MARK SCHEME

GCSE

PHYSICS

AQA - TRIPLE SCIENCE

P5 - TEST 3

Moments, Momentum & Fluid Pressure

Beginner

www.examqa.com

Mark schemes

1. lever

turning effect

pivot

for 1 mark each

[3]

2. (a) (i) 75

*allow **1** mark for correct substitution ie 250 × 0.3*
*do **not** credit if subsequent step shown*
*allow **1** mark for an answer 7500*

2

(ii) Nm

1

(b) force is (applied) further from the nut / pivot / axis of rotation

handle is longer is insufficient
*do **not** accept less force needed*

1

moment (on wrench) is larger

1

[5]

3. (a) $p = \frac{27}{0.009}$

1

p = 3000

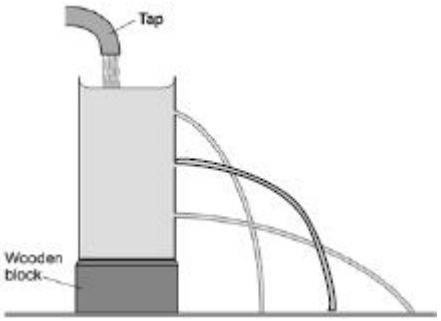
1

Pa

1

*an answer of 3000 scores **2** marks*

(b)



the water path hits the surface somewhere between the other two paths

1

(c) pressure increases with depth

allow when the pressure is higher, the water travels further

1

(d) pressure acts in all directions

or

pressure causes a force on (all) the surfaces

ignore liquids cannot be compressed

1

[6]

4. (a) **A**

1

(perpendicular) distance between the camera and pivot is greatest

1

(b) increases

1

(c) 5.0 × 9.8

*an answer of 49 scores **2** marks*

1

49

1

newton

allow N

1

(d) moment (of a force) = force × distance

allow M = Fd

1

(e) 144 cm = 1.44 m

*an answer of 70.56 scores **3** marks*

*an answer of 71 scores **3** marks*

1

moment = 49 × 1.44

allow ecf from part (c)

1

moment = 70.56

*answers of 7056 or 7100 score **2** marks*

1

[10]

5. (a) moment = 280 × 0.9

1

moment = 252

1

*allow 252 with no working shown for **2** marks*
*allow 25200 with no working shown for **1** mark*

(b) the clockwise moment (of child B) decreases

1

making it is less than the anticlockwise moment (of child A)
accept so moments are no longer balanced

1

so child A moves downwards

or

so child B moves upwards

1

[5]

6. (a) The pressure at X is the same as at Y

1

(b) larger than

1

(c) (i) 3 (N/mm^2)
accept 3 000 000 Pa (correct unit must be given)
*allow **1** mark for correct*
substitution, ie
$\frac{24}{8}$
provided no subsequent step

2

(ii) pascal

1

(d) the brakes would not work
allow the vehicle (car/bike etc) would not stop
*accept they would freeze solid **or** seize up*

1

[6]

7. (a) (force on the chain is) smaller (than the force of the toe)

1

(b) Tick in middle box

The moments are equal and opposite

1

(c) move the toe (up the pedal) away from the pivot

1

[3]

8. (a) work done = 11 500 × 2.60

1

work done = 29 900 (J)

1

*an answer of 29 900 scores **2** marks*

(b) 13 800

1

(c) moment (of a force) = force × distance

allow M = F d

1

(d) 13 800 = 11 500 × distance

1

$$\text{distance} = \frac{13\,800}{11500}$$

1

distance = 1.2(0 m)

1

*of an answer 1.2(0) scores **3** marks*

[7]

9. (a) turning

1

(b) 420

*allow **1** mark for correct substitution, ie 1400 × 0.30 provided no subsequent step shown*

2

(c) **A**

reason only scores if A is chosen

1

any **one** correct reason:
the force is furthest away (from the pivot)

accept distance (from the pivot) is the greatest

accept it is further away (from the pivot)

accept furthest away from the rock

1

[5]

10. (a) make the rod longer

1

push down on the rod with a greater force

1

(b) particles are close together

1

so no room for more movement

dependent on 1st marking point

1

(c) (i) downward force produces pressure in liquid

reference to compression of liquid negates this mark

1

this pressure is the same at all points in a liquid
or
this pressure is transmitted equally through the liquid

and P = F / A ***or*** *F = P × A*

1

area (at load) bigger *(so force bigger)*

1

(ii) the force acting on the car moves less distance than the effort force

1

[9]

11. (a) 3000

*allow **1** mark for correct substitution, ie 600 × 5 provided no subsequent step*

2

(b) anticlockwise moment

must be both words

1

(c) (i) 3400

allow 3.4 kilo (newtons)

1

(ii) as the distance (of the girl from point A) increases, force F increases

allow gets bigger for increases

force is (directly) proportional to distance will negate any correct response

1

[5]

12. (a) hydraulic

1

(b) 9

*allow **1** mark for a correct substitution, ie* $\frac{1800}{200}$ *provided no subsequent step*

2

(c) an environmental

1

[4]

13. (a) 360

*allow **1** mark for correct substitution ie 300 × 1.2 provided no subsequent step shown*

2

(b) the force is applied further from the axis of rotation

accept pivot / (tree) stump for 'axis of rotation'

1

or

this increases the moment of the force

increases the force on the (tree) stump

1

[4]