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All

Jharkhand University of Technology, Ranchi

1st Semester Diploma Examination, 2022

Subject : Engineering Physics-I **Subject Code : 103**

Time Allowed : 3 Hours **Full Marks : 80**

Pass Marks : 26

Answers in your own words.

Answer all questions.

Marks are given on the right margin.

1. Choose the correct answer: 2×8=16

(i) Unit of acceleration is

(a) m/s (b) m/s^2

(c) m/s^3 (d) None of these

(ii) Which is a vector quantity?

(a) Force (b) Work

(c) Speed (d) Distance

(iii) What type of wave carry sound in air?

(a) Transverse wave (b) Longitudinal waves

(c) Both of these (d) None of these

(iv) How many significant digits are in 0·04058?

(a) 4 (b) 5

(c) 6 (d) 3

(v) Viscosity is a property of

(a) liquid only (b) solid only

(c) solid and liquid only (d) liquid and gases only

(vi) The energy possessed by a body by the virtue of its motion is called

(a) Kinetic energy (b) Potential energy

(c) Total energy (d) Motion energy

(vii) The unit of current is

(a) Ampere (b) Weber

(c) Tesla (d) Coulomb

(viii) The spherical shape of rain drop is due to

(a) Density of water (b) Atmospheric pressure

(c) Gravity (d) Surface tension

2. (a) State and explain Newton's law of gravitation.

(b) Define surface tension and write its S.I. unit. Write the relation between surface tension, capillary rise and radius of capillary. 6+4=10

3. (a) Define molecular range.

(b) Define angular displacement, angular velocity and angular acceleration. Establish the relation between linear velocity and angular velocity. 2+8=10

4. (a) State and explain Newton's laws of motion.

(b) Derive the equations of potential energy and kinetic energy. 6+4=10

5. (a) State Hook's law. Define Young's modulus, Bulk modulus and modulus of Rigidity.

(b) Define viscosity. 8+2=10

6. (a) Define the linear, aerial and cubical expansion and give the relation between them.

(b) Define inertia. 8+2=10

7. Answer the following:

(a) Define Echo and Reverberation.

(b) Define Node and Antinode.

(c) Write Sabine's formula. 4+4+2=10

8. Find the viscous force acting on a rain drop of radius 0·5 mm falling with a terminal velocity of 2 ms^{-1} in air. Given, viscosity of air (η) = 18×10^{-6} $kgm^{-1}s^{-1}$. 4