1) It states that when we apply a force and that force displaces an object we say work is done.

* It is the product of force and displacement done in direction of force.

2) If we apply a force and it displaces a object we say work is done by the force.

3)

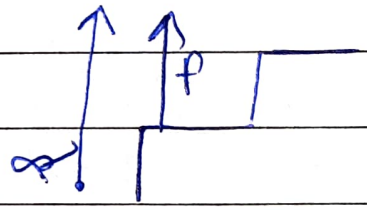
i) A child cycling away.

ii) Moon revolving around earth.

4)

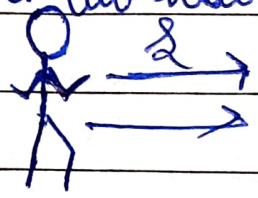
a) The rock doesnt move so, W.D = f x s
no workdone = K x 0 = 0

b) yes, the boy climbing a stair does work done.



c) No, W.D as no motion takes place.

d) As force and s are in same direction there is positive workdone.



5) No, collie doesnt do any work aginst gravity because direction of s is normal and force applied is 90° to the displacement.

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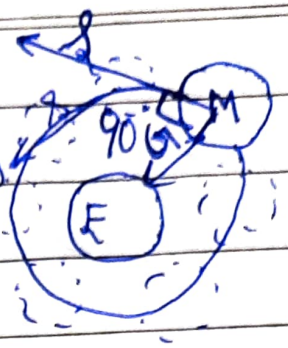
6) Moon Revolves around the earth so, earths gravitation pulls it towards earth. and the moon displaces around the orbit. So,



$W \cdot D = f \times s \times \cos\theta$

$= f \times s \times \cos 90$

Here angle between f and s is 90.

if $\theta = 90°$

$\cos\theta = 0$

$= f \times s \times 0$

$= 0\ J$

∴ So, W.D by moon = 0 J

7) $W \cdot D = f \times s$

8) S.I unit of work is Joule

$W = f \times s =$

$\downarrow N \times \downarrow m$ Newton metre / Joule

$1\ J = 1N/1m$

If 1 N work is done over an area of 1 metre we can say 1 Joule work has been done.

9)

*) A person does no work if there is no change in position or no displacement after force is allied.

*) Work is also done by a force if the force applied on body changes shape and size.

10) Energy :-

→ Its the calability of doing work.

→ It is required to do work and is interchangebly Related That is, workdone can be converted to numerous forms of energy.

→ It is a scalar quantity.

11) S.I unit of energy = Joule

C.G.S = Ergs

Commercial unit = KWh (Kilo watt hour) = 1 unit

~~P = W/t~~

$$P = \frac{W}{t}$$

Energy = Power × Time (By cross multiplication)

↳ K.watt × Hrs

12) If a body can do 1 Joule work its said to have that the posses 1 Joule of energy.

13) energy is the calability to do work and both can be changed into each other.

14) 2 Kinds of mechanical energy is :-

Potential = $M \times g \times h$

Kinetic = $\frac{1}{2} M v^2$

15) Potential energy is a energy of a body possessed possessed due to the virtue of its position or orian

tation. Potential energy is irrelective of path
2. Unit = Joule
Potential energy = $m \times g \times h$
= mass × accelration due to g (9.8 m/s on surface of Earth) × Hight

(16)
a) An archer with streached Bow
b) ~~compression and Rarefraction of string~~.
b) Rarefraction of string

(17) 2 factors are
→ mass
→ accelration due to gravity.

(18)

Potencial energy of Body A	Potential energy of B
= M = 10 kg	M = 20
hight = x	hight = x
g = (let 10 m/s²)	g = (10 m/s²)
Potential energy	Potential energy
= mgh	= mgh
= 10 × x × 10	= 20 × x × 10
= 100x	= 200x

So, Potential energy of B is higher by virtue of its mass.

(19) hight is directly proportional to P.E so, as hight of 2nd floor is more than 1st floor. P.E of 2nd floor will be greater than 1st floor.

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(C) given,

(1) $f = 30N$

$s = 5m$ in direction of force

work $= f \times s \times \cos\theta$ If theta $= 0$ $\cos\theta =$

$= 30N \times 5m \times 1$

$= 150 \times 1 = 150J$

∴ W.D by body $= 150J$

(2)

given,

$M = 20kg$

$s = 2.5m$

so, first we have to find f

$f = m \times g$

$= 20kg \times 10N$

$= 200N$

Now

$W = f \times s = 200 \times \frac{25}{10} = 500J$

$= 2000 \times 5$

$= 10000$

(3) $f = 10Kgf$

$= 100N$

$s = 0.5m$

$\theta = 0°$

$\cos\theta = 1$

$W = f \times s \times \cos\theta$

$= 100 \times \frac{5}{10} \times 1 = 50J$

④ $M = 2.5kg$

$g = 10N$

$P = mg$

$= \frac{25}{10} \times 10 = 25N$

$d = 15m$

$w = P \times d$

$= 25 \times 15$

$= 375J$

⑤ weight $= 150kgf$

$= 150 \times 10$

$= 1500N$

$P.E = 15000$

$P.E = m \times g \times h$

$15000 = 1500 \times h$

$\frac{15000}{1500} = h =$

$10m = h$

⑦ given

$mass = 0.5kg$

$P = m \times g$

$= \frac{5}{10} \times 10 = 5N$

$P.E = m \times g \times h$

$100 = 5N \times h$

$\frac{100}{5} = h \quad 20_m = h$

⑧ Mass $= 60kg$

speed $= 50ms^{-1}$

$K.E = \frac{1}{2} MV^2$

$K.E = \frac{1}{2} \times 60 \times 50^2$

$K.E = \frac{1}{2} \times 60 \times 2500$

$= 75000J$

⑨ given,

$M = 1000kg$

$K.E = \frac{1}{2} MV^2$

$= \frac{1}{2} \times 1000 \times 5184$

$=$