Practice Question Set For A-Level
Subject : Physics
Paper-2 Topic: Fields And Their Consequences(Gravitational Field)

Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) force acting per unit mass **or** $g = F / m$ **or** $g = \frac{GM}{R^2}$ with terms defined **(1)**

(b) (i) direction of F_E correct in each diagram **B1**

direction of F_M correct in each diagram **B1**

direction of F_S correct in each diagram **B1**

F_S must be distinguished from F_M

penalty of 1 mark for any missing labelling **(3)**

(ii) sun and moon pulling in same direction / resultant of F_M and F_S is greatest / clear response including summation of F_M and F_S **M1**

configuration A **A1** **(2)**

(c) $F = GMm / R^2$ **C1**

correct substitution $\frac{6.7 \times 10^{-11} \times 2.0 \times 10^{30}}{(1.5 \times 10^{11})^2}$ **C1**

(5.95 **or** 5.96 **or** 5.9 **or** 6.0) × 10^{-3} N kg^{-1} **A1** **(3)**

[9]

Q2.

(a) (i) g.p.e. = $G\frac{Mm}{R}$ **must be equation** (*condone "V ="*)

B1

1

(ii) equate with k.e. **must be seen**

M1

cancelling **correct *m*** must be seen

A1

2

(b) correct ratios taken ($\frac{v^2}{v_E^2} = 2$)

C1

$v = 15.8(4)$ km s^{-1}

A1

2

(c) mention of air resistance

M1

k.e. of rocket → internal energy of rocket and atmosphere/
work is done against air resistance

A1

2

[7]

Q3.

D

[1]

Q4.

C

[1]