

India's Number 1 Education App

PHYSICS

BOOKS - S CHAND PHYSICS (HINGLISH)

WORK AND ENERGY

Solved Examples

1. How much work is done by a force of 10 N in moving an object through a distance of 1 m in

the direction of the force ?

A. 20J

 $\mathrm{B.}\,100J$

C. 15J

D. 10J

Answer: D

2. Calculate the work done in lifting 200 kg of water through a vertical height of 6 meters (Assume $g=10m/s^2$).



3. A car weighing 1000 kg and travelling at 30m/s stops at a distance of 50 m decelerating uniformly. What is the force exerted on it by the breaks ? What is the work done by the brakes?



4. A child pulls a toy car through a distance of 10 meters on a smooth, horizontal floor. The string held in child's hand makes an angle of 60° with the horizontal surface. If the force applied by the child be 5 N, calculate the work done by the child in pulling the toy car.



5. Calculate the kinetic energy of a body of mass 2 kg moving with a velocity of 0.1 meter per second.

A. 0.01 J

B. 0.02 J

C. 0.03 J

D. 0.04 J

Answer: A



6. Two bodies of equal masses move with unifor veocitits v and 3v respectively. Find the ratio of their kinetic energies.

A. 1:9

B. 1:3

C.9:1

D. None of the above

Answer: A

7. How much work should be done on a bicycle of mass 20 kg to increase its speed from $2ms^{-1}$ to $5ms^{-1}$? (Ignore air resistance and friction).

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8. If acceleration due to gravity is $10m/s^2$, what will be the potential energy of a body of mass 1 kg kept at a height of 5 m?

9. A bag of wheat weighs 200 kg. To what height should it be raised so that its potential energy may be 9800 joules ? ($g = 9.8ms^{-2}$)

A. 10 m

B. 8 m

C. 5 m

D. 4 m

Answer: C

10. A body does 20 joules of work in 20 joules

of work in 5 seconds. What is its power?



11. What is the power of a pump which takes 10 seconds to lift 100 kg of water to a water tank situated at a height of 20 m? ($g = 10ms^{-2}$)

A. 15 kW

B. 2 kW

C. 25 kW

D. None of the above

Answer: B

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12. An electric bulb consumes 7.2 kJ of electrical

energy in 2 minutes. What is the power of the

electric bulb?



13. A radio set of 60 watts runs for 50 hours.How many 'units' (kWh) of electrical energy are consumed ?



14. A family uses 250 units of electrical energy during a month. Calculate this electrical energy in joules.



1. How much work is done when a body of mass m is raised to a height h above the ground?

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2. Derive the SI unit of work.

A. Newton

B. meter

C. newton-meter

D. none of the above

Answer: C



3. Is work a scalar quantity or a vector quantity

?





5. What is the condition for a force to do work

on a body?

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6. Is energy a vector quantity?

7. what are the units of work and energy ?

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8. What is the work done against gravity when

a body is moved horizontally along a

frictionless surface ?

9. By now much will the kinetic energy of a body increase if its speed is doubled ?
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10. What do you mean by kinetic energy ? Derive an expression for the kinetic energy of an object of mass m moving with velocity, v.



11. If the speed of body is halved, what will be

the change in its kinetic energy?

A. 1/4 times

B. 1/6 times

C. 1/8 times

D. 1/10 times

Answer: A

12. On what factors does the kinetic energy of

a body depend ?



13. Which would have a greater effect on the

kinetic energy of an object : doubling the mass

or doubling the velocity?



14. How fast should a man of 50 kg run so that

his kinetic energy be 625 J?

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15. State whether the following objects possess kinetic energy, potential energy, or both :

(a) A man climbing a hill

(b) A flying aeroplane

(c) A bird running on the ground

(d) A ceiling fan in the off position

(e) A stretched spring lying on the ground.



16. two bodies A and B of equal masses are kept at heights of h and 2h respectively. What will be the ratio of their potential energies ?

17. What is the kinetic energy of a body of

mass 1 kg moving with a speed of 2 m/s?

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18. Is potential energy a vector or scalar quantity?



19. A load of 100 kg is pulled up by 5 m. Calculate the work done. ($g=9.8m/s^2$)

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20. State whether the following statement is true or false :

The potential energy of a body of mass 1 kg

kept at a height of 1 m is 1 J.

21. What happens to the potential energy of a

body when its height is doubled ?

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22. What kind of energy is possessed by the following ?

- (a) A stone kept on roof-top.
- (b) A running car.

(c) Water stored in the reservoir of a dam.

(d) A compressed spring.

(e) A stretched rubber band.

23. Fill in the following blank with suitable words:

(a) Work is measured as a product ofand

(b) The work done on a body moving in a circular path is

(c) 1 joule is the work done when a force of one moves an object through a distance of one in the direction of(d) The ability of a body to do work is called

...... The ability of a body to do work because

of its motion is called

(e) The sum of the potential and kinetic

energies of a body is called..... energy.



24. What are the quantities on which the amount of work done depends ? How are the

related to work?



25. Is it possible that a force is acting on a body but still the work done is zero ? Explain giving one example.



26. A boy throws a rubber ball vertically upwards. What type of work, positive or negative, is done :

(a) by the force applied by the boy ?

(b) by the gravitational force of earth ?

27. Write the formula for work done on a body when the body moves at an angle to the direction of force. Give the meaning of each symbol used.

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28. How does the kinetic energy of a moving

body depend on its (i) speed, and (ii) mass ?

29. What is meant by positive work, negative work and zero work ? Illustrate your answer with two examples of each type.



30. A ball of mass 200 g falls from a height 5 metres. What is its kinetic energy when it just reaches the ground ? ($g=9.8m/s^2$).

31. Find the momentum of a body of mass 100

g having a kinetic energy of 20 J.

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32. Two objects having equal masses are moving with uniform velocities of 2 m/s and 6 m/s respectively. Calculate the ratio of their kinetic energies.

33. A body of 2 kg falls from rest. What will be its kinetic energy during the fall at the end of 2 s ? (Assume $g=10m/s^2$)

A. 100 J

B. O J

C. 200 J

D. 400 J

Answer: D

34. On a level road, a scooterist applies brakes to slow down from a speed of 10 m/s to 5 m/s. If the mass of the scooterist and the scooter be 150 kg, calculate the work done by the brakes. (Neglect air resistance and friction)



35. A man drops a 10 kg rock from the top of a

5 m ladder. What is its speed just before it hits

the ground ? What is its kinetic energy when it

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reaches the ground ? (g = 10m/s^2)
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A. $5m/s,\,500J$

B. $10m/s, \, 500J$

C. 10m/s, 250J

D. None of the above

Answer: B



36. Calculate the work done by the brakes of a

car of mass 1000 kg when its speed is reduced

from 20 m/s to10 m/s ?



37. A body of mass 100 kg is lifted up by 10 m. Find :

(i) the amount of work done.

(ii) potential energy of the body at that height

(value of $g=10m\,/\,s^2$).



38. A boy weighing 50 kg climbs up a vertical height of 100 m. Calculate the amount of work done by him. How much potential energy does he gain ? ($g = 9.8m/s^2$).

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39. What is the work done by a constant force

? When is it positive, negative or zero ?

40. To what height should a box of mass 150 kg be lifted, so that its potential energy may become 7350 joules ? ($g=9.8m/s^2$).

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41. A body of mass 2 kg is thrown vertically upwards with an initial velocity of 20 m/s. What will be its potential energy at the end of 2 s ? (Assume $g = 10m/s^2$).





42. How much work is done when a force of 1 N moves a body through a distance of 1 m in its own direction ?

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43. A car is being driven by a force of 2.5×10^{10} N. Travelling at a constant speed of 5 m/s, it takes 2 minutes to reach a certain place. Calculate the work done.


45. (a) On what factors does the gravitational potential energy of a body depend ?(b) Give one example each of a body

possessing : (i) kinetic energy, and (ii)

potential energy.



46. Give two examples where a body possesses

both , kinetic energy as well as potential energy.



47. How much is the mass of a man if he has to do 2500 joules of work in climbing a tree 5 m tall ? ($g = 10ms^{-2}$)



48. If the work done by a force in moving an object through a distance of 20 cm is 24.2 J, what is the magnitude of the force ?

A. 122 N

B. 121 N

C. 123 N

D. 226 N

Answer: B



49. A boy weighing 40 kg makes a high jump of

- 1.5 m.
- (i) What is his kinetic energy at the highest point?

(ii) What is his potential energy at the highest

point ? ($g=10m/s^2$).



50. What type of energy is possessed :

(a) by the stretched rubber strings of a catapult ?

(b) by the piece of stone which is thrown away on releasing the stretched rubber strings of

catapult ?



Stretched strings of a catapult.



51. A weightlifter is lifting weights of mass 200 kg up to a height of 2 metres. If $g = 9.8ms^{-2}$, calculate : (a) potential energy acquired by the weights.

(b) work done by the weightlifter.



A weightlifter in action



52. (a) Define the term 'work'. Write the formula for the work done on a body when a force acts on the body in the direction of its

displacement. Give the meaning of each symbol which occurs in the formula. (b) A person of mass 50 kg climbs a tower of height 72 metres. Calculate the work done. ($g = 9.8ms^{-2}$)

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53. (a) When do we say that work is done ? Write the formula for the work done by a body in moving up against gravity. Give the meaning of each symbol which occurs in it. (b) How much work is done when a force of 2

N moves a body through a distance of 10 cm in

the direction of force?

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54. (a) What happens to the work done when the displacement of a body is at right angles to the direction of force acting on it ? Explain your answer.

(b) A force of 50 N acts on a body and moves it a distance of 4 m on a horizontal surface. Calculate the work done if the direction of force is at an angle of 60° to the horizontal surface.

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55. (a) Define the term 'energy' of a body. What is the SI unit of energy.
(b) What are the various from of energy ?
(c) Two bodies having equal masses are moving with uniform speeds fo v and 2v

respectively. Find the ratio of their kinetic energies.



56. (a) What do you understand by the kinetic energy of a body ?
(b) A body is thrown vertically upwards. Its velocity goes on decreasing. What happens to its kinetic energy as its velocity becomes zero ?

(c) A horse and a dog are running with the

same speed. If the weight of the horse is ten

times that of the dog, what is the ratio of their

kinetic energies ?

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57. (a) Explain by an example what is meant by potential energy. Write down the expression for gravitational potential energy of a body of mass m placed at a height h above the surface of the earth.

(b) What is the difference between potential

energy and kinetic energy ?

(c) A ball of mass 0.5 kg slows down from a speed of 5 m/s to that of 3 m/s. Calculate the change in kinetic energy of the ball. State your answer giving proper units.

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58. (a) What is the difference between gravitational potential energy and elastic potential energy? Give one example of a body having gravitational potential energy and another having elastic potential energy.

(b) If 784 J of work was done in lifting a 20 kg mass, calculate the height through which it was lifted. ($g=9.8m/s^2$)



59. A car is accelerated on a lavelled road and attains a velocity 4 times of its initial velocity. In this process, the potential energy of the car

A. does not change

B. becomes twice that of initial potential

energy

C. becomes 4 times that of initial potential

energy

D. becomes 16 times that of initial kinetic

energy

Answer: A

60. A car is accelerated on a lavelled road and attains a speed of 4 times its initial speed. In this process, the kinetic energy of the car :

A. does not change

B. becomes 4 times that of initial kinetic

energy

C. becomes 8 times that of initial kinetic

energy

D. becomes 16 times that of initial kinetic

energy





61. In case of negative work, the angle between

the force and displacement is

A. 0°

B. $45^{\,\circ}$

C. 90°

D. 180°

Answer: D



62. An iron sphere of mass 10 kg has the same diameter as an aluminium sphere of mass 3.5 kg. Both spheres are dropped simultaneously from a tower. When they are 10 m above the ground, they have the same

A. acceleration

B. momentum

C. potential energy

D. kinetic energy

Answer: A



63. A girl is carrying a school bag of 3 kg mass on her back and moves 200 m on a lavelled road. If the value of g be $10m/s^2$, the work done by the girl against the gravitational force will be : A. 6000 J

B. 0.6 J

C. 0 J

D. 6 J

Answer: C

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64. The work done on an object does not depend on the :

A. displacement

B. angle between force and displacement

C. force applied

D. initial velocity of the object

Answer: D

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65. Water stored in a dam possesses

A. no energy

B. electrical energy

C. kinetic energy

D. potential energy

Answer: D

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66. The momentum of a bullet of mass 20 g fired from a gun is 10 kg.m/s. The kinetic energy of this bullet in kJ will be :

A. 5

B. 1.5

C. 2.5

D. 25

Answer: C



67. Each of the following statement describes

a force acting. Which force is causing work to

be done ?

A. the weight of a book at rest on a table B. the pull of a moving railway engine on its coaches C. the tension in an elastic band wrapped around a parcel D. the push of a person's feet when standing on the floor Answer: B

68. A girl weighing 400 N climbs a vertical ladder. If the value of g be $10ms^{-2}$, the work done by her after climbing 2 m will be :

A. 200 J

B. 800 J

C. 8000 J

D. 2000 J

Answer: B

69. Which of the following does not possess the ability to do work not because of motion ?

A. a sparrow flying in the sky

B. a sparrow moving slowly on the ground

C. a sparrow in the nest on a tree

D. a squirrel going up a tree

Answer: C

70. A stone is thrown upwards as shown in the diagram. When it reaches P, Which of the following has the greatest value for the stone



A. its acceleration

- B. its kinetic energy
- C. its potential energy

D. its weight

Answer: C

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71. A boy tries to push a truck parked on the roadside. The truck does not move at all. Another boy pushes a bicycle. The bicycle moves through a certain distance. In which case was the work done more : on the truck or

on the bicycle ? Give a reason to support your

answer.



72. The work done by a force acting obliquely is given by the formula : $W = F \cos \theta \times s$. What will happen to the work done if angle θ between the direction of force and motion of the body is increased gradually ? Will it increase, decrease or remain constant ?

A. increase

B. decrease

C. remain constant

D. None

Answer: B

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73. What should be the angle between the direction of motion of a body so that the work done is zero ?

74. In which of the following case of work done by a force will be maximum : when the angle between the direction of force and direction of motion is 0° or 90° ?

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75. How much work is done by the gravitational force of earth acting on a satelite

moving around it in a circular path ? Give

reason for your answer.



76. A man is instructed to carry a package from the base camp at B to summit A of a hill at a height of 1200 metres. The man weighs 800 N and the package weighs 200 N. If $g = 10m/s^2$, (i) how much work does man do against gravity? (ii) what is the potential energy of the package

at A if it is assumed to be zero at B?



77. When a ball is thrown vertically upwards, its velocity goes on decreasing. What happens to its potential energy as its velocity becomes zero ?

78. A man X goes to the top of a building by a vertical spiral staircase. Another man Y of the same mass goes to the top of the same building by a slanting ladder. Which of the two does more work against gravity and why ?



79. When a ball is thrown inside a moving bus,

does its kinetic energy depend on the speed of

the bus ? Explain.



80. A bullet of mass 15 g has a speed of 400 m/s. What is its kinetic energy ? If the bullet strikes a thick target and is brought to rest in 2 cm, calculate the average net force acting on the bullet. What happens to the kinetic energy originally in the bullet ?



81. COMMERCIAL UNIT OF ENERGY



82. One kilowatt-hour is equal to :

A. 3.6 x 10^6 watt-sec

B. 6 x 10^5 watt-sec

C. 60 x 10^5 watt-sec

D. none of these

Answer: A


83. Name two units of power bigger than watt.



86. Name the physical quantity whose unit is

watt.



87. What is the power of a body which is doing

work at the rate of one joule per second?



88. A body does 1200 joules of work in 2

minutes. Calculate its power.

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89. How many joules are there in one kilowatt-

hour?



90. Name the quantity whose unit is :

(a) kilowatt

(b) kilowatt-hour



91. What is the common name of '1 kWh' of

electrical energy?

92. A cell converts one form of energy into

another form. Name the two forms.



93. Name the device which converts electrical

energy into mechanical energy.



94. Name the devices or machines which convert :

- (a) Mechanical energy into electrical energy.
- (b) Chemical energy into electrical energy.
- (c) Electrical energy into heat energy.
- (d) Light energy into electrical energy.
- (e) Electrical energy into light energy.

95. Name the devices or machines which convert :

(i) Electrical energy into sound energy.

(ii) Heat energy into kinetic energy (or mechanical energy).

(iii) Chemical energy into kinetic energy (or mechnical energy).

(iv) Chemical energy into heat energy.

(v) Light energy into heat energy.

96. Fill in the following blanks with suitable words :

(a) Power is the rate of doing

.....

(b) 1 watt is a rate of working of one..... per

(c) The electricity meter installed in our home measures electric energy in the units of
(d) The principle of of energy says that energy can be from one form to another, but it cannot be..... or......
(e) When a ball is thrown upwards,..... energy

is transformed intoenergy.



97. A trolley is pushed along a road with a force of 400 N through a distance of 60 m in 1 minute. Calculate the power developed.

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98. What kind of energy transformations take

place at a hydroelectric power station ?



99. What kind of energy transformations take

place at a coal-based thermal power station ?

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100. A man weighing 500 N carried a load of 100 N up a flight of stairs 4 m high in 5 seconds. What is the power ?

101. The power output of an engine is 3 kW.

How much work does the engine do in 20 s ?

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102. An electric heater uses 600 kJ of electrical energy in 5 minutes. Calculate its power rating.

103. How much electrical energy in joules does

a 100 watt lamp consume :

(a) in 1 second ?

(b) in 1 minute ?

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104. Five electric fans of 120 watts each are used for 4 hours. Calculate the electrical energy consumed in kilowatt-hours.

105. Describe the energy changes which take place in an radio.

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106. Write the energy transformations which

take place in an electric bulb (or electric lamp).

107. Name five appliances or machines which

use an electric motor.

Watch Video Solution

108. A bulb lights up when connected to a battery. State the energy change which take place :

(i) in the battery. (ii) in the bulb.

109. The hanging bob of a simple pendulum is displaced to one extreme position B and then released. It swings towards centre position A and then to the other extreme position C. In which position does the bob have : (i) maximum potential energy? (ii) maximum kinetic energy?

Give reasons for your answer.



110. A car of weight 20000 N climbs up a hill at

a steady speed of 8 m/s, gaining a height of

120 m in 100 s. Calculate :

(a) work done by the car.

(b) power of engine of car.



111. (a) What is the meaning of the symbol kWh

? What quantity does it represent ?

(b) How much electric energy in kWh is

comsumed by an electrical appliance of 1000

watts when it is switched on for 60 minutes ?



112. (a) Derive the relation between commercial unit of energy (kWh) and SI unit of energy (joule).

(b) A certain household consumes 650 units of electricity in a month. How much is this electricity in joules ?



113. (a) Define power. Give the SI unit of power. A boy weighing 40 kg carries a box weighing 20 kg to the top of a building 15 m high in 25 seconds. Calculate the power. ($g = 10m/s^2$)

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114. 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

Answer: C

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115. Which one of the following is not the unit

of energy?

A. joule

B. newton - metre

C. kilowatt

D. kilowatt-hour

Answer: C

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116. Which of the following energy change involves frictional force?

A. chemical energy to heat energy

B. kinetic energy to heat energy

C. potential energy to sound energy

D. chemical energy to kinetic energy

Answer: B

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117. An electric motor raises a load of 0.2 kg, at a constant speed, through a vertical distance of 3.0 m in 2 s. If the acceleration of free fall is $10m\,/\,s^2$, the power in W developed by the

motor in raising the load is :

A. 0.3

- $\mathsf{B}.\,1.2$
- C. 3.0
- $D.\,6.0$

Answer: C



118. An object is falling freely from a height x. After it has fallen a height $\frac{x}{2}$, it will possess :

A. only potential energy

B. only kinetic energy

C. half potential and half kinetic energy

D. less potential and more kinetic energy

Answer: C

119. COMMERCIAL UNIT OF ENERGY

A. watt

B. watt-hour

C. kilowatt-hour

D. kilowatt

Answer: C

120. How much energy does a 100W electric

bulb transfer in 1 minute?

A. 100 J

B. 600 J

C. 3600 J

D. 6000 J

Answer: D

121. The device which converts mechanical energy into energy which runs our microwave oven is :

A. electric motor

B. alternator

C. turbine

D. electric heater

Answer: B

122. A microphone converts

A. electrical energy into sound energy in

ordinary telephone

B. microwave energy into sound energy in

a mobile phone

C. sound energy into mechanical energy in

a stereo system

D. sound energy into electrical energy in

public address system

Answer: D



123. The following data was obtained for a body of mass 1 kg dropped from a height of 5 metres : Distance above ground Velocity 5m0m/s6m/s3.2m10m/s0mShow by calculation that the above data verifies the law of conservation of energy (Neglect air resistance). ($g = 10m/s^2$).



(a) What is the kinetic energy of ball when it

potential energy = 0

hits the ground ?

(b) What is the potential energy of ball at B?

(c) Which law you have made use of in answering this question ?

125. In an experiment to measure his power, a student records the time taken by him in running up a flight of steps on a staircase. Use the following data to calculate the power of the student :

Number of steps = 28

Height of each step = 20 cm

Time taken = 5.4 s

Mass of student = 55 kg

Acceleration = $9.8ms^{-2}$

due to gravity



126. In loading a truck, a man lifts boxes of 100

N each through a height of 1.5 m.

(a) How much work does he do in lifting one box ?

(b) How much energy is transferred when one box is lifted ?

(c) If the man lifts 4 boxes per minute, at what

power is he working?

$$(g=10ms^{-2})$$

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127. Name the energy transfers which occur when :

(a) an electric bell rings

(b) someone speaks into a microphone

(c) there is a picture on a television screen

(d) a torch is on



128. A force of 7 N acts on an object. The displacement is, say 8 m, in the direction of the force (see Figure below). Let us take it that the force acts on the object through the displacement. What is the work done in this case ?



129. When do we say that work is done ?

130. Write an expression for the work done when a force is acting on an object in the direction of its displacement.

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131. Define 1 J of work.

132. A pair of bullocks exerts a force of 140N on a plough. The field being ploughed is 15m long. How much work is done in ploughing the length of the field?

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133. What is the kinetic energy of an object ?
134. Write an expression for kinetic energy of

an object.

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135. The kinetic energy of an object of mass` m moving with a velocity of 5 m//s is 25 J. What will be its kinetic energy when its velocity is doubled ? What will be its kinetic energy - when its velocity si increased three times ?





137. Define 1 W of power.

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138. A lamp consumes 1000 J of electrical energy is 10 s. What is its power ?





139. Define avarage power.



140. Look at the activites listed below. Reason out whether or not work is done in the light of your understanding of the term 'work'. (a) Suma is swimming in a pond. (b) A donkey is carrying a load on its back. (c) A wind -mill is lifting water from a well. (d) A green plant is carrying out photosynthesis. (e) An engine is pulling a train. (f) Food grains are getting drired in the Sun. (g) A saliboat is moving due to wind energy.



141. An object thrown at a certain angle to the ground moves in a curved path and falls back to the ground. The intial and the final points of the path object lie on the same horizontal

line. What is the work done by the force of

gravity on the object ?



142. A battery lights a bulb. Describe the

energy changes involved in the process.

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143. Certain force acting on a 20 kg mass changes its velocity from 5m/s
ightarrow 2m/s.

calculate the work done by the force.



144. A mass of 10 kg is at a point A on a table. It is moved to a point B. If the line joining A and B is horizontal, what is the work done on the object by the gravitational force ? Explain your answer.

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145. The potential energy of a freely falling object decreases progressively. Does this violate the law of conservation of energy ? Why?

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146. What are the verious energy transformations that occur when you are riding a bicycle ?

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147. Does the transfer of energy take palce when you push a huge rock with all your might and fail to move it ? Where is the energy you spend going ?

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148. A certain household has consumed 250 units of energy during a month. How much energy is this in joules ?



149. An object of mass 40 kg is raised to a height of 5 m above the ground. What is its potential energy ? If the object is allowed to fall, find its kinetic energy when it is half - way down.

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150. What is the work done by the force of gravity on a satellite moving round the Earth ?

Justify your answer.



151. Can there be displacement of an object in the absence of any force acting on it ? Think. Discuss this question with your friends and teacher.



152. A person holds a bundle of hay over his head for 30 minutes and gets tired. Has he done some work or not ? Justify your answer.



153. An electric heater is rated 1500W. How

much energy does it use in 10 hours?



154. Illustrate the law of conservation of energy by discussing the energy changes which occur when we draw a pendulum bob to one side and allow it to oscillate. Why does the bob eventually come to rest ?

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155. An object of mass m is moving with a constant velocity v How much work should be

done on the object in order to bring the

object to rest ?



156. calculate the work required to be done to

stop a car of 1500 kg moving at a velocity of 60 km//h ?



157. In each of the following a force F is acting

on an object of mass m.



The direction of displacement is form west to east shown by the longer arrow. Observe the diagrams carefully and state whether the work done by the force is negative, positive or zero.



158. Soni says that the acceleration in an object could be zero even when several forces are acting on it. Do you agree with her ? Why ?



159. find the energy in kWh consumed in 10

hours by four devices of power 500 W each.



160. A freely falling object eventually stops on reaching the ground. What happens to its kinetic energy ?



Long Answer Type Questions

1. (a) What do you understand by the term "transformation of energy" ? Explain with an example. (b) Explain the transformation of energy in the

following cases :

(i) A ball thrown upwards.

(ii) A stone dropped from the roof of a

building.

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2. (a) State and explain the law of conservation of energy with an example.
(b) Explain how, the total energy a swinging pendulum at any instant of time remains

conserved. Illustrate your answer with the help

of a labelled diagram.



Multiple Choice Questions

1. Which one of the following statements

about power stations is not true ?

A. hydroelectric power stations use water

to drive turbines

B.in a po	wer st	ations,	turbines	drive
generators				
C. electricity from thermal power stations				
differs	from	that	produced	l in
hydroelectric power stations				
D. in hydro	electric	power	stations	and
thermal	power	statio	ns, alterr	nators
produce electricity				

Answer: C

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