

FIRST YEAR HIGHER SECONDARY EXAMINATION

MODEL QUESTIONS

PHYSICS

TIME :2.15 hrs

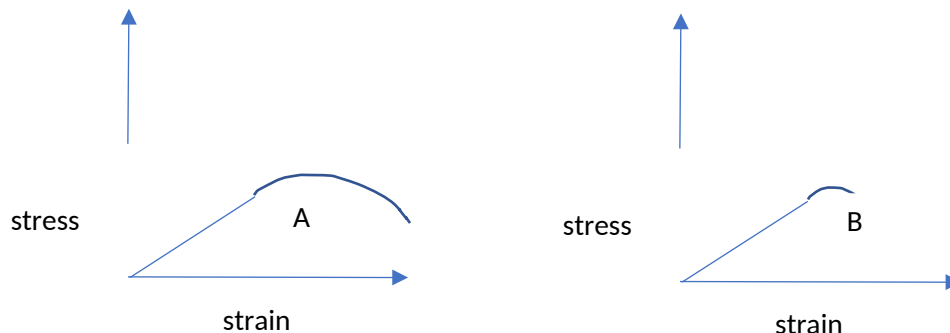
Max .Mark :60

One mark questions (Answer Any 5 questions)

1. Find the number of significant figures in 0.0627
2. Kilowatt hour is the unit of.....
3. Reciprocal of bulk modulus is called.....
4. Raindrops are spherical in shape due to.....
5. Two waves having frequencies 646 Hz and 648 Hz superpose and produce beats what is the beat frequency?
6. A light body and a heavy body are moving with same linear momentum which one has more kinetic energy?
7. The conversion of solid to vapour is called

2 marks question(Answer any 5 questions)

1. Derive the equation for the time of flight of a projectile
2. Differentiate between scalar and vector quantities. Give examples for each
3. A cyclist comes to skidding stop in 10 m. During this process the force on the cycle due to the road is 200 Newton and is directly opposite to the motion. How much work does the road do on the cycle?
4. Stress strain graphs of two materials A and B is shown below



- a. Which material is more ductile?
 - b. State the law which relates stress and strain
5. Consider the flow of a liquid through a pipe of varying cross section
 - a. Write the equation of continuity of flow.
 - b. What is streamline flow?
 6. Name the four-process taking place in a Carnot cycle
 7. Write any two postulates of kinetic theory of gases

3 marks questions(Answer any 6 questions)

1. a. Draw the velocity time graph of uniformly accelerated motion (1)
b. Using the graph obtain the equation $S = ut + \frac{1}{2} at^2$
2. a. State Newton's second law of motion (1)
b. Using the above law derive the equation of force
3. Find out the sign of work done in the following cases
 - a. work done by a man in lifting a bucket out of a well
 - b. Work done by friction on a body sliding down an inclined plane
 - c. work done by the resistive force of air on a vibrating pendulum
4. a. Obtain an expression for escape speed from the surface of Earth. (2)
b. write the relation connecting escape velocity and orbital velocity (1)
5. Obtain relation between coefficient of linear expansion, area expansion and volume expansion
6. Obtain an expression for work done in an isothermal process
7. A wave travelling along a string is described by $y(x, t) = 0.0005 \sin(80.0x - 3.0t)$, in which the numerical constants are in SI units calculate amplitude wavelength period and frequency of the wave

4 marks question(Answer any 3 questions)

1. a. State principle of homogeneity (1)
b. Deduce an expression for centripetal force acting on a body of mass m moving with velocity v in a circular radius r using homogeneity principle. (3)
2. a. Obtain the expression for maximum height and time of flight of a projectile (3)
b. what is the angle of projection for maximum horizontal range (1)
3. A person drives a car along a circular banked road .
 - a. Derive an expression for the maximum safe speed of the car. (3)
 - b. write the expression for optimum speed of the car. (1)
8. a. Define simple harmonic motion (1)
b. Derive an expression for the time period of oscillation of a simple pendulum (3)

5 marks question(Answer any 3 questions)

1. Derive relation $v^2 = u^2 + 2as$ using graphical method (3)
 - a. Identify the type of motion in the region AB (1)
 - b. find the displacement during 8 seconds (1)



2. Derive the relation between torque and angular momentum (3)
state law of conservation of angular momentum (2)
3. A. Derive an expression for acceleration due to gravity at a depth d below the surface of Earth (4)
b. find the value of g at the centre of earth
4. a. State Bernoulli's theorem (1)
b. derive Bernoulli's equation by using a neat diagram (4)
