Support Worksheet – Topic 7, Worksheet 1

1 State what is meant by **non-renewable sources** of energy. [1]

2 State what is meant by a **fuel**. [1]

3 Give one example of a renewable and a non-renewable fuel. [1]

4 Define the **energy density** of a fuel. [1]

5 State a typical efficiency of a gas-fired electricity power plant. [1]

6 State the difference, in terms of energy transformations, between an active solar device and a photovoltaic cell. [2]

7 State the percentage of electrical power that is supplied by nuclear reactors worldwide. [1]

8 State the form of energy that is produced in a nuclear reactor. [1]

9 Describe the role, in a nuclear reactor, of

a the moderator [1]

b the control rods. [1]

10 A hydroelectric power station produces 85 MW of electrical power. The overall efficiency of the station is 65%. The average height of the water above the turbines is 58 m. Calculate the rate at which water runs through the turbines of the power station in kg s^{-1}. [3]

11 A wind generator produces 25 kW of power in wind of speed 5.0 m s^{-1}. Calculate the expected power in wind of speed 10 m s^{-1}. [2]

12 Define **albedo**. [1]

13 State the Stefan–Boltzmann radiation law. [1]

14 Define **emissivity**. [1]

15 Give two examples of a greenhouse gas. [2]

16 State what is meant by the **greenhouse effect**. [2]

17 The average intensity of solar radiation received by the Earth's surface is about 245 W m^{-2}. Assuming the Earth's surface behaves as a black body, calculate its temperature and comment on your answer. [2]

18 Explain why we must distinguish between land-based ice and floating ice when discussing sea-level changes under conditions of global warming. [2]