Indian Maritime University

(A Central University, Govt of India)

Mar/Apr'26 SE

Programme Name: B Sc (NS)

Semester: V

Subject Code: UG21T5502

Subject Name: Naval Architecture Paper - I

Date: 17.03.2026 Max Marks: 70

Duration: 03 Hrs Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted.
(ii) Five out of 7 questions are to be answered in Section C
(iii) Log Tables & Scientific Calculators can be used.

Section A (1 mark each)

1) The effort taken to turn a balanced /semi balanced rudder will be _____ compared to the effort required to turn an unbalanced rudder, on it's pivotal axis.

2) Simpson's first rule is used when the number of ordinates are _____

3) The pressure intensity in a homogeneous liquid at rest under gravity _____ uniformly with depth

4) The _____ provides an international standard for the safe carriage in bulk by sea of dangerous chemicals and noxious liquid substances listed in chapter 17 of the Code.

5) The details of the shipside plates are obtained from the _____plan.

6) The Displacement of a ship changes & the draft increases when one of her compartments is bilged.(True / False)

7) RORO ships are fitted with several transverse watertight bulkheads within the cargo area to maintain watertight integrity of the ship. (True/False)

8) _____ is the name given to a heavy set of plate straightening rolls through which the plate is passed prior to its being worked.

9) Minimum number of passengers required to classify a ship as passenger ship is

a) 12 b) 10 c) 24 d) 100

10) Still water Sagging moment is caused due to

a) wave trough b) More weight loaded at centre

c) wave crest d) More weight loaded at F&A

Section B (2 marks each)

11) Explain The Theorem of Parallel Axes with a sketch.

12) What are the 2 main stresses acting on a ship ? Give examples

13) Define Thrust & Pressure

14) What are the different ways of ship launching ?

15) Give any 4 disadvantages/dangers of RORO ships

Section C (10 marks each)

Answer any 5 Questions

16.a) A box shaped vessel is 175 meters long x 28 meters wide and 12 meters deep, and is floating on an even keel draft of 6 meters. GM =1.0 meter. A compartment midships is 25 meters long and is empty. Find the new GM if this compartment gets bilged. (5 marks)

16.b) What is Design Spiral and the different stages (5 marks)

17) What is sea trial? Explain all tests are carried out during sea trial? (10 marks)

18) The Fore Peak tank is 24 m in depth. Starting from the top, it's aft bulkhead has equally spaced ordinates: 34.0, 33.4, 32.4, 30.5, 26.5, 17.8 and 6.0 m. Calculate the thrust and its Centre of Pressure of above base when the tank is full with seawater. (10 marks)

19) Explain the actions to be taken in the event of partial loss of intact buoyancy (10 marks)

20) The length of a ship's water-plane area is 70 m. The lengths of the equidistantly spaced half ordinates commencing from forward are 0, 5.2, 6.4, 7.0, 6.0, 4.9, 0.3. Find the area of the water-plane & TPC at this draft. (10 marks)

21) Draw the cross section of a Refrigerated Gas Carrier & a Pressurised Gas Carrier (2 x 5 = 10 marks)

22) Describe the various aspects to be considered in designing a ship. (10 marks)