Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Energy (High Demand)

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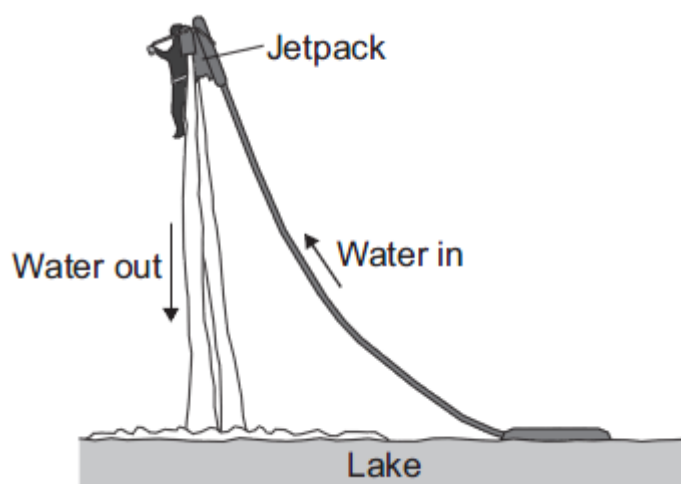
Name of the Student:_____

Max. Marks : 18 Marks　　　　　　　　　　　　　　　　　　　**Time : 18 Minutes**

Q1.

The diagram below shows a person using a device called a jetpack. Water is forced downwards from the jetpack and produces an upward force on the person.

(a)　　State the condition necessary for the person to be able to remain stationary in mid-air.

_____

_____

(1)

(b)　　The person weighs 700 N and the jetpack weighs 140 N.

(i)　　Calculate the combined mass of the person and the jetpack.

Gravitational field strength = 10 N/kg

_____

_____

_____

Combined mass = _____ kg

(2)

(ii)　　Increasing the upward force to 1850 N causes the person to accelerate upwards.

Calculate the acceleration of the person and the jetpack. Give the unit.

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_____

Acceleration = _____ Unit _____

(3)

(Total 6 marks)

Q2.

Under the same conditions, different materials heat up and cool down at different rates.

(a)   What is meant by specific heat capacity?

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(2)

(b)   'Quenching' is a process used to change the properties of steel by cooling it rapidly.

The steel is heated to a very high temperature and then placed in a container of cold water.

(i)   A metalworker quenches a steel rod by heating it to a temperature of 900 °C before placing it in cold water. The mass of the steel rod is 20 kg.

The final temperature of the rod and water is 50 °C.

Calculate the energy transferred from the steel rod to the water.

Specific heat capacity of steel = 420 J/kg °C.

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Energy transferred = _____ J

(3)

(ii)   The temperature of the steel rod eventually returns to room temperature.

Compare the movement and energies of the particles in the steel rod and in the air at room temperature.

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(3)

(iii)   When the steel rod is being quenched, the temperature of the water rises to 50 °C. After a few hours the water cools down to room temperature.

Some of the cooling of the water is due to evaporation.

Explain in terms of particles how evaporation causes the cooling of water.

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(4)
(Total 12 marks)