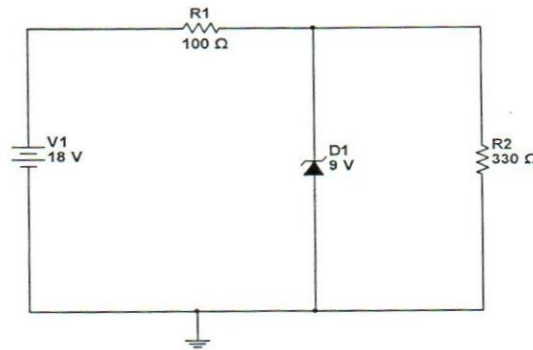
- Draw the circuit diagram of single phase, full-wave, controlled rectifier and sketch its output waveforms for firing angle - α . (08 Marks)

02. With regards to D.C power supplies,
- State the importance of using regulator circuits in DC power supplies. (03 Marks)
 - Consider following Transistor Regulator Circuit, and find,



- i. The value of the Zener (V_z) required to maintain 8V of constant output. (04 Marks)
- ii. The load current (I_L) (03 Marks)
- iii. The Supply current (I_s) (04 Marks)
- iv. The power dissipation in the load (125Ω) (03 Marks)
- v. The power dissipation in the transistor (03 Marks)

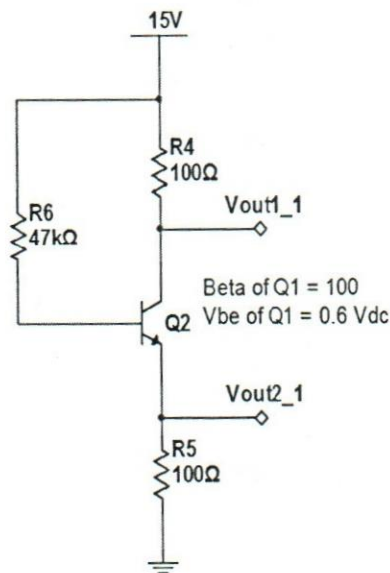
03. With regards to the following Zener Application,



- a. Find the functionality of the Zener diode D1. If it is functioning, find, (05 Marks)
- b. Voltage across 330Ω resistor (03 Marks)
- c. Current through 330Ω resistor (03 Marks)
- d. Current through 100Ω resistor (03 Marks)
- e. Current through Zener diode D1 (03 Marks)
- f. Power dissipation in the Zener diode. (03 Marks)

04. With regards to the Transistors,

- a. State the main two categories of Bipolar Junction Transistors. (02 Marks)
- b. What are the main differences between BJTs and FETs (02 Marks)
- c. State three applications of BJTs (03 Marks)
- d. Consider following BJT configuration and find,



- i. The base current (I_b) (04 Marks)
- ii. The collector current (I_c) (04 Marks)
- iii. The voltage at points V_{out1_1} and V_{out2_1} with referred to the ground. (05 Marks)

05. With regards to the amplifiers,
- a. What is the main difference between small signal amplifiers and power amplifiers. (04 Marks)
 - b. What is the voltage gain of an Amplifier (02 Marks)
 - c. Draw the circuit diagram of a common emitter small signal amplifier and shortly describe its every component. (14 Marks)

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FINAL EXAMINATION QUESTION PAPER
ELECTRICAL PRACTICE

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

Date: 2020.03.13

Pass mark 50%

Time allocated: 03Hrs

01). a. State the full name of the following abbreviations. (Electrically)

- | | | |
|-----------|------------|-------------|
| i. I.E.C. | ii. M.C.B. | iii. O.C.R. |
| iv. N.E.R | v. M.C.C.B | vi. P.F.C. |

(06 Marks)

b. Explain briefly the following electrical terms.

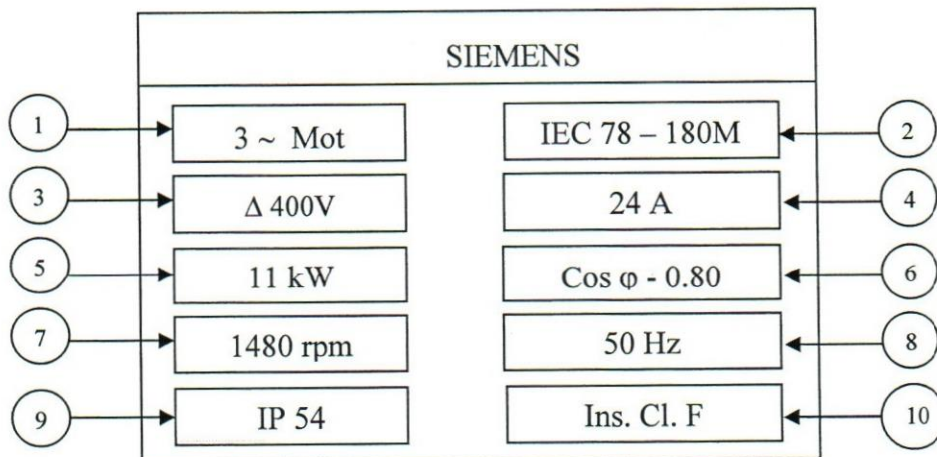
- | | | |
|----------------|------------------|--------------------------|
| i. Conductance | ii. Power factor | iii. Capacitive reaction |
| iv. Impedance | iv. Eddy current | vi. Fusing factor |

(12 Marks)

02). a. When an electrical cable is expressed as AL/ XLPE /SWA /PVC -35mm² - 7/2.52 mm, 600/1000V. What does it signify?

(09 Marks)

b. Following figure shows a name plate data of an electric machine. Explain the terms for each case.



(10 Marks)

03). a. Draw a wiring diagram to show the essential parts of single fluorescent lamp and explain the function of circuit.

(06 Marks)

b. What is a transformer? Explain working principle.

A 2300/400V single phase 200kVA transformer has 80 turns in the secondary winding. Calculate

- i. Primary turns ii. Secondary full load current at unity power factor.

(08 Marks)

- 04). a. Three equal 60Ω resistance are connected in i. Star and ii. Delta across a three phase 460V-60Hz supply. Calculate for each case the line current and the total power absorbed. (08 Marks)
- b. A three phase six (06) terminal connection motor has been flooded with sea water. How are you observe before connecting to electric main supply. (06 Marks)

05). Draw "POWER" and "CONTROL" circuit for D.O.L Remote control magnetic contactor starter circuit. (Mark the all terminal numbers and equipment identification letters)

Specifications :	Power circuit	- 3 ~ 440V / 50Hz (without neutral earth)
	Control circuit voltage	- 230V/50Hz
	Three phase motor	- 5.5kW/440V-50Hz (1440r.p.m)
	Indicating lamps	- Green for motor running
		- Red for motor overload
		- Yellow for power voltage

(18 Marks)

- 06) In reference to AC three phase induction motors and starters,
- a. List two types of step Speed Control Methods (02 Marks)
 - b. List two continuous speed control methods (02 Marks)
 - c. List basic motor protections required in a motor starter (03 Marks)
 - d. List minimum two safety controls (other than motor protection) in the gangway motor control (04 Marks)
 - e. What is the name of the system preventing the motor from rotating back of a gangway or coming down by own weight of the gangway during power failure (03 Marks)
 - f. Explain the consequences of single phasing and How to prevent single phasing fault in a Three phase motor of a Gangway (03 Marks)

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EXAMINATION QUESTION PAPER
COMPUTER & NETWORKING

- This question paper consists of 05 questions.
- Answer all Questions.

Date: 2020.03.12

Pass mark 50%

Time allocated: 03Hrs

01.

- How is an IP address different from a MAC address? (08 Marks)
- Briefly describe the following ports by indicating the usage of them (08 Marks)
 - RJ45 port
 - VGA port
 - Parallel port
 - HDMI port
- What are the main two types of data transmission media? (06 Marks)
- What is a wireless media? Describe giving examples (06 Marks)
- What are the advantages of peer to peer architecture compared to client server architecture? (06 Marks)
- What is the difference between Intranet and Extranet? (06 Marks)

02. With reference computer networks

- What is a computer network and what are the main types of computer networks? (05 Marks)
- How 'LAN' is different from 'CAN' justify your answer (05 Marks)
- What are the advantages and disadvantages of networking? (05 Marks)

03. With reference network topologies

- What is a network topology? (05 Marks)
- State five network topologies and describe one of them (05 Marks)
- How many network cables are needed to connect seven computers in a mesh topology? (05 Marks)

04. With reference network devices

- What is the difference between switch and Hub? (05 Marks)
- Indicate another three network devices and explain the roles and responsibilities of those devices (05 Marks)
- What is a MODEM? (05 Marks)

05. With reference OSI model

- What are the layers of an OSI Model? (05 Marks)
- What is the difference between OSI Model and the TCP/IP MODEL? (05 Marks)
- What is a protocol? (05 Marks)

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COURSE CODE: EED -0465/ B8/M2

FINAL EXAMINATION QUESTION PAPER
MARINE ENGINEERING KNOWLEDGE

- This question paper consists 06 questions.
- Answer all the questions.

Date: 2020.03.12

Pass mark 50%

Time allocated: 03Hrs

01. a. What do you understand by a "STROKE" of an engine? (02 Marks)
- b. Briefly explain the working of a 2-stroke marine engine with respect to crankshaft revolution. (04 Marks)
- c. Write short notes for the following.
- i. Exhaust gas turbocharger.
 - ii. Exhaust valve.
 - iii. Scavenge fire.
 - iv. Stuffing box. (4 x 02 Marks)
- d. With a sketch briefly explain the operation of exhaust valve of Sulzer engine. (03 Marks)
- e. Briefly explain common fuel rail system. (03 Marks)
- f. Write 02 advantages of 2 stroke marine engine over 4 stroke engines. (03 Marks)
02. a. Write 04 purposes of steam in a tanker ship. (04 Marks)
- b. Name the major constructional types of oil fired boilers. (03 Marks)
- c. Briefly explain the boiler burner unit. (05 Marks)
- d. What are the boiler alarms? (06 Marks)
03. a. Briefly explain the sewage treatment plant with "MARPOL" annex. (06 Marks)
- b. What are the routine checks to be carry out to ensure sewage treatment plant is functioning properly? (04 Marks)
- c. How does the anaerobic and aerobic decomposition occurs? What are the products of each? (05 Marks)
04. a. Neatly sketch evaporative type fresh water generator with each part named. (04 Marks)
- b. What is the purpose of brine educator? (04 Marks)
- c. Write 04 functions of sea water pump of evaporative fresh water generator. (04 Marks)

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- 05 a. What is the meaning of an Engine room bilges? (02 Marks)
- b. Briefly explain an oily water separator including 15 ppm monitor. (06 Marks)
- c. What are the maintenance work to be carried out for an oily water separator? (04 Marks)
-
06. a. Draw and explain vapor compression refrigeration cycle briefly. State all physical conditions of the refrigerant at various places. (05 Marks)
- b. Briefly explain construction and working of the thermostatic expansion valve with external equalizer in a refrigeration system? (05 Marks)
- c. Write short notes for the following.
- i. Filter drier.
 - ii. Pump down.
 - iii. Flash gas.
 - iv. Flood back.
 - v. Degree of super heat. (5 x 02 Marks)

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EXAMINATION QUESTION PAPER
 MARINE ELECTRICAL SYSTEM

- This question paper consist 06 questions.
- Answer all Six (06) Questions.

Date: 2020.03.10

Pass mark 50%

Time allocated: 03Hrs

01. With reference to earth fault detecting system on board.
- a. What are the earth fault detection system? (02 Marks)
 - b. Draw the neat diagram for above systems. (06 Marks)
 - c. State the differences for above systems. (03 Marks)
 - d. How to locate and rectify an earth fault(220V) on board? Briefly explain with step by step. (07 Marks)
02. With reference to electrical maintenance and safety on board.
- a. How do you carry out the inspections or maintenance of following?
 - i Motors (03 Marks)
 - ii Power circuit (03 Marks)
 - iii control circuit (03 Marks)
 - b. State five rules of safety. (05 Marks)
 - c. What are the personal protective equipment(PPE) available onboard? (04 Marks)
03. With reference to navigation lights and navigational aids on board
- a. What are the alarms fitted in navigational light panel? (03 Marks)
 - b. Draw the block diagram for navigational light panel. (04 Marks)
 - c. Briefly describe the followings.
 - i. Autopilot (03 Marks)
 - ii. Navetex (03 Marks)
 - iii. GMDSS (03 Marks)
04. With reference to Main switch board and AC alternators
- a. What are the switch board protections? (04 Marks)
 - b. Draw the basic block diagram of self-excited brushless AC alternator and name the each component clearly. (08 Marks)
 - c. list the alternator protections. (04 Marks)
05. With reference to the synchronizing of alternators.
- a. State the condition for Synchronizing an alternator with live bus bar. (04 Marks)
 - b. What are the Synchronizing methods? (05 Marks)
 - c. Draw the block diagram for two methods? (07 Marks)
06. With reference to alarms, routine works and duties on board.
- a. State the main alarms that are installed in the ship to give audio and visual warnings. (04 Marks)
 - b. List the main duties of ETO/Electrician on board. (08 Marks)
 - c. Briefly explain the routine works to be carried out by above person. (04 Marks)



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COURSE CODE : EED -0465/ B007/MI

REPEAT EXAMINATION QUESTION PAPER
MEASUREMENT & INSTRUMENTATION

- This question paper consist 06 questions. Date : 2020.02.07
• Answer all six the questions. Pass mark 50% Time allocated : 03Hrs

- 01 a. Sketch a Moving Coil meter and Name Each components of it (10 Marks)
b. Compare features of moving coil meter and Moving Iron meter (06 Marks)
02. a. Show terminal connection of a MC ammeter is extended for high measuring current range (04 Marks)
b. With the aid of neat sketch Find the Shunt resistance value to measure 500 A DC load by 0.1 Ohm, 10 mA MC Ammeter (08Marks)
c. Draw correct Symbols of Moving coil, Moving iron, Vibrating type meter ,Vertical position, test voltage, Double insulation type meters (06 Marks)
03. a. Sketch of a Dynamometer and Name Each component of it (08 Marks)
b. List Four applications of Dynamometer (04 Marks)
04. a. What are the fundamental difference between Power transformer /Instrument transformer (06 Marks)
b. List six practical applications of Instrument transformer (06 Marks)
c. Sketch clear symbols of CT (Current transformer) and PT (Potential transformer) (04 Marks)
05. a. Sketch Synchro scope and Name each and every components (12 Marks)
b. Purpose of the Synchro scope (02 Marks)
c. Precautions to be taken after each and every use of the Synchro scope (04 Marks)
06. a. Sketch electrical connection in a single-phase power circuit comprises of 400 Volts Power supply and a pure resistive load of 50 Ohms. the following instruments to be connected to measure V, f, I and W. Given instruments are one Current Transformer (CT 100:5 A), one Potential transformer (PT-400 :100 V) connected to One Volt meter 400:100 V, Two Ampere meters of 100: 5A, One Watt meter of 100 V and 5 A, One Frequency meter (100 V), one of 10 A fuse, one of 1A fuse and one of 2 A fuses. (14 Marks)
- b. What is the difficulty in changing one of a faulty ampere meter at the live switch board given in the same as in Q06 a, explain precautions to be taken. (02 Marks)
- c. How to replace an AC ampere meter, what is the suitable type applicable for this purpose (04 Marks)



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 PRE SEA TRAINING COURSE FOR ELECTRO TECHNICAL RATING.
 COURSE CODE : EED -0465/ B007/MI

REPEAT EXAMINATION QUESTION PAPER
 COMPUTER KNOWLEDGE

- This question paper consist of questions.
- Answer all the questions.

Date: 2020.02.05

Pass Marks 50%

Time allocated: 03Hrs

Q1. Regarding basics of computers

- What is the difference between computer HARDWARE and SOFTWARE? (04 Marks)
- Write down the main two types of soft wares and describe one them (04 Marks)
- What are INPUT devices and OUTPUT devices? Explain giving examples (04 Marks)
- What are the three main parts of a CPU? (Central processing unit) (04 Marks)

Q2. Regarding basics of computers

- List a comparison between the main memory and secondary memory of a computer (04 Marks)
- What is an operating system? (04 Marks)
- Write down the classification of computers according to the size? (04 Marks)
- 4 Write down the classification of computers according to the technology? (04 Marks)

Q3 Regarding MS Word

- Write down the steps to start MS WORD (04 Marks)
- What is the importance of nonprinting characters and list down three of them (04 Marks)
- How to save MS WORD document (Steps) (04 Marks)
- How to save MS WORD document in PDF format (Steps) (04 Marks)

Q4. Regarding MS PowerPoint

00002

- a. How to start POWERPOINT and save the document as “My future Goals” (04 Marks)
- b. How to insert a text into a slide in POWERPOINT? (04 Marks)
- c. How to apply a theme to a slide in POWERPOINT? (04 Marks)
- d. How to insert a picture to a slide. (04 Marks)

Q5. Regarding MS Excel

	A	B	C	D	E	F	G
1	Column1	Column2	Column3	Column4	Column5	Column6	Column7
2	Name	Subject					Average
3		Sinhala	English	Tamil	Maths	Science	
4	Sunil	58	58	45	85	85	
5	Kamal	65	56	56	ab	45	
6	Amal	85	ab	47	29	75	
7	Ajith	92	54	84	ab	65	
8	Sumith	46	85	65	45	45	
9	Sasindu	78	95	65	38	57	
10							
11	Minimum						
12	Maximum						
13	Total						
14	No of students						

- a. What is a work sheet? (06 Marks)
- b. Write the formula to get the Average marks of Sunil? (06 Marks)
- c. Write the formula to get the Average marks of Sasindu? (06 Marks)
- d. Write the formula to get the Minimum marks for Sinhala? (06 Marks)
- e. Write the formula to get the total marks for Tamil? (06 Marks)
- f. What is the formula to get the number of students who faced Maths exam? (06 Marks)



Colombo International Nautical and Engineering College

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COURSE CODE : EED -0465/ B007/MI

REPEAT FINAL EXAMINATION QUESTION PAPER
BASIC ELECTRICAL POWER & MACHINES

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

Pass mark 50%

Date : 2020.02.03
Time allocated : 03Hrs

- 01 a. List all type of Electrical DC Motors and show it in a Tree diagram. (10 Marks)
b. List all type of losses in the DC motors (06 Marks)
02. a. Draw the diagrams with all field windings, armature circuit for all three types of DC motors. (Make a clear drawings with names all the components for full marks) (12 Marks)
b. What type of starters required to start DC motors (06 Marks)
03. a Explain main purposes of Power transformer and Instrument transformer (06 Marks)
b. Sketch and show the instrument connections to Potential and Current transformer (06 Marks)
c. List all applications of Instrument transformers (04 Marks)
04. a. Sketch static Excitor and name each components (07 Marks)
b. List three advantages and three disadvantages of static Excitor (03 Marks)
c. Sketch brush less generator and name all components (07 Marks)
d. List three advantages and three disadvantages of brushless type AC generator (03 Marks)
05. a. Why large DC Compound motors cannot be connected or started without starting resistance (06 Marks)
b. Sketch and mark starting resistance connection arrangements to the compound motor and the precaution to be taken every time while starting Shunt or Compound motor (10 Marks)
c. Sketch connections of short shunt motor with polarity marks to change the direction of rotation (04 Marks)
06. a. Make a table to compare parts of wound rotor induction motor and squirrel cage rotor induction motor (05 Marks)
b. Make a table to compare features of wound rotor induction motor and squirrel cage rotor induction motor (05 Marks)



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RE REPEAT EXAMINATION QUESTION PAPER
 WORK SHOP THEORY

- This question paper consists 06 questions.
- Answer all the Questions.

Date: 2020.01.31

Pass marks 50%

Time allocated: 03Hrs

- 01). a. What do you understand by the term welding? (04 Marks).
 b. What are classification of welding? (06 Marks).
 c. What do you mean by inert gas welding? (08 Marks).
- 02). a. What is "fitting"? (06 Marks).
 b. Name 08 tools use for fitting. (04 Marks).
 c. Write 6 safe working practices of fitting. (04 Marks).
- 03). a. Draw and explain the temperatures and uses of three types of Oxy -Acetylene flames. (08 Marks).
 b. Briefly explain about "Stick welding". (06 Marks).
- 04). a. What is turning? (04 Marks)
 b. What do you mean by cutting speed? (06 Marks)
 c. What are the operations of turning? (08 Marks).
- 05). a. Why safety is so important while working on board? (04 Marks).
 b. Define the term "PPE", what are they and the use of each. (06 Marks).
 c. What does the most essential item need to be keep in the workshop other than the PPE which is helpful after the injury. (04 Marks)
- 06). a. What is the definition of drilling? (05 Marks).
 b. What are the types of drilling machines? (06 Marks).
 c. Draw and explain the twist drill. (05 Marks).
 d. What are the cutting drill angles? (06 Marks).



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 COURSE CODE : EED -0465/ B007/M2

REPEAT EXAMINATION QUESTION PAPER
 MARINE ELECTRICAL SYSTEM

- This question paper consist 06 questions.
- Answer all Six (06) Questions.

Date: 2020.01.21

Pass mark 50%

Time allocated: 03Hrs

01. With reference to fire alarm system on shipboard.
- What are the basic requirements for fire detection system? (06 Marks)
 - State various fire detectors generally found onboard a ship and indicate their locations. (10 Marks)
02. With reference to shipboard electrical maintenance
- What are the four types of maintenance (04 Marks)
 - How do you carry out the inspection of following?
 - Motors (04 Marks)
 - Starter & motor control gear (04 Marks)
 - Contactors & relays. (04 Marks)
03. With reference to navigation lights and navigational aids shipboard
- What are the alarms fitted in navigational light panel? (04 Marks)
 - Make a table for locations and colour, angle of projection, range of visibility and rated power of navigation lights. (08 Marks)
 - Draw the block diagram of basic navigational light circuit. (06 Marks)
04. With reference to shipboard alternators and main switch board and
- What are alternator protections? (06 Marks)
 - Draw the basic block diagram of self-excited brushless AC alternator and name each component clearly. (12 Marks)
05. With reference to the Low Voltage and High Voltage alternators.
- State the condition for Synchronizing an alternator with live bus bar. (04 Marks)
 - What are the Synchronizing method? (05 Marks)
 - Draw the block diagram for any method (07 Marks)
06. With reference to electrical circuits in tankers
- Make the table for type of protection(Ex.) with their symbols. (06 Marks)
 - Draw the intrinsically safe barrier circuit (Zener barrier) with main component. (06 Marks)
 - list the electrical sources of ignition in hazard area. (04 Marks)



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COURSE CODE : EED -0465/ B007/M2

REPEAT EXAMINATION QUESTION PAPER
ADVANCED ELECTRICAL POWER & MACHINES

• This question paper consist 06 questions.

Date : 2020.01.21

• Answer all six questions.

Pass mark 50%

Time allocated : 03Hrs

01. a. List type of Electrical (AC & DC) Motors and show it in a Tree diagram. (10 Marks)
b. List type of losses in the AC motors and DC motors (06 Marks)
02. a. Draw the diagrams with all field windings, armature circuit for all three types of DC motors.
(Make a clear drawings with names all the components for full marks) (12 Marks)
b. List at-least one application or the purpose of each type of DC motors (06 Marks)
03. a. Explain main purposes of Power transformer and Instrument transformer (06 Marks)
b. Sketch and show the instrument connections to Potential and Current transformer (04 Marks)
c. List applications of current and potential transformers, Losses in the transformer (06 Marks)
04. a. Sketch an Error operated AVR and name each components (07 Marks)
b. List three advantages and three disadvantages Error operated AVR (03 Marks)
c. Sketch brush type generator and name all components (07 Marks)
d. List three advantages and three disadvantages of brush type AC generator (03 Marks)
05. a. Sketch Static Exciter (compound transformer) and name each components (07 Marks)
b. List three advantages and three disadvantages of Static Exciter (compound transformer) (03 Marks)
c. Sketch brush less generator and name all components (07 Marks)
d. List three advantages and three disadvantages of brushless type AC generator (03 Marks)
06. a. Make a table to compare parts and the features of Synchronous motor and squirrel cage rotor induction motor (05 Marks)
b. Make a table to compare parts and the features of Wound rotor induction motor and squirrel cage rotor induction motor (05 Marks)



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COURSE CODE : EED -0465/ B7/ M2

REPEAT EXAMINATION QUESTION PAPER
COMPUTER KNOWLEDGE PC NETWORKING INTERFACING

- This question paper consists of 04 Questions.
- Answer all the questions.

Date: 2020.01.20

Pass Mark 50%

Time allocated: 03Hrs

01. Questions regarding addresses and ports

- How is an IP address different from a MAC address? (10 Marks)
- Briefly describe the following ports by indicating the usage of them (10 Marks)
 - RJ45 port
 - VGA port
 - HDMI port
- What are the main two types of data transmission media? (05 Marks)

02. Questions regarding computer networks

- What is a computer network and what are the main types of computer networks? (10 Marks)
- How 'LAN' is different from 'CAN' justify your answer (10 Marks)
- What are the advantages and disadvantages of networking? (05 Marks)

03. Questions regarding network topologies

- What is a network topology? (10 Marks)
- State five network topologies and describe one of them (10 Marks)
- How many network cables are needed to connect seven computers in a mesh topology? (05 Marks)

04. Questions regarding network devices

- What is the difference between switch and Hub? (10 Marks)
- Indicate another three network devices and explain the roles and responsibilities of those devices (10 Marks)
- What is a MODEM? (05 Marks)



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REPEAT EXAMINATION QUESTION PAPER
APPLIED ELECTRONICS

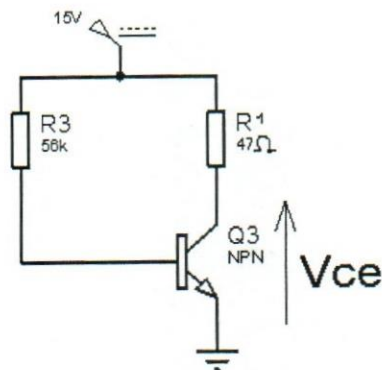
- This question paper consist of 05 questions.
- Answer all the questions.

Date: 2020.01.22

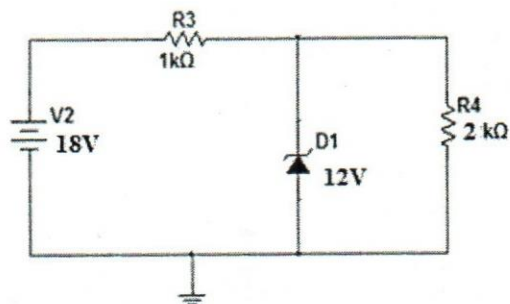
Pass mark 50%

Time allocated: 03Hrs

1. With regards to the Thyristors
 - a. Draw the symbols and mark terminals of following different components in the thyristor family. (06 Marks)
 - I. SCR
 - II. DIAC
 - III. TRIAC
 - b. Sketch the circuit diagram of a full wave controlled rectifier using 2 SCRs and 2 Diodes. Sketch the waveforms of both input and output for a firing angle of α . (10 Marks)
 - c. Draw a circuit diagram for single phase AC power control, using two back-to-back connected SCRs (04 Marks)
2. With regards to the DC power supplies,
 - a. What is a DC power supply? (04 Marks)
 - b. Draw a complete circuit diagram of a single phase conventional DC power supply using centre-tap transformer. (08 Marks)
 - c. What is the function of a "Regulator circuit" used in power supplies. (04 Marks)
 - d. What are the types of regulators used in DC power supplies. (04 Marks)
3. With regards to the Transistors,
 - a. State four different kinds of transistors used in electronic circuits. (04 Marks)
 - b. Consider following BJT arrangement and find (Consider the V_{BE} of transistor as 0.6V and β as 100)
 - i. The base current (04 Marks)
 - ii. The collector current (04 Marks)
 - iii. The emitter current (04 Marks)
 - iv. The voltage across collector and emitter terminals (04 Marks)



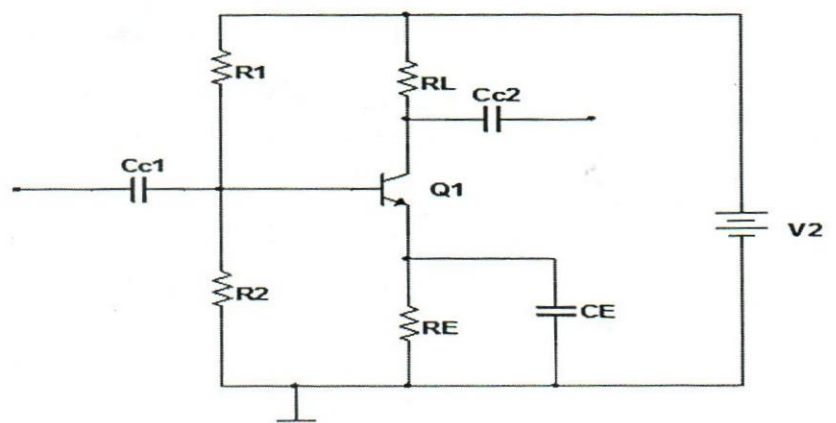
4. With regard to the Zener diodes,
- Describe the importance of using Zener diodes in electronic circuits. (05 Marks)
 - In below Zener circuit, find



- Load voltage - V_L (03 Marks)
- Load current - I_L (03 Marks)
- Supply current - I_s (03 Marks)
- Zener current - I_z (03 Marks)
- Power dissipation in the Zener Diode (03 Marks)

5. With regards to the amplifiers,
- Describe why the amplifiers are used? (05 Marks)
 - Describe the difference between the pre-amplifier and the power amplifier. (05 Marks)
 - Identify the type of following amplifier. Also describe following components, (10 Marks)

- R_1 and R_2
- R_E
- C_E
- C_{c1} and C_{c2}





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REPEAT EXAMINATION QUESTION PAPER
 MARINE ENGINEERING KNOWLEDGE

- This question paper consists 06 questions.
- Answer all the questions.

Date: 2020.01.19

Pass mark 50%

Time allocated: 03Hrs

01. a. Neatly sketch evaporative type fresh water generator with each part named. (04 Marks)
- b. What is the purpose of brine educator? (04 Marks)
- c. Write 04 functions of sea water pump of evaporative fresh water generator. (04 Marks)
02. a. What are "Engine room bilges" and how do you manage this? (02 Marks)
- b. Briefly explain the construction & operation of an oily water separator. (06 Marks)
- c. What are the maintenance work to be carried out for 15 ppm monitor as well as oily water separator. (05 Marks)
03. a. What do you understand by a "STROKE" of an engine? (02 Marks)
- b. Briefly explain the working of a 2-stroke marine engine with respect to crankshaft revolution. (04 Marks)
- c. Write short notes for the following.
- i. Stuffing box.
- ii. Scavenge fire.
- iii. Exhaust valve.
- iv. Exhaust gas turbocharger. (4 x 02 Marks)
- d. With a sketch briefly explain the operation of exhaust valve of Sulzer engine. (03 Marks)
- e. Briefly explain common fuel rail system. (03 Marks)
- f. Write 02 advantages of 2 stroke marine engine over 4 stroke engines. (03 Marks)
04. a. Briefly explain the sewage treatment plant with "MARPOL" annex. (06 Marks)
- b. What are the routine checks to be carry out to ensure sewage treatment plant is functioning properly? (04 Marks)
- c. How does the anaerobic and aerobic decomposition occurs? What are the products of each? (05 Marks)

05. a. Draw and explain vapor compression refrigeration cycle briefly. State all physical conditions of the refrigerant at various places. (05 Marks) 00004
- b. Briefly explain construction and working of the thermostatic expansion valve with external equalizer in a refrigeration system? (05 Marks)
- c. Write short notes for the following.
- i. Flash gas.
 - ii. Degree of super heat.
 - iii. Flood back.
 - iv. Filter drier.
 - v. Pump down. (5 x 02 Marks)
06. a. Write 04 purposes of steam in a tanker ship. (04 Marks)
- b. Name the major constructional types of oil fired boilers. (02 Marks)
- c. Briefly explain the boiler burner unit. (05 Marks)
- d. What are the boiler alarms? (06 Marks)



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REPEAT EXAMINATION QUESTION PAPER
 ELECTRICAL PRACTICE

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

Date: 2020.01.19

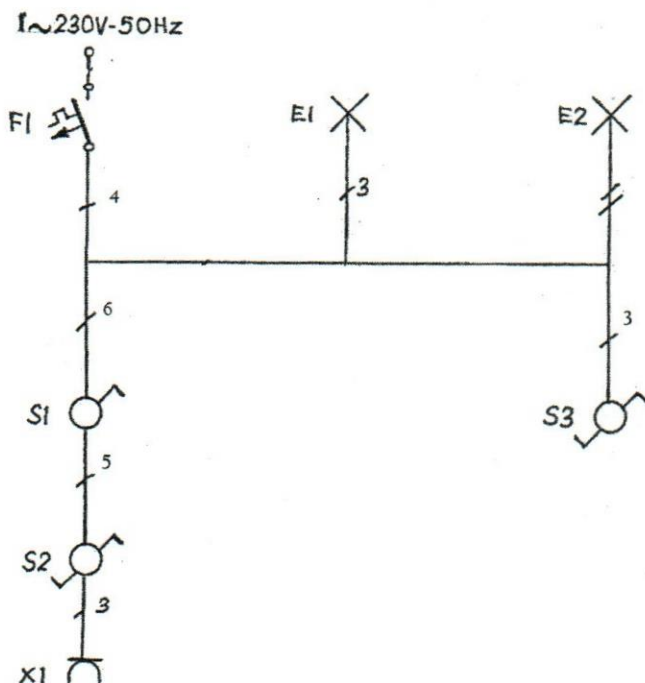
Pass mark 50%

Time allocated: 03Hrs

01). a. Briefly explain following electrical terms.

- | | |
|--------------------------------|---------------------------------------|
| i. Resistivity | ii. Impedance of a coil |
| iii. Apparent power of a motor | v. Slip speed of a A.C. Motor |
| iv. Efficient of a transformer | vi. Fusing factor of a rewirable fuse |
- (12 Marks)

b. Draw the circuit diagram of the following single line diagram.



S1 for E1
 S2 & S3 for E2

(08 Marks)

02. a). Draw a circuit diagram to show the essential parts of a single fluorescent lamp circuit and label each part with their specifications. (06 Marks)

b). A 440/230V-50Hz single phase transformer supplied a load 6.9kW at 0.8 power factor load. Calculate secondary and primary currents. (Ignoring transformer losses).

(08 Marks)

03). a. What are the five (05) rules of safety.

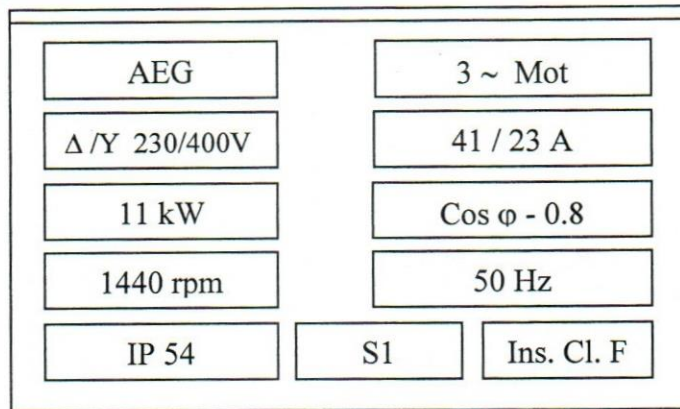
(05 Marks)

b. When an electrical cable is expressed as $25\text{mm}^2 - 7/2.14 \text{ mm}$, Cu/ XLPE /PVC -300/500V. What does it signify?

(08 Marks)

04). a. Figure shows a name plate data of an electric machine. Explain the following values (data) according to as name plate.

(20 Marks)



- i. Type of Machin
- iii. Synchronous speed.
- v. Slip speed
- vii Apparent power (Full load)
- ix. IP 54

- ii. Numbers of magnetic poles.
- iv. Full load rotor speed.
- vi. Slip
- viii. S1

x. Δ/Y 230/400V

b. How to rotation direction on reversed, of a three-phase asynchronous motor.

(03 Marks)

05). a. Three equal 40Ω heating elements are connected in i. Star and ii. Delta across a three phase 400V - 50Hz supply. Calculate for each case the line current and the total power absorbed.

(08 Marks)

b. A three phase induction motor has been flooded with sea water and its insulation is down to zero $M\Omega$. What is the procedure for putting the motor back to service.

(08 Marks)

06). a. Draw "POWER" and "CONTROL" circuit for D.O.L Remote control, magnetic contactor starter circuit. (Mark the all terminal numbers and equipment identification letters)

- Specifications :
- Power supply voltage - 3 ~ 440V / 60Hz - E (Insulated neutral)
 - Control circuit voltage - 110V/60Hz
 - Electric motor - 3 ~ 440V / 5.5kW-60Hz
 - Indicating lamps (LED 110V) - Green for motor running
 - Red for motor overload
 - Orange for control circuit voltage - ok

(12 Marks)

b. What would a "clamp meter" indicate if clipped around three core cable which is drawn to be carrying 10A to a three phase induction motor?.

(02 Marks)



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REPEAT EXAMINATION QUESTION PAPER
AWARENESS TO QUALITY, ENVIRONMENT & SAFETY MANAGEMENT SYSTEM

- This question paper consists of 06 questions.
- Answer all the questions.

Date: 2020.01.23

Pass mark 50%

Time allocated: 03Hrs

1. Explain all FIVE elements of "5S Concept" giving examples for each element. (15 Marks)
2. Write short notes of all FOUR pillars of Maritime Law, explaining why they are so important to seafarers and Maritime Industry. (16 Marks)
3. Name and explain briefly all SIX annexes of MARPOL (18 Marks)
4. a. Under Annex SIX regulations, explain what gases from the ships, pollutes the atmosphere how the pollution is reduced by the regulations. (10 Marks)
b. Explain what is the purpose of "Ballast Water Management". (06 Marks)
5. a. Explain under what conditions oil mixture can be pumped out from Engine room bilge tank. (06 Marks).
b. With a suitable diagram explain the function of the Oily Water Separator which can be used to pump out engine room bilge water. (09 Marks)
6. Write short notes of the following. (20 Marks)
 - a. Flag State.
 - b. Port State.
 - c. Classification Society.
 - d. Territorial Water.
 - e. Exclusive Economic Zone