

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2024
Programme Name: B.Sc. Nautical science
Semester: V
Subject Code: UG21T5506

Subject Name: BRIDGE EQUIPMENT & WATCHKEEPING PAPER - II

Date: 18.12.2024

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) **All Sections (A, B & C) are to be attempted.**
- (ii) **Options, if any, are specified in respective section.**
- (iii) **Radar Plotting chart to be used.**

Section A

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

1. Gyro compass is based on one of the below principle
 - a) Gyroscopic gravity
 - b) Gyroscopic velocity
 - c) Gyroscopic precession
 - d) Earth magnetic field

2. **S-band radar works on the wave length band of -----?**
 - A. 3 cm
 - B. 6 cm
 - C. 10 cm
 - D. 12 cm

3. **What does the Anti-Clutter Sea (ACS) control do on a radar?**
 - A. It filters out rain clutter
 - B. It reduces reflections from the ship's own structures
 - C. It diminishes radar echoes from waves and sea clutter
 - D. It enhances the radar's ability to detect distant targets

4. **SSAS is a part ---**

- a) IMDG Code
- b) ISPS Code
- c) Polar code
- d) Ships weather code

5. What is the primary function of a north-seeking gyroscope?

- A. To measure the ship's speed
- B. To automatically align the gyro compass with true north
- C. To determine the ship's depth
- D. To detect magnetic fields

6. SART transmits a series of pulses which appears as ---- blips on the PPI of an X band RADAR .

- a) 6
- b) 8
- c) 12
- d) 14

7. Which frequency band does AIS operate on?

- a) VHF
- b) UHF
- c) HF
- d) MF

8. The Master of every ship is bound to ensure that watch keeping arrangements are

- a) Adequate for a safe navigational watch
- b) As per owner's requirement
- c) As per charterer's requirement
- d) As per flag state requirements

9. What does LRIT stand for?

- a) Long Range Identification and Tracking
- b) Local Radar Identification Technology
- c) Long-range Retrieval and Interrogation Technique
- d) Land-based Radar Information Tracking

10. As per the STCW Code there should be minimum of ----- hours of rest in any 24-hour period.

- a) 12

- b) 10
- c) 8
- d) 14

Section B

Five Questions of 02 Marks each

11. Explain working Principle of DGPS.
12. What is drift and tilt of the gyroscope?
13. Write short notes on global navigational satellite system (GNSS)
14. What is the use of ship reporting system?
15. Mention any four actions that needs to be undertaken by OOW in case of a restricted visibility?

Section C

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

16. While on a course of 340° (T) at 15 knots, a target on the radar screen was observed at 0800 to bear 020° (T) at a range of 12 M. At 0812, it bore 017° (T) at 9 M range.

Find the

- 1) CPA and TCPA (2+2)
- 2) course and speed of target (2+2)
- 3) and the aspect at 0812. (2) (Total :10marks)

17. Write a short note on

- a) Pulse length and Pulse repetition frequency (5 marks)
- b) Performance Monitor and Parallel Indexing in RADAR. (5 marks)

18. (a) What are information transmitted by AIS? (5)

18. (b) Discuss the different errors associated with GNSS? (5)

19. a) What is gyroscopic inertia and precession? (5 marks)

19. b) Explain briefly a free gyroscope? (5 marks)

20. Discuss BNWAS and the sequence of alarms in the BNWAS. (10 marks)

21. How a GPS receiver determines the ship's position? List alarms of GPS (10 marks)
22. What are the points (Any ten) to be discussed and checked while handing over and taking over a navigational watch? (10 marks)

T.M.M.