Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: Forces (High Demand Questions)

Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) the total amount of energy (of the bumper car and barrier) remains constant.
or
total momentum (of bumper car and barrier) before collision equals total momentum (of bumper car and barrier) after collision
or
the resultant external force acting (on the system) is zero
allow there are no external forces (acting on the system)
1

(b) the force of the car on the barrier is equal to the force of the barrier on the car and in the opposite direction
1

(c) $F = \frac{700}{0.28}$
1

F = 2 500 (N)
1

(d) increases the time taken for the collision to occur
allow increases contact time
*do **not** accept slows down time*
1

(so) the rate of change of momentum decreases
allow reduces acceleration / deceleration
1

reducing the force (on the people)
reduces impact is insufficient
1

(e) $2.5^2 - u^2 = 2 \times 2.0 \times 1.5$
1

$u^2 = 2.5^2 - (2 \times 2.0 \times 1.5)$
1

u = 0.50 (m/s)
allow 0.5 (m/s)
1

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Q2.

(a) satellite

allow moon

1

(b) 12.5 cm = 0.125 m

1

$3 \times 10^8 = f \times 0.125$

this mark may be awarded for an incorrectly / not converted value for wavelength

1

$$f = \frac{3 \times 10^8}{0.125}$$

this mark may be awarded for an incorrectly / not converted value for wavelength

1

f = 2 400 000 000 (Hz)

this mark may be awarded for an incorrectly / not converted value for wavelength

1

$f = 2.4 \times 10^9$ (Hz)

this mark may be awarded for an incorrectly calculated value for frequency in standard form using the given data

1

(c) gravitational force causes the Hubble Space Telescope to accelerate towards the Earth

1

this changes the direction of motion (but not the speed)

1

so changes the velocity of the Hubble Space Telescope

if no other marks awarded, allow 1 mark for gravitational force maintains circular orbit

1

(d) galaxy A has the greater red shift

1

(so) A is travelling (away from us) faster (than B)

1

(because) A is further away (from us than B)

if no other marks awarded, allow 1 mark for galaxy A and galaxy B are moving away from us

1

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