

B.E. Degree Examination, September 2020

Semester - VIII

MR16801 Marine Vehicle Performance

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions**PART A - (8 X 2 = 16 marks)**

1. The power of the engine depends upon
a) Frictional resistance b) Wetted surface area c) block coefficient d) total resistance.
2. Noise is also a form of
a) thrust b) vibration c) turbulence d) cavitations
3. If the thrust developed by the propeller is zero, then slip is
a) Nil. b) maximum c) equal to apparent slip d) equal to wake speed.
4. Controllable pitch propeller varies with the
a) power output b) slip c) Pitch angle d) SFC
5. When 'Admiralty coefficient is used?
6. How the Propeller Pitch is calculated?
7. Why the Rudder turning angle is limited?
8. What is Simple harmonic motion?

PART B - (4 X16 = 64 marks)

09. (a) A 6m model of a ship has a wetted surface area of 8m^2 . When towed at a speed of 3 knots in Fresh water the total resistance is found to be 38N. If the ship is 130m long, Calculate the effective power at the corresponding speed. Take $n=1.825$ and calculate f from the formula. SCF 1.15 **(16)**
- (OR)**
- (b) The normal speed of ship is 14 knots and the fuel consumption per hour is given by $0.12+0.001V^3$ tonne, with V in knots, calculate
a) total fuel consumption over a voyage of 1700 nautical miles
b) speed at which the vessel must travel to save 10 tonne of fuel per day. **(16)**
10. (a) The total resistance of a ship at 13 knots is 180kN the QPC is 0.70, shaft losses 5% and the mechanical efficiency of the machinery is 87%. Calculate the indicated power. **(16)**
- (OR)**
- (b) A propeller 4.6m diameter has a pitch of 4.3 m and boss diameter of 0.75m. The real slip is 28% at 95rev/min. Calculate the speed of advance, thrust and thrust power **(16)**
11. (a) A rudder has an area of 15m^2 with its centre of effort 0.9m from the centre of stock. The maximum rudder angle is 35° and it is designed for a service speed of 15 knots. calculate the diameter of rudder stock if the maximum allowable stress in the stock is 55MN/m^2 and the rudder force parallel to the centre line of the ship is given by $F=580Av^2$ N where v in m/s **(16)**
- (OR)**
- (b) A ship 150m long and 8.5m draught has a rudder whose area is one sixtieth of the middle line plane and diameter of stock 320mm. calculate the maximum speed at which the vessel may travel if the maximum allowable stress is 70MN/m^2 , the centre of stock 0.9m from the centre of effort and the maximum rudder angle is 35° . Take rudder force parallel to the stream line as $580Av^2\text{N}$. **(16)**

12. (a) Discuss in detail the different types vibration that occur on board a vessel and its effect on ship structure. **(16)**

(OR)

- (b) With reference to engine shafting system discuss the source, measurement, and action to dampen the same. **(16)**