Sound

Mark Scheme 3

Level	IGCSE
Subject	Physics
ExamBoard	CIE
Topic	Properties of Waves including Light and Sound
Sub-Topic	Sound
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 3

Time Allowed: **52 minutes**

Score: **/43**

Percentage: **/100**

1 (a   source of sound (e.g. gun/hooter), tape (100 m), stopwatch   B1   [1]
           NOT clock, metre rule (unless lab method)

   (b)   distance <u>and</u> time between "flash and bang" (must be clear)   B1   [1]

   (c)   distance/time OR d/t OR 2d/t   B1   [1]

   (d)   further apart/more accurate timer/repeat/any other   B1   [1]

   (e)   speed of sound in air, tick 100   B1

           speed of sound in water, tick 1000   B1   [2]

                                                                                     [Total: 6]

2 (a (i) diagram showing compressions and rarefactions
           (could be either spaced vertical lines or dots, or coil or sine wave)   B1
           2C's and 2R's in approx correct place   B1

       (ii) wavelength correctly marked, by eye   B1

   (b) (i) all 3 in correct positions   B1

        (ii) radio (waves)   B1

        (iii) 3×10^8 m/s   B1

                                                                                     [Total: 6]

3	**(a** Longitudinal or pressure waves	B1 **1**
	(b) a correct C marked	B1
	a correct R marked	B1 **2**
	(c) oscillation/vibration/backwards and forwards	M1
	along PY (consider pressure waves as alternative)	A1 **2**
	(d) wavelength = 340/200	C1
	PX(= λ/2) = 0.85 m	A1 **2**
		[7]

4	**(a)**	Sound reflects off wall	**B1**	**[1]**
	(b)	400 Hz	**B1**	**[1]**
	(c)	λ = v/f or = 330/400	**C1**	
		= 0.83 m	**A1**	**[2]**
	(d)	vibration/oscillation along line of/direction of wave	**B1**	**[1]**
				Total [5]

5	**(a**	C,R,C,R,C,R marked (or v.v.) along XY	B1 **1**
	(b) **(i)**	Above normal / high air pressure or particles close together	B1
	(ii)	Below normal / low pressure or particles further apart	B1 **2**
	(c)	Oscillation / vibration of particles / molecules (or particles / molecules move to and fro)	B1
		Oscillation is along XY	B1 **2**
	(d)	Time = distance / speed or (2x) 50/340	C1
		Time = 0.29 s	A1 **2**

6 **(a)**		diffraction	**1**	**1**
(b)		plane waves in front of gap	**1**	
		curved end effect shown, reasonable curves	**1**	
		wavelength constant throughout and approximately same as in Fig. 8.1	**1**	
		good quality i.e. end effect starts at correct points	**1**	**4**
(c)		<u>particles/water</u> oscillate/vibrate/move up and down	**1**	
		at right angles to wave direction	**1**	**2**

<div align="right">

(7)

</div>

7 a(i) C marked vertically under/at any peak (including on axis)   B1
    R marked on NEXT trough (either way)   1 B1
  (ii) <u>half a wavelength</u>   1 B1   3

  b $f = v/w$ or $340/1.3$ C1
      $= 260$ Hz*   2 A1   2

                                                                  QT   5