Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /47

**Year 8 Physics**

**End of Topic Test**

**Multiple Choice Answer Sheet**

|  |  |  |  |  |
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|  |  |  |  |  |
| **1.** | **A** | **B** | **C** | **D** |
| **2.** | **A** | **B** | **C** | **D** |
| **3.** | **A** | **B** | **C** | **D** |
| **4.** | **A** | **B** | **C** | **D** |
| **5.** | **A** | **B** | **C** | **D** |
| **6.** | **A** | **B** | **C** | **D** |
| **7.** | **A** | **B** | **C** | **D** |
| **8.** | **A** | **B** | **C** | **D** |
| **9.** | **A** | **B** | **C** | **D** |
| **10.** | **A** | **B** | **C** | **D** |
| **11.** | **A** | **B** | **C** | **D** |
| **12.** | **A** | **B** | **C** | **D** |
| **13.** | **A** | **B** | **C** | **D** |
| **14.** | **A** | **B** | **C** | **D** |
| **15.** | **A** | **B** | **C** | **D** |
| **16.** | **A** | **B** | **C** | **D** |
| **17.** | **A** | **B** | **C** | **D** |
| **18.** | **A** | **B** | **C** | **D** |
| **19.** | **A** | **B** | **C** | **D** |
| **20** | **A** | **B** | **C** | **D** |

**Multiple Choice**

**1** Energy is measured using a unit called the:

A kilogram.

B metre.

C second.

D joule.

**2** Select which of the following require energy to happen.

A running in a race

B a leaf falling from a tree

C clothes drying in the sun

D all of the above

**3** The energy of a moving object is called:

A nuclear energy.

B gravitational potential energy.

C elastic potential energy.

D kinetic energy.

**4** Jordan watches a music video clip on his iPhone. Choose the best description of the energy transformations that are happening.

A electrical energy 🡪sound energy + light energy + heat energy

B electrical energy 🡪sound energy + light energy

C sound energy + light energy + heat energy 🡪 electrical energy

D sound energy + light energy 🡪 electrical energy

**5** A particular electric knife is 40% efficient. If 100 J of energy is supplied to the knife how many joules are then transformed into kinetic energy ?

A 40

B 100

C 60

D 140

**6** The number of stars found on an Energy Rating Label indicate:

A the energy efficiency of an appliance.

B how much energy the appliance will require to operate.

C how much effort needs to be taken to maintain the appliance.

D how easy the appliance is to clean.

**7** Select which of the following contains elastic potential energy.

A a stretched bow about to fire an arrow

B a tree branch

C a seagull in flight

D an apple

**8** Select which device transforms chemical energy into kinetic energy.

A a torch

B a battery operated car

C a kettle

D an electric knife

**9** Heat flows from areas of:

A higher temperature to those of lower temperature.

B the same temperature.

C lower temperature to those of higher temperature.

D all of the above.

**10** Select the correct energy flow diagram showing energy changes that occur when operating a battery-operated fire truck that moves and sounds a siren.

A electrical energy 🡪 chemical energy + sound energy

B chemical energy 🡪 sound + heat energy

C electrical energy 🡪 heat + elastic potential energy

D chemical energy 🡪 kinetic energy + sound + heat

**11** If a food processor is 25% efficient, then for every 10 kJ input, its useful energy output is:

A 25 kJ

B 75 kJ

C 2.5 kJ

D 7.5 kJ

**12** The efficiency of the Spinners washing machine is 40%,

Sparkles washing machine is 35% and the

Sprinkles washing machine is 52%,

The machines listed from most to least efficient are:

A Spinners, Sparkles, Sprinkles

B Sparkles, Sprinkles, Spinners

C Sprinkles, Spinners, Sparkles

D Sparkles, Spinners, Sprinkles

**13** The table below lists the specific thermal capabilities of a number of materials. This specific heat or specific thermal capacity is the number of joules of energy that is needed to raise the temperature of 1 kg of this substance by 1° Celsius.

|  |  |
| --- | --- |
| **Substance** | **Specific thermal capacity (J/kg/°C)** |
| water | 4180 |
| oil | 2800 |
| glass | 840 |
| copper | 385 |

If each material listed in the table was heated with 100 kJ of energy, the material that would be the hottest after heating is:

A water

B oil

C glass

D copper

**14** The table below lists the thermal conductivities of a number of materials. This unit is a measure of how well a material conducts heat. The larger the thermal conductivity, the better the material will conduct heat.

|  |  |
| --- | --- |
| **Substance** | **Thermal conductivity**  **(W/m °C)** |
| glass | 0.84 |
| steel | 40 |
| cork | 0.42 |
| wood | 0.10 |
| copper | 380 |

If a sample of each of these materials is placed outside on a sunny day, select the alternative that lists how they would feel to touch, in order from hottest to coolest:

A glass, steel, cork, wood, copper

B copper, steel, glass, cork, wood

C steel, copper, glass, cork, wood

D wood, cork, glass, steel, copper

**15** The table below lists the typical amount of energy required per minute by a

58 kg woman and a 70 kg man to perform several activities.

|  |  |  |
| --- | --- | --- |
| Activity | Average energy (kJ) required per minute by a 58 kg woman | Average energy (kJ) required per minute by a 70 kg man |
| Sleeping or resting | 4 | 5 |
| Working on a computer | 8 | 10 |
| Light work: shop keeping, gardening | 12 | 16 |
| Social sports such as cycling, playing tennis or cricket | 16 | 20 |
| Heavy work: chopping wood, running, competitive sports | 24 | 30 |
| Intense exercise such as hard physical work | 40+ | 50+ |

Lisa weighs 58 kg. In one particular hour, she uses up 720 kJ of energy. Select the activity that she was most likely to be involved in.

A lying on the couch watching television

B working in a chemist

C riding her bike

D playing football

**16** Josh weighs 70kg. In one particular hour, he uses up 1800 kJ of energy. Referring to the table shown in the previous question, the activity that he was most likely to be involved in is:

A lying on the couch watching television

B working in a chemist

C riding his bike

D playing football

**17** Which of the following factors affect the amount of kinetic energy possessed by an object?

A Mass and speed.

B Volume and height.

C Temperature and volume.

D Height and speed.

**18** How many Joules in a kilojoule?

A 10

B 100

C 1000

D 10000

**19** Whenever an object is shifted or changes shape, work has been done. Select the situation below in which work has been done on an object:

A a cat sits on a rug

B Ben lifts his dog’s food dish

C sunlight shines on a parked car

D music plays from a radio

[](http://www.google.com.au/imgres?hl=en&biw=1920&bih=931&tbm=isch&tbnid=rELzCzmWGMl_FM:&imgrefurl=http://www.outdoorandcountry.co.uk/Thermos-Flask-e28093-Stainless-King-Travel-Mug-Hammertone-450ml.html&docid=jT__EPlCarbg2M&imgurl=http://www.outdoorandcountry.co.uk/userimages/productstyles/product_large/0078490000000.jpg&w=1000&h=1200&ei=2b5CUf_sMdDYkQW5kYDIDA&zoom=1&sa=X&ved=0CMICEIQcMEk&ved=1t:3588,r:73,s:0,i:322&iact=rc&dur=1501&page=2&tbnh=178&tbnw=142&start=40&ndsp=50&tx=76&ty=124)**20** An effective insulator traps heat. The effectiveness of three brands of thermos are shown below. An equal volume of water at 80°C was poured into each thermos. The temperature of the water was tested every 10 minutes. These temperatures in each thermos are shown in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Time (mins) | Silvertop thermos | Geyser thermos | Thermocool thermos | Radiant thermos |
| 0 | 80 | 80 | 80 | 80 |
| 10 | 72 | 80 | 68 | 79 |
| 20 | 65 | 77 | 55 | 78 |
| 30 | 57 | 76 | 48 | 77 |
| 40 | 54 | 76 | 41 | 76 |
| 50 | 52 | 75 | 36 | 73 |
| 60 | 49 | 75 | 34 | 66 |

The most effective insulator is the:

A Silvertop thermos

B Geyser thermos

C Thermocool thermos

D Radiant thermos

**Short Answer**

**1** A red Honda travels at 20 km/h around a curved road near the top of a mountain. A blue Honda travels at 50 km/h along a flat road near a beach.

a State which car has the greatest kinetic energy. 1

b State which car has the greatest gravitational potential energy. 1

c Explain your answer. 2

**2** Explain the difference between an energy transfer and an energy transformation. 2

**3** James watches a television show after school.

a State the source of energy for the television. 1

b List any forms of energy that this energy is transformed into. 2

c Can a television can be 100% efficient? 1

d Explain your response. 1

**4**



This diagram shows a solar cell that is used to operate a solar fan.

Draw an energy flow diagram to show the energy changes that take place in this process. 2

**7** Consider the four situations listed below. 4

Write the corresponding letter in each box below to match the situation to its energy transformation flow diagram.

a a solar fan starts to spin

b Abdul dives into a pool

c newspaper burns in a fire

d a battery operated mouse rolls along the floor

gravitational potential energy 🡪 kinetic energy + sound energy + heat energy

light energy🡪 kinetic energy + sound energy + heat energy

chemical energy 🡪 light energy + sound energy + heat energy

chemical energy🡪 kinetic energy + sound energy + heat energy

**8** Some students investigated the effect of colour on the ability of a container to radiate heat. They painted two identical steel cans blue and yellow. Each was filled with 50 mL of hot water at 80°C and the temperature was recorded every minute. The results are below.

|  |  |  |
| --- | --- | --- |
| **TIME (mins)** | **TEMPERATURE (°C)** | |
| **BLUE** | **YELLOW** |
| 0 | 80 | 80 |
| 1 | 76 | 78 |
| 2 | 71 | 73 |
| 3 | 67 | 69 |
| 4 | 62 | 67 |
| 5 | 58 | 63 |
| 6 | 54 | 59 |
| 7 | 49 | 56 |
| 8 | 44 | 51 |

a What is the variable being ***changed*** (independent variable)? 1

b What is the variable being ***measured*** (dependent variable)? 1

c Give two variables that are controlled and kept the same. 2

d Graph the results on the grid below using a ***legend and different colours***. 5

e What conclusion would you make based on these results and graphs? 1

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Solutions /47

**Year 8 Physics**

**End of Topic Test**

**Multiple Choice Answer Sheet**

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|  |  |  |  |  |
| **1.** | **A** | **B** | **C** | **D** |
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| **6.** | **A** | **B** | **C** | **D** |
| **7.** | **A** | **B** | **C** | **D** |
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| **19.** | **A** | **B** | **C** | **D** |
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**Short Answer**

**1** A red Honda travels at 20 km/h around a curved road near the top of a mountain. A blue Honda travels at 50 km/h along a flat road near a beach.

a State which car has the greatest kinetic energy. 1

Blue

b State which car has the greatest gravitational potential energy. 1

Red

c Explain your answer. 2

It is at the top of a hill, so has stored energy

**2** Explain the difference between an energy transfer and an energy transformation. 2

Energy transfer from one object/medium to another

Energy transformation changes from one form to another

**3** James watches a television show after school.

a State the source of energy for the television. 1

Electrical

b List any forms of energy that this energy is transformed into. 2

Heat, Light Sound

c Can a television can be 100% efficient? 1

No

d Explain your response. 1

Energy always lost as heat during energy transformation

**4**

Light/solar -> electrical (optional) -> Kinetic + Sound + Heat

**7** Consider the four situations listed below. 4

Write the corresponding letter in each box below to match the situation to its energy transformation flow diagram.

a a solar fan starts to spin

b Abdul dives into a pool

c newspaper burns in a fire

d a battery operated mouse rolls along the floor

B gravitational potential energy 🡪 kinetic energy + sound energy + heat energy

A light energy🡪 kinetic energy + sound energy + heat energy

C chemical energy 🡪 light energy + sound energy + heat energy

D chemical energy🡪 kinetic energy + sound energy + heat energy

a What is the variable being ***changed*** (independent variable)? 1

Colour of Can

b What is the variable being ***measured*** (dependent variable)? 1

Temp Change oC

c Give two variables that are controlled and kept the same. 2

Volume of Water

Time

d Graph the results on the grid below using a ***legend and different colours***. 5

-1 each for no

Title

Lables

Units

Key/Legend

Ruler

Neat

Pencil

e What conclusion would you make based on these results and graphs? 1

Blue radiates more heat