1st Yr. / 2nd Sem. / June 2016.

# INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

May/June 2016 End Semester Examinations

B.Sc. (Nautical Science)- Second Semester (2013 batch onwards)

Marine Engineering, Automation & Control Systems – II (UG21T2212)



**Date : 02.07.2016** **Maximum Marks: 70**

**Time: 3 Hrs** **Pass Marks : 35**

**NOTE:** Answer at least **ONE** question from each section, a total of **SEVEN** questions to be answered. All questions carry **EQUAL** marks.

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## SECTION - A

1. (a) Draw & explain a navigational lighting circuit fitted with indicators/alarms and connected to both main and alternate/emergency power source. (6 marks)
   (b) How is an electrical motor coupled to the purifier drive? Why this type of coupling is used? (4 marks)

2. (a) Explain in detail the procedure of maintenance of batteries. (5 marks)
   (b) Describe the procedure for starting emergency generator manually. (5 marks)

3. (a) Name the machineries found in an engine room of a ship. (4 marks)
   (b) Name any five supporting pipeline system for the main engine plant (3 marks)
   (c) Name the services/equipments that should be supplied emergency power from the emergency generator. (3 marks)

4. a) How are the ships classified as per the propulsion plants? (5 Marks)
   b) Name any five supporting pipeline system for the main engine plant (5 Marks)

## SECTION- B

5. (a) Explain the term Pre-heating of Main Engine. (5 marks)
   (b) What do you mean by a "hydrophore tank"? How does it work on a ship? (5 marks)

6. Explain the following terms (10 marks)

   (a) Annealing
   (b) Quenching
   (c) Stress relieving
   (d) Pack carburising
   (e) Cryogenic treatment

7. (a) What are the different types of steel & their uses? (6 marks)
   (b) What are the uses of ceramics? (4 marks)

## SECTION – C

8. (a) Draw and explain the process of steel refining. (6 marks)
   (b) How Ferrous metal and cost iron are classified? (4 marks)

9. Draw a general layout of engine room bottom platform of a bulk carrier & Name the different machineries. (10 Marks)

# INDIAN MARITIME UNIVERSITY

**(A Central University, Government of India)**

**May/June 2016 End Semester Examinations**
**B.Sc. (Nautical Science)- Second Semester (2013 batch onwards)**

**Ship Operation Technology Paper – II (UG21T2211)**

**Date : 01.07.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

Note: Attempt any **SEVEN** questions .
All questions carry equal marks. (7 x 10 Marks= 70 Marks)

1. How will you prepare a surface for painting? What are the different types of paint process and how they are used?

2. Write short notes on the following:-
   i. Life jacket ii. Immersion suit iii. Line throwing appliances

3. Explain in detail how will you prepare the fully enclosed life boat for launching in heavy weather.

4. Draw a neat sketch of an inflatable life raft and write down the material it contains for life saving.

5. List out the various types of fixed fire fighting systems available on board and describe inert gas system in brief.

6. You have to enter into a enclosure space to fight a fire. Describe the procedure you are going to follow and the equipments you are going to carry to complete assignment.

7. What are the different grades of steel used in making wire ropes? How will you condemn a steel wire rope.

8. (a) What are the types of ropes used on board ships?
   (b) Explain the meaning of 6/12, 6/24, 6/37 types of wire ropes

9. a) Differentiate between normal life buoy and MOB Marker buoy.
   b) What are the requirements as per SOLAS for TPAs.

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# INDIAN MARITIME UNIVERSITY

**(A Central University, Government of India)**

**May/June 2015 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**Naval Architecture Paper - II (UG21T2210)**

**Date : 29.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

**Note**: Question 1 is compulsory. Attempt any TWO questions from the remaining questions of 'Section –A'. Each question carries 10 marks.

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**Section –A** **Ship Construction** **(30 Marks)**

1. Draw profile view of an Oil Tanker and Label various parts (10 Marks)

2. Explain the Static and Dynamic conditions of the vessel and various forces causing the structure to distort. (10 Marks)

3. Name four heat treatments to steel plates normally used in ship building and discuss any one of them (10 marks)

4. Write short notes on the following with sketches: (10 Marks)
   i) Gas Welding
   ii) Electric Arc Welding.

**Section –B** **Ship Stability** **(40 Marks)**

**Note:** Question 5 is compulsory. Attempt any THREE questions from the remaining questions of 'Section –B'. Each question carries 10 marks.

5. Define the following: (10 Marks)
   i) Height of Metacentre ii) Metacentric Height
   iii) Righting Lever iv) Free Surface Effect v) Centre of Flotation

6. Explain the following with diagram: (10 Marks)
   i) Angle of Loll ii) Unstable equilibrium.

7. When a ship of 14000 t displacement is heeled by 8°,her moment of statical stability is 400 tm. If KG is 7.3 m, find KM. (10 Marks)

8. M.V. 'Hindship' floating in Condition No.2 loads 400 tonnes of cargo in No. 1 TD and on the voyage consumes the entire oil in No.2 DB tanks P & S. Calculate GM (Solid & Fluid). As change of displacement is negligible, assume FSC constant. (10 Marks)

9. Explain different types of hydrostatic curves and tables as given in M.V. Hind Ship and their uses in the stability calculation. (10 Marks)

# INDIAN MARITIME UNIVERSITY

**(A Central University, Government of India)**

**May/June 2016 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**Cargo Handling and Stowage Paper – II (T 2209)**

**Date : 27.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

**Note:** All questions carry equal marks. Attempt any SEVEN.

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1. Write short notes on the following: (5 x 2 = 10 Marks)
   a. Ship Sweat
   b. Cargo Sweat
   c. Relative Humidity
   d. Bale capacity
   e. Cargo slings

2. (a) Short Notes on Inspection of Refer Cargo, prior, during and after Loading.
   (b) Short Notes on Use of " BRINE TRAPS". (10 Marks)

3. Write down: (2 x 5 = 10 Marks)
   a. Different markings on any freight container with brief details?
   b. Types of containers being used in international container trade?

4. List down with brief details about loose cargo securing gears being used on any container ship? (10 Marks)

5. What precautions are required to be taken while using forklifts, bulldozers, grabs and other heavy gear onboard ? (10 Marks)

6. (a) Shorts Notes on Types of "OIL Cargoes".
   (b)Draw the Flammability Diagram and explain UFL & LFL (10 Marks)

7. Define following terms as per IMSBC Code (5 x 2 = 10 Marks)
   a. Angle of repose
   b. Moisture migration
   c. Flow moisture point
   d. Transportable moisture limit
   e. Spontaneous combustion

8. Draw and Explain the Cargo Piping System of an Oil Tanker (10 Marks)

9. Give brief detail about different methods of using dunnage to prevent cargo from movement on general cargo ship at sea? Draw related diagrams also? (10 Marks)

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# INDIAN MARITIME UNIVERSITY
## (A Central University, Government of India)

**May/June 2015 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**Bridge Equipment, Watch Keeping & Collision Regulation Paper- II (UG21T2208)**

**Date : 24.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

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## SECTION- A
## BRIDGE EQUIPMENT & WATCH KEEPING (40 Marks)

(Attempt **any FOUR** questions from this section. All questions carry equal marks)

1. Explain the operation and principle of Emergency steering.
2. What are the standard wheel orders and their meanings?
3. How would you monitor the navigation of the pilot?
4. What conditions must be satisfied by the OOW before taking over a bridge watch?
5. What are the circumstances in which the OOW should call the Master immediately?

## SECTION – B
## COLLISION PREVENTION (30 Marks)

(Attempt **any THREE** questions from this section. All questions carry equal marks)

6. With the help of a neat diagram explain the lights and shapes displayed by a power driven vessel underway of length more than 50 meters engaged in towing operations with length of tow exceeds 200 meters both by night and by day.

7. Draw the lights and shapes displayed by the following vessels:
   (a) Vessel Constrained By her Draught (b) Vessel Not Under Command
   (c) Vessel Aground d) Vessel at anchor (e) Fishing Vessel

8. With the help of a neat diagram, draw the arc of visibility of
   (a) Masthead lights (b) Side Lights (c) Stern Light
   (e) Towing light (f) Anchor Light

9. Give the sound signal for the following, when vessels are in sight of one another in a Narrow channel:
   a) I am altering my course to Port b) I am operating astern propulsion
   c) I intend to overtake you from your starboard side
   (a) Two vessels approaching each other and fail to understand the other vessel's intentions.

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# INDIAN MARITIME UNIVERSITY

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May/June 2016 End Semester Examinations

B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)

## Navigation Paper – II (UG21 T2207)

Date : 22.06.2016 Maximum Marks: 70

Time: 3 Hrs Pass Marks : 35

Notes:-

1. Use of non-programmable scientific calculator, Nautical Almanac and Noorie's Nautical Table are allowed.
2. Candidates must show the complete working (including rough work) and not answers alone.
3. Use diagram/sketches/figures for explanations where appropriate.
4. BA Chart 5049 or equivalent chart to be provided by exam centre..
5. Total SEVEN questions from both sections to be done out of NINE questions.

SECTION- A (TERRESTRIAL NAVIGATION) (30 Marks)

(QUESTION NO 1 IS COMPUSORY. ATTEMPT ANY TWO FROM THE REMAINING)

1. a) Define:- i) Position Line ii i) Estimated position (5 Marks)

b) On 14th Nov 1992 at noon, a ship's in DR position 17° 08' N 136° 32'E, set courses as follows:-

| | Time | True Co. | Leeway | Wind | Log |
|---|---|---|---|---|---|
| | 1200 | 274° | 3° | SW | 0 |
| A/Co | 2300 | 256° | 3° | NW | 138 |
| A/Co | 0700 | 286° | 1° | NNW | 246 |
| A/Co | 1200 | 244° | 3° | W | 309 |

Ship experienced a current setting in the direction 140° at 1.0 knots
Find the estimated position next noon. (5 Marks)

2. a) The Horizontal sextant angle between two light houses is observed to be 180°, what conclusion can be drawn from the observation? (5 Marks)

b) If the height of a light given on the chart is 22 mtrs and the height of the observer is 17 mtrs. Find the distance at which the light will be raised? (5 Marks)

3. a) How will you obtain Index Error on a marine sextant.
   b) What are the uses of Azimuth mirror? ( 10 Marks)

4 a) What are T/P notices? (5 Marks)

b) Define 'geographical range' and 'nominal range'. (5 Marks)

**SECTION B** **(VOYAGE PLANNING)** **(40 Marks)**

(QUESTION NO 5 IS COMPUSORY. ATTEMPT ANY THREE FROM THE REMAINING)

5. a) Find the Luminous range of a light in state of visibility of 5 NM if the Nominal Range is 24 NM. (4 Marks)

b) Vertical Sextant angle subtended by a light house is 00° 18', if the height of light house is 53.5 mtrs and the index error of the sextant is 2.0' on the arc, find the distance of the observer from the light house. (6 Marks)

6. At 0800 hrs. , a vessel at anchor observed following compass bearings:-
   i. Casquet's Lt.Ho. 061°C
   ii. Les Hanois Lt. Ho. 112 °C
   iii. Roches Douvers Lt. Ho. 173°C

Find the position of the ship and also deviation for the ship's head, if the Variation was 4°E. (10 Marks)

7. At 1400, from a ship, following compass bearings were observed:-
   Needles Point Lt. Ho. ----------319°C
   St. Catherine Point Lt. Ho.----------359°C
   Nab Tower ----------050°C
   Find the following:-
   a) Position of the ship
   b) Deviation on the ships head if Variation is 6° W. (10 Marks)

8. a) At 0400 hrs, steering a course of 278° T at 16 knots, Nab Tower Lt. dipped bearing 321° T and at 0648 hrs Bill of Portland Lt. was raised bearing 295°T. Find the position of the ship at 0400 hrs and 0648 hrs.

b) Find the set and drift experienced between 0400 hrs and 0648 hrs and the course and speed made good. (Height of eye 11 mtrs) (10 Marks)

9. a) How does navigating officer update Electronic charts using digital notices?

b) What precautions should be observed while using 'Tracings' to update charts? (10 Marks)

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**INDIAN MARITIME UNIVERSITY**
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**May/June 2016 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**Nautical Physics Paper – IV (UG21T2206)**

**Date : 20.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

**Note : Answer any SEVEN from the following NINE questions. All questions carries equal marks.**

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1. a) What is rectifier? With a neat sketch, explain the working of bridge rectifier. (5)
   b) Draw and explain the V-I characteristics of a pn junction. (5)

2. a) A full wave rectifier uses two diodes, the internal resistance of each diode may be assumed constant at 20 Ω The transformer r.m.s. secondary voltage from centre tap to each end of secondary is 50 V and load resistance is 980 Ω Find :
   (i)the mean load current (ii)The r.m.s. value of load current (5)

   b) What is zener diode? Explain how zener diode maintains constant voltage across the load. (5)

3. a) Draw and explain the input and output characteristics of CE configuration. (5)
   b) Define α and β. Show that $\beta = \frac{\alpha}{1-\beta}$. (5)

4. A transistor is connected in CE configuration in which collector supply is 8V and the voltage drop across resistance $R_c$ connected in the collector circuit is 0.5V. The value of $R_c = 800\Omega$ If α=0.96, determine:
   i. collector-emitter voltage ii. base current (10)

5. Write short note on: (10)
   i. LASER diode ii. Transducer and its application

6. a) In a CB connection, α=0.95. The voltage drop across 2 K Ω resistance which is connected is 2V.Find the base current. (4)
   b) Draw and explain the constructional diagram of cathode ray oscilloscope. (6)

7. a) Explain the operation of tank circuit with neat diagrams. (6)

   b) In a certain RC oscillator circuit the value of R=220 k Ω and C=250 pF. Determine the frequency of oscillations. (4)

8. a) Explain the term calibration, accuracy and precision. (5)
   b) What are the different methods of measurement of flow. (5)

9. a) What are the functions of filter circuit? Explain capacitor filter with a neat circuit diagram and waveforms (4)

b) The four diodes used in abridge rectifier circuit have forward resistance which may be considered at 1 Ω and infinite reverse resistance. The alternating supply voltage is 240 V r.m.s. and load resistance is 480 Ω calculate mean load current and power dissipated in each diode. (6)

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# INDIAN MARITIME UNIVERSITY

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**May/June 2016 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**Nautical Physics Paper – III (UG21 T2205)**

**Date : 17.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

**Note: Answer any SEVEN from the following 9 questions.**
**All questions carry equal marks.**

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1. a) Explain with neat diagram, construction and working of sextant (5)

   b) An object placed 48 cm from a lens produce a virtual image at a distance of 8 cm in front of lens. Calculate the focal length of the lens. (5)

2. a) Define relative humidity, dew point and absolute humidity. (5)

   b) A water fall is 800 metres high. Assuming that the entire kinetic energy gained during fall is converted into heat. Calculate the rise in temperature of water at the base of the fall. (5)

3. a) Explain with principle, construction and working of prism binoculars (5)

   b) On a certain day the RH is 66.67%. The saturated vapour pressure at room temperature is 18.6 mm. Calculate the saturated vapour pressure at dew point. (5)

4. a) Define Doppler effect in sound and explain the following cases in detail. (5)

   i. Source moves away from the stationary observer
   ii. Source moving away from the observer and the observer moving towards the source

   b) When a car sounding its horn of frequency 500 Hz passes a stationary observer with a speed of 25 m/s, the frequency changes in the ratio 9:10. Calculate the velocity of sound. (5)

5. a) Explain with principle, diagram, the phenomenon of optical fiber. (5)

   b) What are the effects of different parameters on velocity of sound in air and water? (5)

6. Write short note on ANY TWO of the following: (10)

   i) Carnot's cycle ii) Entropy iii) Heat Engine & Refrigerator

7. a) Explain briefly the following: (5)

(i) fog & Mist (ii) Snow and Hail

b) Explain how the "echo sounder" has been employed for measuring the depth of water (5)

8. a) Explain the working principle of solar cell. List their uses. (5)

b) One kg of water at 373 K is converted into steam at the same temperature. Volume 1 $cm^3$ of water becomes 1671 $cm^3$ on boiling. Calculate the change in the internal energy of the system if the latent heat of vaporization of water is $5.4 \times 10^5$ calories/kg. (5)

9. a) What is a LASER. On what principle does it works. Discuss the uses of a laser (5)

b) Distinguish between Saturated and Un-Saturated vapour pressure. (5)

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**INDIAN MARITIME UNIVERSITY**
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**May/June 2016 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**Applied Mathematics Paper – II (UG21 T2204)**

**Date : 15.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

**NOTE: Attempt any SEVEN questions out of 9. All questions carry equal marks.**

1. a) If $A = i - 2j - 3k,\ B = 2i + j - k, C = i + 3j - k$, find
   i) $AX(BXC)$
   ii) $(AXB)\ X\ (BXC)$

   b) If $P = 5t^2i + t^3j - tk$ and $Q = 2i\ sint - j\ cost + 5tk$, find i) $\frac{d}{dt}\ (P.Q)$; ii) $\frac{d}{dt}\ (PXQ)$.

   c) A particle moves along a curve $x = e^{-t},\ y = 2\cos 3t,\ z = 2\sin 3t$ where t is the time variable.

   Determine its velocity and acceleration vectors and also the magnitudes of velocity and acceleration at $t = 0$. (3+3+4 marks)

2. a) Find the values of constants a,b,c so that the directional derivative of

   $p = axy^2 + byz + cz^2x^3$ at $(1,2,-1)$ has a maximum magnitude 64 in the direction parallel to the Z-axis.

   b) Calculate i) $curl\ (grad\ f)$, given $f(x,y,z) = x^2 + y^2 - z$.

   ii) $curl\ (curl\ A)$ given $A = x^2yi + y^2zj + z^2yk$. (5+5 marks)

3. a) Find the angle between the surfaces
   $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point $(2,-1,2)$.

   b) If $V = \frac{xi+yj+zk}{\sqrt{x^2+y^2+z^2}}$ show that $\nabla.V = \frac{2}{\sqrt{x^2+y^2+z^2}}$ and $\nabla XV = 0$. (5+5 marks)

4. Solve the following differential equations.

   a) $(x+1)\frac{dy}{dx} - y = e^{3x}(x+1)$.

   b) $\frac{dy}{dx} - y\ tanx = y^2 secx$.

   c) $\frac{dy}{dx} + x\ sin2y = x^3\ cos^2y$. (2+4+4 marks)

5. a) Solve $\frac{d^2y}{dx^2} - y = e^x + x^2e^x$.

b) Solve $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + y = e^{2x} - cos^2x$. (5 +5 marks)

6. a) By using method of variation of parameters, solve $\frac{d^2y}{dx^2} + y = secx$.

b) Solve the differential equation $(3x+2)^2\frac{d^2y}{dx^2} + 5(3x+2)\frac{dy}{dx} - 3y = x^2 + x + 1$.

(5 +5 marks)

7. a) By using method of undetermined coefficients solve, $(D^2 + 2D + 4)y = 2x^2 + 3e^{-x}$.

b) Solve $x^2\frac{d^2y}{dx^2} + 3x\frac{dy}{dx} + y = \frac{1}{(1-x)^2}$ (5 +5 marks)

8. a) Solve $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = (1 - e^x)^2$.

b) Solve $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 4cos^2x$. (5+5 marks)

9. a) By using method of variation of parameters, solve $\frac{d^2y}{dx^2} + y = \tan x$.

b) Solve $x^2\frac{d^2y}{dx^2} + 4x\frac{dy}{dx} + 2y = \log x$. (5+ 5 marks)

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5. a) Solve $\frac{d^2y}{dx^2} - y = e^x + x^2e^x$.

b) Solve $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + y = e^{2x} - cos^2x$. (5 +5 marks)

6. a) By using method of variation of parameters, solve $\frac{d^2y}{dx^2} + y = secx$.

b) Solve the differential equation $(3x+2)^2\frac{d^2y}{dx^2} + 5(3x+2)\frac{dy}{dx} - 3y = x^2 + x + 1$ .

(5 +5 marks)

7. a) By using method of undetermined coefficients solve, $(D^2 + 2D + 4)y = 2x^2 + 3e^{-x}$.

b) Solve $x^2\frac{d^2y}{dx^2} + 3x\frac{dy}{dx} + y = \frac{1}{(1-x)^2}$ (5 +5 marks)

8. a) Solve $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = (1 - e^x)^2$.

b) Solve $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 4cos^2x$. (5+5 marks)

9. a) By using method of variation of parameters, solve $\frac{d^2y}{dx^2} + y = \tan x$.

b) Solve $x^2\frac{d^2y}{dx^2} + 4x\frac{dy}{dx} + 2y = \log x$ . (5+ 5 marks)

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**INDIAN MARITIME UNIVERSITY**
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**May/June 2016 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**NAUTICAL MATHEMATICS – II (UG21T2203)**

**Date : 13.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

**NOTE: Attempt any SEVEN questions. All questions carry equal marks. Non-programmable calculator is permitted.**

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1. a) A ship's load water plane is 60 metres long. The lengths of the half ordinates commencing from forward are as follows:

   0.1, 3.5, 4.6, 5.1, 5.2, 5.1, 4.9, 4.3 and 0.1 metres respectively.

   Calculate the area of the water plane.

   b) A ship 150 metres long has semi-ordinates commencing from forward as follows: 0, 5, 9, 9, 9, 7 and 0 metres respectively. Find the distance of the centre of flotation from forward. (5+5 marks)

2. a) The areas of a ship's water-planes, commencing from the load draft of 24 metres, and taken at equal distances apart, are:

   2000, 1950, 1800, 1400, 800, 400, and 100 sq. m. respectively. The lower area is that of the ship's outer bottom. Find the displacement in salt water, and the Fresh water allowance.

   b) A ship is floating upright on an even keel at 6.0 metres draft F and A. The areas of the water-planes are as follows:

| Draft (m) | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Area (Sq.m) | 5000 | 5600 | 6020 | 6025 | 6025 | 6020 | 6000 |

   Find the ship's KB at this draft. (5+5 marks)

3. a) A ships breadth, at 9 metres intervals commencing from forward are as follows:

   0, 7.6, 8.7, 9.2, 9.5, 9.4, and 8.5 metres respectively. Abaft the last ordinate is an appendage of 50 sq. m. Find the total area of the water plane.

b) A ship's water plane is 36 metres long. The half ordinates, at equidistant intervals commencing from forward , are as follows : 0, 4, 5, 6, 6, 5 and 4, metres respectively. Calculate the second moment of the water plane area about the centre line. (5+5 marks)

4. Calculate a area of a ship's water plane between last two ordinates. The ordinates are given as follows and the common interval is of 20 Metres:-

10, 25, 8 Metres respectively. Also find out the centroid for the specified areas. (10 Marks)

5. a) Expand $f(x) = x \sin x$ as a Fourier series in the internal $o < x < 2\pi$.

b) Find the Fourier series expansion for f(x) if

$$f(x) = \begin{matrix} -\pi, & -\pi < x < 0 \\ x, & 0 < x < \pi \end{matrix} .$$

(5+5 marks)

6. a) If $f(x) = |cosx|, expand\ f(x)$ as a Fourier series in the interval $(-\pi, \pi)$.

b) Expand $f(x) = \frac{1}{4} - x, \quad if\ o < x < \frac{1}{2}$

$= x - \frac{3}{4}, \ if\ \frac{1}{2} < x < 1$

as the Fourier series of sine terms. (5+5 marks)

7 a) Obtain Fourier series for the function,

$$f(x) = \begin{cases} \pi x, & 0 \le x \le 1 \\ \pi(2-x), & 1 \le x \le 2 \end{cases}$$

b) Find the Fourier series for, $f(x) = \begin{cases} \pi x, & 0 \le x \le 1 \\ 0, & x = 1 \\ \pi(x-2), & 1 \le x \le 2 \end{cases}$

(5+5 marks)

8. The turning moment T is given for a series of values of the crank angle $\theta° = 75°$.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $\theta°$ | :- | 0 | 30 | 60 | 90 | 120 | 150 | 180 |
| T | :- | 0 | 5224 | 8097 | 7850 | 5499 | 2626 | 0 |

Obtain the first four terms in a series of sines to represent T and calculate T for $\theta = 75$ (10 Marks)

9. The following table gives the variations of periodic current over a period,

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| t sec : | 0 | T/6 | T/3 | T/2 | 2T/3 | 5T/6 | T |
| A amp: | 1.98 | 1.30 | 1.05 | 1.30 | -0.88 | -0.25 | 1.98 |

Show that there is a direct current part of 0.75 amp in the variable current and obtain the amplitude of the first harmonic.

(10 marks)

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**May/June 2016 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**Computer Hardware, Software, Networking – II (UG21T2202)**

**Date : 10.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

Answer any SEVEN of the following. Each carry equal marks

1. Write the procedure to create PDF document state the advantages of using PDF document. (10)

2. Explain networking topology and the types of network topologies. (10)

3. a) Describe the peer to peer network and client to server network system. (5)
   b) Explain the significance as to how a networking can improve business operations. (5)

4. a) Explain the term (10)
   i. crippling and punching of the network cable
   ii. Virus Protection

5. Illustrate the features of various types of filtering mechanism into E-mail system and process of re-arranging grid line and cells. (10)

6. a) Differentiate CAT 5 and CAT 6 cable. (5)
   b) How to change the field size of a number and text field in MS- Access. (5)

7. a) List the procedure to create a Employee table in the new database with the field as:

| | | |
|---|---|---|
| Emp Number | Text | 10 |
| Emp Name | Text | 15 |
| Emp address | Text | 25 |
| Date of Birth | Date/Time | Medium date |
| Salary | Currency | currency |

(5)

   b) What are Queries? Write steps to create query that display first name, last name and city of tudent from India and save the query as query student. (5)

8 a) Describe the following data types with an example : (5)

| Data type | Description | Example |
|---|---|---|
| Date/Time | | |
| Number | | |
| Currency | | |
| Yes/No | | |
| Hyperlink | | |
| Attachment | | |
| Auto Number | | |
| OLE Object | | |

b) What is report Wizard? Write steps to create a report using Report wizard with an example. (5)

9.a) Write the procedure to create a form with all fields on the library table.

i. Name the form Book Entries.
ii. Make the Accession Number of each book in the form, Red.
iii. Insert a picture in the form in way that all text is visible. (5)

b) What is report Wizard? List its advantages as compared to creating a report in design view. (5)

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**INDIAN MARITIME UNIVERSITY**
**(A Central University, Government of India)**

**May/June 2016 End Semester Examinations**
**B.Sc. (Nautical Science) - Second Semester (2013 batch onwards)**

**English and Communication Skills – II (UG21T 2201)**

**Date : 08.06.2016** **Maximum Marks: 70**
**Time: 3 Hrs** **Pass Marks : 35**

**NOTE: Attempt any SEVEN questions out of 9. All questions carry equal marks.**

1. "Technical writing is performed by a technical writer and is the process of writing and sharing information in a professional setting" Justify this statement. (10 Marks)

2. Write an application to the Head of the institute requesting for leave of one week with valid reasons. (10 Marks)

3. Letter Writing: (10 Marks)

   - Write a letter to your Company Head asking for repatriation leave which you are entitled for proceeding to your declared Home Town as your contract period has been completed.

4. Prepare an investigation report for any incident/ damage / accident which has taken place out at sea involving your ship. (10 Marks)

5.Audio Script: (2x 5= 10 Marks)

**VHF radio transmission**:
S.T.: An Jiang this is Suez transit.Question: are you carrying dangerous cargo? Over.

A.J.: Suez Transit, this is An Jiang. Answer: Yes I am carrying hazardous cargo. Over.

S.T.: An Jiang, this is Suez Transit. Understood: You are carrying hazardous cargo. Question: what is the category of your hazardous cargo? Over.

A.J.: Suez Transit, this is An Jiang. Stand by for one minute.

S.T.: This is Suez Transport standing by.

A.J.: This is An Jiang. Answer: hazardous cargo. It is UN class two point three. I repeat: hazardous cargo is UN class two point one. Over.

S.T.: An Jiang, this is Suez Transit. What is the hazardous cargo? Over.

A.J.: Suez transit, this is An Jiang. Answer: hazardous cargo is Ammonia. Over.

Fill in the blanks with the radio transmission from the above mentioned Audio Script:

I. Message broadcast from: _____
II. Ship's name: _____
III. Name of hazardous cargo: _____
IV. Hazardous cargo classification: _____
V. Stand by for how long: _____

6. "In shipping there is a widespread practice of using letters of protest to record discrepancies between ship and shore cargo figures, cargo contamination, damage to or loss of cargo, etc. Protests are also made by the Master against the charterers of the ship or the consignees of the goods, for failing to load or unload the vessel pursuant to contract, or within reasonable or stipulated delays". Write a Letter of Protest for loading of cargo in damaged condition. (10 Marks)

7. Prepare a letter of complaint with regard to incident which involves a crew member misbehaving with you onboard ship. (10 Marks)

8. Prepare a format each for distress, urgency, safety messages as required in shipping. (10 Marks)

9. Match the following: (1 x 10= 10 Marks)

| | | |
|---|---|---|
| I. | hazard - | Crude Oil Washing |
| II. | ventilation - | act of packing and storing |
| III. | wharfage - | amount of water displaced by a ship |
| IV. | stability- | distribution of a cargo |
| V. | Tonnage- | charges for using a dock |
| VI. | ballast - | danger |
| VII. | trim - | the ability of a ship to stay upright |
| VIII. | stowage - | circulation of air |
| IX. | COW- | depth in water at which a vessel floats |
| X. | draught - | water used on a ship as a counter balance |