SEP 2025

Q1 (16 marks)

(a) What is the purpose of providing air pipes to tanks in the vessel? (6)

(b) Sketch an arrangement of air vent head situated on the weather deck. (5)

(c) What factors are considered in deciding the bore size of air pipe? (5)

Tanks

Q2 (16 marks)

(a) What is a right-handed and a left-handed propeller? (5)

(b) With the aid of simple sketches explain Rake, Skew and Pitch of the propeller. (6)

(c) What are the advantages and disadvantages of CPP? (5)

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Q3 (16 marks)

(a) What are various types of tankers for carrying bulk liquids? (6)

(b) Sketch a mid-ship section of a double-hulled crude oil tanker. (10)

Q4 (16 marks)

Briefly explain the following ship terms used:

(a) LOA (2)

(b) LBP (2)

(c) Breadth Extreme (2)

(d) Breadth Moulded (2)

(e) Depth Extreme (2)

(f) Depth Moulded (2)

(g) Draught Extreme (2)

(h) Draught Moulded (2)

Ship terms

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Q5 (16 marks)

What do you understand by 'Free surface effect' and how does it affect the ship's stability? (16)

Stability

Q6 (16 marks)

(a) What is the metric length of one shackle of an anchor chain? (4)

(b) A vessel of 10,000 t displacement consumes 25 t of fuel per day when her speed is 12 knots. Calculate the probable consumption of fuel over a voyage of 3000 nautical miles at a speed of 11 knots with a displacement of 11000t (12)

Calculations

Q7 (16 marks)

(a) What are the different types of stern used in ship construction? (6)

(b) A ship consumes 360 t of fuel, stores and water when moving from sea water of 1.025 t/m3 into fresh water of 1.000t/m3and on arrival it is found that the draught has remained constant. Calculate the displacement in sea water (10)

Calculations

Q8 (16 marks)

(a) What is a 'mast raiser' and what is the purpose of it? (6)

(b) A ship 96 m long is floating at 5m fwd draft and 6.4m aft draft. MCTC 180tm, TPC 16. COF is 2m abaft of midships. Find the location where a weight of 50t should be placed so as to keep the at draft constant (10)

Calculations

Q9 (16 marks)

A ship 120 meters long at the waterline has equidistantly spaced half-ordinates commencing from forward as follows: 0, 3.7, 5.9, 7.6, 7.5, 4.6 and 0.1 meters respectively. Find the area of the waterplane using Simpson's Second rule and the TPC at this draft. Water density is 1.025 t/m3. (16)

Calculations