

C-6840

Sub. Code

98811H

DIPLOMA EXAMINATION, APRIL 2022

First Semester

Nautical Science

Part I – Hindi

HINDI – I (STORY, NOVEL, GRAMMAR AND
TRANSLATION – I)

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

सभी प्रश्नों के उत्तर संक्षेप में लिखिए।

1. बड़े घर की बेटियाँ कैसी होती हैं?
2. रामू की बहू पर क्यों खून सवार हो गया?
3. चन्द्रधर गुलेरी की तीन कहानियों का नाम लिखिए।
4. 'पाँच मिनट' कहानी में गोपाल ने अपने पिताजी से क्या शिकायत किया?
5. वकील उदयभानुलाल को किसने मार डाला और क्यों?
6. सियाराम किसके साथ भाग गया और क्यों?
7. निर्मला से रुक्मिणी का व्यवहार पहले कैसा था?
8. मंसाराम को क्यों हॉस्टल भेजा गया?

9. लिंग बदलिए।
(a) बकरा (b) माली
(c) सुनार (d) नौकर
10. वचन बदलिए।
(a) लता (b) रीति
(c) गुडिया (d) आँख

Part B

(5 × 5 = 25)

सभी प्रश्नों के उत्तर दीजिए।

11. (a) लालबिहारी का गला क्यों भर आया?
या
(b) 'प्रायश्चित' इस कहानी में कौन किस के लिए क्या प्रायश्चित करते हैं?
12. (a) लहनासिंह का चरित्र-चित्रण कीजिए।
या
(b) पाँच मिनट कहानी का शीर्षक की सार्थकता पर विचार कीजिए।
13. (a) निर्मला ने शादी के पहले क्या स्वप्न देखा था और वह कहाँ तक ठीक निकला?
या
(b) जियाराम ने क्यों आत्म-हत्या कर लिया?
14. (a) मोटेराम ने भालचन्द्र सिन्हा को कैसे उल्लू बनाया?
या
(b) सुधा का संक्षिप्त परिचय दीजिए।

15. (a) संज्ञा किसे कहते हैं? उनके भेदों को उदाहरण सहित समझाइए।

या

(b) एकवचन से बहुवचन बनाने के नियमों को उदाहरण सहित समझाइए।

Part C

(3 × 10 = 30)

सभी प्रश्नों के उत्तर विस्तार से लिखिए।

16. (a) 'बड़े घर की बेटी' कहानी का सारांश लिखकर विशेषताएँ बताइए।

या

(b) 'उसने कहा था' कहानी का सारांश लिखिए।

17. (a) सर्वनाम किसे कहते हैं? उनके भेदों को उदाहरण सहित स्पष्ट कीजिए।

या

(b) विशेषण की परिभाषा देकर उसके भेदों को उदाहरण सहित समझाइए।

18. (a) निर्मला उपन्यास में चर्चित सामाजिक समस्याओं का वर्णन कीजिए।

या

(b) अंग्रेजी में अनुवाद कीजिए।

अकसर लड़के अपने से बड़ों की नकल करते हैं। बचपन में लड़के अधिक समय माता-पिता के पास रहते हैं। इसलिए वे उनकी अच्छाइयों और बुराइयों का अनुकरण करने लगते हैं।

समाचार-पत्र आधुनिक सभ्यता का अविभाज्य अंग है। वही देश सभ्य माना जाता है, जिसमें बड़ी तादाद में समाचार-पत्र निकलते हैं।

राजा ने नौजवान की लाश को कंधे पर रखा और श्रवण के पास जाकर यह शोक समाचार सुनाया। बेचारे दोनों बुढ़े; तिसपर दोनों आँखों के अंधे !

C-6841

Sub. Code

98812

DIPLOMA EXAMINATION, APRIL 2022

First Semester

Nautical Science

APPLIED MATHEMATICS

(2020 onwards)

Duration: 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer all questions.

1. Define the vector product or cross product of the two vectors a and b .
2. Find grad ϕ for $\phi(x, y, z) = x^3 + y^3 + z^3 - 3xyz$ at $(1, 1, 1)$.
3. What is meant by Cartesian co-ordinate system?
4. Calculate the first derivative of
 $f(x) = 2x^3 - 3x^2 - 12x + 4$.
5. Define system of simultaneous linear equation.
6. Define Linear programming.
7. What is the formula for co-ordinate geometry?

8. What is the difference between mensuration and geometry?
9. What are the basics of trigonometry?
10. What is spherical trigonometry used for?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Find the work done in moving a particle in a force field $\vec{F} = 3x^2\vec{i} + (2xz - y)\vec{j} + z\vec{k}$ along the straight line from (0, 0, 0) to (2, 1, 3).

Or

- (b) Locate below points on the cartesian coordinate system. Also mention the quadrant points belong to
 - (i) (2, 3)
 - (ii) (-3, 1)
 - (iii) (-1.5, -2.5)
 - (iv) (0, 0).
12. (a) What are the basic steps in formulating a Linear program.

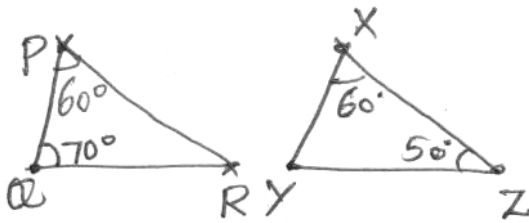
Or

- (b) Draw the graph of the function $y^2 = x + 5$.
13. (a) Find the centre and radius of the circle $x^2 + y^2 - 6x + 4y - 12 = 0$.

Or

- (b) Find the equation of the tangent at the point (4, -2) to the circle $x^2 + y^2 - 2x - 4y - 20 = 0$.

14. (a) Check whether the following triangles are similar.



Or

- (b) The length of a side of the square wooden frame is 5 cm. Find the total length of the wood used in the frame.
15. (a) If $\sin 3A = \cos(A - 26^\circ)$ where $3A$ is an acute angle, find the value of A .

Or

- (b) Find the value of $\sin 60 - \cos 30^\circ$.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Solve the following LPP by the graphical method

$$\text{Maximize } Z = 3x_1 + 2x_2$$

$$\text{subject to } -2x_1 + x_2 \leq 1$$

$$x_1 \leq 2$$

$$x_1 + x_2 \leq 3 \text{ and}$$

$$x_1, x_2 \geq 0.$$

Or

- (b) The population of a city was recorded every ten years, starting in 1980. Use the table below and interpolation to estimate what the population was in 2009.

17. (a) ABC is a spherical triangle in which $A = 90^\circ$, $B = 120^\circ$, $C = 60^\circ$, find a , b , c .

Or

- (b) Find the area of a water-plane which is 72 metres long. Using Simpson's first rule with the following half-ordinates commencing from forward : 0.2, 2.2, 5.0, 5.8, 6.0, 5.9, 4.9, 2.0, 0.2.
18. (a) Describe the properties of similar and congruent triangles.

Or

- (b) Two cubes each of volume 512 cm^3 are joined end to end. Find the surface area of the resulting cuboid.

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98813

DIPLOMA EXAMINATION, APRIL 2022

First Semester

Nautical Science

APPLIED SCIENCE

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Define energy.
2. What is meant by centrifugal force?
3. Mention the difference between conduction and convection.
4. Discuss the pitch of the sound.
5. Write a note on telescope.
6. Explain the concept of refraction.
7. Define power.
8. Mention any two types of electric cables.
9. What is average and RMS value of AC current?
10. What is mean by ionosphere?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Discuss about the conservation of linear momentum.

Or

- (b) Discuss about the specific heat and latent heat.

12. (a) Explain the damped and undamped oscillations.

Or

- (b) Discuss about the transverse and longitudinal waves.

13. (a) Why wheel house windows are required to be inclined? Explain.

Or

- (b) Briefly describe the static electricity and mention its hazards.

14. (a) State the Lenz's law and discuss its uses in alternators.

Or

- (b) Describe the conditions which increase the effect of electric shock.

15. (a) Discuss about the measurement of electrical quantities.

Or

- (b) Explain the working of temperature sensor.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) State and explain Newton's law of gravitation and determine 'g' at different latitudes.

Or

- (b) Explain the basic formation of superheated steam and mention its applications, hazards and precautions.
17. (a) Clearly explain the Doppler effect. List out its applications.

Or

- (b) Explain the heating effect of electric current and mention its applications in geysers and electric bulbs.
18. (a) Explain the magnetic effect of electric current with special reference to straight conductor and parallel conductor.

Or

- (b) Discuss about radar transmitters, receivers and antenna.
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C-6843

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98814

DIPLOMA EXAMINATION, APRIL 2022.

First Semester

Nautical Science

SHIP CONSTRUCTION AND SHIP STABILITY – I

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Name the different types of Bulkheads.
2. State the use of hatch cover.
3. Define Freeboard.
4. How will you calculate the Air draught of a ship?
5. What is Meta-centric Height?
6. Express Deadweight Tonnage.
7. Define Archimedes Principle.
8. What do you understand by the term Fresh Water Allowance?
9. What would happen to Ship, If the Meta-centre is located above the Centre of Gravity of the ship?
10. Describe the Keel of the ship.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Draw the Diagram of Rudder and mention its Parts.

Or

- (b) State the Difference between Cargo Tanks And Ballast Tanks.

12. (a) Explain the Draft marks, Plimsoll line and Deck line.

Or

- (b) Explain the Change in Draught due to Added mass.

13. (a) How do you Calculate the Stability of a ship?

Or

- (b) Explain the Relationship between the Displacement and Mean Draught for given displacement.

14. (a) Explain what is mean by Reserve Buoyancy.

Or

- (b) Determine the Meta-centric Height of the ship with an aid of neat diagram.

15. (a) A Plank 6m long, 0.3m wide and 50mm thick has a mass of 60kg. Calculate the density of the wood.

Or

- (b) A Ship Displaces 1224 m^3 of seawater at particular draught

- (i) Calculate the displacement of the ship.
(ii) How many tones of cargo would have to be discharged for the vessel to float at the same draught in Fresh Water?

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the procedure of calculating ballast weight displacement of ship with neat diagram.

Or

- (b) Sketch and Label the parts of Bilge Sounding pipe, Hatch cover, Bulkhead and Deep tanks?

17. (a) Explain Load Line Marking of ship and Load Line Certification and Surveys.

Or

- (b) A Ship 150 m long has draught of 7.70 m forward and 8.25m Aft, MCT 1cm 250 tonne m, TPC 6 and LCF 1.8 m forward of midship. Calculate the new draught after the following masses have been added
50 tonne, 70 m aft of midship
170 tonne, 36m aft of midship
100 tonne, 5m aft of midship

18. (a) A Vessel of constant triangular cross-section has a depth of 12m and a breath at the deck of 15 m. Calculate the draught at which the vessel will become unstable if the centre of gravity is 6675 m above the Keel.

Or

- (b) Explain uses of Hydrometer and describe the difference between Load line Hydrometer and Draft Survey Hydrometer.

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98815

DIPLOMA EXAMINATION, APRIL 2022

First Semester

Nautical Science

NAVIGATION – I : TERESTRIAL AND CELESTIAL

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What is Small Circle?
2. Define Straits.
3. Describe True course line.
4. Define Magnetic course.
5. Define the Celestial sphere.
6. What is estimated Positions?
7. What do you understand by the term ‘Dip’?
8. Specify the ‘Submarine pipeline’ symbol used on chart.
9. Define “Dead Reckoning position”.
10. How many compasses are used on board ship.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Explain “Earth’s axis’ with neat diagram.

Or

- (b) Mention any 10 major ports of World.

12. (a) Show the layout and use of the traverse table.

Or

- (b) Describe Mercator charts and Mercator projections.

13. (a) Explain the apparel annual motion of the Sun.

Or

- (b) Discuss the principle of Sextant.

14. (a) Find the true Course from given quarantal course.

1 2 3

Q. Course: N 74° W S 10° E S 36° W

True course: – – –

Or

- (b) Describe the direction of the ship’s head on the Magnetic compass.

15. (a) Explain the term ‘Running fix’.

Or

- (b) Find the position arrived

Position: Lat: 46°12’ N 084°18’E

Course: East: Distance : 350 m (Parallel sailing)

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Draw the boxing of Compass and mark all cardinal points.

Or

- (b) Find the course and distance using TT

A: 18° 30' N 154° 36' E

B: 15° 18' N 165° 32' W

17. (a) With an aid of neat sketch explain the working principles of Gyro Compass.

Or

- (b) Find the course and distance the Mercator sailing.

From: 34°00' N 079° 15' W

To: 49°00' N 058°45' W

18. (a) Discuss the procedure for checking accuracy of Azimuth mirrors.

Or

- (b) Find the position arrived from the given information.

Position left: 36° 48'N 085° 53' W

Course: 241° 00(T), Distance: 1897 M (Mercator)

C-6845

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98816

DIPLOMA EXAMINATION, APRIL 2022.

First Semester

Nautical Science

**NAVIGATION II : BRIDGE EQUIPMENT,
WATCHKEEPING AND METEOROLOGY**

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What is "Lubber line"?
2. Where is the location of Gyro repeaters on board ship?
3. How frequently Magnetic compass and Gyro compass is compared and checked?
4. What is the use of Azimuth mirror?
5. What is lookout?
6. What is Gyroscope?
7. Name the uses of VDR.
8. Define "narrow channel and fairway".
9. Specify the Day and Night signals used on board ship.
10. What is the value of Atmospheric value?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) List out the advantages and disadvantages of Magnetic compass.

Or

- (b) Explain the procedures for over taking a vessel.

12. (a) Distinguish between “Under way and making way”.

Or

- (b) List down the restrictions on crossing the channel on fairway.

13. (a) What are the signals produced when the ship is at Anchorage?

Or

- (b) State the visibility of lights as described in Rule 22.

14. (a) Describe the composition of Earths atmosphere.

Or

- (b) Discuss the relationship between atmospheric pressure and height above the sea level.

15. (a) Explain the sound signals to be used by vessels in sight of another vessel.

Or

- (b) Name any five Meteorological instruments used on board ship.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the Sextant working principle with neat diagram.

Or

- (b) Discuss the working principles of gyro compass with an aid neat diagram.

17. (a) With an aid of neat sketch explain the working principles of Magnetic compass.

Or

- (b) State the regulatory requirements with regard to Gyro and Magnetic compass.

18. (a) Sketch and explain the working of Aneroid barometer.

Or

- (b) Sketch and explain the working of Barograph.
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C- 6846

Sub. Code

98817

DIPLOMA EXAMINATION, APRIL 2022.

First Semester

Nautical Science

CARGO HANDLING, STOWAGE AND SEAMANSHIP - I

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Name the types of Ores carried by ships
2. Define Bulk carrier.
3. What is broken stowage?
4. Describe transportable moisture limit
5. Name the documents required for loading
6. What are grain loading booklet
7. To what extent the clanship is required for Grain carrier ships?
8. What is the use of hydrometer?
9. Where the location of Ballast tanks on board ship?
10. When do you prefer for degreasing chemical wash?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Mention the cares required for containers carrying dangerous goods.

Or

- (b) State the preparation of holds for loading cooled chilled and frozen.

12. (a) Write down the hazards associated with carriage of bulk cargos.

Or

- (b) What precaution will you take during and after loading coal?

13. (a) State the principles of Freight rate.

Or

- (b) How will you ensure weather tightness of Hatch cover?

14. (a) Distinguish between upper and lower flammable limits.

Or

- (b) List down the preloading inspections of cargo space.

15. (a) State the precautions needed while attempting to pick up a heavy load from ground using your hands.

Or

- (b) Describe briefly the various colour codes used in pipe line systems.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Classify the ships as per cargo carried on board.

Or

- (b) Distinguish in detail about securing free grain in filled and partially filled compartments.

17. (a) Write down the documentation require prior loading hazards associated with and precatons to be taken.

Or

- (b) Find the course and distance the Mercator sailing.

From: 24° 00'N 074° 15'W

To: 46° 00'N 053° 45'W

18. (a) What precaution to be taken for the shipment of (i) Ores (ii) Concentrates (iii) DRI.

Or

- (b) Explain the fixed gas monitoring system with neat sketch.
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Sub. Code

98818

DIPLOMA EXAMINATION, APRIL 2022

First Semester

Nautical Science

**ENGLISH, HUMAN FACTORS AND MARITIME
HISTORY**

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. Define adverb.
2. What is meant by word stress?
3. What are the basic techniques for developing the career?
4. What are needed for effective functioning onboard?
5. What are called human factors?
6. What is meant by Interpersonal relationship?
7. Who is important for a team work?
8. How do you develop positive attitude in a team work?
9. Why is food hygiene necessary?
10. How do you control spread of contagious diseases?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Prepare a notice on safety measurements on shipping management.

Or

- (b) Write a short note on physical and emotional demands of the career.

12. (a) Write in short on human skill development in interpersonal relationship.

Or

- (b) Write briefly on work ethics in leadership management.

13. (a) Write in short on time management and planning for a career.

Or

- (b) Write briefly on team bonding in human resource development.

14. (a) Write in short on MS Act 1958.

Or

- (b) Write a paragraph on significance of the RPS, Rules, 2005.

15. (a) Describe in short on India's ancient maritime history.

Or

- (b) Write on short note on travel safety.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Write an essay on awareness of language learning techniques.

Or

- (b) Write an essay on leadership qualities to lead a team successfully.

17. (a) Explain briefly on shipboard organizational structure.

Or

- (b) Write an essay on stress management and distress situations.

18. (a) Explain in detail on post independence growth of Indian shipping.

Or

- (b) Write an essay on public health awareness on seafarers.

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98821

DIPLOMA EXAMINATION, APRIL 2022.

Second Semester

Nautical Science

**NAVIGATION III : TERRESTRIAL, COASTAL AND
CELESTIAL NAVIGATION**

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

- Note :
1. Draw diagram wherever it is applicable.
 2. Use of Norie's tables or other tables allowed.
 3. Use of 2008 Nautical Almanac is allowed.

1. What are Inferior and Superior planets in Solar system?
2. Define the term "Greenwich Hour Angle".
3. What do you understand by the term "First point of Aries"?
4. Define the term "Amplitude".
5. What is the relationship between "true zenith distance and Meridian Zenith distance"?
6. What do you understand by "Great circle"?
7. What do you understand by "Cumulative Notices to Mariners"?

8. Draw and briefly write about traffic lanes and separation Zones of a TSS.
9. Define the term “leeway”?
10. What do you understand by the term “Chart Datum”?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Briefly explain the concept of earth’s axial rotation giving day and night.

Or

- (b) “Equal day and night in a year happens TWICE a year”. Support this statement with a diagram with reasons.
12. (a) What do you understand by the term GP of a heavenly body? Explain.

Or

- (b) Define the following terms with a diagram :
 - (i) Rational horizon
 - (ii) Zenith
 - (iii) Nadir
13. (a) (i) Describe the Salient features of Great circle.
(ii) What do you understand by “Vertex”?

Or

- (b) Find the distance by great circle track between
A: 24°00' N 074°15' W B: 46° 00' N 053°45' W.

14. (a) Explain the use of admiralty sailing directions.

Or

(b) How do you know that a chart is corrected up to date? Explain.

15. (a) Describe the basic theory of TIDES.

Or

(b) With reference to tides explain the following terms :

(i) Range of tide.

(ii) Duration of tide.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) With reference to time explain the following with diagrams :

(i) Zone time

(ii) Standard time

Or

(b) (i) What do you know about international date line? (2)

(ii) Explain how is the change of date takes place when a ship crosses date line. (8)

17. (a) Briefly explain passage planning.

Or

(b) Briefly explain the following publications :

(i) Mariner's Hand book

(ii) Ocean Passages of the world.

18. (a) On 2nd Sept 2008, in DR $40^{\circ} 28' N$ $064^{\circ} 20' E$, the rising sun bore $090^{\circ}(C)$. If the variation is $5^{\circ} W$, find the deviation of the ship's head.

Or

- (b) On 1st Sept. 2008 in DR Equator $50^{\circ} 27'E$, the sextant meridian altitude of the Sun's UL was $82^{\circ}10.4'$, if $IE = 2.4'$ on the arc and $HE = 17$ m, Calculate the latitude and LOP.
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C-6849

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98822

DIPLOMA EXAMINATION, APRIL 2022

Second Semester

Nautical Science

**NAVIGATION IV – ADVANCED BRIDGE EQUIP,
KEEPING AND METEOROLOGY**

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

- Note: (1) Draw diagram wherever it is applicable.
(2) Use of Norie's tables or other tables allowed.
(3) Use of 2008 Nautical Almanac is allowed.

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What is the principle of the 'Echo Sounder'?
2. What are the important duties of the "MASTER" of a ship?
3. Differentiate "RASTOR and VECTOR CHARTS"?
4. Briefly explain the position fixing in Congested waters.
5. What is the responsibility of an OVER TAKING VESSEL as per Rule no.13?
6. What is the difference between "PRECIPITATION and "DRIZZLE"?
7. Name the rules from 1 to 10.

8. Give an example of a situation where the rule allows you to make a departure from ROR. Name the rule.
9. What do you understand by the terms “True wind and Apparent wind”?
10. What is Buy ballot’s law?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Name and explain three modes of steering controls.

Or

(b) What are the controls of a RADAR? Briefly explain.
12. (a) What is the purpose of fitting a VDR? List out the data which will be recorded automatically by a VDR unit.

Or

(b) Describe the organizational structure of a bridge team.
13. (a) Under what circumstances an OOW will call MASTER as per ROR?

Or

(b) How will you take over a sea watch?
14. (a) List various ship reporting systems and explain any one in details?

Or

(b) Explain rule no.17 “Action by stand on vessel”?

15. (a) What are the duties of the “LOOK OUT personal” at sea?

Or

- (b) Explain briefly the causes of “Tsunamis”.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain GNSS system of position fixing using earth orbiting satellites?

Or

- (b) What is principle of “SPEED LOG”? Explain any one type of speed log.

17. (a) As an officer on watch how will make the preparations for departure port? Explain in detail.

Or

- (b) Explain rule no.19 “Conduct of vessels in Restricted Visibility”.

18. (a) Explain land and sea breezes with neat diagrams.

Or

- (b) What do you understand by “TRS”? Briefly explain origin, path and movement of TRS with diagrams.

C-6850

Sub. Code

98823

DIPLOMA EXAMINATION, APRIL 2022

Second Semester

Nautical Science

**CARGO HANDLING, STOWAGE AND
SEAMANSHIP — II**

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What is use of “Slop tank” in a tanker?
2. What is meant by “Inert gas”?
3. What do you understand by Reefer temperature log of a container?
4. What do you understand by the term “BAY PLAN”?
5. What is “Mate’s log book”?
6. What is the meaning of “Tainting”? Name any TWO cargoes which will taint?
7. Define the terms :
 - (a) A’cock bill
 - (b) Anchor aweigh.

8. Draw a joining shackle and label its parts.
9. What are the functions of “Scrubber” and “Demister pads” in an Inert Gas plant?
10. What are the uses of “Bridge fittings” and Penguin hooks”?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) (i) Name the different types of Cargo pumps.
(ii) Sketch and briefly explain the working of any one pump.

Or

- (b) Briefly explain
 - (i) Direct Pipe line system.
 - (ii) Ring Main system.
12. (a) Briefly discuss about the container handling gears.

Or

- (b) Name the markings on a container.
13. (a) Explain in detail about the hazards associated with coal cargo.

Or

- (b) Explain the SEGREGATION of IMDG cargo with neat diagram.
14. (a) State the contents of “CAPACITY PLAN”.

Or

- (b) Explain the “Standard crane signals” while operating cranes.

15. (a) How do you secure an anchor for sea?

Or

(b) List the safety precautions observed prior entering "Battery Room".

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Write down important 20 points of SHIP/SHORE CHECK LIST of a tanker.

Or

(b) Sketch and explain

(i) Explosive meter

(ii) Tankscope.

17. (a) Draw and briefly explain the container securing arrangements.

Or

(b) What are the precautions one will observe prior "ENTERING A CARGO HOLD"?

18. (a) Prepare a "PERMIT TO WORK SYSTEM" prior doing any "HOT WORK" on board a ship.

Or

(b) Explain the procedure of preparing a Hold for loading "Grain Cargo"?

C-6851

Sub. Code

98824

DIPLOMA EXAMINATION, APRIL 2022

Second Semester

Nautical Science

SHIP CONSTRUCTION AND SHIP STABILITY – II

(2020 onwards)

Duration: 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

Draw diagrams wherever applicable.

1. With diagram briefly explain “Hogging and sagging”.
2. Define the term “Bending moment”.
3. Define the term “Gross tonnage”
4. Define the term “Deck beam”.
5. Sketch and briefly describe hawse pipe.
6. What is “Chain locker” and its uses?
7. What is the use of SAVE ALL and DRIP TRAYS?
8. What is “Free surface correction”?
9. What do you understand by the term “Centre of floatation”?
10. Define the terms “List and Trim”.

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) What are the contents of General Arrangement plan?

Or

- (b) Briefly explain 'combined system of framing' on transverse section of ship.
12. (a) What do you understand by the term "Pounding"? Which part of the ship is affected? Briefly explain the construction part for withstanding the above.

Or

- (b) What do you know about the term "Racking stresses"? Briefly explain its causes.
13. (a) Sketch and describe a bilge strum box. How bilge pumping is carried out?

Or

- (b) Sketch and briefly explain sounding pipe arrangement with a striker plate.
14. (a) Sketch and briefly describe parts of the rudder.

Or

- (b) A double bottom tank measures 20 m × 20 m × 1 m. Its air pipe extends 12 m above its top. Find the thrust on the tank top when it is pressed up with salt water.

15. (a) On a vessel of 6000 t displacement KG 7.4 m, how many tonnes of cargo may be discharged from the lower hold (KG 2.0 m) in order to have a final KG of 8.0 m?

Or

- (b) A ship 120 m long, COF 2.5 m abaft amidships (HF 2.5 m aft), MCTC 100 tm, TPC 25, floats at 7 m fwd and 10 m aft. Find the new drafts if 200 t is discharged from a position 50 m abaft amidships.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Sketch and label a profile view of a container ship showing holds, D.B arrangements, peak tank arrangements, E/R and cell guide arrangement.

Or

- (b) Define the terms “Hogging and “Sagging”. Describe the conditions which give rise to hogging and sagging with simple diagrams.

17. (a) Explain longitudinal framing with a diagram.

Or

- (b) A vessel of 10000 t displacement, KM 9.3 m, KG 7.3 m, has two rectangular, identical deep tanks, Port and Stbd each 15 m long, 10 m wide and 8 m deep. The starboard deep tank is full of SW while the port deep tank is empty. Calculate the GM of the ship when one quarter of the water in the starboard deep tank is transferred to the port deep tank.

18. (a) Define the term “Angle of loll”. Explain the remedial action for correcting angle of loll.

Or

- (b) A ship is afloat at drafts at 6.60 m (fwd) and 27.40 m aft. 500 t of cargo is loaded 54 m aft of H (amidships) and 800 t is loaded 52 m abaft H. If the final drafts are 6.85 m and 8.51 m F & A respectively, and $MC \pi = 200 \text{ tm}$, find HF (distance of the COF from amidships).

C-6852

Sub. Code

98825

DIPLOMA EXAMINATION, APRIL 2022

Second Semester

Nautical Science

MARPOL AND MARINE ENGINEERING KNOWLEDGE

(2020 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What type of Pollution certificate is issued to Tanker ship?
2. What do you understand by the term COW System?
3. Define the term IMO 2020.
4. What is the purpose of Annex-II?
5. Expand SOPEP.
6. Define Chemical carrier ship.
7. State that sources of emission of harmful gases from ships.
8. What is Clean Ballast?
9. Why do you use Super charger?
10. Where do you find quick closing valve on board ship?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) Enumerate SOPEP equipment.

Or

- (b) State the permissible limits of ship's exhaust constituent.

12. (a) What precautionary measures will you take to avoid oil spillage during bunkering operation?

Or

- (b) Explain all the Annexes to the MARPOL 73/78 Convention.

13. (a) Define Volatile Organic Compounds? Explain with examples.

Or

- (b) Discuss the safety precautionary measures to be followed for carriage of Noxious Liquid substances.

14. (a) List down the special areas with respect to MARPOL.

Or

- (b) Explain the working principle of OWS.

15. (a) What safety precautionary measures are to be observed while entering into Pump room.

Or

- (b) Explain 'Ballast Water Management Plan'.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Discuss the safety precautions to be observed for ships carrying Liquefied gases.

Or

- (b) With an aid of neat diagram explain the special safety system provided for Tanker ship.

17. (a) With an example explain the special safety arrangements to be made prior to loading Coal.

Or

- (b) State that provisions under MARPOL Annexure –I, which deals with measures taken for prevention of Oil pollution from ships.

18. (a) With neat diagram explain the Fresh water generation system.

Or

- (b) Distinguish between Centripetal and centrifugal pumps with neat sketches.

C-6853

Sub. Code

98826

DIPLOMA EXAMINATION, APRIL 2022.

Second Semester

Nautical Science

**EMERGENCIES, MARITIME COMMUNICATIONS AND
COMMERCIAL SHIPPING KNOWLEDGE**

(2019 onwards)

Duration : 3 Hours

Maximum : 75 Marks

Part A

(10 × 2 = 20)

Answer **all** questions.

1. What is FPD?
2. Describe the penalty for not using or wrongly using an Jack staff
3. How will you check the ingress of air in fire flaps?
4. What is Fire control station?
5. State the objectives of ISM.
6. When do you hoist Courtesy flag?
7. What is Semaphore signal?
8. State precautions to be observed while crossing narrow channel?
9. Define Freight.
10. What is MLC?

Part B

(5 × 5 = 25)

Answer **all** questions.

11. (a) What are the functions of flag State Inspection?

Or

- (b) State the roles of PSC.

12. (a) Mention the salient features of SOLAS.

Or

- (b) Describe the procedures for launching Life rafts.

13. (a) What is the minimum mandatory requirement for Navigational watch Keeping officers at operational level?

Or

- (b) List down the GMDSS equipment.

14. (a) Describe the function of BIMCO.

Or

- (b) State the relationship between ship-owner and agent.

15. (a) List the precautions to be observed while lowering lifeboat.

Or

- (b) Explain the Articles of Agreement.

Part C

(3 × 10 = 30)

Answer **all** questions.

16. (a) Explain the proper procedure to use a walkie-talkie and VHF set.

Or

- (b) With an aid of neat diagram explain the fire fighting in machinery spaces of General Cargo ship.

17. (a) Explain Liner and Tramp shipping trades.

Or

- (b) Discuss in detail about Global Maritime Distress and Safety System.

18. (a) What is IMO and specify the Conventions made by it for Maritime sector?

Or

- (b) Explain the role of Shipping Master in detail.
