INDIAN MARITIME UNIVERSITY

(A Central University, Government of India)

End Semester Examination Dec 2019/Jan 2020

DNS - Diploma in Nautical Science

Semester -I

UD11T1102- Applied Sciences

Date: 10.12.2019	**Max Marks: 70**
Time: 2 Hours	**Pass Marks: 25**

NOTE: Question paper consists of two sections. Use separate answer sheets for each section.
Answer any 7 questions from the following 9 questions.
All questions carries equal marks.

PART-A

Applied Physics

(7× 5 =35)

1. State and Explain Newton's law of gravitation. (5)

2. State and prove theorem of parallel axis. (5)

3. Explain the different modes of heat transfer. (5)

4. 10 g of ice at 0^0C are added to 100 g of water at 20^0C.if the final temperature of the mixture is 10.9^0C.find the latent heat of fusion of ice. Specific heat of water is 4200 KJ/kg^{0}C. (5)

5. A man wants to measure the height of a building. He notes that a long pendulum extends from the celling almost to the floor and that its period is 24 sec. Determine Height of the tower and the period when the pendulum is taken to the moon where g=1.67 m/s^2 (5)

6. Arrive at the Newton's formula for the velocity of sound in air. (5)

7. Discuss the Characteristics of Sound. (5)

8. Explain the Phenomenon of Total internal reflection. (5)

9. Explain with neat diagram, the construction and working of Periscope. (5)

PART-B

APPLIED CHEMISTRY

1. Explain the following:
   a) Preparation of chloroform
   b) Formation of Aniline (3)

2.Define the terms pollution and pollutants. (3)

3. State Gay Lussac's Law and Graham's Law of Diffusion. (5)

4. Describe the sources and ill effects of cadmium and Lead. (4)

5. Sketch and explain briefly flash point of lubricating oils as determined by the closed cup method. (8)

6. Give the IUPAC names and write down the structure of the following. (5)
   a) n-butyl alcohol
   b) Glycerol

7. Give preparation of: (4)
   a) Glycerol from propylene
   b) Phloroglucinol from trinitro benzoic acid

8. Define: (3)
   a) BOD
   b) TLV
   c) Auto ignition temperature

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