

Indian Maritime University
(A Central University, Govt of India)

End Semester Examinations – December 2025

Programme Name: B Sc NS

Semester: 5

Subject Code: UG21T5506

Subject Name: BRIDGE EQUIPMENT & WATCHKEEPING PAPER - II

Date: 17.12.2025

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Radar Plotting sheet to be provided
- (iii) Non Programmable Scientific calculator is permitted.
- (iv) Options, if any, are specified in the respective section.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. Magnetic compass deviation is due to -----
(a) Earth's Magnetic field (b) Ships magnetism (c) Vibration of ships (d) Defective magnetic compass
2. Frequency of a S-Band Radar is:
(a) 9 GHz (b) 3 cm (c) 3 GHz (d) 10 cm
3. Which of the following is an incorrect statement regarding the gyro compass
(a) It is based on earth's magnetic field (b) Spinning wheel rotates in 3 axis
(c) It points to true north (d) It is based on the property of gyroscopic inertia.
4. The _____ is responsible on board for overseeing the implementation of the ship's security measures including the SSAS.
(a) CSO (b) Flag State (c) SSO (d) Recognised Organisation
5. The pulse length of RADAR affects
(a) Range discrimination (b) Bearing discrimination (c) Life of magnetron
(d) Scanner revolution

6. IRNSS satellites system provides accurate position information system for the ----- region

- a) Global (b) Entire Indian Ocean (c) 1500 nm around India (d) Asian

7. Which of the following is not a static information transmitted by AIS

- (a) MMSI Number (b) IMO Number (c) Ship's position (d) Length and Beam

8. Once SSAS is pressed the alert should be continuously transmitted to the ----- unless it is reset or deactivated.

- (a) Other ship nearby (b) Administration (c) Port State Control (d) Company

9. The compass error is to be recorded at least---

- (a) Once in a day (b) Once in every two hours (c) once every watch
(d) Every one hour

10. The dormant (silent) period in BNWAS lasts between 3 to _____ minutes during which the watch officer must acknowledge presence by pressing a confirmation button.

- (a) 12 (b) 6 (c) 9 (d) 3

Section B

Five Questions of 02 Marks each

11. Explain 'Trial Maneuver' an Aid to radar navigation
12. Briefly describe any two sources of GPS error?
13. What in the sequence of operation of BNWAS?
14. State at least four actions to be taken upon receiving a Storm Warning
15. Write short notes on World Geodetic System 1984 (WGS 84)

Section C

Seven Questions of 10 Marks each, out of which any 05 questions to be answered.

16. a) Describe the properties of the gyroscope that plays an important role in the operation of a Gyro compass? (4 marks)
16. b) What is drift and tilt in a gyro compass? (6 marks)
17. Draw Block diagram of a Marine Radar and explain its components
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18. a) What is RACON? (3 marks)
18. b) While on a course of $340^{\circ}(T)$ at 15 knots, a target on the radar screen was observed at 0800 to bear $020^{\circ}(T)$ at a range of 12 M. At 0812, it bore $017^{\circ}(T)$ at 9 M range. Find the time and range at CPA, course and speed of target and the aspect at 0812. (7 marks)
19. a) Explain 'Intelligent Awareness System' used for Navigation (5 marks)
19. b) The concept of 'Digital Twins' (5 marks)
20. a) What are the principles to be observed for keeping safe navigational watch (any five)? (5 marks)
20. b) What is VTS and ship reporting system? (5 marks)
21. a) Write a short note on Bridge Watching in ice navigation? (5 marks)
21. b) Prepare a check list for arrival in Port (at least 10 points) (5 marks)
22. a) What action will you take on receiving a storm warning? (5 marks)
22. b) Usefulness of Ship Reporting Systems (5 marks)

