Introduction of Naval Architecture

Unit-1

Q1. What are the different types of merchant ships, and what are their functions

Q2. Write short note on (i) Passenger Ship, (ii) Liners, (iii) Cargo tanks, (iv)Oil tankers

Q3. Write short notes on (i) Oil tanker, (ii) Bull tanker, (iii) Ore carrier, with neat sketch.

Q4. Sketch a neat diagram of (i) Ro-Ro vessels, (ii) Liquefied gas carriers, (iii) Chemical carrier

Q5. What are the different types of transportation of cargoes? Name the vessels for carrying these cargoes.

Q6. Write short note on Economic of Ship design.

Q7. Describe what are the terms related to ship design (i) Economic criteria, (ii) initial cost, (iii) operating cost, (iv)Owners requirement.

Q8. Define Lpp, Draft, Camber, Bow, Stern, Starboard, port?

Q9. Draw ship and define, shear plan, waterline plan, buttock lines, and body plan.

Q10. Define what all degree of freedom are there for ship? And which of them are oscillating

Q11. Define (i) Translational and (ii) Rotational degree of freedom for ship.

Q12. Draw a neat sketch of (i) Shear plan, (ii) Body Plan, (iii) Water line plan, (iv) Stations

Q13. Draw a neat sketch and show (i) Port, (ii) Starboard, (iii) Bow, (iv) Stern, (v) Design water line, (vi) LoA, (vii) Mode ship, (viii) Draft, (ix) Keel

Q14. Draw a neat sketch of ship with axis system and define various degree of freedom systems.

Q15. Draw a neat sketch of ship, and define general arrangements.

Q16. What are the reasons for castle deck

Q17. Draw a neat sketch of different types of bulkhead and write what is their function

Q18. Describe the points to be considered while making tank arrangements.

Q19. Draw and explain General arrangement for consideration of accommodation layout in merchant ships.

Q20. What is the difference between GA of Cargo vessel, Tanker vessel, and passenger vessel?

Unit-2

Q1. Name different classification societies for ships and what are their significance

Q2. Write short note on role and impact of regulating authorities on ship design.

Q3. What is principle law of floatation? Describe with example

Q4. What is block coefficient, water plane coefficient, prismatic coefficient, mid ship section coefficient.

Q5 What is law of floatation? Give example of (i) Positively buoyant structure, (ii) Neutrally buoyant structure

Q6. Find the area of Circle, Square, and Any irregular shape.

Q7. What is first moment of area; write its expression, for what purpose it is used in ship.

Q8. Find the (i) volume (ii) Under water volume of (a) cylinder of radius (r) and height (h) (b) for cuboid with dimensions length (L), breadth, (B), height (H)

Q9. How we can find the C.O.G of irregular shape body?

Q10. How to find the volume of displacement for a ship using (i) crossectional area (ii) Using water plane area.

Q11. What is centre of floatation? Find how to find the Centre of floatation of water plane area.

Q12. Write hull form characteristic required for (a) Displacement type mono hull boats, (b) Semi-planning vessels.

Q13. Write the hull from characteristic of (a) catamaran vessel, (b) Swath vessel, (c) Sea going vessel.

Q14. Write the advantages and disadvantages of forward section shape, U and V.

Q15. What is ship resistance? What are the functions of bulbous bow?

Q16. What are the criteria for designing of stern forms?

Q17. Write the benefits of having (a) Water line above propeller, (b) Waterlines forward to propeller.

Q18. What are the principle parameters of hull form?

Q19. What is meant by propeller clearance? And what are the propeller clearance offsets.

Q20. Write short note on computer added hull form design.

Q21. Describe the design hull.

Unit-3

Q1.What is utility of load line assignment.

Q2. What are the considerations which affect the free board?

Q3. Write note on considerations which affect the freeboard listed below, (i) Strength of hull, (ii) protection of crew, (iii) Stability, (iv) Geometry of vessel reserve buoyancy.

Q4. Differentiate between type A and type B ships.

Q5. Write how, various seasonal and fresh watermarks are obtained, (i) Tropical freeboard mark, (ii) Water free board mark, (iii) Winter north Atlantic free board (WNA), (iv) Fresh water

Q6. Write short note on (i) Passenger Ship subdivision load line (ii) Environmental subdivision protection.

Q7. What is displacement tonnage? Write expression for finding displacement tonnage with clearly indicating each and individual terms in that expression.

Q8. Write short note on gross tonnage.

Q9.Write short note on net tonnage? Mathematical expression for finding net tonnage with clearly specifying each individual term of expression.

Q10. Why Moorsoom system of tonnage with clearly specifying each individual term of expression.

Q11. What is the effect of tonnage on DWT.

Unit-4

Q1. What is the use of parent ship analysis? Explain with an example.

Q2. Considering the parent ship analysis explain fairing process.

Q3. How table of offset is prepared in parent ship analysis.

Q4. Which ship characteristics are affected by main dimension? Explain briefly

Q5. Draw a flow chart for explaining design of a vessel from parent ship.

Q6. Write the units and definition of following (i)DWT, (ii) D, (iii) LBP, (iv) V, (v) g, (vi) B, (vii) D, (viii)T, (ix) T, (x) CB, , (x)Fn

Q7. Explain How to obtain first estimate of main dimensions and coefficients.

Q8. How estimation of Loaded displacement is obtained for tankers.

Q9. Write Schneekluth, and Ashik’s formula for for obtaining estimation of length of required vessel from parent container vessel.

Q10.What is block coefficient? Write its expression with clearly indication all terms? How estimation of block coefficient can be obtained from parent tanker vessel .[Hint: Dankwart Formula, Schneekluth]

Unit-5

Q1. Find the area of Trapezium with ‘a’ and ‘b’ are lengths of the parallel sides, and ‘h’ the perpendicular distance between them. How areas of water planes and other Ship-sections can be obtained.

Q2. Write the formula for Simpson rule and trapezoidal rule .

Q3. Use the trapezoidal Rule to find the area of water plane which has the following ordinates, 10 meters apart. 8, 14.6, 17.2, 16.2, 11.8, 4 meters

Q4. Use Simpson’s First rule to find the area of water plane which has the following half-ordinates, spaced 12 meters apart: 1.7,5.9,7.0,5.2,1.3 meters.

Q5. Use the trapezoidal Rule to find the area of water plane which has the following ordinates, 10 meters apart. 9, 14.8, 16.2, 15.2, 14.8, 3.4.

Q6. Use Simpson’s First rule to find the area of water plane which has the following half-ordinates, spaced 12 metres apart: 1.6,5.6,7.0,5.1,1.8 meters.

Q7. Find the area of waterplane, using Simpsons second rule. The common interval is 15 minutes and the ordinates are: 0;9.0;13.3;14.7;12.8;7.5;0.6 metres.

Q8. Write the formula for Five eight rule.

Q9. Three ordinates a, b, c are 12 meters apart and have lengths of 29.2, 33.5, and 37.6 meters resp. Find the area contained between a and b

Q10. A water plane has ordinates, 20 meters apart, of 1.6, 13.6, 26.5, 25.1, 10.6, and 2.1 meters. There is also an intermediate ordinate, midway between ythe first two, of 9.4 metres. Find the area.

Q11. Three men are working at a capstan and push on bars 3 metres long with forces of 70, 95, 86 kg respectively. Find the moment to turn the capstan.

Q12. A sea saw is exactly balanced about its centerline. Weights of 50 kg and 90 kgs are placed on one side at distances of 3 meters and 7 meters, respectively, from the centre line. What weight must be placed on the other side, at a distance of 6 meters from the centre, to cause the see saw to balance once more.

Q13. A ship’s underwater volume is divided into following vertical crossections from forward to aft, space 20 metres apart: 10;91;164;228;265;292;273;240;185;111;67 square metres. If the same under water volume is divided into waterplanes, 2 metres apart their areas from keel upwards are 300; 2704; 31110; 3597; 3872 square metre. Find the position of C.O.G of the volume (a) fore anf aft relative to mid ordinate, (b) Vertically above the keel.

Q14. A waterplanes are 60m long and has ordinates, from forward to aft of 1, 6.9, 11.1, 11.2, 8.9, 5.0 metres. Thers is also an intermediate ordinate of 3.8 metres, midway between the first two forward ones. Find the area and position of C.O.G of this water plane.

Q15. A vessel has water plane, 2 metres apart, from keel iupward, of 24, 400, 807, 1032, square metres. An intermediate waterplane, 1 metre above the keel, has an area of 153, square metres. Find the displacement and KB, when the vessel is floating at uppermost waterplane.

Q16.A Ship displaces 28,800 cubic ,etres and is heeled so that the volume of the immersed wedge is 1500 cubic metres. The distance between the C.O.G of the of the immersed and emerged wedges is found to be 9 metres, Find the shift of B.

Q17. The inclining experiment is performed on ship and her GM is found to be 1.90m. her displacement in salt water is 3200 tonnes and the Moment of inertia of her waterplane was 17,070, if her KB is 1.62 metres, what is her KG.

Q18. A box shaped vessel is 60m long, 10m broad and floats at a draft. Find her BM and height of the metacentre

Q19. A ship of 6420 tones displacement has GM of 0.67m Find her moment of static stability at an angle of heel of 9 degree.

Q20. A ship has displacement of 4500 tonnes and GM of 0.24m. Aweight of 270 tonnes is then loaded on deck, so that its C.O.G is 5m above that of the ship and the BM is then found to be 4.40m. Find the new GM and the angle of loll, if any.