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B.Sc. DEGREE EXAMINATION, APRIL 2018

Second Semester

Nautical Science

Allied III — NAUTICAL MATHEMATICS – II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

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

2. Find the real and imaginary parts of $\sin(x-iy)$.

3. Define numerical integration.

4. What is the order of error in the Simpson's $\frac{1}{3}$ rule?

5. Define solenoidal vector.

6. Show that the vector $\bar{f}=(y^2-z^2+3yz-2x)\bar{i}+(3xz+2xy)\bar{j}+(3xy-2xz+2z)\bar{k}$ is irrotational.

7. Form the differential equation by eliminating a and b from $xy=ae^x+be^{-x}$.

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

9. Solve : $(D^2-3D+2)y=0$.

10. Discuss oscillatory electric circuits.

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

Answer **all** questions.

11. (a) Discuss the geometric representation of $z_1 \cdot z_2$.

Or

(b) If $\sin(A+iB)=x+iy$, prove that $\frac{x^2}{\cosh^2 B}+\frac{y^2}{\sinh^2 B}=1$.

12. (a) Find $y'(0)$ and $y''(0)$ from the following data :

x :	0	1	2	3	4	5
y :	4	8	15	7	6	2

Or

(b) Evaluate $\int_0^4 e^x dx$ by Simpson's rule, given that $e=2.72$, $e^2=7.39$, $e^3=20.09$, $e^4=54.6$ and compare it with the actual value.

13. (a) Evaluate $\int_C [x^2y\,dx+(x-z)\,dy+xyz\,dz]$ where C is the arc of the parabola $y=x^2$ in the plane $z=2$ from $(0,0,2)$ to $(1,1,2)$.

Or

(b) If $r=|\bar{r}|$, where $\bar{r}$ is the position vector of the point (x,y,z), prove that $\nabla^2(r^n)=n(n+1)r^{n-2}$.

14. (a) Solve $ydx - xdy + 3x^2y^2e^{x^2}dx = 0$.

Or

(b) Solve : $\frac{dy}{dx} - \frac{2}{x}y = \frac{y^3}{x^3}$.

15. (a) Solve : $(D^2 - 8D + 9)y = 8\sin 5x$.

Or

(b) Solve : $(D^2 - 1)y = 2 + 5x$.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Find the sum to infinity of the series $1 - \frac{1}{2}\cos\theta + \frac{1.3}{2.4}\cos 2\theta - \frac{1.3.5}{2.4.6}\cos 3\theta + ...(-\pi < \theta < \pi)$.

Or

(b) State and prove Demoivre's theorem.

17. (a) Given that

x	4.0	4.2	4.4	4.6	4.8	5.0	5.2
$\log x$	1.3863	1.4351	1.4816	1.5261	1.5686	1.6094	1.6484

Evaluate $\int_4^{5.2} \log x\, dx$ by (i) Trapezoidal rule, (ii) Simpson's $\frac{1}{3}$ rule (iii) Simpson's $\frac{3}{8}$ rule, (iv) Weddle's rule.

Or

(b) Verify Green's theorem in a plane for $\int_C [(3x^2 - 8y^2)dx + (4y - 6xy)dy]$ where C is the boundary of the region defined by the lines $x = 0$, $y = 0$ and $x + y = 1$.

18. (a) Solve :

(i) $(x^2 - yx^2)\frac{dy}{dx} + (y^2 + x^2y^2) = 0$

(ii) $\frac{dy}{dx} = x^2y^3 - xy$.

Or

(b) Solve $(D^3 - 7D - 6)y = e^{2x}(1 + x)$.

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B.Sc. DEGREE EXAMINATION, APRIL 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 a note on Oil splashing?

2. Give the use of electrical resonance in radio communication.

3. What is meant by skip distance and skip zone?

4. What is RS flipflop?

5. State De Morgan's theorem.

6. List out the advantages of transistor.

7. What is meant by switching transistor?

8. What is frequency modulation (FM)?

9. Define modulation factor.

10. Explain the role of modulator in transmitter.

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

Answer **all** questions.

11. (a) Give a short note on waste hazards, detection and safety precautions in nuclear reactor.

Or

(b) Explain briefly about the radiation pattern of Hertz antenna.

12. (a) What is meant by impendence and give its effects in electrical circuits?

Or

(b) Give a short note on binary addition and binary subtraction.

13. (a) Explain about the NAND and NOR universal gates.

Or

(b) Explain the characteristics and operation of switching transistors.

14. (a) Distinguish between common emitter, common base and common collector connections.

Or

(b) Give the comparison of amplitude modulation and frequency modulation.

15. (a) What is transmitter and explain its function with a diagram.

Or

(b) Give a short note on receiving antenna and its functions.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Define electrostatic charging and explain in detail about the electrostatic charging of oil in pipeline flow.

Or

(b) (i) Derive an expression for RMS and average value of current and voltage in an a.c. circuit.

(ii) Give a short note on ground wave and Sky waves.

17. (a) Explain the function of Half adder and Full adder.

Or

(b) Give a relation between β and α in common emitter connection and also describe about the characteristics of common emitter connection.

18. (a) Explain about the descriptive treatment of transmission of information of the modulated carrier wave.

Or

(b) Describe in detail about the super hetrodyne receivers.

———————

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B.Sc. DEGREE EXAMINATION, APRIL 2018.

Second Semester

Nautical Science

Elective II — SHIP OPERATION TECHNOLOGY — II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is bow stopper and when will you use?

2. What you mean by anchor aweigh?

3. How will you determine anchor is dragging?

4. How often abandon ship drill to be conducted on board ships?

5. How would you secure the rope tails of the pilot ladder to the deck ring bolts?

6. What are the two functions of the ships rescue boat?

7. At what depth would you expect the Hydrostatic Release Unit of a life raft to activate?

8. Why do you require battening down the hatch cover before sailing?

9. Explain the use of anchor buoy.

10. Explain what do you understand the term" slip wire.

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

Answer **all** questions.

11. (a) Describe the reasons for anchoring.

Or

(b) Draw a D-lugged joining shackle and name the parts.

12. (a) List out all the ISA requirements for cargo ships.

Or

(b) Explain about Life Boat Propulsion and Buoyancy tank.

13. (a) What safety precaution will you observe when entering battery room?

Or

(b) Explain about difference between- Portable, Semi portable and fixed fire fighting installation system.

14. (a) Draw a neat sketch of turning circle and stopping distance.

Or

(b) Explain Williamson turn with neat sketch.

15. (a) What are shallow water effects and explain how to avoid?

Or

(b) Explain the dangers of using different mooring rope types in one mooring system.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Draw the layout of forecastle with names of fixtures/ fittings and their uses?

Or

(b) List out all Personal Protective Equipments used, and Explain about each PRE.

17. (a) What are the general SOLAS requirements of LIFE BUOY and LIFE JACKET?

Or

(b) List out all Life Boat Survival Equipments and explain about Pyrotechnics?

18. (a) With neat sketch Explain about Operation and Recharging method of portable mechanical foam type Fire Extinguisher.

Or

(b) Explain the operation of SELF CONTAINED BREATHING APPARATUS with diagram.

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B.Sc. DEGREE EXAMINATION, APRIL 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 with diagram - parallel of latitude.

2. Define Geocentric latitude with diagram.

3. Explain great circle with an example.

4. What is departure, explain with diagram.

5. What is DR position and estimated position?

6. What is variation and deviation?

7. Find the magnetic compass course if true course is 325°(T) variation 7°W and deviation 2°E?

8. Define nautical mile and geographical mile.

9. What is Dip?

10. Enumerate the adjustable errors of a sextant.

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

Answer **all** questions.

11. (a) Discuss the use, advantages and limitations of a Gnomonic chart.

Or

(b) Discuss mercator projection and advantages, disadvantages of a mercator chart.

12. (a) Ship steamed from A 40°24'N 086° 38'E to B 40°24°N 093° 41'E. Find course and distance steamed?

Or

(b) If GMT = $19^{d}\ 07^{h}\ 10^{m}\ 31^{s}$ and ships position 24°00'N 154°18'N. Calculate LMT?

13. (a) Explain with neat diagram :

(i) D'Lat and D'Long.

(ii) Plane sailing.

(iii) DMP.

Or

(b) (i) What is an isogonal lines?

(ii) What are the causes for change in annual value of magnetic variation?

14. (a) Find d'at from following :

	①	②	③	④	⑤
From -	21°18'N	36°44'S	43°27'N	32°09'S	03°12.0'N
To -	45°10'N	10°27'S	12°30's	30°01'N	02°30.4'N

Or

(b) On 13th Sep pm at ship in DR 27°16'N 075°00'W. The chronometer showed $03^h18^m12^s$ error 02^m 05^s fast. Find correct GMT?

(c) Define LMT?

15. (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 sailing method?

Or

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

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Find the course and distance from A04°16'S 177°37'W to B 02°29'N 179°24'E.

Or

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

Position : 65° 01.7°S 170°54.9'W

Course : 332°

Distance : 319 miles.

17. (a) Compare mercator chart and Gnomnoic chart w.r.t. advantages and disadvantages.

Or

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

(c) What is polar gnomonic projection?

18. (a) Using traverse tables find the course and distance between the positions?

Position A 42°29'N 177°37'W to

Position B 44°16N 179°24'E?

Or

(b) At noon on 20th November ship was in position 02°10's 072° 54'E. Course 020°(C) Dev 2°E Var 10°E, log reset to zero. Ship maintained this course till noon next day when log indicated 348. Clocks were advanced 20 minutes at each of three watches - 2200, 0200, 0500 during the night. The vessel was stopped for 1 hour on 21st November. The ship experienced 2° beway due to Northerly wind and estimated current $1\frac{1}{2}$ knots setting at 250° throughout. Find

(i) DR position on 21st November noon.

(ii) EP position on 21st November noon.

(iii) If the fix on 21st noon was 02°27.0N 075°30.0'E. Find set and rate of current?

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B.Sc. DEGREE EXAMINATION, APRIL 2018.

Fourth Semester

Nautical Science

EMPLOYABILITY SKILLS — I

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the telephone etiquette?

2. How do you introduce a person?

3. What is formal letter?

4. Mention any two important step for writing a resume.

5. What are the types of greetings?

6. What is note-making?

7. What is controlled composition?

8. Define gesture.

9. How do we develop creative writing?

10. What are the types of charts?

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

Answer **all** questions.

11. (a) What are called common interview questions?

Or

(b) How to prepare for an interview?

12. (a) What are the etiquettes needed for business communication?

Or

(b) Differentiate the formal and informal letters.

13. (a) Write a short birthday invite of your younger sister.

Or

(b) Write a story with these hints in about 200 words :

A group of 10 foolish boys ———— went to take a dip in the river ———— then they count ———— and find one missing ———— another boy counted ———— again a boy missing ———— boy cried ————passer by enquired ———— then he counted ———— forgot to count yourself ———— boys felt ashamed.

14. (a) Write a short note on controlled and free composition.

Or

(b) What are the characteristics of developing creative competency?

15. (a) Write a short note on Gesture and Posture.

Or

(b) What are the salient features of creating tables?

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

Answer **all** questions.

16. (a) Write a short note on the following :

(i) Preparation.

(ii) Punctuality.

(iii) Sincerity.

(iv) Honesty.

Or

(b) Write a letter to your father for getting permission to attend the seminar at Bangalore.

17. (a) Prepare your own curriculum Vitae.

Or

(b) Write a review of the story you have read recently.

18. (a) Write a report of your college dry celebration.

Or

(b) Write an essay on visual aids and audio aids.

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B.Sc. DEGREE EXAMINATION, APRIL 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 out of gauge cargoes?

2. What is the purpose of container shoes?

3. What is TLV?

4. Define Moisture Migration.

5. Define spontaneous combustion.

6. How cargoes are classified as per IMSBC code?

7. What is DOA?

8. What is the purpose of PV value on a tanker?

9. What are the maximum allowable weight for single and adjacent holds?

10. What is the necessacity for testing weather–tightness of hatch covers?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) Write down the various parts of a container.

Or

(b) Draw a bay–plan of a cellular container ship.

12. (a) Define the following :

(i) Crude oil

(ii) Reid vapour pressure

Or

(b) Define the following :

(i) Pump room

(ii) Slop tanks

13. (a) What is dry and wet shift and explain what will happen if it happens onboard bulk carrier?

Or

(b) What are the hazards associated with bulk cargoes?

14. (a) What are the hazards associated with loading /carrying high density cargoes?

Or

(b) What are the pre loading inspections/ survey to be carried out before loading grain in bulk?

15. (a) What are the methods to reduce rain heeling moments in order to meet grain stability criteria?

Or

(b) Describe the I.G. systems with a neat line diagram.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Discuss in detail the method adopted for stowage of containers in cellular container ships.

Or

(b) Draw flammability diagram and explain UFL, LFL, Flammability range.

17. (a) Describe preparation of cargo holds prior loading bulk cargo of sulphur?

Or

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

18. (a) What are the advantages and disadvantages of crude oil washing adopted on board crude oil tankers?

Or

(b) What are the contents of BLU code?

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Fourth Semester

Nautical Science

MARINE ENGINEERING AND CONTROL SYSTEMS – II

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Why air cooler used in heat engine?

2. Write any four typical pipe line system in onboard.

3. Scavenge air pressure is required for higher engine output. Explain.

4. Why chemical treatment of main engine jacket cooling water is necessary?

5. What is the speed control methods used for electric drives?

6. Define pitch angle.

7. What is bourdon Gauge?

8. What are methods to take sounding?

9. Sprinkler heads bulbs are colored Red, Yellow and Green. State their temperature ratings.

10. Describe Internal Shore connection.

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

Answer **all** questions.

11. (a) Explain the properties of Fuel.

Or

(b) Describe the working function of Windlass.

12. (a) Write short note on: (i) Brake Horse power and (ii) Power by weight Ratio.

Or

(b) Explain the types of lubricating oil and state their duties.

13. (a) Explain the purpose Thrust Block and Drive Shaft in ship.

Or

(b) Enumerate the differences between impulse and reaction turbine.

14. (a) Describe alarm scanning and data logging Terminology.

Or

(b) Explain the types of temperature sensors.

15. (a) State the requirements of inert gas system.

Or

(b) Explain the various types of fire.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Explain with the sketch of main engine jacket cooling water temperature control system.

Or

(b) What is "scavenging" in diesel engines? What are the different types of scavenging employed for marine diesel engines?

17. (a) With the neat sketch explain the diesel Electric Propulsion.

Or

(b) Discuss the requirements of UMS operation on motor ships.

18. (a) With a Sketch describe the operation of a two stage oily bilge water separator.

Or

(b) Explain Fixed CO_2 Flooding System.

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B.Sc. DEGREE EXAMINATION, APRIL 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. Routing charts are used ——————

   (a) To find recommended route

   (b) To find the path of ocean currents

   (c) To find expected wind directions

   (d) To find all above

2. In finding out compass error which parameter varies from place to place.

   (a) Deviation

   (b) Variation

   (c) Sea water

   (d) Mountains

3. Which unit of distance is used in voyage planning?
   (a) Kilometer
   (b) Nautical Mile
   (c) Mile
   (d) Fathome

4. How many Annexes are present in ROR?
   (a) 41
   (b) 38
   (c) 2
   (d) 25

5. Gravitation pull of sun and moon causes ———————— on Earth.
   (a) Tides
   (b) Wind
   (c) Sunset
   (d) Apple to fall

6. Draw the chart symbols for the following:
   (a) Isolated Danger mark buoy
   (b) Pilot boarding ground
   (c) Light buoy with flashing two in 10 seconds

7. What is meant by Chart Datum? If height of tide is given as 3.5 meters and charted depth is marked as 4.5 meters, what is the actual depth at that mark?

8. Define
   (a) Power driven vessel
   (b) Vessel not under command.

9. List the Rule no. which defines

   (a) Risk of collision

   (b) Look out

   (c) Safe speed.

10. What is a Safe Speed?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) List out the various charts you would find onboard.

Or

   (b) When involved in a coastal passage, in clear weather, how would you ascertain the vessels position to ensure that the ship is maintaining her course?

12. (a) A vessel is coming on a head on course, what action would you take and based on which Rule?

Or

   (b) How many parts are there in ROR and write down each part name?

13. Answer one of the following:

   (a) What are the distress signals as given in annex of COLREG?

Or

   (b) A light house off Mumbai has a charted height of 115m. Explain in detail how to find its height above water level at 0930 IST on 22nd Dec'13 for use with vertical sextant angle.

14. (a) Interpret any two of the following:

(i) Give way vessel

(ii) Stand by vessel

(iii) Overtaking vessel.

Or

(b) Interpret any one of the following:

(i) Rule 14(Head on Situation)

(ii) Rule 7(Risk of Collision)

15. (a) Write short notes on:

(i) DR position

(ii) Fix or Observed Position

(iii) Estimated position

(iv) Set and Drift.

Or

(b) Interpret any two of the following :

(i) Restricted visibility

(ii) CBD vessel

(iii) RAM vessel.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) (i) Given magnetic course 300°(M) deviation 8°E find the compass course.

(ii) Given magnetic course 160° (M) deviation 5°W find the compass course.

(iii) Given magnetic course 050° (M) deviation 8°E,find thw true course

(iv) Given true course of 310°(T) variation of 6°E. Find the magnetic course.

Or

(b) Explain variation and deviation with a neat diagram and examples.

17. (a) Differentiate course steered and course made good. Explain the principle.

Or

(b) write short notes on.

(i) DR position

(ii) EP

(iii) Fix or observed position

(iv) set and drift

18. (a) Explain the use of NP5011 and its contents.

Or

(b) Explain compass error with example and a suitable diagram.

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B.Sc. DEGREE EXAMINATION, APRIL 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. Define TPC and write the formula.
2. Define MCTC and write the formula.
3. When will you use wall sideded formula for calculating GZ values?
4. What is rolling?
5. What is the formula for BM for a box shaped vessel?
6. State the two basic methods of manufacturing shipbuilding Steel.
7. What is Shear force and bending moment?
8. Tempering relieves ———— and ———— in a hardened steel and makes it ductile without loss of hardness.
9. What is IACS?
10. What is A-60 class fire resistant bulkhead?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) A ship 120 metres long at the waterline has equidistantly spaced half-ordinates commencing from forward as follows:

0, 3.7, 5.9, 7.6, 7.5, 4.6 and 0.1 metres, respectively. Find the area of the water-plane using Simpson's 2nd rule?

Or

(b) The second moment of a ship's water-plane area about the centre line is 20000 m4 units. The displacement is 7000 tonnes whilst floating in dock water of density 1008 kg per cu. m. KB 1.9 m and KG 3.2m. Calculate the initial metacentric height?

12. (a) A ship displaces 7000 tonnes whilst floating in fresh water. Find the displacement of the ship when floating at the same draft in water of density 1015kg per cubic metre, i.e. 1.015 t/m^3.

Or

(b) Find the water pressure and the total thrust on the flat plate keel of a ship which is floating on an even keel at 4 metres mean draft in water of density 1.024 t/m^3 per cu. m. The keel plate is 35m long and 1.5m wide.

13. (a) A box-shaped vessel is 50 metres long and is floating on an even keel at 4 metres draft. A amidships compartment is 10 metres long and is empty. Find the increase in draft if this compartment is bilged.

Or

(b) "Oil tankers are permitted to have more Summer freeboard than general cargo ships with a similar LBP". Discuss the reasons, give atleast 5 reasons.

14. (a) What are the properties required of a good shipbuilding steel?

Or

(b) What are the functions of electrodes?

15. (a) What are the points to be considered while creating a preliminary ship design?

Or

(b) What is the prime role of classification societies?

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

Answer **all** questions.

16. (a) A ship 75m long has half-ordinates at the load water-plane commencing from aft as follows:

0, 1, 2, 4, 5, 5, 5, 4, 3, 2 and 0 metres, respectively.

The spacing between the first three semi-ordinates and the last three semiordinates is half of that between the other semi-ordinates. Find the position of the Centre of Flotation relative to amidships.

Or

(b) A vessel is in the form of a triangular prism 32m long, 8m wide at the top and 5m deep. KG 3.7m. Find the initial metacentric height when floating on even keel at 4m draft F and A.

17. (a) A box-shaped vessel 30m 6m 4m floats in salt water on an even keel at 2m, draft F and A. KG = 3m. Calculate the angle of loll.

Or

(b) A ship of 5000 tonnes displacement and 120 metres in length has a KG 5.7 metres, KM 6.3 metres, LCF 1.2 metres forward of anidship and MCTC 45 tonnesmetres. Calculate the maximum trim for the ship to enter drydock if the metacentric height at the critical instant before she takes the blocks overall is not to be less than 0.3 metres.

18. (a) What are the advantages and disadvantages of aluminum as a shipbuilding metal?

Or

(b) Discuss the structural requirements for "fire safety measures for Cargo ships"?

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Fourth Semester

Nautical Science

NAVIGATION — III

(2016 onwards)

Time : 3 Hours Maximum : 75 Marks

Draw neat sketches wherever necessary.

Part A (10 × 2 = 20)

Answer **all** questions.

1. Occultation of Star or planet.
2. Path of Totality.
3. Circumpolar Bodies.
4. Zodiac belt.
5. Vertex.
6. Umbra and Penumbra.
7. DGPS.
8. ARPA.
9. Lunation.
10. Free Gyroscope.

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

Answer **all** questions.

11. (a) Conditions Required for Lunar Eclipses to occur.

Or

(b) What does "Liberation of Moon "mean?

12. (a) Why does Planet Venus seem to be a rising star or setting Star?

Or

(b) What is "V" correction? And why it must be applied to planets and moon?

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

Or

(b) Write short note on Phases of Moon.

14. (a) Explain the principles of RADAR.

Or

(b) In brief write about the GMDSS purpose and function in a Safety Net system.

15. (a) What is EPIRB and its Uses.

Or

(b) Give roles of India as Nav area VIII coordinator.

Part C (3 × 10 = 30)

Answer **all** questions.

16. (a) Find the Distance and Initial Course and Final Course of Great Circle sailing from Lat : 33° 22' S 113° 08'E To Long: 10° 51' 5 049° 16' E.

Or

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

17. (a) On the 6th March 1992, AM at DR 30° 30'N, 140° 11'W the Moon bore 105° (C) at 07 H 35M 02 S chron time (Err- 04 m 06 s Fast) . If Variation was 2' E, find the Deviation.

Or

(b) On 1st Dec 1992, PM at ship in DR 36° 27'N, 144° 44'E VENUS bore 235° (C) at 09H 18 M 08s chron time (err-10m 04s fast). If Var was 2.5' E, find the deviation for ship s head.

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

Or

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

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Sixth Semester

Nautical Science

MARITIME LAW

(Upto 2015 Batch)

Time : 3 Hours Maximum : 100 Marks

Answer **all** questions.

(5 × 20 = 100)

1. (a) What are the essential elements in a salvage service? (10)

   (b) Define the term deviation as applied to marine insurance. (10)

Or

   (c) What are the advantages of using Lyod's Open Form w.r.t. salvage? (10)

   (d) What are the risks not covered by a marine H & M policy? (10)

2. (a) Write short notes on note of protest and letter of protest. (10)

   (b) Explain briefly what is :

   (i) Safe port and

   (ii) Safe berth. (10)

Or

   (c) Discuss about contribution of IMO towards merchant shipping. (20)

3. (a) What official log book entries are required in connection with Musters and drills? (20)

Or

(b) What entries should be made in the official log book after?

(i) When a seaman has been formally warned for misbehaviour?

(ii) When an employed seaman has been injured? (20)

4. (a) A panamax vessel loaded wheat cargo 50,000 mT from Vancouver, Canada bound for Mumbai port India for discharge. During her passage through Pacific Ocean, South China Sea Indian Ocean the vessel encountered very rough seas and lost one of Life boat and few Life buoys. Upon arrival discharge port found about 1000 mT of wheat cargo was damaged by sea water ingress. Enumerate the lapses of safety measures and corrective action to be taken by ship staff to prevent such occurrences? (20)

Or

(b) How does Flag discrimination affect shipping in general? (10)

(c) What are the UNCLOS provisions concerning ships flag and nationality? (10)

5. (a) Describe :

(i) Contract

(ii) A void contract

(iii) A voidable contract? (10)

(b) What are the remedies for breach of contract? (10)

Or

(c) Define :

(i) Force majeure

(ii) Right in rem

(iii) Right in personam

(iv) Bailment w.r.t maritime law? (10)

(d) What are the essential functions of a Bill of Lading? Write short notes. (10)

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Sixth Semester

Nautical Science

NAVIGATION – VI

(Upto 2015 Batch)

Time : 3 Hours Maximum : 75 Marks

(5 × 15 = 75)

Answer **all** questions.

1. (a) What are the propogation characteristics of sound waves in water? (5)

   (b) What is phasing in a an echo sounder? Explain with diagram. (10)

   Or

   (c) State and explain the working principle and errors of ECHO SOUNDER.

2. (a) Explain the errors and factors affecting the accuracy of a GPS.

   Or

   (b) Write short notes on :

   (i) P code

   (ii) C/a code

   (iii) GDOP

   (iv) Pseudo ranges.

3. (a) Explain the working principles, maintenance and use of AIS, RACON, EPIRB, S-VDR.

Or

(b) Write short notes on :

(i) Differential GPS

(ii) Ramark

(iii) SONAR system

(iv) SART.

4. (a) While steering 336°(T) at 12 knots, the following observations of a target were made on the radar screen.

At 1100 bearing 050°(T) range 5.50 nm

At 1106 bearing 05°(T) range 4.25 nm

Find :

(i) Time and range at CPA.

(ii) Course and speed of target.

(iii) Aspect at 1106?

Or

(b) Compare between "North Up" and "Head up" preservation of a radar? (10)

(c) Write notes on "Multiple echo". (5)

5. (a) Write short notes on :

(i) Earths magnetism

(ii) Permanent magnetism

(iii) Induced magnetism. (10)

(b) What are the different types of coefficients contained in the total deviation of a ships magnetic compass? (5)

Or

(c) Following compass bearings of a distant object were obtained on cardinal and inter cardinal headings. Calculate value of coefficients B, C and also deviation due to these coefficients when heading 125°and 295°C? Assume coefficient A is zero?

Compass Co :	N	NE	E	SE
Compass Brg :	287°	282°	280°	284°
Compass Co :	S	SW	W	NW
Compass Brg :	290°	293°	295°	291°

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Sixth Semester

Nautical Science

CONVENTIONS AND REGULATIONS

(Upto 2015 Batch)

Time : 3 Hours Maximum : 75 Marks

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

1. (a) What are the conditions to be met for assignment of freeboard? (10)

(b) Describe the conditions when load line certificate can get cancelled? (5)

Or

(c) What is the purpose of SMPEP? Enumerate the contents of SMPEP manual. (15)

2. (a) Describe the guidelines to be followed for carriage of bulk cargoes. (10)

(b) What is liquefaction, TML, Angle of repose? (5)

Or

(c) What is the necessity for exchanging ballast water? What different methods are used to achieve ballast exchange? (15)

3. (a) Define :

(i) Different security levels

(ii) DOS

(iii) Non-conformity

(iv) Near miss

(v) FOC. (15)

Or

(b) What are the main objectives of ISM code? (5)

(c) Discuss and enumerate the elements of the ISM code? (10)

4. (a) What is the role and contribution of classification societies to shipping? (8)

(b) What are the different types of surveys / inspections carried out by classification society? (7)

Or

(c) List IMDG classes of cargoes with examples. (8)

(d) What are the annexes of Marpol? List and write short notes about the same. (7)

5. (a) What are the contents of COSWP to merchant seaman? (7)

(b) Discuss the guidelines provided in COSWP for merchant seaman while working in enclosed spaces. (8)

Or

(c) What is the role of safety officer safety committee on board a ship? (7)

(d) Write down the main elements of ship-store safety checklist of an oil tanker as detailed in ISGOTT? (8)

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B.Sc. DEGREE EXAMINATION, APRIL 2018.

Sixth Semester

Nautical Science

MARINE ENGINEERING AND CONTROL SYSTEMS – III

(Up to 2015 Batch)

Time : 3 Hours Maximum : 75 Marks

Attempt ALL questions. (5 × 15 = 75)

1. (a) Explain with the sketch of main engine jacket cooling water temperature control system. (10)

   (b) Explain the operation of Derricks & Cranes. (5)

   Or

   (c) Draw and explain the fresh water generator layout in ship. (10)

   (d) discuss about types of fuels and Fuel storage in ship. (5)

2. (a) What is super charging for a modern two stroke engine? How is it done and what are the benefits? What maintenance need to be carried out and how it is done to keep the machinery efficient. (4+4+7)

   Or

(b) Explain the operation of 2 stroke Diesel Engine. (10)

(c) Write short note on: (5)

(i) Brake Horse power

(ii) Power by weight Ratio.

3. (a) 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. (10)

(b) Explain the purpose Thrust Block and Drive Shaft in ship. (5)

Or

(c) Explain the Propulsion based on tube Electric drive. (10)

(d) How to measure power in the diesel engine with indicator diagram? (5)

4. (a) Explain the Bridge Control on Main Engine. (8)

(b) Describe alarm scanning and data logging Terminology. (7)

Or

(c) Explain the remote control operation of cargo line valve covers and ballasting. (10)

(d) Write short notes on CP Propeller and Bow Thrusters. (5)

5. (a) Describe the operation of Explosive meter. (6)

(b) Explain the operation of Sprinikler System. (6)

(c) Explain the types of fire detectors. (3)

Or

(d) Describe the Foam generation and distribution in Ship. (10)

(e) Explain the purpose of smoke helmets & Fire Helmets. (5)

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B.Sc. DEGREE EXAMINATION, APRIL 2018

Sixth Semester

Nautical Science

OCEANOGRAPHY AND METEOROLOGY – III

(Upto 2015 batch)

Time : 3 Hours Maximum : 75 Marks

Answer **all** questions.

Illustrate with suitable diagram.

1. (a) Give a note on non-frontal depressions. (15)

Or

(b) Define front and describe the types and weather associated with fronts. (15)

2. (a) Give a description on cyclone warning bulletins for merchant ships under international conventions. (15)

Or

(b) Describe in detail about cyclone forecasting. (15)

3. (a) Describe about ship's code and international systems of weather reporting. (15)

Or

(b) What are the principles associated with short range weather forecasting? (15)

4. (a) Give a detailed description on causes, common pollutants and effects of marine pollution. (15)

Or

(b) Write a note on pollution by micro organisms in Ballast water and explain the ballast water management system onboard. (15)

5. (a) What are the parameters for least time track and ship performance curves? (15)

Or

(b) Differentiate between weather routing and climatological routing. Write the factors taken into consideration for weather routing. (15)

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