The City School

North Nazimabad Boys Campus

PHYSICS MONTHLY TEST 2

1ST TERM

Name of Student: _____ Class: _____ Section: _____

Max Marks: 30 Time: 40 minutes Date: _____

Q1. Fig. 1.1 shows a skydiver, of mass 70 kg, falling towards the Earth at constant speed, a long time after jumping from an aeroplane.

Fig. 1.1

At time t = 0, he receives a radio signal. He opens his parachute 12 s later. Fig. 1.2 is the speed-time graph for the skydiver.

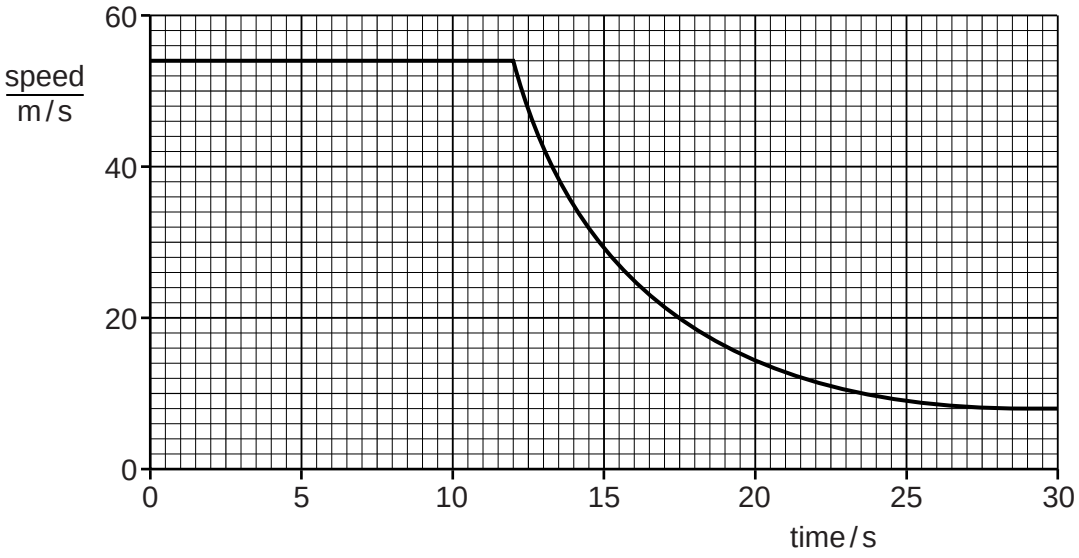

Fig. 1.2

(a) State the difference between *speed* and *velocity*.

.....

..... [1]

(b) The gravitational field strength g is 10 N/kg.

(i) Calculate the weight of the skydiver.

weight = ... [1]

(ii) State the size of the air resistance acting on the skydiver between $t = 0$ and $t = 12\,s$.

air resistance = ...[1]

(c) For the period between $t = 0$ and $t = 12\,s$, determine

(i) the speed of the skydiver,

speed = ...[1]

(ii) the distance fallen by the skydiver,

distance = ...[2]

(e) **(i)** State and explain what happens to the air resistance as the skydiver opens his parachute.

.....

.....

.....[2]

(ii) State and explain the effect on the motion of the skydiver of opening the parachute.

.....

.....

.....[2]

(f) By $t = 15\,s$, his parachute is fully open.

State and explain what happens to the air resistance after $t = 15\,s$.

.....

.....

.....[2]

Q2 A student wishes to find the density of a stone. He uses a measuring cylinder and a spring balance with a scale marked in newtons. The measuring cylinder, spring balance and stone are shown in Fig. 2.1.

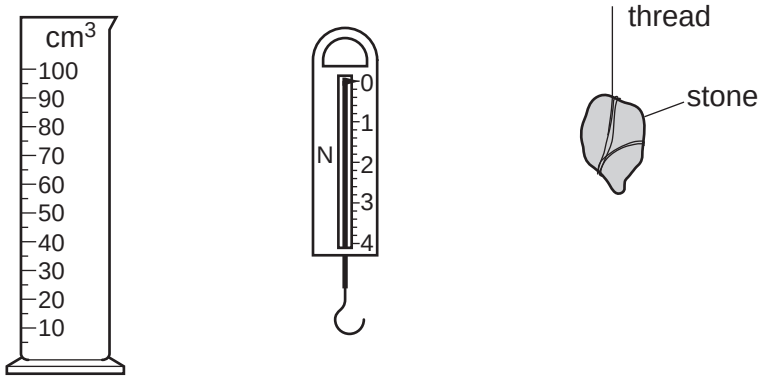

Fig. 2.1

The student knows that the gravitational field strength is 10 N / kg.

(a) Describe how the student uses the spring balance to find the mass of the stone.

.....

.....

.....[2]

(b) Describe how the student uses the measuring cylinder to find the volume of the stone.

.....

.....

.....[2]

(c) The mass of the stone is 150 g and its volume is 70 cm^3.
Calculate the density of the stone.

density of stone = ...[1]

(d) The stone is taken to another place, where the gravitational field strength is less than 10 N / kg. State how this affects the mass and the weight of the stone.

mass .....

weight .....
[1]

Q3 Fig. 1.1 shows an ice cube at 0 °C.

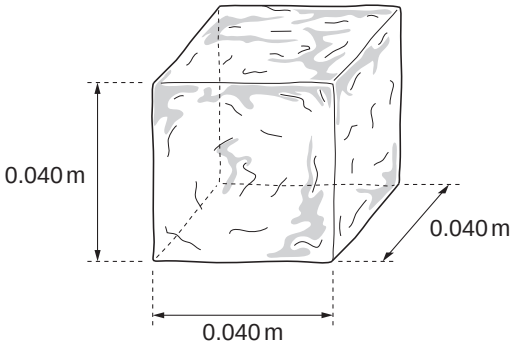

Fig. 3.1

The sides of the cube are of length 0.040 m. Ice at 0 °C has a density of 920 kg / m^3.

(a) Calculate

(i) the mass of the ice cube,

mass = ...[3]

(ii) the weight of the ice cube.

weight = ...[1]