

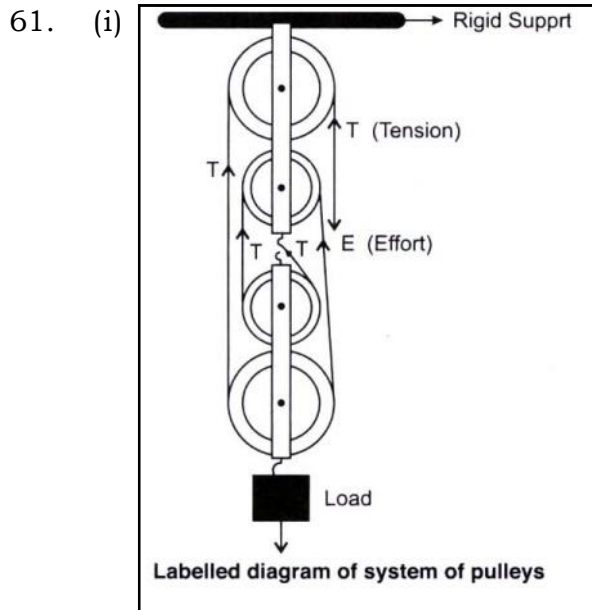
MT EDUCARE LTD.

ICSE X

SUBJECT : **PHYSICS**

Force, Work Energy Power, Machine (Board papers)
Assignment Sheet
STEP UP ANSWERSHEET

54. (i) Centre of gravity of a uniform ring is at its geometric centre.
(ii) False. **(ICSE 2013)**
55. (i) Single fixed pulley.
(ii) Single fixed pulley is used to change the direction of effort applied. **(ICSE 2013)**
56. (i) Ideal machine has 100% efficiency i.e., work done on the machine is equal to the work done by the machine while a practical machine is not 100% efficient due to the energy loss in friction etc. **(ICSE 2013)**
57. (a) No, it will either be acting as a speed multiplier or a force multiplier.
(i) Class 3 lever.
(ii) Class 2 lever. **(ICSE 2013)**
58. Direction of centripetal force is towards the centre of the circle whereas centrifugal force is directed radially outwards. **(ICSE 2013)**
59. Principle of conservation of energy : It states that energy can neither be created nor be destroyed but can be transferred from one form to another form. The total sum of energy in the universe always remains the same. **(ICSE 2013)**
60. Potential energy. **(ICSE 2013)**



- (ii) M.A. = 4 for an ideal pulley system.

(ICSE 2013)

*62.

*63.

64. (i) The weight of a body placed at the centre of the earth is zero as

$$\begin{aligned} g &= 0 \\ \therefore W &= mg \\ &= 0 \end{aligned}$$

(ICSE 2014)

(ii) An ideal machine works on the principle that work input = work output and has 100% efficiency as there is no energy loss.

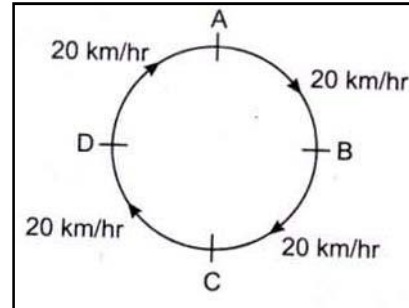
Or

Work done by the machine = Work done on the machine. (ICSE 2014)

65. Yes, it is possible to have accelerated motion with constant speed.

For example, in uniform circular motion, the magnitude of speed is constant but direction of motion changes so that acceleration is produced.

(ICSE 2014)



66. (i) Work is said to be done when the applied force produces displacement in the direction of the force.

$$\text{Work done} = \text{Force} \times \text{Displacement}$$

(ii) Work done is zero by the moon, as there is no displacement since it is moving in a circular path.

(ICSE 2014)

67. (i) Loud speaker : Electrical energy to sound energy.

(ii) Glowing electric bulb : Electrical energy to heat and light energy.

(ICSE 2014)

68. (i) Nuclear energy is the energy released by the atom's nucleus during a nuclear reaction.

(ii) Nuclear fission.

(ICSE 2014)

69.

Advantage	Disadvantage
Tremendous amount of electrical energy can be produced by using a very small amount of nuclear fuel.	The nuclear waste produced by it is the source of harmful radiations and also causes environmental pollution.

(ICSE 2014)

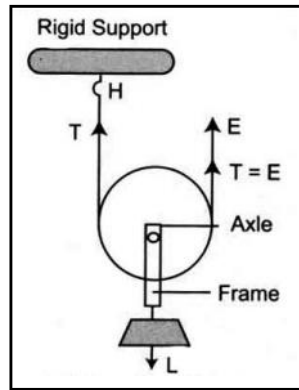
70. (i) Dissipation of energy.

(ICSE 2014)

*(ii)

71. (i) K. E. completely changes to P.E. (K.E. becomes zero)

(ii)



and $\text{Load, } L = T + T = 2T$
 $\text{Effort, } E = T$

$\therefore \text{M.A.} = \frac{\text{Load}}{\text{Effort}}$

(ICSE 2014)

72. $\text{M.A.} = \frac{2T}{T} = 2$

$\text{M. A.} = \frac{\text{Load}}{\text{Effort}}$

$\text{V. R.} = \frac{\text{Displacement of the effort}}{\text{Displacement of the load}}$

$\text{Efficiency, } \eta = \frac{\text{Work output}}{\text{Work input}}$

$\eta = \frac{L \times d \text{ load}}{E \times d \text{ effort}}$

$\eta = \text{M.A.} \times \frac{1}{\text{V.R.}}$

$\eta = \frac{\text{M.A.}}{\text{V.R.}}$

(ICSE 2014)

*73.

74. (i) The thickness of glass slab affects the lateral displacement of light as it passes through a rectangular glass slab.

(ii) On reversing the direction of the current in a wire, the magnetic field produced by it gets **reversed**. **(ICSE 2015)**

75. (i) The position of the centre of gravity of a body of mass depends on its shape, i.e., the distribution of mass in it.

(ii) The S.I. unit of moment of force is Newton metre (Nm.) **(ICSE 2015)**

76. The factors affecting the turning effects of a body are :

(i) the magnitude of force applied.

(ii) the perpendicular distance of the line of action of force from axis of rotation. **(ICSE 2015)**

77. (i) When a number of forces act on a body produce no change in its state of rest or of motion, then the body is said to be in equilibrium.
 (ii) In a beam balance when the beam is balanced in a horizontal position it is in **Static** equilibrium. **(ICSE 2015)**

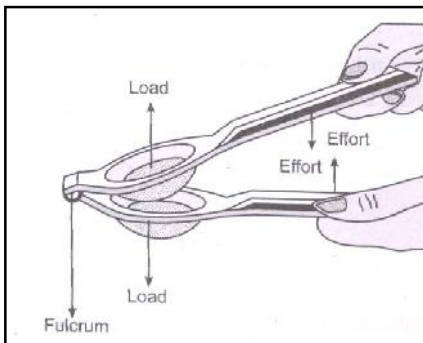
78. (i) Work done is given by the product of the force (F) and the displacement in the direction of the force.
 i.e., Work done = $F \times d$
 (ii) Work done is measured by the product of the force (F) and the component of displacement (d) in the direction of the force.
 i.e., Work done = $F \times d \cos \theta$
 Where θ is the angle which the displacement makes with the direction of the force. **(ICSE 2015)**

79. (i) A scissor is a **Force** multiplier.
 (ii) $1 \text{ kWh} = 3.6 \times 10^6 \text{ J}$ **(ICSE 2015)**

80. The motion of a planet around the sun in a circular path is due to the centripetal force which is provided by the gravitational force of attraction on the planet by the sun. **(ICSE 2015)**

*81.

82.



(ICSE 2015)

83. (i) The physical quantity is power. $1 \text{ H.P.} = 746 \text{ W}$
 (iii) Here the fielder uses a force to oppose the motion of the ball
 Thus, $\theta = 180^\circ$
 Thus
 work done = force (F) \times displacement (d) $\times \cos 180^\circ = - F \times d$
 (since $\cos 180^\circ = -1$)
 Thus, work done is negative. **(ICSE 2015)**

84. (i) Chemical energy to light and heat energy.
 (ii) Heat energy to mechanical energy. **(ICSE 2015)**

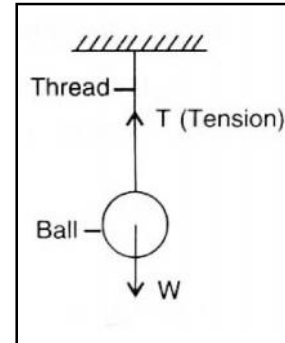
85. Same as 83.

- *86. (i) Gravitational force.
 (ii) The magnitude of gravitational force between the two bodies is inversely proportional to the square of the distance between them. **(ICSE 2016)**

87. Velocity ratio will not change.
Velocity ratio is defined as the ratio of the distance moved by the effort to the distance moved by the load in the same interval of time. **(ICSE 2016)**

88. (i) The stone is moving with a variable velocity.
(ii) No, acceleration is variable. It is directed towards the centre of circular path. **(ICSE 2016)**

89. The force on the ball is the weight W acting vertically downwards and the force on the thread is the tension T upwards.
[ICSE 2017]



90. The gravitational force becomes one-fourth since it is inversely proportional to the square of the distance of separation (i.e., $F \propto \frac{1}{d^2}$)

[ICSE 2017]

91. A uniform circular motion is an accelerated motion with constant speed but variable velocity while a uniform linear motion is with zero acceleration in which both the speed and velocity are constant.

[ICSE 2017]

92. The process of releasing nuclear energy is the **nuclear fission** of uranium – 235 by slow neutrons.

[ICSE 2017]

93. A jack screw is provided with a long arm so that a less force (or effort) may provide the sufficient moment of force to rotate it. **[ICSE 2017]**

94. The class II lever always has M.A. > 1 because it has the effort arm always longer than the load arm. **[ICSE 2017]**

Note : * marked questions are not applicable as per new syllabus.

