

**S. M.B.S.T. College Sangamner , Dist. Ahmednagar**

**Department of Physics**

**Question Bank**

**Class: F.Y.B.Sc.**

**Subject: Physics I Mechanics**

**Sem- I**

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### **Chapter :1 : Motion**

#### **Questions for 1 mark**

1. What is displacement? How does displacement differ from distance travelled?
2. Define average velocity of motion.
3. How is average speed defined?
4. Define instantaneous velocity of motion.
5. How is instantaneous speed defined?
6. Define average acceleration of motion.
7. Define instantaneous acceleration of motion.
8. What is difference between mass and weight?
9. Why is Newton's first law is called law of inertia?
10. What are the different types of motion.
11. What is translational motion?
12. What is rotational motion?
13. What is periodic motion?
14. What is non periodic motion?
15. What is uniform motion?
16. What is non-uniform motion?

#### **Questions for $2\frac{1}{2}$ marks**

1. State and explain Newton's first law of motion.
2. State and explain Newton's second law of motion.
3. State and explain Newton's third law of motion.
4. Explain application of Newton's law in real life.
5. Explain various types of forces in nature.
6. Explain inertial and non-inertial frame of reference.

#### **Questions for 4 marks**

1. What is gravitational force? Give the properties.
2. What is electromagnetic force? Give the properties.
3. What is pseudo force? Illustrate it.

## **Chapter: 2 : Work and Energy**

### **Question. 1 : questions for 1 marks**

1. Define kinetic energy of a body. Give its SI unit.
2. Define potential energy of a body. Give its SI unit.
3. What do you mean by work done? Give its SI unit.
4. State work –energy theorem.
5. Define conservative force. Give its example.
6. Define non- conservative force. Give its example.
7. State law of conservation of energy.
8. State the condition under which a force does no work. Give its example.
9. State the condition under which a force does positive work. Give its example.
10. State the condition under which a force does Negative work. Give its example.
11. When the potential energy of a system is positive? Give example of system having positive potential energy.
12. When the potential energy of a system is negative? Give example of system having negative potential energy.

### **Question. 2 : questions for 2 ½ Marks**

1. State and explain principle of conservation of energy.
2. State and prove work- energy theorem.
3. Define conservative force. With suitable example show that the work done by conservative force during round trip journey or closed path is equal to zero.
4. Define non-conservative force. With suitable example show that the work done by non-conservative force during round trip journey or closed path is not equal to zero.

### **Question. 3 : questions for 6 marks**

1. Explain the term work done. Calculate the work-done by constant force.
2. Explain the term work done. Calculate the work-done by varying force.

## **Chapter: 3 : Fluid Mechanics**

### **Question. 1 : questions for 1 marks**

1. Define the term Fluid.
2. Define Viscosity.
3. Define Viscous force.
4. Define Coefficient of viscosity. Give its S.I. unit and dimension.
5. What do you mean by streamline flow?
6. What do you mean by turbulent flow?
7. Define the term steady flow.
8. What is Reynolds number?
9. What is the value of Reynolds number for stream line and turbulent flow?
10. State Bernoulli's principle.
11. What are different types of energies can a liquid possess?
12. What is equation of continuity?
13. State the principle of venturimeter.

**Question. 2 : questions for 2 ½ Marks**

1. Give the physical significance of Reynold's number.
2. Obtain equation of continuity.
3. Write a note on Reynold's number.
4. Distinguish between steady flow and turbulent flow.
5. Explain few applications of viscous fluids.
6. Explain Pitot tube.

**Question. 3 : questions for 6 marks**

1. State the working principle of venturimeter and discuss in detail the working of venturimeter.
2. Derive the Bernoulli's equation.
3. Obtain an expression for kinetic energy, potential energy and pressure energy of liquid.

**Chapter: 4 : Properties of Matter**

**Question. 1 : questions for 1 marks**

1. What is surface tension? Give its units and dimensions.
2. Define angle of contact. State under what conditions it is zero.
3. Explain why the surface of water in a broad glass vessel is curved near the walls of the vessel.
4. Explain any two applications of surface tension.
5. State the factors which affect the surface tension.
6. Give two important applications of Jaegers method. Why in rainy season oil is spread on pools and ponds?

7. State characteristics of angle of contact.
8. Define the term stress and strain.
9. Define Young's modulus.
10. Define bulk modulus.
11. Define rigidity modulus
12. Define Poisson's ratio.
13. State Hook's law of elasticity.
14. Define modulus of elasticity.
15. Explain why only solid possess all three constants of elasticity.

Question. 2 : questions for 2 ½ Marks

1. Discuss various applications of surface tension.
2. Discuss applications of elasticity.
3. Explain the factors affecting the surface tension of liquid.
4. Show that the work done during longitudinal strain is  
Stretching force X stretch
5. Show that the work done during volume strain is  
 $\frac{1}{2}$  X volume stress X change in volume
6. Show that the work done during shearing strain is  
 $\frac{1}{2}$  X shearing stress X shearing strain
7. Show that poisson's ratio lies between -1 and 0.5.

Question. 3 : questions for 6 marks

1. Describe in detail Jaegers method to determine surface tension of a liquid. Give advantages of Jaeger's method.
2. Derive the relation between three elastic moduli Y, K and  $\eta$ .