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Name: \_\_\_\_\_ (   )

Class: \_\_\_\_\_

**WOODLANDS SECONDARY SCHOOL  
MID-YEAR EXAMINATION 2019**

Level:            Sec 2 Normal Technical

Marks:        60 marks

Subject:        NT Science

Day:            Wednesday

Paper:          5148

Date:          15 May 2019

Duration:      1 hour 15 minutes

Time:          0750 – 0905 hrs

**READ THESE INSTRUCTIONS FIRST**

Write your name, index number and class on the question paper.

Write in dark blue or black pen. You may use a soft pencil for any diagrams, graphs, tables or rough working. Do not use staples, paper clips, highlighters, glue or correction fluid.

**Section A**

There are twenty five questions. Answer **all** questions.

For each question, there are four possible answers, **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate optical answer sheet provided. Hand in **both** multiple choice answer sheet and question paper separately.

**Sections B**

Answer **all** questions in the spaces provided on the question paper.

| FOR EXAMINER'S USE |     |
|--------------------|-----|
| Section A          | /25 |
| Section B          | /35 |
| Total              | /60 |

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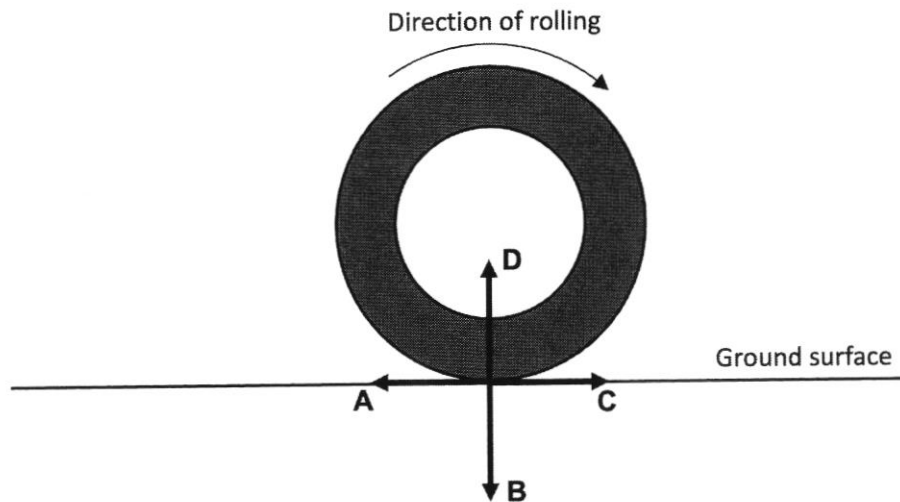
**DO NOT TURN THE PAGE UNTIL YOU ARE TOLD TO DO SO.**

This document consists of **12** printed pages.

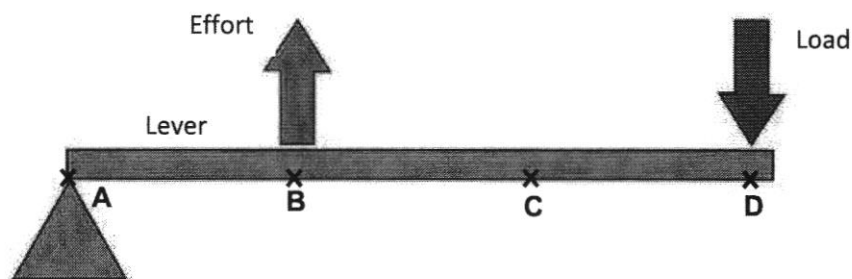
**Section A : Multiple Choice Questions (25 marks)**

Answer **all** questions. Write your answers in the multiple choice answer sheet provided.

- 1 What is the SI unit of force?
- A kilogram      B metre      C Newton      D pound
- 2 Which of the following statements is **not true** about force?
- A A force can change the shape and size of an object.  
B A force can change the mass of an object.  
C A force can move a stationary object or stop a moving object.  
D A force can change the speed of a moving object.
- 3 Which instrument is used to measure force?
- A Ammeter  
B Beam balance  
C Metre rule  
D Spring balance
- 4 A student lifts a box from the floor to the table. Which of the following forces is **not** present?
- A Frictional force  
B Gravitational force  
C Lifting force  
D Magnetic force
- 5 A wheel is rolling in the direction shown.  
In which direction does the frictional force between the wheel and the ground act?



- 6 Which of the following points is the fulcrum of the lever system?



- 7 Which of the following are correct examples of the various types of simple machines?

|          | <b>Levers</b> | <b>Inclined plane</b> |
|----------|---------------|-----------------------|
| <b>A</b> | Ladder        | Ramp                  |
| <b>B</b> | Ladder        | Watch                 |
| <b>C</b> | Serving tongs | Bicycle               |
| <b>D</b> | Serving tongs | Ramp                  |

- 8 When a rubber band is stretched, what type of energy is increased?

- A** Chemical potential energy
- B** Elastic potential energy
- C** Heat energy
- D** Kinetic energy

- 9 A skateboard is placed at the top of a smooth slope. As the skateboard moves down the smooth slope, what happens the energy of the skateboard?

|          | <b>Kinetic energy</b> | <b>Potential energy</b> |
|----------|-----------------------|-------------------------|
| <b>A</b> | Increases             | Increases               |
| <b>B</b> | Decreases             | Increases               |
| <b>C</b> | Increases             | Decreases               |
| <b>D</b> | Decreases             | Decreases               |

- 10 Which of the following statements about energy is **true**?

- A** When a car stops moving, its kinetic energy is destroyed.
- B** Electrical energy is converted to heat energy when a fluorescent light is switched on.
- C** A flying aeroplane has no gravitational potential energy.
- D** When a person is running, chemical potential energy is converted to kinetic energy.

- 11 Which of the following is a renewable source of energy?
- A Coal
  - B Crude oil
  - C Hydropower
  - D Natural gas
- 12 Which of the following sources of energy causes air pollution?
- A Fossil fuels
  - B Hydropower
  - C Solar energy
  - D Wind energy
- 13 Which of the following does **not** help with conservation of energy?
- A Cooking with oven instead of stove.
  - B Switching lights off when leaving a room.
  - C Taking public transport instead of driving.
  - D Using fans instead of air conditioners.
- 14 Which of the following is a greenhouse gas?
- A Methane
  - B Nitrogen
  - C Oxygen
  - D Sulfur dioxide
- 15 The buildings in a city corrode very quickly. Which of the following is the likely cause?
- A Too much sulfur dioxide is emitted.
  - B There is lack of oxygen in the city.
  - C There is too much dust in the city.
  - D Too much carbon monoxide is emitted.
- 16 The temperature in Singapore has risen by an average of  $0.25^{\circ}\text{C}$  per decade between 1948 and today. What is the main cause?
- A Greenhouse gases
  - B Haze
  - C Less forest
  - D More sunlight

- 17 Which of the following gases will cause dizziness, headaches and even death when inhaled in large amounts?
- A Carbon monoxide
  - B Carbon dioxide
  - C Oxygen
  - D Sulfur dioxide
- 18 The forest area of a developing country decreases over the past 30 years. How does this affect the air quality of the country?

|   | Amount of oxygen in the air | Amount of carbon dioxide in the air |
|---|-----------------------------|-------------------------------------|
| A | Increases                   | Increases                           |
| B | Decreases                   | Increases                           |
| C | Increases                   | Decreases                           |
| D | Decreases                   | Decreases                           |

- 19 The table below shows how PSI values are used to measure air quality in Singapore.

| <b>PSI Value</b> | <b>Air Quality</b> |
|------------------|--------------------|
| 0 – 50           | Good               |
| 51 – 100         | Moderate           |
| 101 – 200        | Unhealthy          |
| 201 – 300        | Very unhealthy     |
| Above 300        | Hazardous          |

Which of the following correctly describes air quality of Singapore?

|   | Average air quality | Air Quality during Haze |
|---|---------------------|-------------------------|
| A | Good                | Good                    |
| B | Moderate            | Very unhealthy          |
| C | Moderate            | Good                    |
| D | Unhealthy           | Very unhealthy          |

- 20 Which of the following is **not** a source of water for Singapore?

- A Desalination of sea water
- B Imported water from Malaysia
- C Water from underground
- D Water reservoirs

21 Which of the following statement(s) about clean water is/are correct?

- I. Clean water supports life processes.
- II. Clean water is necessary for producing food.
- III. Water in the river is definitely clean.

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

22 Country X is an industrialised country that relies on exporting consumer products. Country Y is an agricultural country that relies on exporting rice. What are the likely sources of water pollution in these countries?

|   | Country X                   | Country Y                   |
|---|-----------------------------|-----------------------------|
| A | Industrial waste and sewage | Pesticides and fertilisers  |
| B | Industrial waste and sewage | Industrial waste and sewage |
| C | Pesticides and fertilisers  | Pesticides and fertilisers  |
| D | Pesticides and fertilisers  | Industrial waste and sewage |

23 Which of the following statements about oil spills is **incorrect**?

- A Oil spills take place at the sea.
- B Oil forms a layer on the water that prevent oxygen from entering the water.
- C Oil is a breeding ground for bacteria.
- D Oil can clog up the gills of fishes and cause them to die.

24 NEWater is produced from

- A Rain water
- B Sea water
- C Waste water
- D Water from reservoir

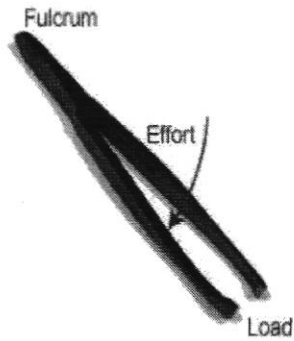
25 What has Singapore **not** done to reduce water pollution?

- A Clean up the river.
- B Educate the public on the importance of clean waterways.
- C Provide bins along waterways.
- D Shut down oil refinery plants.

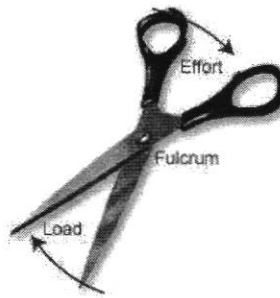
**Section B (35 marks)**

Answer **all** questions in the spaces provided on the question paper.

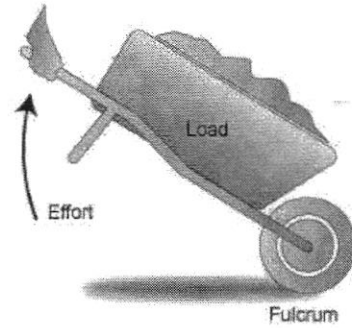
- 1 Classify the following examples into the three types of levers.



Tweezers



Scissors

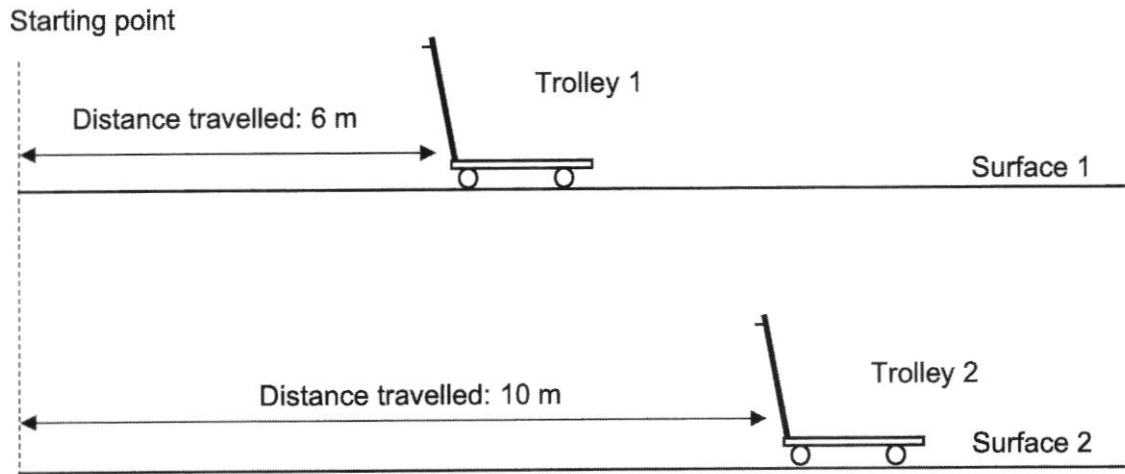


Wheelbarrow

| 1 <sup>st</sup> class lever | 2 <sup>nd</sup> class lever | 3 <sup>rd</sup> class lever |
|-----------------------------|-----------------------------|-----------------------------|
|                             |                             |                             |

[3]

- 2 Two identical trolleys with the same speed travelled along two different surfaces. Trolley 1 on surface 1 travelled 6 m before stopping completely while trolley 2 on surface 2 travelled 10 m before stopping completely.



- (a) Which surface is smoother?

..... [1]

- (b) If some books are placed on trolley 1, how will the friction between trolley 1 and surface 1 change? Explain your answer.

.....  
 .....  
 ..... [2]

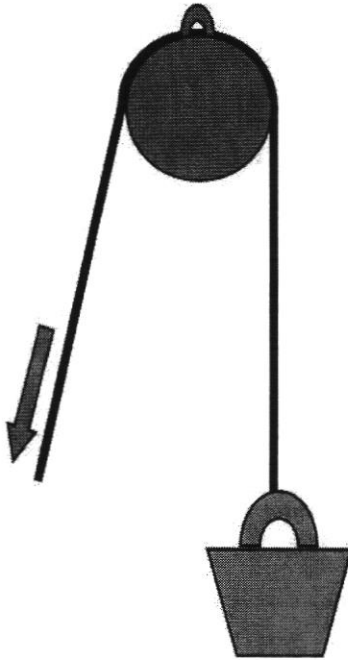
- (c) If water is poured onto surface 2, how will friction between trolley 2 and surface 2 change? Explain your answer.

.....  
 .....  
 ..... [2]

- (d) Describe one situation where friction is useful.

..... [1]

- 3 The diagram shows a pulley system.



Determine whether the following statements about the pulley system are true or false. [3]

| Statement                                                     | True or False |
|---------------------------------------------------------------|---------------|
| The effort needed is less than the load.                      |               |
| The work is made easier.                                      |               |
| The direction of effort is the same as the direction of load. |               |

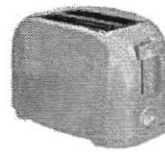
- 4 Use the objects listed below to fill in the table. [4]



Loudspeaker



Washing machine



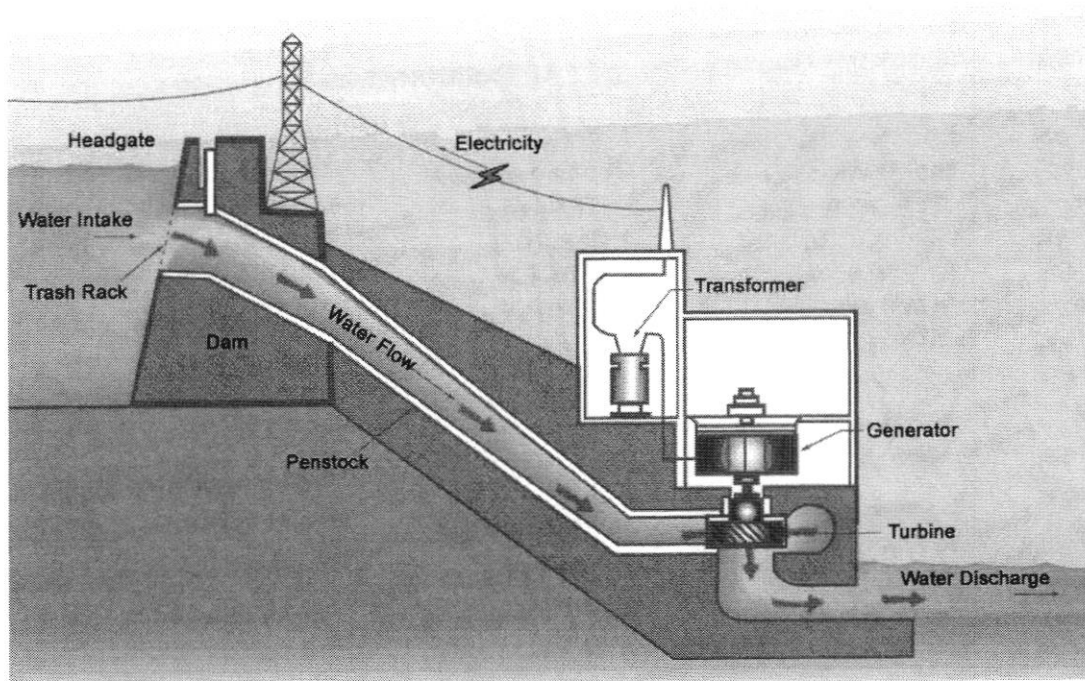
Toaster



Battery

| Energy Conversion                    | Object |
|--------------------------------------|--------|
| Electrical energy to kinetic energy  |        |
| Electrical energy to sound energy    |        |
| Electrical energy to heat energy     |        |
| Chemical energy to electrical energy |        |

- 5 The diagram shows a power plant that uses hydropower to generate electricity.



- (a) Fill in the blanks with forms of energy listed below. Each form of energy may be used more than once.

Elastic potential energy  
 Chemical potential energy  
 Gravitational potential energy  
 Kinetic energy  
 Light energy  
 Heat energy  
 Electrical energy

When water flows from the dam towards the turbine, .....

is converted into .....

When the turbine spins and the generator starts working, .....

is converted into .....

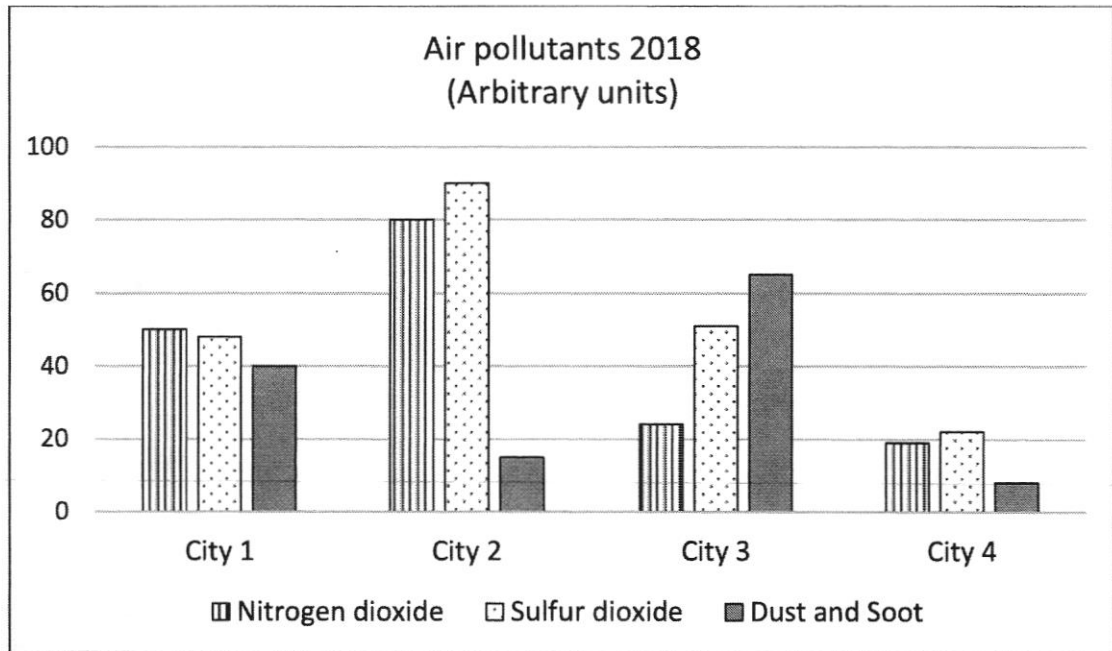
[4]

- (b) Hydropower is a renewable source of energy. State two advantages of hydropower compared to fossil fuels.

.....

..... [2]

- 6 The chart shows the amount of air pollutants detected in four cities in 2018.



- (a) Which city is most suitable for people with asthma to live in? Explain your answer.

.....  
 ..... [2]

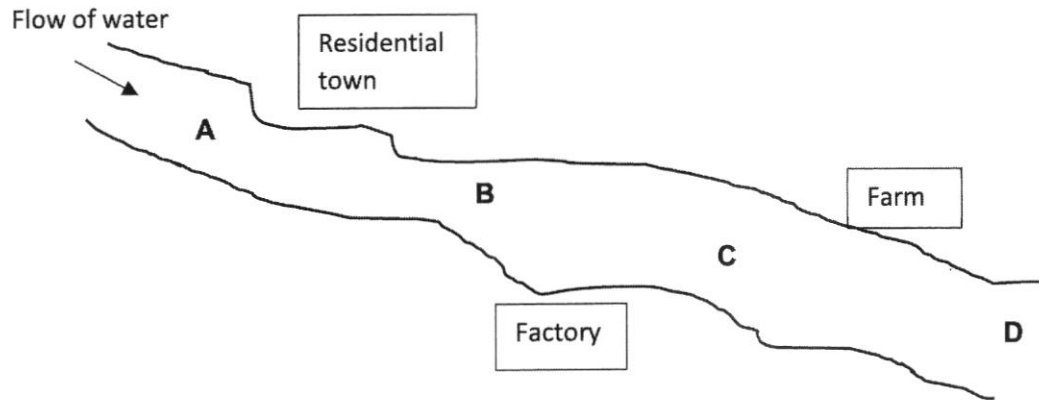
- (b) City 2 spends the most amount of money in maintaining the conditions of buildings and metal structures. Explain the reasons.

.....  
 ..... [2]

- (c) A neighbouring country routinely burns down forest for agricultural purpose. Which city is closest to this country? Explain your answer.

.....  
 ..... [2]

- 7 The diagram below shows part of a river. A residential town, a factory and a farm are situated near the river.



To investigate the water pollution situation, an environmental agency tested the water at four locations: A, B, C and D.

- (a) Which location has no water pollution?

..... [1]

- (b) Which location has only litter and industrial waste found in water?

..... [1]

- (c) Which location has litter, fertilisers and industrial waste found in water?

..... [1]

- 8 Match the following common water pollutants with their effects.

[4]

|                   |                                   |
|-------------------|-----------------------------------|
| Litter●           | ● Cause algae to grow rapidly     |
| Oil spills●       | ● Choke birds to death            |
| Industrial waste● | ● Prevent air from entering water |
| Fertilisers●      | ● Kill aquatic plants and animals |

**END OF PAPER**

**Woodlands Secondary School**  
**2 Normal (Technical) Mid-Year Examination 2019**

**Section A**

|           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>1</b>  | <b>2</b>  | <b>3</b>  | <b>4</b>  | <b>5</b>  | <b>6</b>  | <b>7</b>  | <b>8</b>  | <b>9</b>  | <b>10</b> |
| C         | B         | D         | D         | C         | A         | D         | B         | C         | D         |
| <b>11</b> | <b>12</b> | <b>13</b> | <b>14</b> | <b>15</b> | <b>16</b> | <b>17</b> | <b>18</b> | <b>19</b> | <b>20</b> |
| C         | A         | A         | A         | A         | A         | A         | B         | B         | C         |
| <b>21</b> | <b>22</b> | <b>23</b> | <b>24</b> | <b>25</b> |           |           |           |           |           |
| B         | A         | C         | C         | D         |           |           |           |           |           |

**Section B**

|      |                                                                                          |                             |                             |                             |  |     |
|------|------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|-----------------------------|--|-----|
| 1    |                                                                                          | 1 <sup>st</sup> class lever | 2 <sup>nd</sup> class lever | 3 <sup>rd</sup> class lever |  | [3] |
|      |                                                                                          | Scissors                    | Wheelbarrow                 | Tweezers                    |  |     |
| 2(a) | Surface 2                                                                                |                             |                             |                             |  | [1] |
| 2(b) | The friction will increase because the force pressing on the surface is increased.       |                             |                             |                             |  | [2] |
| 2(c) | The friction will decrease because water will act as lubricant.                          |                             |                             |                             |  | [2] |
| 2(d) | Helps with walking<br>Helps to grip things<br>Needed for braking<br><br>Any valid answer |                             |                             |                             |  | [1] |
| 3    | False<br>True<br>True                                                                    |                             |                             |                             |  | [3] |
| 4    | Washing machine<br>Loudspeaker<br>Toaster<br>Battery                                     |                             |                             |                             |  | [4] |
| 5(a) | Gravitational potential energy<br>Kinetic energy<br>Kinetic energy<br>Electrical energy  |                             |                             |                             |  | [4] |
| 5(b) | Can be renewed and will not run out<br>Does not produce greenhouse and harmful gases     |                             |                             |                             |  | [2] |
| 6(a) | City 4<br>It has the lowest amount of air pollutants/dust and soot                       |                             |                             |                             |  | [2] |
| 6(b) | City 2 has the most amount of nitrogen dioxide and sulfur dioxide                        |                             |                             |                             |  | [2] |

|      |                                                                                                                                                                                                                                        |     |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
|      | Which cause acid rain and corrode buildings and metal structures.                                                                                                                                                                      |     |
| 6(c) | City 3<br>Because it has the highest amount of dust and soot.                                                                                                                                                                          | [2] |
| 7(a) | A                                                                                                                                                                                                                                      | [1] |
| 7(b) | C                                                                                                                                                                                                                                      | [1] |
| 7(c) | D                                                                                                                                                                                                                                      | [1] |
| 8    | <div> <div> Litter●<br/>Oil spills●<br/>Industrial waste●<br/>Fertilisers● </div> <div> Cause algae to grow rapidly●<br/>Choke birds to death●<br/>Prevent air from entering water●<br/>Kill aquatic plants and animals● </div> </div> | [4] |