

INDIAN MARITIME UNIVERSITY

(A Central University Government of India)

END SEMESTER EXAMINATIONS-June/July 2019

B.Sc Nautical Science

Semester-I

Naval Architecture Paper - I

UG21T3502

Date: 10-07-2019

Maximum Marks: 70

Duration: 3 hrs.

Pass Marks: 35

Note: Question No. 1 is compulsory.

Answer any 6 questions from remaining 8 questions (each of 10 marks).

Scientific Calculator is permitted if required.

- Q.1 Write short notes on the following: (2 x 5 = 10 marks)
- (a) Critical Period
 - (b) Effects of bilging
 - (c) Racking stress
 - (d) Point of contraflexure
 - (e) Second Moment of waterplane area
- Q2. (a) A ship's waterplane is 18 m long. The half-ordinates at equal distances commencing from forward are 0, 1.2, 1.5, 1.8, 1.8, 1.5 and 1.2 m respectively. Find the second moment of the waterplane area about the centerline. (5 marks)
- (b) What are the uses of application of Simson's Rule on board ships. (5 marks)
- Q3. (a) Define Centre of Pressure. Write down formula for calculation of Centre of Pressure. (5 marks)
- (b) One bulkhead of tank consist of triangle apex downwards is 14m broad on top and 12 m high. Calculate the centre of pressure above the bottom of tank when the sounding in the tank is 9m. (5 marks)
- Q4. (a) State the actions to be taken in the event of bilging of a compartment. (5 marks)
- (b) A box shaped vessel 120m X 20m is floating in salt water at an even keel draft of 7m with KG of 7m. An empty compartment 12m long, 8m wide, 2m height situated at Mid-ship is bilged. Find the GM before and after the bilging. (5 marks)
- Q5. (a) Explain how virtual loss of GM affects stability during drydocking. (5 marks)
- (b) A ship of 3000 t displacement is 100m long has KM=6m, KG=5.5m. The

centre of flotation is 2m aft of amidships and MCTC = 40 tm. Find the maximum trim for the ship to enter the drydock if the metacentric height at the critical instant before the ship takes the blocks forward and aft is to be not less than 0.3m. (5 marks)

- Q6. (a) How ships are strengthened to take care of stresses caused by Pounding? (5 marks)
(b) Explain neutral axis, shear force and bending moments. (5 marks)
- Q.7. (a) A light beam 6 m long is supported at ends A and B. A mass of 12.232 Kg is hung at point C, 2 m from end A. Draw the SF diagram to scale. (5 marks)
(b) What are precautions to be observed while conducting inclining experiment? (5 Marks)
- Q8. (a) Sketch the statical stability curve and describe the effect of change of beam on stability. (5 marks)
(b) Why the initial GM does not change whereas the range of stability changes by increasing the freeboard? (5 marks)
- Q.9. (a) What are the information to be fed in the input module of a Loadicator? (5 marks)
(b) Explain how loadicator reduces the workload of cargo officer onboard. (5 marks)
