INDIAN MARITIME UNIVERSITY

(A Central University Government of India)

END SEMESTER EXAMINATIONS-JUNE/JULY 2019

B.Sc (Nautical Science)

Semester-I

Nautical Physics-I- UG21T2105

Date: 03-07-2019	Maximum marks:70
Time:3 Hours	Pass marks:35

Note: Answer any SEVEN from the following 9 Questions.

All questions carry equal marks.

(7 ×10 =70)

1.a)Compute the rotational kinetic energy of a 2 kg wheel rotating at 6 revolutions per second, if the radius of gyration of the wheel is 0.22m.(5)

b)Explain anomalous expansion of water. (5)

2.a)A body whose mass is 6 kg is acted upon by a force which changes its velocity from 3 m/s to 5 m/s.find the impulse of the force.if the force is acted for 2 seconds, find the force in newton. (5)

b)What is Reynolds number? how is it related with critical velocity. (5)

3.a)Explain the term "Gyro inertia" (5)

b)What do you understand by capillarity? (5)

4.a)Define mechanical advantage, velocity ratio and efficiency as applied to machines. Derive the relation between them. (5)

b)Why the bottom of the ship is made heavy. (5)

5.a)Define and explain the term viscosity and coefficient of viscosity. (5)

b)State and prove the Bernoulli's equation for the liquid of flow. (5)

6.a)Define surface tension ?Derive an expression for the excess pressure inside the soap bubble of radius R. (5)

b)With the help of neat sketch,explain the differential pulley and derive an expression for its efficiency. (5)

7.a)State Pascal's law.Describe one experiment to demonstrate this law. (5)

b)Calculate the viscuous force on a ball of radius 1 mm moving through a liquid of viscosity 0.2 Nsm^{-2} at a speed of 0.07 ms^{-1}. (5)

8.a)Explain the principle, construction and working of hydraulic brake. (5)

b)Determine the force required to double the length of a steel wire of cross section 0.5 cm^2.Young's modulus of steel is 2×10^{11} N/m^2 (5)

9. a)Explain the different modes of heat transfer. (5)

b)State and explain Hooke's Law. (5)

****