

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2022
Programme Name: DNS
Semester: I
Subject Code: UD11T5102
Subject Name: Applied Sciences

Date: 26.12.2022

Max Marks: 70

Duration: 02 Hours

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Attempt any five questions from section C.
- (iii) Non-Scientific Calculator is permitted.

Section A

Choose the correct answer.

(01 Mark Each)

1. An object moving in a circle of radius 'r' with a constant speed 'v' has a constant acceleration towards the centre equal to
 - a) v^2/r
 - b) v/r
 - c) $v^2 \times r$
 - d) $v \times r$
2. Due to energy dissipation by viscous forces in air, if simple harmonic variations a pendulum die away after some time, then oscillation is said to be
 - a) Undamped
 - b) Free
 - c) Damped
 - d) Dependent
3. Velocity of sound waves through any material depends on
 - a. The material density 'd' only.
 - b. The materials modulus of elasticity 'E' only.
 - c. The materials density 'd' as well as its modulus of elasticity 'E'.
 - d. Neither the materials density 'd' nor its modulus of elasticity 'E'.
4. To help avoid reflections, the bridge front windows shall be inclined.
 - a. At an angle of not less than 25° and not more than 10° .
 - b. At an angle of not less than 15° and not more than 25° .
 - c. At an angle of not less than 25° and not more than 15° .
 - d. At an angle of not less than 10° and not more than 25° .
5. When the bulb of a liquid in glass thermometer is brought in contact with a hot substance then the liquid inside it.
 - a) Contracts
 - b) Expands
 - c) Remains same
 - d) Varies linearly with temperature.

18. a) Explain why water has its minimum volume and maximum density at 4°C ?
- b) What is a transformer? Explain with neat diagram the principle and construction of transformer?
19. a) Write the equation of a simple harmonic motion with an amplitude of 5 cm if 150 oscillations are performed in one minute and the initial phase is 45° .
- b) What is an electric shock? What are the conditions that affect the electric shock?
20. a) Define Doppler effect in sound. Discuss the following cases
1. Source is approaching a stationary listener.
 2. Source receding from stationary listener.
- b) A loud symphonic passage produces an intensity level of 70 dB. A person speaking normally produces a sound level of 40 dB. Compare their intensities.
21. a) Explain the term " Looming " (mirages on sea).
- b) Explain with neat diagram working of radio transmitter?
22. a) Monochromatic light of wavelength 600 nm is incident from air on a glass surface. What are the wavelength, frequency, and speed of the refracted light? Take μ of glass as 1.5.
- b) Explain the neat diagram working of Radar Transmitter?

