

END OF SEMESTER EXAMINATIONS, APRIL / MAY - 2017
MECHANICS, PROPERTIES OF MATTER & ACOUSTICS
SUBJECT CODE : 12UAPH01

MAJOR : B.Sc. (PHYSICS) / Physics CCH
TIME : 3 HOURS

SEMESTER : I
MAX. MARKS: 75

SECTION A - (10 X 1 = 10)

Answer ALL the Questions:

- Kinetic energy before collision is equal to kinetic energy after collision for ____ collision.
 a) elastic b) inelastic c) both a & b d) none of the above.
- Potential energy of a rigid body is also called as ____ energy.
 a) Rotational potential b) angular potential
 c) self d) none of the above
- Time average kinetic energy is equal to ____ of the total energy.
 a) $\frac{1}{4}$ b) $\frac{3}{4}$ c) $\frac{1}{2}$ d) none of the above
- Moment of inertia of a rigid body about a fixed axis _____.
 a) $1 = MK^2$ b) $1 = M / K^2$ c) $1 = K^2 / M$ d) $1 = MK$
- The intensity of a gravitational field at a point is the ____ experienced by unit mass situated at that point.
 a) Force b) workdone c) pressure d) none of the above
- When a beam is bent, the filaments lying on that surface retain their original length, such surface is called _____.
 a) Neutral surface b) upper surface
 c) lower surface d) none of the above
- Viscosity exists in _____.
 a) Gases b) liquids c) both liquids & gases d) none of the above
- Equation of continuity is _____.
 a) $a_1 v_1 p = a_2 v_2 p$ b) $a_1 v_2 p = a_2 v_1 p$
 c) $a_1 v_1 = a_2 v_2$ d) none of the above
- When resonance occurs, the body vibrates with ____ amplitude.
 a) Large b) Medium c) small d) none of the above
- Audible range of frequency is between _____.
 a) 200 Hz & 20,000 Hz b) 20 Hz & 20,000 Hz
 c) 200 Hz & 2000 Hz d) none of the above

SECTION B - (5 X 4 = 20)

Answer ALL the Questions:

- a) Explain the conservation of linear momentum of a system of particles.
 [OR]
 b) Distinguish between elastic collision and inelastic collision.
- a) Explain perpendicular axis theorem.
 [OR]
 b) Find the average potential energy of a harmonic oscillator.
- a) Define gravitational field and gravitational potential.
 [OR]
 b) A steel wire of 1mm radius is bent to form a circle of radius 10cm. Young's modulus of steel = 200 GPa. What is the bending moment?

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14. a) Distinguish between stream line flow and turbulent flow of a liquid.

[OR]

b) Discuss the energies of the liquid.

15. a) Write short note on sharpness of resonance.

[OR]

b) List the applications of ultrasonic wave.

SECTION C – (5 X 9 = 45)

Answer ALL the Questions:

16. a) Discuss the angular momentum of a system of particles.

[OR]

b) Describe the gravitational potential energy of a system of particles.

17. a) Find an expression for the moment of inertia of a uniform circular disc about one of its diameter.

[OR]

b) Derive an expression for finding the period of oscillation of a compound pendulum.

18. a) Find the gravitational potential due to a spherical shell at a point outside the shell.

[OR]

b) Describe an experimental method of finding the Young's modulus of a bar by uniform bending.

19. a) State and explain Bernoulli's theorem.

[OR]

b) Explain with theory the Jaeger's method of determining the variation of surface tension with temperature.

20. a) Deduce Sabine's reverberation formula?

[OR]

b) Explain how ultrasonic waves can be produced by Magnetostriction method.
