

3 Energy around us

3.1 Sources and forms of energy

- 1 A body is said to possess potential energy because of its position or arrangement. Which one of the following bodies does not possess potential energy?
 - A a stone at a highest point
 - B a compressed spring
 - C a stretched spring
 - D a marble on the floor

- 2 Energy exists in many forms. What is the most common form of energy used in homes and industry ?
 - A chemical energy
 - B potential energy
 - C kinetic energy
 - D electrical energy

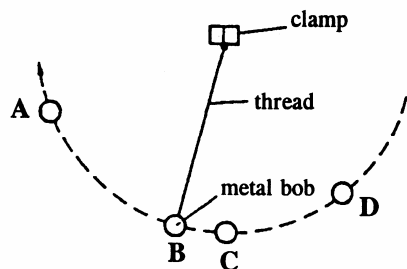
- 3 The following are forms of energy **except**
 - A heat
 - B light
 - C gravity
 - D sound

- 4 The following are natural sources of energy **except** the
 - A sea
 - B sun
 - C waterfall
 - D windmill

- 5 A boy, 1.5 metre tall, standing on a 10 metre high platform, throws a stone vertically upwards. The stone rises to 1 metre above the boy and then falls to the ground. At what height from the ground is the potential energy greatest ?
 - A 2.5 metres
 - B 10 metres
 - C 11 metres
 - D 12.5 metres

- 6 When a lift is at the highest level it has the most
 - A kinetic energy
 - B potential energy
 - C chemical energy
 - D electrical energy

- 7 The diagram below shows a swinging pendulum. In which position, A, B, C or D, does the swinging pendulum have the maximum kinetic energy ?

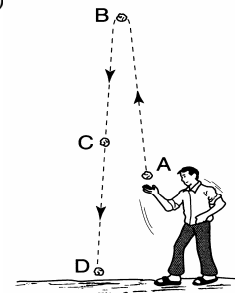


Answer: C

- 8 Ahmad throws a stone into the air and it falls to the ground as shown below (98)

At which position does the stone possess the **greatest** potential energy?

Answer: B



3.1 Sources and forms of energy

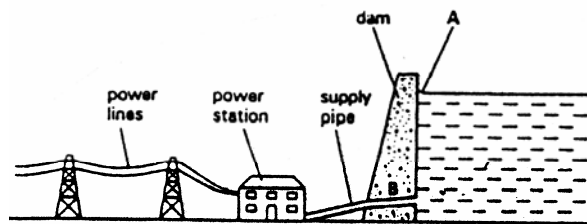
9 The chemical energy stored in oil, coal and gas all originate from (98)

- A animals
B green plants
C the sun
D the wind

10 We eat food to provide us with energy. What energy is present in food? (98)

- A chemical energy
B heat energy
C light energy
D stored energy

11 Electricity is produced by hydroelectric power station. Name the form of energy at position A.



- A kinetic energy
B potential energy
C solar energy
D heat energy

12 Which mode of transport is **not** a way to conserve energy?

- A cycling to work
B forming car pool
C driving to school alone
D walking to school

13 Which of the following does **not** conserve energy?

- A Recycling waste materials such as metals and plastics
B Forming car pool
C Using fans instead of air-conditioners
D Burning old newspapers

14 Old newspapers may be recycled so that the

- A news can be updated
B paper can be used again
C paper is reduced in size
D news can be condensed and easy to read

15 In order to save energy, car manufacturers in the future may design cars that

- A are much lighter
B run faster
C consume more fuel
D use water as fuel

16 C

17 C

3.2 Transformation of energy

1 When some pellets of sodium hydroxide are dropped into a beaker containing some water, the beaker feels warm when touched. What energy change has taken place ?

- A chemical energy → kinetic energy
- B chemical energy → potential energy
- C chemical energy → heat energy
- D chemical energy → light energy

2 The energy changes in a battery operated torch-light bulb are

- A electrical → light → sound
- B chemical → electrical → light energy
- C chemical → electrical → sound
- D chemical → light → electrical

3 A wind-up toy works by means of a spring. What energy change in the toy takes place when the spring is released ?

- A potential to electrical
- B potential to chemical
- C potential to kinetic
- D potential to light

4 An example of a device that can change electrical energy to heat energy is

- A an electric fan
- B a dynamo
- C a steam engine
- D an electric iron

5 Water which falls half-way down a waterfall has two types of energy . They are

- A heat energy and kinetic energy
- B chemical energy and kinetic energy
- C potential energy and kinetic energy
- D potential energy and heat energy

6 Coal is used to boil water to generate steam which runs a generator producing electricity . Which one of the following shows the **correct** order of energy changes taking place ?

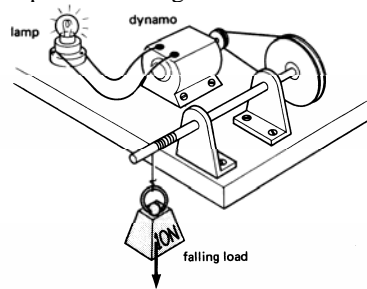
- A chemical energy → heat energy → electrical energy
- B chemical energy → kinetic energy → heat energy
- C chemical energy → heat energy → kinetic energy → electrical energy
- D chemical energy → kinetic energy → heat energy → electrical energy

7 What are the energy changes which take place in a battery-operated fan ?

- A potential energy → electrical energy → kinetic energy
- B potential energy → kinetic energy → sound energy
- C chemical energy → potential energy → kinetic energy
- D chemical energy → electrical energy → kinetic energy

3.2 Transformation of energy

8 What are the energy changes that take place in the figure ?



- A chemical energy → electrical energy → kinetic energy → potential energy
- B potential energy → kinetic energy → electrical energy → heat and light
- C chemical energy → heat energy → kinetic energy → potential
- D potential energy → kinetic energy → electrical energy → sound energy

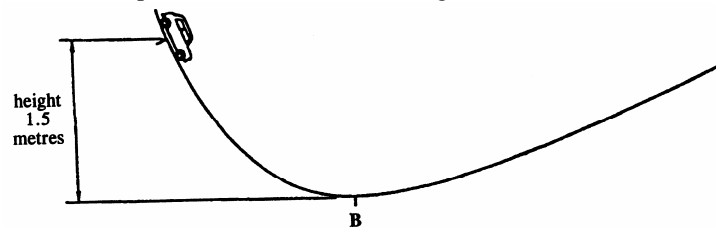
9 The following figure shows a car going uphill .



What are the main energy changes taking place during the journey upwards.

- A chemical energy → kinetic energy → potential energy
- B chemical energy → electrical energy → potential energy
- C chemical energy → sound energy → potential energy
- D kinetic energy → potential energy → chemical energy

10 A model car runs down and up the track as shown in the figure.

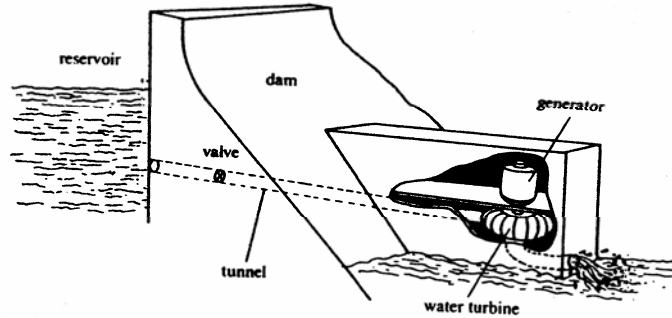


The energy changes taking place are

- A kinetic energy → sound energy → to potential energy
- B potential energy → kinetic energy → sound energy
- C potential energy → sound energy → potential energy
- D potential energy → kinetic energy → potential energy

3.2 Transformation of energy

11 The diagram in the figure shows a hydroelectric power station.



Which of the energy changes take place when electricity is produced in a hydroelectric power station?

- A kinetic energy → potential energy → electrical energy
- B chemical energy → potential energy → electrical energy
- C kinetic energy → chemical energy → electrical energy
- D potential energy → kinetic energy → electrical energy

12 The head of an iron nail becomes hot when hammered into furniture. The heat energy originates from the energy of the

- A hammer
- B nail
- C wood
- D carpenter

13 What energy changes take place when a battery operated door bell is switched on?

- A Chemical → Electrical → Kinetic → Sound
- B Chemical → Kinetic → Electrical → Sound
- C Electrical → Chemical → Kinetic → Sound
- D Kinetic → Sound → Electrical → Chemical

14 Electrical energy that goes into the television is converted to

- I heat energy
- II light energy
- III sound energy
- IV nuclear energy

- A I, II and III
- B I, II and IV
- C II, III and IV
- D I, III and IV

15 What causes a chemical change to take place on the photographic film in a camera? (95)

- A Electricity
- B Light
- C Movement
- D Sound

16 Which example best illustrates the conversion of electrical energy to chemical energy?

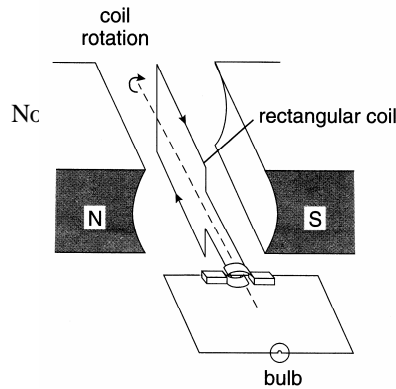
- A Charging a car battery
- B Switching on a television
- C Starting a car
- D Lighting a candle

3.2 Transformation of energy

17 The product formed from animal and plant matter that decayed many millions of years ago is known as (97 BJCE)

- A dried wood
- B humus
- C fossil fuel
- D soil

18 The diagram shows the structure of a simple dynamo (97 BJCE)



What would be the main energy changes taking place when the coil is rotated at high speed ?

- A Electrical energy → Sound energy → Kinetic energy
- B Kinetic energy → Electrical energy → Light energy
- C Kinetic energy → Light energy → Sound energy
- D Kinetic energy → Sound energy → Light energy

19 When a ripe coconut falls down to the ground, the energy change is (97 BJCE)

- A Chemical energy → Kinetic energy → Light energy
- B Potential energy → Kinetic energy → Sound and Heat energy
- C Mechanical energy → Heat energy → Sound energy
- D Potential energy → Heat energy → Sound and Light energy

20 When a person and a car engine are running, the same energy change takes place. Which of the following shows the energy change? (97 PMB)

- A Chemical energy → Kinetic energy
- B Heat energy → Chemical energy
- C Heat energy → Kinetic energy
- D Kinetic energy → Electrical energy

21 What energy change takes place when current flows through a resistance wire? (98)

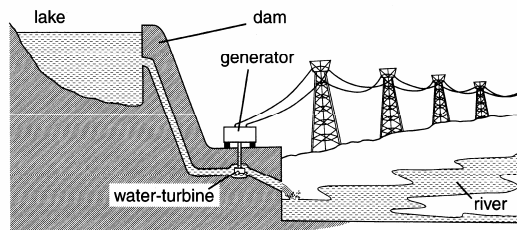
- A Electrical energy is changed into chemical energy
- B Electrical energy is changed into heat energy
- C Electrical energy is changed into kinetic energy
- D Electrical energy is changed into potential energy

3.2 Transformation of energy

22 The energy conversion in burning wood is from (99)

- A chemical energy into electrical and light energy
- B chemical energy into heat and light energy**
- C kinetic energy into heat and electrical energy
- D kinetic energy into light and chemical energy

23 The following figure shows a hydroelectric power station. (2000S)



Which of the following correctly shows the energy changes that take place ?

- A Chemical energy → Heat energy → Potential energy
- B Heat energy → Sound energy → Electrical energy
- C Potential energy → Chemical energy → Heat energy
- D Potential energy → Kinetic energy → Electrical energy**

24 The figure shows a burning candle. (2000IS)



Which of the following correctly shows the energy changes that take place?

- A Chemical energy → Kinetic energy + Light energy
- B Chemical energy → Light energy + Heat energy**
- C Chemical energy → Light energy + Sound energy
- D Chemical energy → Sound energy + Heat energy

- 25 C
- 26 D
- 27 A
- 28 A
- 29 A
- 30 C

3.3 Conservation of energy

1 The unit of energy is

- A newton B meter **C joule** D watt

2 A person needs one joule of energy (J) when he lifts

- A 1 newton of weight through a vertical distance of 1 m**
 B 1 newton of weight through a vertical distance of 1 cm
 C 1 kilogram of mass through a vertical height of 1 m
 D 1 kilogram of mass through a vertical distance of 1 cm

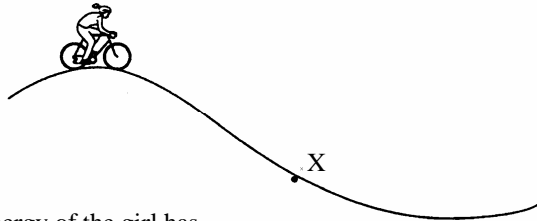
3 A weight of 1 N is lifted through a vertical height of 2 m. How much energy is required?

- A 0.5 J B 1 J **C 2 J** D 3 J

4 Which of the following statements about energy is correct?

- A Energy can be created and destroyed
 B Energy cannot be created but can be destroyed
C Energy can neither be created nor destroyed
 D Energy can be created but cannot be destroyed

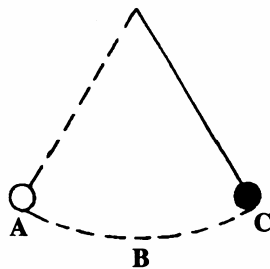
5 A girl rides a bicycle down a frictionless hill without pedaling as shown in the figure.



At X, the total amount of energy of the girl has

- A increased **C remained constant**
 B decreased D become zero

6 A simple pendulum swings from A through B and up to C.



The total amount of energy of the bob at C is

- A greater than it is at A
 B less than it is at A
C the same as when it is at A
 D zero

3.3 Conservation of energy

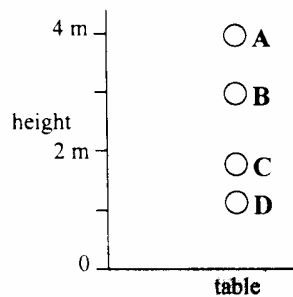
7 A pendulum is swinging in a vacuum. At any stage of the swing,

- A the kinetic energy of the bob is more than its potential energy
- B the kinetic energy is less than its potential energy
- C the sum of the kinetic energy and potential energy is increasing
- D the sum of the kinetic energy and potential energy is constant

8 The unit of electrical energy is (2000IS)

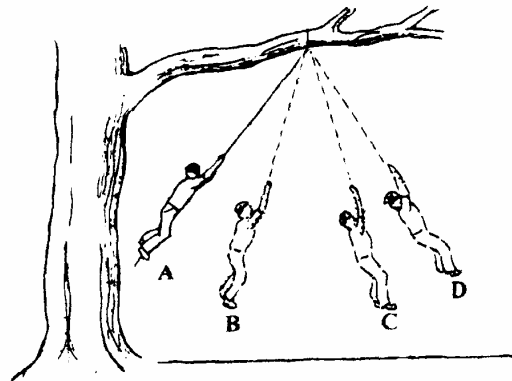
- A joule (J)
- B ohm (Ω)
- C volt (V)
- D watt (W)

9 A rubber ball is dropped at a height of 3 metres from a table. What is the highest point the ball could reach after bouncing? Assume there is no loss of energy from the ball.



Ans: B

10 A student swings on a rope tied to a branch of a tree. He starts swinging at A. What is the highest position he could reach when he swings back? Assume there is no loss of energy from the student.



Ans: A

11 B