Name of the Student:_____
Max. Marks : 16 Marks **Time : 16 Minutes**

Mark Schemes

Q1.

(a) energy transferred from athlete / skin / body to water / sweat
allow water / sweat heated by athlete
1

(so) more energetic (water / sweat) particles escape (from the liquid)
accept particles with higher speeds escape (from the liquid)
1

water / sweat <u>evaporates</u>
accept particles escape from the (surface of the) liquid
1

(which) lowers the <u>average</u> energy of (remaining) water / sweat particles
allow reference to the total energy of the liquid reducing
allow lowers the athlete's <u>temperature</u>
ignore cool down
1

(b) any **three** from:
accept IR / radiation / heat / infrared / energy throughout

- the blanket traps air
- air is an insulator
  accept for 2 marks trapped air reduces conduction / convection
- space blanket reflects infrared radiation (back to the body)
  ignore incident solar radiation
  ignore reflects light
  ignore bounces off
- space blanket is a poor emitter / radiator of infrared radiation
  *do **not** accept does not emit infrared radiation*

3

[7]

Q2.

(a) any **two** from:
- (longitudinal) oscillations are parallel to the direction of energy transfer
- (transverse) oscillations are perpendicular / 90° to the direction of energy transfer

allow vibrations for oscillations

allow correct description of particle movement for oscillation
allow direction of wave for direction of energy transfer

- (longitudinal waves) show areas of compression and rarefaction

marks can be gained from correctly labelled diagrams
ignore references to need for a medium to travel through

2

(a) (i) reaction time

allow a description of reaction time
allow measuring the time

1

(as) time measured is very small

allow (as) sound travels quickly

1

(ii) 0.28(3)

*an answer of 283(.3) gains **2** marks*
*allow correct substitution and unit conversion for **2** marks 340 =1200 λ **or** 340 / 1200 = λ provided no subsequent step shown*
*allow correct substitution for **1** mark 340 =1.2 λ **or** 340 / 1.2 = λ provided no subsequent step shown*

3

[7]

Q3.

$v = f \times \lambda$

1.5×10^{10} (hertz)
or
15 000 000 000

*allow **1** mark for correct substitution and transformation*
$(3 \times 10^8 / 0.02)$
*allow **1** mark for 1.5×10^8*
***or** 150 000 000*

2

[2]