INDIAN MARITIME UNIVERSITY

Time Bound Assignment September/October 2020

B Sc (Nautical Science) Arrear Examinations

NAVAL ARCHITECTURE PAPER - I (UG21T3502)

Date: 23/09/2020	Maximum Marks: 70
Time: 3 Hrs	Pass Marks: 35

Q.NO 1 IS COMPULSORY. ATTEMPT ANY SIX OUT OF THE REST.

ALL QUESTIONS CARRY EQUAL MARKS.

NON PROGRAMMABLE SCIENTIFIC CALCULATOR IS PERMITTED

Q1) Write short notes on the following. **(5 x 2 Marks)**

a) Formula for centre of pressure
b) Grounding
c) Shearing force
d) Loadicator
e) Inclining experiment.

Q2) a) Explain parallel axis theorem. **(5 Marks)**

b) A ship's water plane is 18 metres long. The half ordinates at equal distance from forward are as follows 0, 1.2,1.5,1.8,1.8,1.5, and 1.2 Metres respectively. Find the second moment of the water plane area about the centre line. **(5 Marks)**

Q3) A lower hold bulkhead is 12 metres high. The transverse width in metres, commencing at the upper edge and spaced at 3m interval are as follows:

15,15.2,15.4,15.5,15m respectively. The hold is filled with SW to sounding of 14 metres. Find

a) KP (The height of the COP above the bottom). **(5 Marks)**

b) Thrust. **(5 Marks)**

Q4) A box shaped vessel is 150metres long,24 metres wide and 12 metres deep is floating on an even keel at a 5 m draft.GM=0.9m. An amidships compartment is 20 metres long and is empty. This compartment is bilged. Find

a) New draft. **(5 Marks)**
b) New GM. **(5 Marks)**

Q5) a) Define critical period during dry docking with the help of a sketch. **(5 Marks)**

b) A ship of 5000 tonnes displacement, enters a drydock trimmed 0.45m by the stern.KM=7.5m,KG=6m,and MCTC=120 tm. The centre of flotation is 60m from aft. Find the effective metacentre height at the critical instant before the ship takes the blocks overall assuming that the transverse metacentre rises 0.075m. **(5Marks)**

Q6) Explain the following. **(5 Marks)**

a) i) Racking stress ii) tortional stresses

b) Explain the effect of Shearing force and bending moment on ship's strength. **(5Marks)**

Q7) a) A light beam 8 m long is supported at its ends. If a mass of 10.1937 kg is placed at its centre,draw the SF and BM diagrams to scale. **(5marks)**

b) Explain how GM is obtained by conducting the inclining experiment. **(5 Marks)**

Q8) a) Explain with diagram the effect of increasing the beam on the stability of the ship **(5 Marks)**

b) Explain with diagram the effect of increasing the freeboard on the stability of the ship. **(5Marks)**

Q9) How loadicator is useful during

a) Cargo planning **(5 Marks)**
b) Cargo operation. **(5 Marks)**

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