Indian Maritime University

(A Central University, Govt of India)

Supplementary Examinations – March / April 2024

Programme Name: B Sc (NS)

Semester: I

Subject Code: UG21T5103

Subject Name: Physics

Date: 13/04/2024	Max Marks: 70
Duration: 03 Hrs	Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted.
(ii) Options, if any, are specified in respective section.
(iii) Scientific Calculator is permitted.

Section A
Answer all the questions
(10 x 1 = 10)

1. Soft magnetic materials have:
   a) Low retentivity and high coercivity
   b) Low retentivity and low coercivity
   c) High retentivity and high coercivity
   d) High retentivity and low coercivity

2. The no. of stages / sequences in one Carnot cycle are:
   a) 2 b) 3 c) 4 d)5

3. SONAR stands for:
   a) Sound Navigation & Research
   b) Surface Navigation & Ranging
   c) Solar Navigation & Ranging
   d) Sound Navigation & Ranging

4. The type of Lens(s) present in the prism binoculars are:
   a) Objective lens
   b) Eyepiece lens
   c) Both (a) & (b)
   d) None of these

5. Which of the following statement(s) are true for "Reynolds numbers" in fluid dynamics.
   a) It helps to categorise between laminar flow and turbulent flow, and it is a dimensionless no.
   b) It helps to categorise between laminar flow and turbulent flow, and it is unit is Pascal
   c) It helps to categorise between Fluid of different density and its unit is Poise
   d) Both (a) & (c) are correct

6. Hydraulic works on the principle of:
   a) Bernoulli`s Principle
   b) Pascal's Law
   c) Archimedes Principle
   d) Viscosity of Liquid

7. Two Lenses of Power – 5D and +5D are in contact with each other. The focal length of the combination is:
   a) -20cm b) -10cm c) +20cm d) +10cm

8. The angle between the compass needle and the magnetic needle to the presence of iron within the ship is known as:
   a) Induced Magnetism
   b) Magnetising Force
   c) Magnetic Deviation
   d) Magnetic Variation

9. What does the term "chromaticity" of light refer to?
   a) The intensity of light b) The speed of light c) The color of light independent of its intensity d) The angle at which light is refracted

10. What is the primary property that defines a material as elastic?

    a) Its ability to withstand high temperatures b) Its ability to return to its original shape after deformation c) Its ability to conduct electricity d) Its ability to change colour under stress

Section B
Answer all the questions
(5 x 2 = 10)

11. State second Law of thermodynamics.
12. What is cargo sweat?
13. What do we mean by angle of Repose of granular substances/objects?
14. What is magnetic permeability?
15. What is venturi meter?

Section C
Answer any five out of seven questions.
(5 x 10 = 50)

16.(a) Write three differences between transverse wave and longitudinal wave?
(b) Explain Echo-sounder along with its working principle.
[4+6=10]

17.a) Define Relative and absolute humidity.

b) calculate the coefficient of performance of a Refrigerator, if it extracts 1200 J of heat from the cold reservoir and releases 1800 J of heat to the hot reservoir in each cycle. [5+5=10]

18.(a) What do you mean by magnetic Declination and Dip or Inclination?
(b) Calculate the earth`s total magnetic field at a place where the angle of Dip is $45^0$C horizontal component of earth`s magnetic field 0.8 Gauss.
[4+6=10]

19. a) Define dry and wet hygrometer.

b) State the principle and explain the working of Sextant. [4+6=10]

20.(a) State Hooke`s Law and define Young`s Modules of elasticity.
(b)The electric limit of brass is 379 M Pa. What should be minimum diameter of brass rod if it is to support a 400 N load without exceeding the elastic limit? [5+5=10]

21.(a) Define conduction, convection and radiation.
(b) A factory siren whistles a note of frequency 680Hz. A man travelling in a car at 108 km/h moving towards the factory hears the whistle. What is the apparent frequency of the sound as heard by him? Speed of air = 340m/s.
[6+4=10]

22. a) State Bernoulli's theorem and explain its application in detail.

b) Calculate the Reynolds number if a liquid of viscosity 0.5 Ns/m^2 and relative density of 500 Kg/m^3 through a 10 mm pipe flows with a Velocity of 3 m/s.
[7+3=10]