[Time: 2 ½ Hours]   **[Marks:75]**

Please check whether you have got the right question paper.

N.B: i) Use of programmable scientific calculator is permitted
                 ii) Attempt all questions and all questions carry equal marks.

Q.1   a.   One bulkhead of a tank consist of a triangle, apex upward, 16m broad and 12m high. Calculate KP (heaight of the COP above th bottom) when the sounding is 14m.

<div align="center">OR</div>

     b.   A box shaped vessel 150m x 20m, floats is Salt water at 5.5m draft, even keel. KG=4.0m. An empty amidship compartment 30m long and 20m broad, gets bilged. Find the GM after bilging.

Q.2   a.   Find tha salt Wate displacement of barge 60m long whose Under-Water transverse cross-sectional areas are: 19.6, 25, 17.5, 13 and 0 m².

<div align="center">OR</div>

     b.   A deep tank bulkhead is 15m broad at the top. The vertical ordinates at equidistant transverse intervals, are :
       0, 3, 5, 6, 5, 3, and 0 m resectively.
Find the KP (the height of the COP above the bottom) and the trust when the tank is filled with Fresh Water to a head of 1.5 metres

(i.e, sounding of 7.5 m).

Q.3   a.   Draw the internal structural arrangement of a ship's After Peak Tank and name the various parts.

<div align="center">OR</div>

     b.   Draw and label the amidships section of a crude oil tanker.

Q.4   a.   Describe the folowing periodical surveys carried out by Classification Society-
         i.   Annual Survey
         ii.   Docking Survey
         iii.   Special Survey

<div align="center">OR</div>

     b.   Sketch transverse sections through a ship, showing when the ship is in-
         i.   Stable Equilibrium
         ii.   Unstable equilibrium
         iii.   Neutral Equilibrium

5.   a.   Explain the follows:-
         i.   Shell Expansion Plan of a ship & its uses.
         ii.   State how the structure of a cotainer ship differs from that of a bulk carrier.
         iii.   The various types of welding processes used in shipyard.

<div align="center">OR</div>

     b.   With Sketches explain reasons for Cember, Sheer, Rise of Floor and Flare

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