

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)
May-June 2018 End Semester Examinations
Diploma in Nautical Science (DNS)
Semester : I
APPLIED SCIENCE (UD21T1102)

Date: 05-06-2018
Time: 2 Hrs

Max.Marks: 70
Pass Marks: 25

SECTION-A (PHYSICS)

Answer any seven questions from the following nine questions.

(7×5=35)

1. Explain the term "Gyro inertia". (5)
2. State newton's second law of motion. Derive the relation between force and acceleration. (5)
3. What is meant by anomalous expansion of water. (5)
4. Explain h-s diagram in detail. (5)
5. A locomotive approaches and passes a person standing beside the track at 30 m/s.its whistle is emitting a note of frequency 2000 Hz.what frequency will the person hear.
 - a) As the train approaches.
 - b) As it recedes.
- Given that speed of sound in air is 340 m/s. (5)
- 6.Discuss the characteristics of sound. (5)
- 7.The equation of an oscillating particle is given by $x= 2 \sin (\pi t /2 + \pi/4)$ Where x is in metre and t is in seconds.
find
 - a)period of the oscillation
 - b)maximum velocity
 - c)maximum acceleration.
 - d) initial displacement. (5)
8. Image is formed on a screen placed at a distance of 15 cm from convex lens of focal length 10 cm.find the position of the object and also the magnification. (5)
9. Explain the phenomenon of total internal reflection. (5)

SECTION-B(CHEMISTRY)

Answer all the questions

10. Define the terms pollution and pollutants. (3)
11. Explain the following
- a) Preparation of chloroform.
 - b) Formation of Aniline. (5)
12. Draw a neat diagram of Rutherford model of an atom and explain it. (5)
13. An aromatic compound containing 92.3% carbon, 7.7% hydrogen having molecular mass of 77.5 grams/mole. What is its molecular formula. (3)
14. What is meant by acid rain and explain the ill effects of acid rain. (5)
15. Define the following terms.
- a)COD b)BOD. (4)
16. Sketch and explain briefly flash point of lubricating oils as determined by the closed cup method. (5)
17. Write the structural formula of
- a)Propylene (C₃H₆)
 - b)Butylene (C₄H₈) (5)