

Name of the Student: \_\_\_\_\_

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

**Q1.**

- |     |                                                                                                                                                                             |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| (a) | pitch                                                                                                                                                                       | 1 |
|     | loudness                                                                                                                                                                    | 1 |
| (b) | (i) as length (of prongs) decreases frequency / pitch increases<br><i>accept converse</i><br><i>accept negative correlation</i><br><i>ignore inversely proportional</i>     | 1 |
|     | (ii) 8.3 (cm)<br><i>accept <math>8.3 \pm 0.1</math> cm</i>                                                                                                                  | 1 |
|     | (iii) (8.3 cm is) between 7.8 (cm) and 8.7 (cm)<br><i>ecf from part (ii)</i>                                                                                                | 1 |
|     | (so $f$ must be) between 384 (Hz) and 480 (Hz)                                                                                                                              | 1 |
|     | $410 \text{ (Hz)} \leq f \leq 450 \text{ (Hz)}$<br><i>if only the estimated frequency given, accept for 1 mark an answer within the range</i>                               | 1 |
| (c) | (i) electronic                                                                                                                                                              | 1 |
|     | (ii) frequency is (very) high<br><i>accept frequency above</i><br><i>20 000 (Hz) or audible range</i>                                                                       | 1 |
|     | so tuning fork <b>or</b> length of prongs would be very small (1.2 mm)                                                                                                      | 1 |
| (d) | 285.7 (Hz)<br><i>accept any correct rounding 286, 290, 300</i><br><i>allow 2 marks for 285</i><br><i>allow 2 marks for correct substitution <math>0.0035 = 1 / f</math></i> |   |

allow **1** mark for  $T = 0.0035$  s  
allow **1** mark for an answer of 2000

3

[13]

**Q2.**

(a) transmits

*correct order*

1

absorbs

1

(b) light

*allow ultra violet **or** UV **or** infrared **or** IR **or** gamma*

1

(c) 20

*allow **1** mark for correct working, ie  $\frac{60}{3}$  provided no subsequent step*

2

(d) Killing cancer cells

1

[6]