Grade X

PHYSICS

ASSESSMENT-I

M.M:80

INSTRUCTIONS:

1.Read the question paper carefully.

2. Attempt all the questions.

3. Intended marks are given in the brackets [].

SECTION A

Q1. Multiple choice questions **[15X1=15]**

1.The mass of a child on earth surface is 60kg then his mass on the moon will be:

a) 60kg b) 360kg c) 20kg d) 10kg

2.Select the correct option for circular motion

a)velocity is constant b) acceleration is zero

c) speed is constant d) speed changes

3. When a body falls freely towards the earth then its total energy

a) increases b) decreases c) remains constant d) first increases and then decreases

4. A single fixed pulley is used because

a) it changes the direction of effort conveniently b) it multiplies speed

c) it multiplies effort d) its efficiency is 100%

5. The deviation produced by an equilateral prism does not depend on:

a) The angle of incidence b) The size of the prism

c) The material of the prism d) The colour of light used

6. Light waves pass from air into glycerine and are refracted. What always remain constant when this happens

a) direction b) frequency c) speed d) wavelength

7. For which of the following color, critical angle of light passing from glass to air is minimum

a) red b) violet c) yellow d) green

8. A body at a height possesses

a) kinetic energy b) potential energy c) solar energy d) heat energy

9. The centre of gravity of a hollow cone of height h is at distance x from its vertex where the value of x is

a)h/3 b)h/4 c) 2h/3 d) 3h/4

10. Class II levers are designed to have:

a) MA=VR b) MR>VR c) MA>1 d) MA<1

11. To detect obstacles in their path, bats produce:

a) infrasonic waves b) ultrasonic waves c) electromagnetic waves d) radio waves

12. When a body vibrates under a periodic force, the vibrations of the body are-

a) natural vibrations b) damped vibrations c) forced vibrations d) resonant vibrations

13. By reducing the amplitude of a wave,its

a) pitch increases b) loudness decreases c) loudness increases d) pitch decreases

14. The MA of an ideal single movable pulley

a) 1 b)2 c) less than 2 d) less than 1

15. In an electric cell while in use, the change in energy is from

a) electrical to mechanical b) electrical to chemical

c) chemical to mechanical d) chemical to electrical

Q2.a) State two factors affecting the turning effect of a force. [2]

b)State a factor on which the position of the centre of gravity of a body depends .Explain your answer with an example. [3]

Q3.a) Define the term power. State its SI unit. [2]

b) State the work-energy theorem. [3]

Q4. a) Name the three classes of levers and state how are they distinguished. Give two examples of each class. [2]

b) State four differences between a single fixed pulley and a single movable pulley. [3]

Q5.a) Define the term angle of deviation. [2]

b)The speed of light in air is $3X10^8$ m/s. Calculate the speed of light in glass. The refractive index of glass is 1.5. [3]

Q6. a) State one difference between a musical note and noise. [2]

b) State two applications of echo. [3]

SECTION B

Answer the following (Any 4)

Q1.a) Prove that

Moment of couple = Force X couple arm [3]

b)Draw a neat labelled diagram for a particle moving in a circular path with a constant speed. In your diagram show the direction of velocity at any instant. [3]

c) Describe a simple experiment to verify the principle of moments, if you are supplied with a metre rule, a fulcrum and two springs with slotted weights. [4]

Q2. a) A body, when acted upon by a force of 20kgf, gets displaced by 1m. Calculate the work done by the force, when the displacement is i) in the direction of force , ii) at an angle of 60 With the force, and iii) normal to the force. (g=10 N/kg) [3]

b) State the principle of conservation of energy. Give one example to illustrate it. [3]

c) A pendulum is oscillating on either side of its rest position. Explain the energy changes that take place in the oscillating pendulum. How does mechanical energy remain constant in it? Draw the necessary diagram. [4]

Q3.a) Derive the relationship between mechanical advantage, velocity ratio and efficiency of a machine. [3]

b) Draw a diagram of a lever which is always used as a force multiplier. How is the effort arm related to the load arm in such a lever? [3]

c) Draw a diagram of a combination of three movable pulleys and one fixed pulley to lift up a load. In the diagram show the direction of load, effort and tension in each strand. Find: i) MA ii) VR and iii) the efficiency of the combination, in the ideal situation. [4]

Q4.a) What is a prism? With the help of a diagram of the principal section of a prism, indicate its refracting surfaces, refracting angle and base. [3]

b) Show with the help of a diagram how a total reflecting prism can be used to turn a ray of light through 90 . Name one instrument in which such a prism is used. [3]

c) What is lateral displacement? Draw a ray diagram showing the lateral displacement of a ray of light when it passes through a parallel sided glass slab. [4]

Q5.a)What is meant by resonance? Describe a simple experiment to illustrate the phenomenon of resonance and explain it. [3]

b) Name three characteristics of a musical sound. [3]

c) Define the following terms in relation to a wave: a) amplitude b) frequency c) wavelength, d) wave velocity. [4]

Q6. Solve the following numericals:

a)Calculate the power of an engine required to lift 10^5kg of coal per hour from a mine 360m deep. (take g=10 m/s) [3]

b) A nut is opened by a wrench of length 25cm. If the least force required is 10N. Find the moment of force needed to turn the nut. [3]

c) In a block and tackle system consisting of 3 pulleys, a load of 75kgf is raised with an effort of 25kgf. Find i) the MA ii) the VR iii) the efficiency. [4]