CP–9361	Sub. Code
	11613

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

First Semester

Nautical Science

NAUTICAL MATHEMATICS — I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Find $\overline{a} \cdot \overline{b}$ if $\overline{a} = \overline{i} + \overline{j} + \overline{k}$ and $\overline{b} = 2\overline{i} + \overline{j} - 2\overline{k}$.

2. Define events and sample space.

3. Define conic.

4. What is the volume of a cone?

5. State any two properties of spherical triangle.

6. State the Napier's rule for a right angled triangle.

7. Find $\frac{dy}{dx}$ if $y = e^{3x} \cdot \cos x$.

8. Evaluate $\int_1^2 \left(x^2 + \frac{1}{x^2} \right) dx$.

9. Define rank of a matrix.

10. State Cayley-Hamilton theorem.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) What is the chance that a leap year selected at random will contain 53 sundays?

Or

(b) Calculate the standard deviation from the following data of income of 10 employees of a firm.

100, 120, 140, 120, 180, 175, 185, 130, 200, 150

12. (a) Explain the focus, eccentricity and directrix of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$.

Or

(b) Find the area and volume of sphere and cylinder.

13. (a) In an equilateral spherical triangle ABC, prove that $\cos\frac{1}{2}a \cdot \sin\frac{1}{2}a = \frac{1}{2}$.

Or

(b) The sides of a spherical triangle ABC are all quadrants and x, y, z are the arcs joining any point within the triangle to the angular points, prove that $\cos^2 x + \cos^2 y + \cos^2 z = 1$.

14. (a) If $x = e^{\tan^{-1}\left(\frac{y - x^2}{x^2}\right)}$, prove that $\frac{dy}{dx} = \frac{2x^4 + y^2}{x^3}$.

Or

(b) Evaluate $\int \frac{5x\,dx}{(x+1)\,(x^2+4)}$.

15. (a) Show that the following system of equations is inconsistent.

$x + y + z = 1$, $2x - 2y + 3z = 1$, $x - y + 2z = 5$ and $3x + y + z = 2$.

Or

(b) Diagonalise the matrix $A = \begin{bmatrix} 2 & 1 & -1 \\ 1 & 1 & -2 \\ -1 & -2 & 1 \end{bmatrix}$ by means of an orthogonal transformation.

Part C $(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Calculate the mean and standard deviation for

x :	6	7	8	9	10	11	12
y :	3	6	9	13	8	5	4

Or

(b) Find the equation of the sphere having the circle.

$x^2 + y^2 + z^2 - 2x + 4y - 6z + 7 = 0$, $2x - y + 2z = 5$ for a great circle.

17. (a) In a spherical triangle ABC, prove that $\sin b \sin c + \cos b \cos c \cos A = \sin B \sin C - \cos B \cos C \cdot \cos a$.

Or

(b) Evaluate $\int_0^{\pi/2} \log \sin x \, dx$.

18. (a) Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$.

Or

(b) Verify that the matrix $A = \frac{1}{3}\begin{bmatrix} -1 & 2 & -2 \\ -2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ is orthogonal and that its eigen values are of unit modulus.

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CP–9362

Sub. Code
11614

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

First Semester

Nautical Science

NAUTICAL PHYSICS AND ELECTRONICS — I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Impulse.
2. Define Lami's theorem.
3. What is Isogonic lines?
4. List out the advantages of transformers.
5. Define luminous intensity.
6. Write the equation of Einstein.
7. What is a bridge rectifier?
8. What are the uses of voltage regulators?
9. List out the element of radar system.
10. What is UHF omni range.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) What are projectiles and derive the expressions for the path of projectile?

Or

(b) Derive the expression for direct and oblique impact.

12. (a) Briefly explain about electrical lighting circuit.

Or

(b) Discuss the theory of insulation tester and its use.

13. (a) Explain the construction and working of Bourdon Pressure Gauge.

Or

(b) Explain in detail about the flew of viscous fluid through pipes.

14. (a) Write the application of a LDR and LED.

Or

(b) Explain about optical pyrometer with a diagram.

15. (a) Explain in detail about the zener diode as voltage regulator.

Or

(b) Write a short notes on :

(i) Marine Hydrometer

(ii) Radio Detection Finding (RDF).

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Describe an experiment to determine surface tension of a liquid by capillary tube method.

Or

(b) Give a brief notes on magnetic elements of the earth.

17. (a) Discuss in detail on astronomical telescope with diagram.

Or

(b) Explain the following.

(i) streamline

(ii) turbulent flow.

18. (a) Explain the construction and characteristics of the transistors.

Or

(b) Write a short notes on :

(i) Tactical air navigation

(ii) Radar altimeters.

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CP–9363

Sub. Code
11615

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

First Semester

Nautical Science

NAVAL ARCHITECTURE — I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is Reefer ships?
2. Define an Oil tanker.
3. How will you calculate Prismatic coefficient?
4. How and when Hogging of the vessel is takes place?
5. What will happen when a ship moves from Fresh water to salt water?
6. What do you understand “non destructive test methods” during ship construction?
7. Write short notes on Electric arc welding.
8. Define LBP.
9. Draw a neat diagram of Flare of Bows.
10. What is the difference between List and Heel?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the basic difference between bulk carrier and oil tanker.

Or

(b) Explain typical characteristics of a CONRO vessel.

12. (a) Write short notes on welded joint with suitable sketch of various types of joints used In ship building.

Or

(b) Write short notes on Riveted joint with suitable sketch of various types of joints used In ship building.

13. (a) Describe the purpose of bilge keels and their attachment to the ship's side with suitable Sketch.

Or

(b) Draw and name the parts of longitudinally framed double bottom.

14. (a) List the function of longitudinal bulkheads and longitudinal framing.

Or

(b) List the functions of floors and double bottoms in a general cargo ship.

15. (a) A box shaped vessel 20 × 6 × 4.5 floats in DW of RD 1.010 at a draft of 2.4 m. Calculate her Percentage reserve buoyancy in DW of RD 1.020.

Or

(b) On a vessel of 5000 t displacement, KM 7.8 m, KG 7.0 m, No.2 port DB tank is partly full of FW. If this tank is 15 m long and 9 m broad, find the fluid GM.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Write the distinctive features of the following ships.

(i) OBO

(ii) Passenger ships.

Or

(b) Discuss the development of Ocean going Merchant vessels.

17. (a) (i) Construct a graph from the following information:

Mean draft (m)	3.0	3.5	4.0	4.5
TPC (tonnes)	8.0	8.5	9.2	10.0

(ii) From this graph find the TPCs at drafts of 3.2 m; 3.7 m; and 4.3 m.

Or

(b) Draw and label mid ship section of a Bulk Carrier.

18. (a) Write short notes on various types of heat treatment commonly used for ship building Steels.

Or

(b) A ship of 15,000 t W, KM 9.0 m, KG 8.7 m, is listed 10 deg to port. She now loads 150 t of cargo above the keel and 4 m to starboard of the centre line. Find the final List.

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CP–9364

Sub. Code
11616

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

First Semester

Nautical Science

SHIP OPERATION TECHNOLOGY — I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is the use of Head line on board ship?

2. What is FORECASTLE DECK?

3. What is SURVIVAL CRAFT? List out the types of Survival Craft.

4. What is the maximum capacity of LIFE BOAT?

5. Name at least two types of Fire Hose Coupling.

6. What is Semi portable Fire Extinguishers?

7. What is sisal Rope? Explain shortly.

8. What are the grades of steel used to make steel wire rope?

9. List how many types of speed log used on board ship.

10. Explain shortly – Cargo Winch.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) How to clean and polish BRASS and COPPER equipments used on board ship?

Or

(b) List out all the Personal Protective Equipments you will use. And Explain about how they provide protection to you.

12. (a) Draw a line diagram of Totally enclosed type LIFE BOAT and mention the important parts of it.

Or

(b) What is LIFE JACKET? Explain the description of Life Jacket.

13. (a) Explain with diagram about operation of CO_2 portable Fire Extinguisher.

Or

(b) List out all the Fire man's outfit Equipments; and explain about each.

14. (a) Explain shortly about :

(i) Marline

(ii) Hall yard

(iii) Logline

(iv) Lead line.

Or

(b) What are the advantages and disadvantages of fiber heart in steel wire rope? And explain about the factors determining the flexibility of steel wire rope.

15. (a) What is HAND LEAD LINE? Explain with procedure for taking a cast.

Or

(b) Draw a neat line diagram of Windlass and mention the parts.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) List out and explain about any six Painting defects and four common paint defects and their preventions.

Or

(b) Draw a neat diagram of COMPASS POINTS and mark all the Compass Points from North to East and South to West.

17. (a) List out all the LIFE BOAT survival Equipments; and explain about Food and Water ration provided.

Or

(b) How to measure the size of Ropes, Wires and chains? And find out the diameter of grade one manila rope is required to lift 2 tones of weight.

18. (a) How to operate and recharge Portable Water type Fire Extinguisher? Explain with diagram.

Or

(b) What is INERT GAS SYSTEM? Explain with schematic diagram of IGS system.

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CP–9365

Sub. Code
11623

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Second Semester

Nautical Science

NAUTICAL MATHEMATICS — II

(2016 Onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Verify $\frac{1-i}{1+i}=-i$.

2. Find the conjugate of $\frac{1+2i}{1-(1-i)^2}$.

3. State Simpson's $\frac{1}{3}$ rule.

4. Define numerical differentiation.

5. Define irrotational vector.

6. Show that $\bar{f}=(x+2y)\bar{i}+(y+3z)\bar{j}+(x-2z)\bar{k}$ is solenoidal.

7. Eliminate a and b from $xy=ae^{x}+be^{-x}$.

8. Solve = $\sqrt{1+x^2}\,dx+\sqrt{1+y^2}\,dy=0$.

9. Define simple harmonic motion.

10. Solve: $\left(D^2+5D+6\right)y=0$.

Part B $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) For any two complex numbers z_1 and z_2, show that $|z_1+z_2| \le |z_1| + |z_2|$.

Or

(b) Find the expansion of $\tan n\theta, n$ being positive integer.

12. (a) Find $\frac{dy}{dx}$ at $x=1$ from the following table

x	0	1	3
y	1	-2	4

Or

(b) Evaluate $\int_0^1 \frac{x^2}{1+x^2}\,dx$ using Simpson's $\frac{1}{3}$ rule with $h=0.25$.

13. (a) Prove that $\bar{f}=3yz\,\bar{i}+2zx\,\bar{j}+4xy\,\bar{k}$ is not irrotational.

Or

(b) If $r=|\bar{r}|$, where r is the position vector of the point (x, y, z) with respect to the origin, prove that $\nabla f(r)=\frac{f'(r)}{r}\bar{r}$.

14. (a) Solve: $\frac{dy}{dx} = \frac{y^3 + 3x^2 y}{x^3 + 3x y^2}$.

Or

(b) Solve : $\frac{dy}{dx} + y\cot x = 4x \operatorname{cosec} x$, given that $y = 0$ where $x = \pi/2$.

15. (a) Solve : $\left(D^2 - D - 2\right) y = 4e^{3x}$.

Or

(b) Solve : $\left(D^3 - 3D^2 + 4D - 2\right) y = \cos x$.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) State and prove De-Movire's theorem.

Or

(b) Show that

$$\sin(x + y) \cdot \cosh(x - y) = \frac{1}{2}\left(\sinh 2x + \sinh 2y\right).$$

17. (a) Evaluate $\int_1^2 \frac{dx}{1 + x^2}$ taking $h = 0.2$ using trapezoidal rule. Can you use Simpson's $\frac{1}{3}$ rule? Give the reason.

Or

(b) Verify Gauss divergence theorem for $\bar{f} = x^2 \bar{i} + y^2 \bar{j} + z^2 \bar{k}$, where S is the surface of the cuboid formed by the planes $x = 0, x = a; y = 0, y = b, z = 0$ and $z = c$.

18. (a) Solve

(i) $(x+1)\frac{dy}{dx}+1=2e^{-y}$

(ii) $\left(x^2-x+y^2\right)dx-\left(ye^{y}-2xy\right)dy=0$.

Or

(b) Solve: $\left(D^2-4D+3\right)y=e^{x}\cos 2x+\cos 3x$.

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CP–9366

Sub. Code
11624

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Second Semester

Nautical Sciences

Allied IV — NAUTICAL PHYSICS AND ELECTRONICS — II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write down the safety precautions in nuclear reactor.

2. Write a note on formation of charges.

3. What is meant by impedance?

4. Define critical frequency.

5. Define OR, AND and NOT gate.

6. What is Bistable Multivibrator?

7. Explain the term voltage gain.

8. Give the important terms of switching circuits.

9. What is Amplitude Modulation (AM)?

10. What is transmitter?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Briefly explain about the oil mixing with water.

Or

(b) Explain the role of satellite in communication.

12. (a) Give the theory of electrical resonance in series LCR circuits.

Or

(b) Write down the effect of ionosphere on radiowaves.

13. (a) Explain about Binary to Decimal conversion.

Or

(b) Describe the working of JK flipflop.

14. (a) Explain briefly about the characteristics of common collector connection.

Or

(b) Give a short note on frequency modulation.

15. (a) Explain about the characteristics of radio receivers.

Or

(b) Write a short note on ship borne VHF.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) What is meant by nuclear energy? Give a brief account on nuclear reactor.

Or

(b) Discuss about the radiation pattern of Hertz and Marconi antenna with suitable diagram.

17. (a) Describe the construction and working of monostable and astable multivibrator.

Or

(b) Discuss in detail about the common base connection with its characteristics.

18. (a) Give a detailed description on modulation techniques and its advantages and disadvantages.

Or

(b) (i) Give the principle of superhetrodyne receivers.

(ii) List out the advantages and disadvantages of superhetrodyne receivers.

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CP–9367

Sub. Code
11625

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018.

Second Semester

Nautical Science

SHIP OPERATION TECHNOLOGY — II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What do you by anchor ready for letting go?

2. How the anchor cable are marked and identified as length of shackle?

3. What is SURVIVAL CRAFT? List out the types of Survival Craft.

4. What is the maximum capacity of LIFE BOAT?

5. Name and least two types of Are Hose Coupling.

6. What is semi portable Fire Extinguishers?

7. What is squat?

8. What is LTA and HRU?

9. What do you mean the term “Enclosed space”?

10. What is fire damper and fire flaps?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) What safety precautions would you adopt when rigging stages to work overside?

Or

(b) List out all the Personal Protective Equipments you will use? And Explain about how they provide protection to you.

12. (a) Draw a line diagram of Totally enclosed type LIFE BOAT and mention the important parts of it.

Or

(b) What is LIFE JACKET? Explain the description of Life Jacket.

13. (a) Explain with diagram about operation of CO_2 portable Fire Extinguisher.

Or

(b) List out all the Fire man's Outfit Equipments; and Explain about each.

14. (a) What safety precautions you will take while painting in ships funnel?

Or

(b) What are shallow water effects?

15. (a) Draw a mooring plan of a tanker with 3 + 3 + 3 and label it?

Or

(b) Draw a neat line diagram of Windlass and mention the parts?

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) What is standing moor and running moor? Explain the procedure how to do it?

Or

(b) List out all the LIFE BOAT survival Equipments; and Explain about Food and Water ration provided.

17. (a) What are all safety precautions you will observe while rigging pilot ladder and Gangway?

Or

(b) What are the LIFE SAVING APPLIANCES carried on board Cargo Ships as per IMO standard.

18. (a) How to operate and recharge Portable Water type Fire Extinguisher? Explain with diagram.

Or

(b) What is INERT GAS SYSTEM? Explain with schematic diagram of IGS system.

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CP–9368

Sub. Code
11626

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Second Semester

Nautical Science

NAVIGATION - I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Explain a Great circle with a diagram.
2. Define D'cat and D'Long.
3. Define Geographical latitude with the help of a diagram.
4. Define variation and deviation.
5. Find the true course for a compass course of 040° where deviation 15°E variation 10°W.
6. Explain with diagram proof of parallel sailing formula Dep / D'long = Cos lat?
7. Compare Mercator chart and Gnomonic chart w.r.t advantages.
8. What is Horizontal parallax of a body?
9. What is a sensible horizon?
10. What is index error of a sextant?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Draw a neat sketch for boxing of magnetic compass and name the points? How many degrees for each points?

Or

(b) Explain what is a meridional part and DMP with the help of a diagram.

12. (a) A vessel steered a course of 237° (T) from position A = 02° 01.1'N 177° 51.4'W for 348 miles. Find the position arrived by plane soiling method?

Or

(b) Find the rhumb line course and distance from 28° 20'S 048° 38'W to 14° 50'N 017° 21'W?

13. (a) How will you transfer a great circle track from a gnomonic chart to a mercator chart?

Or

(b) What are the non adjustable errors of a sextant?

14. (a) If LMT is 22 d 02h 47m 17s at position 12° 30'N, 094° 18'W. Calculate the GMT?

Or

(b) On 12th sep at about 2100 at ship (time difference + 05 hrs) find the chronometer error if it was 07^{m} 05^{s} slow on 10th Sep at 0600 UTC and its daily rate was 06S gaining?

15. (a) Find m'Lat and DMP from the following

(use traverse table)

(i) LAT A 24° 38'N , LAT B 10° 12'S

(ii) LAT P 37° 48'S , LAT Q 20° 18'N

Or

(b) Find meriodinal parts and DMP using Nories table.

(i) LAT A 02°12'S, LAT B 10° 19'N

(ii) LAP P 00° 04.0S LAT Q 12° 01.2'N.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Find the course and distance from given positions.

Position A : 36° 11.7'N 075° 12.6'E to

Position B : 40° 18.6'N 080° 11.5'E

Or

(b) Find the position arrived from given position course and distance.

Position = 03° 40.3'S 175° 40.1'W

Course = 301°

Distance = 589 miles.

17. (a) Using Traverse table find the course and distance between two positions?

Position A : 03° 12.0N 004° 11.3'E

Position B : 02° 30.4S 002° 10.0'W

Or

(b) Find by mercator sailing the rhumb line course and distance from 40°18'N 100°20'W to 68° 00'N 140° 10'E?

18. (a) Find position arrived after sailing a course of 241° for 1897 miles from a position A 36° 48'N 085°53'W?

Or

(b) At noon on 20th July a ship was in position 32°43.8'N 017° 26.8'W steaming 219°(C) Dev 3°E var 18°W. Ship maintained this course at a steady speed of 15 knots till noon next day. Clocks were retarded 20 minutes at each of three times – 2200, 0200, 0500 hours. Find the DR position of ship at 1200 hrs on 21st July. If the fix at noon on 21st July was 27° 24.3'N 020°01.0'W, find the set and rate of current?

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CP–9369

Sub. Code
11632

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Third Semester

Nautical Science

CARGO HANDLING AND STOWAGE — I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

Define the following :

1. Grain capacity.

2. Proof load.

3. Breaking strength of a rope.

4. Stowage factor.

Name the following :

5. Any two types of derricks.

6. Any two types of bulk carriers.

7. Any two types of tests for water-tightness on a bulk carrier.

8. Any two types container securing materials.

9. The two types pumps for discharging in a VLCC.

10. What is one most important requirement of a tanker using cow method, as per solas, '78.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) State the grain loading stability criteria of a bulk carrier.

Or

(b) If partly filled with grain. Then explain one method of securing the grain in bulk carrier.

12. (a) Enumerate the visible and audible alarms of IG system IN and VLCC.

Or

(b) Describe the types of tests carried-out in a bulk carrier for the water-tightness of the hatch.

13. (a) What are the operations recorded in cargo record book on a Tank-To-Tank basis?

Or

(b) What are the general fire precautions when carrying dangerous goods as per IMDG code?

14. (a) Enumerate and describe any four types of gas carriers.

Or

(b) How will you prepare the cargo hold for loading in a bulk carrier?

15. (a) What are the benefits of IG system?

Or

(b) Explain about union purchase system of derrick.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) State the inherent hazards of concentrates in bulk.

Or

(b) Describe the operating procedures for cooling a tank prior loading in a LNG tankers.

17. (a) What are the entries made in a cargo/port LOG during cargo operations in port?

Or

(b) Enumerate the guidelines loading timber deck cargo.

18. (a) Describe the advantages and disadvantages of union purchase system.

Or

(b) What are the precautions to be observed during loading, unloading and handling of refrigerated cargoes?

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CP–9370

Sub. Code
11633

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018.

Third Semester

Nautical Science

MARINE ENGINEERING AND CONTROL SYSTEM — I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** following.

1. Write different types of steels used on board.
2. What are the various uses of compressed air?
3. What are the advantages of producing fresh water on board?
4. Write five mountings of boiler.
5. Difference between forced and natural ventilation.
6. What are the safeties in Air Compressor?
7. What is IC Engine?
8. What is the use of Crank case relief valve?
9. Define frequency.
10. Difference between AC and DC.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Define the various types of heat treatment.

Or

(b) Write short notes on :

(i) Smelting

(ii) Refining.

12. (a) Describe working and construction of Air Compressor.

Or

(b) Draw steam cycle and how the steam is produced on board.

13. (a) Draw and explain refrigeration cycle.

Or

(b) Write all the types of pump and its application.

14. (a) Difference between 4 – stroke and 2 – stroke engine.

Or

(b) Write the note on IC engine.

15. (a) Write all the safeties of main switch board.

Or

(b) Write short note on AC generator.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) With neat sketch, explain the working principle of fresh water generator.

Or

(b) Explain the working of 4 – stroke engine.

17. (a) Explain the working and construction of Air Compressor and its safeties.

Or

(b) Write the procedure for paralleling of Generators.

18. (a) Explain the working of 2 – stroke engine with its components.

Or

(b) Describe the working principle of 4 – RAM steering system.

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CP–9371

Sub. Code
11634

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Third Semester

Nautical Science

VOYAGE PLANNING AND COLLISION PREVENTION – I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is a Nautical chart?
2. Where can you find the units of depth used on chart?
3. What is a small correction?
4. What is chart datum?
5. Explain variation.
6. What is a deviation card?
7. What is observed position?
8. Define Leewony.
9. What is 'SEAPLANE'?
10. Define a 'NUC V/L'.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What is a Natural scale? What are the different types of projection?

Or

(b) Draw symbols for the following as per BA 5011.

(i) Wreck dangerous for surface navigation

(ii) Pilot station

(iii) Anchorage area

(iv) Racon

(v) 1.5 m depth obtained by wire sweeping.

12. (a) What are the contents of a weekly NTM?

Or

(b) Explain about Roveting charts.

13. (a) Given variation on the chart 5°W. Annual rate of change decreasing 1' from 2012. Find how much variation will you apply.

Or

(b) How will you apply Gyro error to obtain true course from Gyro course?

14. (a) Explain :

(i) Set and Drift

(ii) CMG with a suitable diagram.

Or

(b) Define DR Posn and estimated Posn.

15. (a) What is 'SAFE SPEED' according to COLREGS?

Or

(b) Explain 'OVERTAKING' as per COLREGS.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Write about the following :

(i) Ocean charts

(ii) Coastal charts

(iii) Gnomonic charts

(iv) Harbour/plan charts.

Or

(b) What are the contents of a admiralty chart catalogue.

17. (a) Explain about :

(i) Head on situation

(ii) Crossing situation and illustrate with a simple diagram.

Or

(b) Write briefly about T.S.S as given in COLREGS.

18. (a) What are the responsibilities between vessel's according to COLREGS .

Or

(b) Explain 'RULE 19' of COLREGS.

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CP–9372

Sub. Code
11635

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Third Semester

Nautical Science

NAVAL ARCHITECTURE - II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What types of steel is used in ship building industry and state its components?

2. Define sheer strake and garboard strake.

3. What is the purpose of sounding pipe fitted on Deep tanks?

4. Define MCTC and formula.

5. Define LCF.

6. What is stern tube and Rudder Trunk?

7. State Simpson's first rule and second rule.

8. What are Hause pipe and spurling pipe?

9. What is Bodily sinkage (or) rise?

10. What is Bilge and Ballast line system?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Sketch the different types of Rolled steel sections.

Or

(b) A ship of 4,000 tonnes displacement has KG 5.5m and KM 6.0 m. Calculate the moment of statical stability when heeled 5°?

12. (a) Purpose and construction of Bilge Keel.

Or

(b) A box shaped vessel is 24 m × 5m × 5 m and floats on an even keel at 2m draft. KG = 1.5m calculate the initial meta centric height.

13. (a) Explain panting and pounding forces.

Or

(b) Explain the two types of framming system incorporated on ships.

14. (a) What are the functions of watertight bulkhead?

Or

(b) A box-shaped vessel floats at a mean draft of 2.1 metres, in dock water of density 1020 kg per cu.m. Find the mean draft for the same mass displacement in salt water of density 1025 kg per cu.m.

15. (a) State any seven classification societies.

Or

(b) When a weight is shifted aft in a ship 150 meters long, it causes the ship's COG to move 0.2m horizontally and the trim to change by 0.17m. Find the longitudinal meta centric height.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the construction of fox peak tank along with a neat sketch (label all the parts).

Or

(b) A box shaped vessel 65 m × 12 m × 8 m has KG 4m, and is floating in salt water upright on a even keel condition at 4m draft forward and 4ft. Calculate the moments of statiscal stability at (i) 5 degrees heel and (ii) 10 degrees heel (iii) 2 degree heel.

17. (a) Explain all the treatments of steel and describe about how the materials are tested in ship building industry.

Or

(b) A ship 120 metres long at the waterline has equidistantly spaced half ordinates commencing from forward as follow:

0, 3.7, 5.9, 7.6, 7.5, 4.6 and 0.1 meters respectively.

Find the area of the waterplane and the T_{PC} at this draft.

18. (a) 'M.V. Hindship' is at Bombay in condition No. 4. A consignment of cargo weighting 500 tonnes is shifted from 2 Hold to the upper Deck. KG = 13.28 m. Find the final GM (Solid and Fluid).

Or

(b) Explain the purpose and construction of sounding pipe, Air pipes and ventilators along with neat sketch.

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CP–9373

Sub. Code
11636

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Third Semester

Nautical Science

SHIP OPERATION TECHNOLOGY — III

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write down the different name of anchors. What type of anchor mostly we are using in cargo ships?

2. What is the use of DB tank, fore peak tank and after peak tank?

3. What is planned maintenance system? What is its purpose?

4. Why should we do the weather tightness and hose testing before loading?

5. Why should we use primer as first coat?

6. What is the function of "Solvent"?

7. What is "EPIRB"? And give the use in GMDSS station?

8. What is the use of GMDSS walkie talkies? How many numbers require in ships?

9. What is the use of line throwing appliances? What is the requirements in above 500 GRT ships?

10. What is "IAMSAR"? How many volumes are published?

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) Draw the stockless anchor diagram and name the parts.

Or

(b) List down all safety equipments on board ship.

12. (a) Explain the procedure for lowering a davit life boat?

Or

(b) Draw the diagram of square search pattern and explain it.

13. (a) What is the sea area for GMDSS operation? And write down the GMDSS equipments for it?

Or

(b) Write down procedure for maintaining the hatch covers?

14. (a) How will you rescue a person from sea or from a vessel in distress?

Or

(b) Write down the manover board action.

15. (a) What is the importance of safety committee meeting?

Or

(b) Write down the safe bunkering practices.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Write down the detail about the standard marine communication phrases.

Or

(b) Write down the dry docking procedure.

17. (a) Write about course module on RPSL vide DGS order No 60F2006.

Or

(b) Write a notes on survey and classification of ships.

18. (a) Write the full notes on Ais sart working methods.

Or

(b) Write the details about the maintenance of crew accommodation.

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CP–9374

Sub. Code
11637

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Third Semester

Nautical Science

NAVIGATION – II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

Draw Diagram, if necessary.

1. Define celestial equator.
2. What is the declination? Explain.
3. Define Azimuth of a celestial Body.
4. Explain the relationship between GHA, LHA and longitude E/W.
5. Explain prime vertical and principal vertical.
6. Explain the relationship between SHA* and RA*.
7. Explain solar day and Sidereal day.
8. What is 'Semi-diameter correction'?
9. Explain the first point of Aries and the First point of Libra.
10. Explain the term 'Advance' and 'Retard' of ship's clocks.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) What is the relation between Are and Time

(b) Convert 107°37' of are to time without the use of the tables and verify the result using conversion table.

Or

(c) What is the relationship between longitude and time?

12. (a) Find the GMT, when LMT in longitude 125° 30°E was' $5^d\ 03^h\ 15^m\ 04^s$.

(b) Define 'Mean sun' and True (Apparent) sun.

Or

(c) What is the relationship between GMT and GAT?

(d) At 1300 Hours GMT when the 'Equation of Time is -8^m, What is the sun's GHA.

13. (a) "Venus as a Morning/Evening star" Explain with neat diagram.

(b) Find the LHA on 12^{th} Sept at GMT $14^h\ 23^m 04^s$, in position 24°10'N 135°27'E.

Or

(c) Explain the 'Horizontal Parallax' correction of a celestial body.

(d) Find the True Altitude of Moon's UL/LL from the given apparent altitude on 4^{th} March at $14^h\ 20^m\ 12^s$, GMT and Apparent altitude was 56°0.7.0' .

14. (a) What is the GP of a celestial body?

(b) Find the Sun's GP at GMT March $04^d\ 05^h\ 23^m\ 09^s$.

Or

(c) Explain the Horizon system to fix position of a celestial body.

(d) Find the CAP of star Aldebaran on Sept 2008 at GMT $12^d\ 02^h\ 11^m 04^s$.

15. (a) What is Line of Position (LOP) of a celestial body?

(b) Find the correct GMT from the following in PM at ship.

Chron time : Sept $22^d\ 00^h\ 46^m\ 31^s$ (error $05^m\ 01^s$ slow.).

DR Lat : 18° 20' N Dr. Long : 085°40'E.

Or

(c) Explain the Index errors 'on the arc' and 'off of the arc'.

(d) Calculate the precise time of mer pass. *Star GHA r 039°57.0' a (GMT) on Dec 2008, 01^d

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) On 13^{th} Sept 2008 in Dr 23° 21's 047°18'W, the observed azimuth of the sun was 046° (c). When the chron showed $01^h\ 08^m\ 10^s$. If the chron error was $02^m\ 12^s$ slow and variation was 3°W, find the deviation of the compass for that ship's head.

Or

(b) On 21^{st} Sept 2008 PM at ship in DR. 43°18'S 140° 11'W. the star 'CANOPUS' bore 150°(C) at $07^h\ 31^m\ 04^s$ by GPS clock. If variation was 4°W, Find deviation for that compass course.

17. (a) On 2^{nd} Sep 2008, DR. 40°28'N 064° 20'E. the rising sun bore 090°(C). If variation was 5°W, Find deviation of the compass.

Or

(b) On 28th April 2008, DR. 25°20'N 075° 00'E, the sextant MERIDIAN attitude of 'Jupiter' was 43°04.5'. If IE was 1.5' off the arc and HE was 25m, find the latitude and LOP.

18. (a) On 17th Jan 2008 PM at ship DR. 34°56'N 093° 30'W the sextant attitude of the Moon's UL was 48°15.4' when the chron (error 03^m 29^s slow) showed 10^h ,44^m 12^s. If HE was 16m and IE was 2.8' on the arc. Calculate the Intercept and the direction of the LOP.

Or

(b) On 17th Jan 2008 AM at ship DR. 34° 56'N 093° 30'W the sextant attitude of the 'VENUS' was 18° 06.4'. When the chron (error 03^m 29^s slow) showed 00^h ,40^m 50^s. If HE was 16m and IE was 2.8' on the arc. Calculate the direction of the LOP and the longitude where it cuts the DR latitude.

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CP–9375

Sub. Code
11642

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018.

Fourth Semester

Nautical Science

CARGO HANDLING AND STOWAGE — II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are refer containers?

2. What is the use of brine traps?

3. Define LFL.

4. What are the objectives of IMSBC code?

5. Define angle of repose.

6. Define block loading as per bulk carrier code.

7. Define grain cargo.

8. What are the uses of shifting boards as per grain code?

9. How many types of piping arrangements / systems in an oil tanker?

10. What is SOPEP and SMPEP?

Part B (5 × 5 = 25)

Answer **all** the questions.

11. (a) List the various types of containers and state their purpose.

Or

(b) Explain the figure 05 03 06 found on Bay plan of a container vessel.

12. (a) Explain in detail, how will you test hatch cover for weather tightness?

Or

(b) Briefly explain what are the contents of cargo securing manual.

13. (a) What are the hazards associated with bulk cargoes?

Or

(b) What are the precautions to be taken to prevent deck machinery from dust when loading bulk cargoes?

14. (a) What are the contents of grain loading booklet?

Or

(b) Briefly explain loading two different grain cargoes in the same hold.

15. (a) With the aid of a diagram, explain the direct line system on a tanker?

Or

(b) Draw Flammability diagram and explain in detail.

Part C (3 × 10 = 30)

Answer **all** the questions.

16. (a) Explain in detail, "segregation and care of containers carrying dangerous goods".

Or

(b) Describe the main hazards and precautions with the shipment of Ores.

17. (a) Discuss and explain with suitable diagram grain loading stability criteria for ships with DOA.

Or

(b) What are the advantages and disadvantages of COW?

18. (a) What are the contents of BLU code?

Or

(b) What are the methods of reducing (or) eliminating the adverse heeling effect of grain shift?

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CP–9376

Sub. Code
11643

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fourth Semester

Nautical Science

MARINE ENGINEERING CONTROL SYSTEM - II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the basic properties of fuel suitable for combustion in diesel engine?

2. Explain why bore cooling system is preferred in modern engines.

3. What are the various impurities generally found in Heavy Fuel oil used in large 2-stroke Diesel Engine.?

4. How cooler tubes expansion is taken care?

5. Draw the heat Balance Diagram of a Diesel Engine.

6. What are the types of propeller?

7. Define transducer.

8. What is closed loop control?

9. Explain fire triangle.

10. What is fire damper & where it's fitted?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Describe the working function of Mooring Winch.

Or

(b) Discuss about types of fuels and Fuel storage in ship.

12. (a) Write short note on:

(i) Shaft horse power.

(ii) Specific Fuel Consumption.

Or

(b) Explain the chemical treatment of cooling water system.

13. (a) Define the Following: Pitch and Apparent Slip.

Or

(b) Explain about Gas turbines.

14. (a) Write a short note on load and stress indicator.

Or

(b) Explain the types of pressure sensors.

15. (a) Explain the operation of sprinkler system.

Or

(b) Explain the purpose of fire helmets and smoke helmets.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) With the aid of a sketch trace the path of HFO (Heavy Fuel Oil) from its storage in D.B tanks right up to the fuel injector.

Or

(b) Explain with sketch of cooling water circuit for diesel engine.

17. (a) Compare the advantage and disadvantage of large two stroke propulsion engine and medium speed 4 stroke engines.

Or

(b) With a Sketch describe the operation of a two stage oily bilge water separator. What are the safety devices incorporated to prevent accidental discharge of oil overboard.

18. (a) Explain the Bridge Control on Main Engine.

Or

(b) Describe the Foam extinguisher generation and distribution in Ship.

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CP–9377

Sub. Code
11644

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fourth Semester

Nautical Science

VOYAGE PLANNING, COLLISION PREVENTION AND MARINE COMMUNICATION – II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Masthead Light.
2. What are the uses of COLREGS?
3. What is the day and night signal for a power driven vessel at 'RAM'?
4. Define Nautical Publications and state the uses.
5. What is 'M' notices?
6. What is 'Notices to Mariners'?
7. What is the meaning of Bunting?
8. What do you understand by 'Quarantine flag'?
9. Define the term 'Landfall'.
10. What is the use of marine radar?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Define CBD. State the day and night signal for a vessel of CBD. Under Rule No. 28.

(b) State when a power driven vessel are in;

(i) course altering to port

(ii) course altering to starboard.

Or

(c) Define 'short' and 'prolonged blast'.

(d) Define the following.

(i) side lights

(ii) stern light.

12. (a) What is the characteristics of light flashes for the followings:

(i) F (ii) F1 (iii) QF1 (iv) VQ (v) GFI.

Or

(b) What are the publications to carry on board vessel at all times?

(c) What is chart catalogues? What are the information available from chart catalogue?

13. (a) What is ALRS? Explain the uses.

(b) List all volumes of ALRS and give the complete detailed information available in each volume.

Or

(c) Describe the ocean passage of the world.

(d) How does the ocean passage of the world useful for safe navigation?

14. (a) Draw diagram and mark the location of the following.
    (i) Jack staff
    (ii) Ensign staff
    (iii) Gaff
    (iv) Triadic stay
    (v) Yard arm.

Or

(b) Define Landfalls.

(c) How do you select a suitable anchorage as an OOW?

15. (a) What is Marine Radar?

(b) How the Marine Radar works?

Or

(c) What is ECDIS?

(d) How does the ECDIS use in navigation?

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) What is ship's routeing?

(b) Define the following.
    (i) TSS
    (ii) Round about
    (iii) Deep water route
    (iv) No anchoring area.

Or

(c) What are the important characteristics of a Radar set?

(d) What are the limitations of a Radar set?

17. (a) How do you determine, while vessels crossing your vessel in various situations as an OOW-Rule No.7?

(b) What is your action to be taken in a Narrow channel, while overtaking?

Or

(c) Explain the following:
(i) Buoys
(ii) Beacon
(iii) Depth contour
(iv) Height contour
(v) Tidal Stream.

18. (a) Given the following extracts from the tide tables, find the standard time during the afternoon on 28th February at which there will be 5 meters of water over a shoal patch where the chart shows 2 metres soundings, off the post of Darwin (Australia).

Extract from ATT

Time	Height
0018	2.7 m
0557	6.2 m
1223	1.5 m
1832	7.0 m

Or

(b) Find the height of tide at Darwin (Australia) at 1805 hours standard time on 20th January. The extracts from the tide tables are given below:

Extract from ATT

Time	Height
0250	2.0 m
0830	6.6 m
1436	1.2 m
2105	7.5 m

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CP–9378

Sub. Code
11645

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fourth Semester

Nautical Science

NAVAL ARCHITECTURE – III

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is rolling?

2. What is the formula for calculating Moment of Inertia about water line of a box shaped vessel?

3. What is the formula for BM for a box shaped vessel?

4. What do you understand" Bilging of compartment"?

5. Who is classification Societies?

6. State TRUE or False: "Normalising is used to restore the original properties to a metal".

7. State TRUE or FALSE "Aluminum has a high melting point as compared to steel which has a melting point of 1500 deg C"

8. Draw a sketch for "double'U' butt weld".

9. For the purpose of computation of freeboard how the ships are divided into types?

10. State the Two main methods of testing of welds?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) The areas of a ship's water-planes are as follows:

Draft(m):	0	1	2	3	4
Area of WP (sq. m):	650	660	662	661	660

Calculate the ship's displacement in tonnes when floating in salt water at 4 metres draft.

Or

(b) A ship is floating at 8 metres mean draft in dock water of relative density 1.01; TPC = 15 tonnes and FWA = 150mm. The maximum permissible draft in salt water is 8.1m. Find the amount of cargo yet to load?

12. (a) What is angle of Loll and illustrate with suitable diagrams?

Or

(b) MV. Hindship is floating at her summer draft in salt water, proceeds to water of density 1.008 T/m^3. Calculate her freeboard?

13. (a) A ship of 5000 tonnes displacement enters a drydock on an even keel. KM = 6m, KG = 5.5m and TPC = 50 tonnes. Find the virtual loss of metacentric height after the ship has taken the blocks and the water has fallen another 0.24m.

Or

(b) A box-shaped vessel is 24m × 5m × 5m and floats on an even keel at 2m draft. KG = 1.5m. Calculate the initial metacentric height?

14. (a) What are the disadvantages of aluminum as a shipbuilding metal?

Or

(b) What are the factors affecting assignment of freeboard?

15. (a) List and brief the different type of welding used in shipbuilding yards?

Or

(b) What do the passenger ship subdivision regulations deal with?

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) A ship's water plane is 18 metres long. The half-Ordinates at equal distances from forward are as follows: 0, 1.2, 1.5, 1.8, 1.8, 1.5 and 1.2 meters, respectively. Find the second moment of the 1 water plane area about a transverse axis through the centre of flotation?

Or

(b) A box–Shaped vessel 64m × 10m × 6m floats in salt water on an even keel at 5m draft. A forward compartment 6 metres long and 10 metres wide, extends from the outer bottom to a height of 3.5m. and is full of carge of permeability 25 per cent. Find the new drafts if this compartment is now bilged

17. (a) Describe the sequence of events in the construction of a ship.

Or

(b) Discuss the constructional requirements for subdivision and stability of passenger ships as per SOLAS chapter II –1.

18. (a) Describe with the help of neat diagrams, the various faults that could occur in welding?

Or

(b) Describe the role and functions of classification societies.

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CP–9379

Sub. Code
11646

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fourth Semester

Nautical Science

NAVIGATION – III

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Gyro error is obtained at sea for once every watch (a) True or (b) False.

2. State the errors of Echo sounder.

3. Lunation of Moon.

4. Umbra.

5. Sidereal period of Moon.

6. Free Gyroscope.

7. Abbreviate -RADAR.

8. What are Circumpolar bodies?

9. GMDSS is required for all SOLAS convention ships of 300 GRT — (a) True or (b) False.

10. Explain Occultation.

Part B $(5 \times 5 = 25)$

Answer **all** questions.

11. (a) What is the difference between Racon and Ramark?

Or

(b) What are the various influence of weather on radar set?

12. (a) Explain the properties of a Free Gyroscope.

Or

(b) Explain the errors associated with Gyro compass in brief.

13. (a) What is Sidereal period of moon?

Or

(b) What is vertex in a Great Circle? How is it calculated?

14. (a) What does apparent altitude of Sun mean?

Or

(b) Conditions Required for Solar Eclipses to occur.

15. (a) Explain Conditions required for bodies to be Circumpolar.

Or

(b) Write short note on Phases of Moon.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) On 23rd Sept 1992, in DR 23°40'N, 161°56'E, the Sextant Meridian Alt of sun's Lower Limb was 66°10.6', if IE was 2.3' on the arc and the HE was 10.5 m, find the latitude and the PL.

Or

(b) On 25th Feb 1992, Am at ship in DR 20°04'S, 090° 04'W, the sextant Altitude of the Moons UL was 52°26.8' at 02h 56m 17s (error 04 m 01 s Fast) if HE was 19 m and IE was 0.6' off the Arc, calculate the direction of the PL and a position through which it passes.

17. (a) Find the distance and initial course of great circle sailing from Vancouver to Guam: Vancouver (i) : 49°12'N 122°50'W Guam (ii) : 13°30'N 145°15'E.

Or

(b) After traveling a distance of 3800 Miles along a great circles the ships Course was 112° in Latitude 48° N and Longitude 100° E. Find the initial position?

18. (a) What is the error associated with latitude and its correction in a gyro compass?

Or

(b) What is the rolling error and its correction associated with Gyro compass?

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CP–9380

Sub. Code
11651

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fifth Semester

Nautical Science

CARGO HANDLING AND STOWAGE – III

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What do you mean by Timber Deck Cargo?

2. Define the term “Weather deck”.

3. Define the word “Sea worthiners”.

4. What do you mean by “thrust” along the derrick boom?

5. Define the term “ Explosives”.

6. What do you meant by LFL?

7. What do you mean by broken stowage?

8. What are the objectives of SMDG Code?

9. Define the word “Cargo area”.

10. What do you meant by flammable limits?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the comprehensive stability informations to be provided to the Master?

Or

(b) What are the preparations to be taken during Loading deck cargo?

12. (a) Explain the lashing arrangement of timber cargo. Why should need a regular inspection on lashing of deck cargo?

Or

(b) What do you mean by cargo chain? Explain the duties of Master While damage of cargo vessel in unworthy condition?

13. (a) Define the following

(i) Timber Load line

(ii) Stowage factors

(iii) Boiling point.

Or

(b) What are the entries are to be made in the "Cargo Record book"?

14. (a) What are the three types of chemical tankers? Explain the control systems fitted in a tank.

Or

(b) What is the purpose and uses of IBC Code?

15. (a) Define the following.

(i) Gas / dangerous zone

(ii) MARVs

(iii) Inter Barrier Space.

Or

(b) What are the precautions to be taken during stowage of dangerous cargo?

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the rolling period test for determining ship's stability and limitations of the method.

Or

(b) What do you mean by charter party? Explain the types of charter and role of charterer.

17. (a) How many tonnes of the following commodities will fit in a hold of dimensions 13 m × 10 m × 8.5 m and bale capacity 1015 m?

Cargo	Stowage factors (M/t)	Broken stowage
Wheat	1.32	Nil
Fruit cases	1.98	4.5%
Bones in bulk	2.23	0.8%
Bagged Rice	1.63	6.0%
Scrap metal	0.67	1.2%

Or

(b) What are classifications of dangerous goods divided under IMDG Code? Give any five class of dangerous goods under IMDG Code and explain with symbols.

18. (a) (i) A 5 m long beam weiging 3 tonnes is lifted by a two legged sling having one leg 5 m and the other 6 m is length. A weight of 3 tonnes is placed on the beam 0.5 m. from the short end. Find the tensions in the two legs and the angle of inclination of the beam.

(ii) Describe labelling.

Or

(b) What are the hazards of gas cargo and control measures adopted?

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Ws9

CP–9381

Sub. Code
11652

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fifth Semester

Nautical Science

VOYAGE PLANNING AND COLLISION PREVENTION – III

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define distress and safety alert.

2. Define DSC.

3. What do you understand by NBDP?

4. Describe the use of ALRS publication.

5. Define "Reporting" in terms of navigation.

6. What do you mean by "Vessel restricted in her ability to manoeuvre"? What is the day and night signal?

7. Define "Underway".

8. Abbreviate the following :
   (a) MMSI
   (b) GMDSS
   (c) DSC
   (d) MSI.

9. Describe the safe water marks.

10. Define Isolated danger marks.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What is the procedure to send a distress message when your own vessel in distress?

Or

(b) Describe the use and functions of NAVTEX and explain the method of selecting sea region and message type.

12. (a) Define CASPAS-SARSAT system of communication. What is the basic concept of these satellite?

Or

(b) (i) How to send a "Distress message"?

(ii) How to send a "routine message" to your share office.

13. (a) Explain the following :

(i) ARQ

(ii) FEC

(iii) SELFEC.

Or

(b) What is ITU publications? List the ITU publication and state the use of safe navigation.

14. (a) What is meant by VTIS? Explain the function of VTIS on control of ships traffic.

Or

(b) What is your Indian reporting system and procedure, as your own vessel proceeding to Indian port in the following condition

(i) VSL with Indian port registry

(ii) VSl with foreight port registry.

15. (a) What do you mean by TSS? Explain the rules apply for a vessel transitting TSS in different situations.

Or

(b) What are the log books to be carried on board vessel? Explain in details about carbage lag book and mates log.

Part C $(3 \times 10 = 30)$

Answer **all** questions.

16. (a) What are the four sea areas? List in table with radio equipments required to carry on board vessel sea going.

Or

(b) What do you understand by meteorological broadcast? Write notes on routine messages and storm warnings in different warning areas.

17. (a) What are the principles and application of GMDSS? What is the role of India, as a coordination for weather warning area 8.

Or

(b) What you understand by colregs? Your own vessel sighted a red light at your starboard bow. As a OOW, What is your action to avoid risks of collision and safe navigation. Apply all applicable rules on that situation and explain with sketch.

18. (a) What do you mean by IALA system of Buoyage? Explain the characteristics of buoy and lights of cardinal marks with proper sketch.

Or

(b) What are the different types world wide of reporting system. Explain in detail under reporting system of India, America, Australia and South Africa.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fifth Semester

Nautical Science

COMPUTER PROGRAMMING AND UTILITIES

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the characteristics of computer?

2. List the types of computer languages.

3. Define : Database.

4. Narrate the need for database.

5. Define '*keyword*' in C. Give examples.

6. What do you meant by compiler?

7. List the types of computer networks.

8. Define Internet.

9. What is 'What if analysis' in spread sheet? Give Example.

10. What are the features of spread sheet?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Explain the block diagram of a digital computer.

Or

(b) Discuss about various types of input devices.

12. (a) Explain the role of database administrator.

Or

(b) Explain about various data types with example.

13. (a) Write a 'C' program to display 'Hello C World'.

Or

(b) Briefly explain various types of operators in C.

14. (a) Write short note on: Encryption and Decryption.

Or

(b) Briefly explain about e-mail communication.

15. (a) Explain about 'Autofill' text and number series in Spread Sheet.

Or

(b) Discuss the applications of spread sheet in various fields.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Discuss in detail about the classification of computers.

Or

(b) Explain about various types of database models with neat diagram.

17. (a) Explain about '*if-else*' and nested '*if*' statements in 'C' with example.

Or

(b) Discuss about OSI reference model with neat diagram.

18. (a) Discuss in detail about creating and formatting various types of charts in spread sheet with suitable examples.

Or

(b) Describe the procedure for the following in the spread sheet cell :

(i) Entering Student names and their marks in various subjects.

(ii) Aligning the text in left (Student names).

(iii) Including formula to calculate sum and average of marks.

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11654

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fifth Semester

Nautical Science

SHIPPING MANAGEMENT

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions are compulsory.

1. What is resoruce management?

2. What is management policy?

3. What is meant by shipping management?

4. Define port.

5. What is custom house?

6. What do you mean by 'Linear service'?

7. What is 'Demurrage'?

8. Define consignee.

9. What do you mean by shipper?

10. Define "NOR".

Part B $(5 \times 5 = 25)$

Answer **five** questions of the following.

11. (a) Describe the following

(i) Written and oral executive communication.

(ii) Management policy.

Or

(b) What is the role of the HR manager on Management and planning?

12. (a) Evaluate the world Merchant fleet.

Or

(b) What do you mean by port location? What are the major port in India? Give brief notes.

13. (a) What is meant by freight brokers and mention their role between world trade?

Or

(b) Define cleaning and forwarding agent. How they work and guide directly to the shipping trade?

14. (a) Describe the following

(i) Mates receipt

(ii) Prills of Lading

(iii) Negotiable Bills of lading

(iv) Lay time.

Or

(b) Define organization and administration.

15. (a) What is meant by intermediaries? Explain the role of Intermediaries in shipping business.

Or

(b) A Vessel of FWA 200 mm goes from water RD 1:018 to water RD 1.006. Find the change in draft and state whether it will by sinkage (or) rise

Part C (3 × 10 = 30)

Answer **three** questions from the following.

16. (a) Define Maritime fraud. Explain the different types of Maritime fraud.

Or

(b) What are the documents to produce in costum house to clear the vessel from a load port? Why should a ship produce port clearance prior leaving load port?

17. (a) Describe the following

(i) The role of freight brokers in shipping business.

(ii) Chartering

(iii) Custom main fest.

Or

(b) What do you mean by charter party? Explain the advantages of world scale in firing freight.

18. (a) (i) What is multimodal transport? State the contents of the multimodal transport documents.

(ii) Under what conditions can a registration of a multimodal transport license cancelled?

Or

(b) Explain the following

(i) Charterer

(ii) Voyage charter

(iii) Time charter

(iv) Bareboat charter.

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B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fifth Semester

Nautical Science

METEOROLOGY AND OCEANOGRAPHY — I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Draw diagrams as required.

Part A (10 × 2 = 20)

Answer **all** questions.

1. Expand :
   (a) DALR
   (b) SALR.
2. What is an ISOBAR?
3. What is the unit of measurement of wind force?
4. Define a Gradient Wind.
5. Explain Precipitation.
6. What is visibility?
7. What is Dew Point temperature?
8. Give the use of an Anemometer.
9. Name two Warm Currents.
10. What is a Tsunami?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the different layers of earth's atmosphere?

Or

(b) Explain various means of Heat Exchange Process.

12. (a) What factors affects the motion of winds?

Or

(b) Write down the impact of weather on shipping.

13. (a) How are clouds formed?

Or

(b) What are the different types of fogs?

14. (a) Define the following :

(i) Relative Humidity

(ii) Super cooling.

Or

(b) Draw the sketch of a whirling psychrometer.

15. (a) What causes ocean currents?

Or

(b) What is the difference between a wave and swell?

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Write about Green house effect with a suitable diagram.

Or

(b) What is true and apparent wind? How true wind speed is calculated using apparent wind and ship's speed?

17. (a) What are the various types of clouds? Explain briefly atleast 3 of them.

Or

(b) What is the effect of ocean currents on climate?

18. (a) What is an Aneroid Barometer? Explain the principle and draw a simple sketch.

Or

(b) How are tides caused? Write briefly on tidal streams and co-tidal charts.

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11656

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fifth Semester

Nautical Science

NAVIGATION – IV

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Year 1992 Almanac should be used for problems in Part C.

Question No. 19 is compulsory.

Part A (10 × 2 = 20)

Answer **all** questions.

Define :

1. Semi diurnal tides.
2. Spring range.
3. Chart datum.
4. Ebb tide.
5. Rudder limit alarm.
6. Lubber line of the compass.
7. Solar tide has a period of 12 hrs. True or False.
8. Name any two contents of GPS signals from satellites.
9. Name the two properties of Gyno scope.
10. In takes 24 hours for a Gyro compass to settle down, after switching-on. True of False.

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Describe any two errors of GPS.

Or

(b) Describe the general principles of Echo Sounder.

12. (a) Enumerate the benefits of S-VDR.

Or

(b) State the contents of static and dynamic data of AIS.

13. (a) Draw a simplified block diagram to auto-pilot and label and define them.

Or

(b) Define and describe STDMA protocol of AIS.

14. (a) Explain about various alarms of GMDSS on bridge.

Or

(b) Explain about various types of alarms of a Gyrd compass.

15. (a) Describe the spring tide and neap tide with appropriate diagrams.

Or

(b) Describe any two modules of S-VDR.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) On 22nd September 1992 pm at ship in DR 60'10'N 092' 27'E. The sextant altitude of an unidentified star bearing 266°(T) was found in be 25° 01.0'. At OOh 46 m 31 s by chrond meter (error 05 m O/S slow). If IE was 0.2' on the arc and he was 17 m, identify the star.

Or

(b) Describe the segments of GPS in detail.

17. (a) On 17th January 1992. in DR 46° 17 N 174° 30'E. Find the 1st Magnitude stars that will be within 40° of hour angle from the observer's meridian at the beginning of AM civil twilight.

Or

(b) Name of standard port : Townsville

Name of standard port : Pith reef.

Std Port Tides on 25.12.2018.

0505	0.6
1124	6.4
1717	1.4
2329	7.0

Time differences height differences S'SL.

	HW	MLW	HHW	LHW
Townville	–	–	3.1	2.3
Pith reef	–0012	–0014	–0.5	–0.7
	HLW	LLW	CHANGE	
	1.6	0.8	–0.1	
	–0.1	–0.3	+0,1	

Find the times and heights 'Pith Reef' on 25.12.2018.

18. (a) What are the inherent limitations of AIS?

Or

(b) Describe the Gyroscopic interita an precession with suitable diagrams.

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11612

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

First Semester

Nautical Sciences

NAUTICAL MATHEMATICS — I

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Answer **all** questions.

(5 × 15 = 75)

1. (a) (i) Show that the points (1, 3, 1), (1, 1, –1), (–1, 1, 1) and (2, 2, –1) are lying on the same plane.

(ii) Define : sample space, events, axiom of probability position vector, vector product of two vectors.

Or

(b) (i) Find the coefficient of correlation for the following data.

x	62	64	65	69	70	71	72	74
y	126	125	139	145	165	152	180	208

(ii) Let $\overline{a} = \overline{i} + \overline{j} + \overline{k}$, $\overline{b} = 2\overline{i} + 3\overline{j} + 4\overline{k}$ and $\overline{c} = 2\overline{i} - 2\overline{j} + 5\overline{k}$. Find $\overline{a} \cdot (\overline{b} \cdot \overline{c})$, $\overline{a} \cdot (\overline{b} \times \overline{c})$, $\overline{a} \cdot (\overline{c} \times \overline{b})$, $\overline{b} \cdot (\overline{c} \times \overline{a})$ and $\overline{a} \times (\overline{b} \times \overline{c})$.

2. (a) Derive the standard form of equation of the parabola $y^2 = 4ax$.

Or

(b) (i) A river is 40 m width. The depth d in meter at a distance x meters from one place is given by the following data :

x	0	5	10	15	20	25	30	35	40
y	0	7	6	8	7	6	4	3	0

Use of Simpson's rule to estimate the area of cross section of the river.

(ii) The orbit of the earth around the sun is elliptical in shape with sun at a focus. The semi – major axis is of length 92.9 million miles. Find how close the earth gets to the sun and the greatest possible distance between the earth and the sun.

3. (a) (i) The sides of a spherical triangle ABC are all quadrants and x, y, z are the arcs joining any point within the triangle to the angular points, prove that $\cos^2 x + \cos^2 y + \cos^2 z = 1$.

(ii) In a spherical triangle ABC, prove that $\frac{\sin a}{\sin A} = \sqrt{\frac{1 - \cos a \cos b \cos c}{1 + \cos A \cos B \cos C}}$.

Or

(b) (i) In a spherical triangle ABC, derive the Napier's formula

$$\tan\frac{1}{2}(a-b)=\frac{\sin\frac{1}{2}(A-B)}{\sin\frac{1}{2}(A+B)}\cdot\tan\frac{c}{2}.$$

(ii) Solve the triangle, given that $A=63^\circ 20'$, $B=135^\circ 34'$, $C=90^\circ$.

4. (a) (i) Find the derivate of $y=ax^2+3x$, $y=x^2\log x$, $y=x^3e^{2x}$, $y=x^3+x^2+1$ and $y=\sin^{-1}x\times\log x$.

(ii) Find $\frac{dy}{dx}$ if

(1) $x=\frac{t-1}{t+1}$, $y=\frac{t+1}{t-1}$ and

(2) $x=\sqrt{2t^2+1}$, $y=(2t+1)^2$.

Or

(b) (i) Find $\int\frac{2dx}{(1-x)(1+x^2)}$ and $\int\frac{2x+3}{(2x+1)(1-3x)}dx$.

(ii) Show that $\int_0^{\pi/2}\log\sin x\,dx=\frac{\pi}{2}\log\left(\frac{1}{2}\right)$.

5. (a) (i) Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 3 & 4 & 4 \\ 7 & 10 & 11 \end{bmatrix}$.

(ii) Verify Cayley – Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 3 & 7 \\ 4 & 2 & 3 \\ 1 & 2 & 1 \end{bmatrix}$.

Or

(b) Diagonalise the matrix $A = \begin{bmatrix} 2 & 0 & 4 \\ 0 & 6 & 0 \\ 4 & 0 & 2 \end{bmatrix}$ by means of orthogonal transformation.

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CP–9387

Sub. Code
11621

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Second Semester

Nautical Science

NAUTICAL MATHEMATICS – II

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Answer **all** questions.

(5 × 15 = 75)

1. (a) Prove that $|z_1 + z_2| \leq |z_1|\,|z_2|$

Or

(b) Express $\dfrac{\sin 7\theta}{\sin\theta}$ in a series of powers of $\sin\theta$.

2. (a) Find the first and second derivatives of the function tabulated below at the point $x = 1.5$

x	1.5	2.0	2.5	3.0	3.5	4.0
$f(x)$	3.375	7.0	13.625	24.0	38.875	59.0

Or

(b) Evaluate $\int_0^2 e^x dx$, by using Trapezoidal rule and simpson's rule, by dividing 6 equal intervals.

3. (a) Evaluate $\int_{-3}^{3} x^4 dx$ by taking seven equidistant ordinates. Compare it with the exact value.

Or

(b) Find the work done by the force $\bar{f} = z\bar{i} + x\bar{j} + y\bar{k}$, when it moves a particle along the arc of the curve $\bar{r} = \cos t\bar{i} + \sin t\bar{k}$ from $t = 0$ to $t = 2\pi$

4. (a) Use Green's theorem in a plane to evalute $\int_c [(2x - y)dx + (x + y)dy]$, when c is the boundary of the circle $x^2 + y^2 + a^2$ in the xoy – plane.

Or

(b) Evaluate $\iint_s (xdydz + 2ydzdx + 3zdxdy)$, where s is the closed surface of the sphere $x^2 + y^2 + z^2 = a^2$.

5. (a) Verify Stoke's theorem for $\bar{f} = xy\bar{i} - 2yz\bar{j} - zx\bar{k}$, where S is the open surface of the rectangular parallellopiped formed by the planes $x = 0$, $x = 1$, $y = 0$, $y = 2$ and $z = 3$ above the xoy – plane.

Or

(b) Solve :

(i) $\tan y \sec^2 x dx + \tan x \sec^2 y \, dy = 0$

(ii) $\frac{dy}{dx} + \left(\frac{1 - y^2}{1 - x^2}\right)^{1/2} = 0$.

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CP–9388

Sub. Code
11644

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Fourth Semester

Nautical Science

MARINE ENGINEERING AND CONTROL SYSTEM – II

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Answer **all** questions. (5 × 15 = 75)

1. (a) (i) Explain in detail about the heat treatment of steels. Mention its properties and its use in different areas.

(ii) Define alloy. What are the properties and uses of alloy?

Or

(b) (i) Explain in detail about the mechanical and thermal properties of common engineering materials.

(ii) Describe smelting and refining of steels. Also explain the effect of carbon in steel.

2. (a) (i) Write a brief description about the reverse osmosis. Explain the membrane construction and function. Explain the pre-treatment and post treatment methods to maintain the system in good condition.

(ii) Sketch and describe a two stage air compressor along with the materials used for various components. What are the advantages of multi stage air compressor? What stage piston is connected to the connecting rod and why?

Or

(b) (i) Sketch and describe a water tube boiler used on board the ship. Explain the various water walls used in the boiler.

(ii) Sketch and describe the working of the soot blower. What is the purpose of orifice plates fitted in the steam supply passage to the individual soot blower? What type of steam is used in the soot blower system and why? How steam line to soot blower system is fitted and why?

3. (a) (i) Sketch and describe the reciprocating refrigerated compressor. Also mention the materials used for the various parts. Describe 'Shaft seal'.

(ii) Sketch and describe dehumidifier. Explain the three major assignments of the control system of an air conditioning plant. Explain the room temperature control system with block diagram. Describe with a simple sketch the room thermostat using a bimetallic strip.

Or

(b) (i) Sketch and describe the variable delivery pump (Hell-Shaw pump) used in the steering operation. Explain with sketch the Pawl mechanism.

(ii) What is Roto-dynamic pump or dynamic pump? Explain its working principle. Sketch and describe a Franco pump. Where it is used?

4. (a) (i) Write a brief description of various types of modern diesel engines.

(ii) Explain the faults detected in main engine.

(1) Early injections

(2) Late injection and after burning

(3) Loss of compression.

Or

(b) (i) What is thrust block and what is it major purpose?

(ii) What is the process of scavenging in a two stroke marine engine?

5. (a) (i) Mention the conditions for parallel operation or synchronization of alternators.

(ii) Why are the routine checks made in battery room?

Or

(b) (i) Explain the difference between the core type transfer and the shell type transformer.

(ii) What are the important alarms and trips provided on board ships?

CP–9389

Sub. Code
11663

B.Sc. DEGREE EXAMINATION, NOVEMBER 2018

Sixth Semester

Nautical Science

CONVENTIONS AND REGULATIONS

(Upto 2015 Batches)

Time : 3 Hours Maximum : 75 Marks

Answer **all** questions.

(5 × 15 = 75)

1. (a) Write about Tonnage Regulations. Give details on Tonnage certificate.

Or

(b) How a load line survey is carried out? Write the importance of international Loadline certificate.

2. (a) Write about ship-shore checklist followed as per ISGOTT.

Or

(b) Write about entries made on OIL RECORD BOOK for cargo oil.

3. (a) Write about different classes as per IMDG with an example. What is EMS schedule and MFAG?

Or

(b) Write in detail about loading of Timber as deck cargo. Also write about what is jettisoning.

4. (a) Write in brief about following :

(i) Marpol Annex II

(ii) SMPEP

(iii) PA manual

(iv) COF.

Or

(b) Write in detail about code of safe practices for merchant seamen.

5. (a) What is Ballast water management? What are the various methods for exchange of ballast water?

Or

(b) Write about following :

(i) Port state control

(ii) Classification societies

(iii) Role of safety officer

(iv) Safety committee meeting.

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