INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

June 2017 End Semester Examinations
Diploma in Nautical Science – First Semester

(Applied Sciences – UD11T 1102)
(Aug' 2009 to Feb' 2012 batches only)

Date: 16.06.2017 Maximum Marks : 70
Time: 2 Hrs Pass Marks : 25

NOTE: Question paper consists of two sections. use separate answer sheets for each section.

SECTION-A

Applied Physics

Answer any 7 questions from the following 9 questions.

1. Define the following terms (7× 5 =35)

   a) angular velocity b) angular acceleration c) angular momentum.

2. A constant retarding force of 60 N is applied to a body of mass 30 kg moving initially with a speed of 18 m/s.how long does the body take to stop?

3. Define thermal conductivity. Discuss some of the application of thermal conductivity in daily life.

4. How much heat is gained by 60 g of mercury when its temperature rises from 27°C to 60°C.The specific heat capacity of mercury is 1.39 j/g°C.

5.A particle executes S.H.M given by the equation

$Y = 12 \sin(4000t + \pi/6)$

Calculate a)Velocity at t= 2.5 S

b)Displacement at t= 1.25 S

c)Accelaration at t=5S.

6.Discuss the characteristics of musical sound.

7. Density and pressure of a gas are 1.98 kg/m^3 and $1.013 * 10^5$ N/m^2 respectively. if the adiabatic constant is 1.41.calculate the wavelength of sound if frequency 1000 HZ.

8.An optical fiber($\mu = 1.72$) is surrounded by a glass coating ($\mu = 1.5$).find the critical angle for the total internal reflection at the fiber glass interface.

9.Explain with neat diagram, construction and working of prism binoculars.

SECTION-B

APPLIED CHEMISTRY

Answer any 7 questions

1.Define the terms pollution and pollutants? (5 marks)

2.Explain the following:

a) preparation of chloroform
b) formation of Aniline (5 marks)

3.Draw a neat diagram of Rutherford model of an atom and explain it. (5 marks)

4.An aromatic compound containing 92.3% carbon,7.7% hydrogen having molecular mass of 77.5 gms/mole. what is its molecular formula. (5 markss)

5.what is meant by acid rain and explain the ill effects of acid rain. (5 marks)

6.Define the following terms
a)COD b) BOD (5 marks)

7. Sketch and explain briefly flash point of lubricating oils as determined by the closed cup method. (5 marks)

8.write the structural formula of:

a)Propylene (C_3H_6)
b)Butylene(C_4H_8) (5 marks)

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