PHYSICS

BOOKS - R G PUBLICATION

WORK AND ENERGY

Example

1. A force of 7 N acts on an object. The displacement it, say 8m, in the direction of the force. Let us take it that the force acts on the

object through the displacement. What is the work done in this case?

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2. When do we say that work is done?

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3. Write an expression for the work done when a force is action on an object in the direction of its displacement?

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4. Define 1 J of work.

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5. A pair of bullocks exerts of force of 140 N 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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6. What is the kinetic energy of an object?

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7. Write an expression for the kinetic energy of an object.

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8. The kinetic energy of an object of mass, m moving with a elocity of $5ms^{-1}$, is 25J. What will be its kinetic energy when its velocity is doubled? What will be its kinetic energy when its velocity is increased three times?

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9. What is power?

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10. Define 1 watt of power.

11. A lamp consumes 1000J of electrical energy in 10s. What is the power?

12. Define average power.

13. An object thrown at a certain angle to the ground moves in a curved path and fails back to the ground.. The initial and the final points of the path of the object lie on the same horizontal line. What is the work done by the force of gravity on the object?

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14. A battery lights a bulb. Describe the energy changes involved in the process.

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15. Certain force acting on a 20 kg mass changes its velocity from $5ms^{-1}$ to $2ms^{-1}$. Calculate the work done by the force.

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16. A mass of 10 kg is 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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17. The potential energy of.a freely falling object decreases progressively. Does this violate the law of conservation of energy? Why?

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18. What are the various energy transformations that occur when you are riding a bicycle?

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19. Does the transfer of energy take place 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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20. A certain household has consumed 250 units of energy during a month. How much energy is this in joules?

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21. 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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22. What is the work done by the force of gravity on a satellite moving round the earth? Justify your answer.

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23. Can there be displacement of an object in the absence of any force acting on it?

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24. 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.

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25. An electric heater is rated 1500 W. How much energy does it use in 10 hours?

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26. 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?

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27. Calculate the work required to be done to stop a car of 1500 kg moving at a velocity of 60 km/h?

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28. 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?

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29. Find the energy in KWh consumed in 10 hours by four devices of power 500W each.

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

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31. Unit of work done

A. Newton

B. Joule

C. Watt

D. Horsepower

Answer:

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32. S.I. unit of power.

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33. When a body of mass 'm' moves with a velocity 'v' its kinetic energy-

A. $\frac{1}{mv^2}$

B. 1/2 mv^2

C. mgh

D. m^2

Answer:

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34. The potential energy of a body of mass 'm' placed at a height h is

A. $\frac{1}{2}mgh$

B. mgh

C. mh

D. $(mgh)^2$

Answer:

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35. When a body falls freely towards the earth, then its total energy-

A. increases

B. decreses

C. remains constant

D. first increases then decreases.

Answer:

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36. What will be the potential energy of a body when its mass becomes doubled.

A. half

B. double

C. one third

D. one fourth

Answer:

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37. What is the relation between horsepower and watt.

A. 1 horse power = 746 watt

B. 1 horse power = 647 watt

C. 1 horse power = 746 watt

D. 1 watt = 746 horse power

Answer:

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38. The wrok done on an object does not depend upon the

A. displacement

B. force applied

C. angle between force and displacement.

D. initial velocity of the object.

Answer:

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39. If energy is E, power is P and time is 't', which one is correct-

A. t = P.E

B. $P = \frac{E}{t}$

C. $P = \frac{1}{2}Et^2$

D. P = Et

Answer:

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40. Which one is vector

A. Work done

B. Energy

C. momentum

D. Power

Answer:

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41. What is work done?

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42. Write the relation between work, displacement and force.

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43. Is work done a vector quantity?

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44. What is the S.I. unit of work done?

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45. Define 1 J.

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46. What is energy?

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47. Is energy a scalar quantity?

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48. What is the S.I. unit of energy?

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49. Why are the units of work and energy same?

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50. What is kinetic energy?

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51. What is the expression for kinetic energy of a body of mass 'm' moving with velocity 'v'.

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52. Give one example of kinetic energy.

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53. What is potential energy? Explain it with an example.

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54. What is the potential energy of an object of mass 'm' at a height 'h'?

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55. Energy stored in stretched spring is ?

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56. Which energy is stored in wrist watch?

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57. Which energy is stored in a string of bow?

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58. Which kind of energy is possessed by flowing water?

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59. What is the work done when the force on the object is zero?

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60. What would be the work done when the displacement of the object is zero?

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61. The masses of two bodies are same. One is placed at the height of 10 m and the other is placed at the height of 20 m. Which one has more potential energy?

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62. What is power?

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63. Write the relation between power P, work done W and time t.

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64. What is the unit of power?

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65. Define 1 watt.

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66. Write relation between watt. Joule and second.

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67. What is the commercial unit of energy?

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68. What is 1kwh?

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69. What is meant by 1 unit of electricity?

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70. Write the law of conservation energy.

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71. What are the two forms of mechanical energy?

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72. Mention names of different forms of energy?

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73. What do you mean by transformation of energy?

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74. If force is applied on the body in the direction of motion then ?

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75. How potential energy is stored in a powerful stretched spring?

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76. Which energy is stored in wrist watch?

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77. A body of mass ‘m’ is moving with velocity ‘v' .If the mass of the body is doubled what will be its kinetic energy?

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78. A body of mass ‘m’ is moving with velocity ‘v’: If the velocity is doubled what will be its kinetic energy?

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79. Can an object have kinetic energy even if its momentum is zero? Explain.

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80. If a body of mass m is moving with velocity v then prove that kinetic energy of the body $= \frac{1}{2}mv^2$

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81. Prove that potential energy = mgh.

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82. what is law of conservation of energy?

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83. Explain the relationship between energy and power.

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84. A body age of mass 50 kilogram, what is his weight?

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85. How much work does a boy of mass 50kg do when he climbs a height 30 metre.

86. On the body of machine is written 4H.P. Express its power in watt.

87. A boy of mass 50 kg runs up to a stair case of 45 steps in 9 s. If the height of a 15 cm, find his power.

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88. A body of mass 30 kg is raised from the floor to a table height 1 meter. Relative to the ground, what is the potential energy of the body

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89. What is the kinetic energy of a body of mass 50 kg after it has fallen from rest for 5 seconds? (g = $9.8\frac{m}{s^2}$)

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90. A 60 watt bulb burns for 5 hours. What is the energy consume?

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