PHYSICS

BOOKS - JEEVITH PUBLICATIONS PHYSICS (KANNADA ENGLISH)

SUPER MODEL QUESTION PAPER (WITH ANSWERS)

Part A

1. What are derived units ?

2. If $\vec{A} \cdot \vec{B} = \left| \vec{A} \times \vec{B} \right|$ then fibnd the angle between $\vec{A}$ and $\vec{B}$

3. Represent KE and PE of a particle executing SHM graphically.

4. Express the position vector of centre of mass of a right body for a continuous distribution of mass particles.

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5. What is meant by elasticity?

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6. What is buoyancy or force of buoyancy ?

7. Give an example for a compressible substance .

8. Name the device used to measure the temperature of a body.

9. What is a diathermic wall ?

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10. What is meant by a free path ?

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Part B

1. Mention any two contributions of physics to the society.

2. Suggest any two methods of minimizing the

errors.

3. Distinguish between distance covered and

displacement of a particle.

4. Outline the difference between scalars and vectors physical quantities.

5. Distinguish between impulse and impulsive force.

6. Define the term radius of gyration.

7. Explain the uplift of air craft by using Bernoulli theorem .

8. Mention any two arbitrary initial conditions in order to determine the linear simple harmonic motion.

1. State converse law of triangle of forces.

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2. State the laws of friction.

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3. Explain the elastic and inelastic types of collisions.

4. S.T. the time rate of the total angular momentum of a system of particles about a point is equal to the sum of the external torques acting on the system taken about the same point.

5. Derive an expression for the gravitational potential energy of a body . Give the difference between gravitational potential and gravitational potential energy.

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6. State and explain Hooke's law.

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7. Explain the variation of temperature with heat for water at 1 atm with a graph.

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8. Distinguish between gas constant and universal gas constant.

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Part D

1. Show that $v = v_0 + at$ by graphical method.

2. Explain the work done by a varible force.

3. Obtain and expression for the work done by a torque.

4. Distinguish between isothermal and adiabatic processes.

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5. Show that period of a simple pendulum for small angular displacement $T = 2\pi\dfrac{\sqrt{L}}{g}$.

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6. Bring out the differences between longitudinal and transverse mechanical waves.

7. Calculate the minimum and maximum tensions in a string of length 1m, one end of which is tied to a stone of mass 0.010 kg and whirled with a uniform speed of $10ms^{-1}\left(g = 9.8ms^{-2}\right).$

8. An electron and a proton are detected in a cosmic ray experiment, the first with kinetic energy 10 keV, and the second with 100 keV. Which is faster, the electron or the proton? Obtain the ratio of their speeds. (electron mass $= 9.11 \times 10^{-31} kg$, proton mass $= 1.67 \times 10^{-27} kg$, $1eV = 1.60 \times 10^{-19} J$).

9. A star , 2 .5 times the mass of sum , collapse to a size of 12 km with a speed of 1.2 rps . T the object placed on the surface remains stuck to the surface due to gravity ? [mass of sun $= 2 \times 10^{30} kg$]

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10. A' thermacole' icebox is a cheap and an efficient method for storing small quantities of cooked food in summer in particular. A

cubical icebox of side 30 cm has a thickness of 5.0cm. if 4.0kg of ice is put in the box, estimate the amount of Ice remaining after 6 h. The outside temperature is $45°C$ and co-efficient of thermal conductivity of thermacole is $0.01Js^{-1}m^{-1}K^{-1}$. [Heat of fusion of water $= 335 \times 10^3 Jkg^{-1}$]

11. For the travelling harmonic wave y(x,t) $= 20\cos 2\pi(10t - 0.0080x + 0.35)$ where x,y

are in cm and t is in s. Calculate the phase difference between oscillatory motion of two point separated by a distance of (a) 4m (b) 0.5 m (c) $\left(\dfrac{\lambda}{2}\right)$ (d) $\left(\dfrac{3\lambda}{4}\right)$.