

**IGCSE Physics**

**Paper 4**

**Unsolved Topical**

**Past Papers with Marking Schemes**

**All Variants**

**2014-2021**

<b>Title</b>	IGCSE TOPICAL PHYSICS PAPER 4
<b>Published by</b>	MS Books (042-35774780)
<b>Legal Advisor</b>	Ashir Najeeb Khan (Advocate) <b>AKBAR LAW CHAMBERS</b> 39-40, 1 <sup>st</sup> Floor, Sadiq Plaza, The Mall, Lahore. 0307-4299886, 042-36314839
<b>For Complaints/Order</b>	<b>MS Books</b> 83-B1 Ghalib Market, Gulberg III, Lahore <a href="mailto:contact@msbook.net">contact@msbook.net</a> <a href="http://www.msbooks.net">www.msbooks.net</a> (042-35774780),(03334504507),(03334548651)

## PREFACE

Excellence in learning cannot be claimed without application of concepts in a dexterous way. In this regard one of the logical approach is to start in chunks; like chapter wise learning and applying the concept on exam based questions.

This booklet provides an opportunity to candidates to practice topic wise questions from previous years to the latest. Extensive working of Team MS Books has tried to take this booklet to perfection by collaborating with top of the line teachers.

We have added answer key / marks scheme at the end of each topic for the candidate to compare the his/her answer to the best.

MS Books strives to maintain actual spacing between consecutive questions and within options as per CAIE format which gives students a more realistic feel of attempting question.

Review, feedback and contribution in this booklet by various competent teachers of a subject belonging to renowned school chains make it most valuable resource and tool for both teachers and students.

With all belief in strength of this resource material I can confidently claim that it is worth in achieving brilliance.

Our sincere thanks and gratification to **Mr. Mirza Irshad Baig** who took out special time to help compile and manage this booklet. We would also like to appreciate physics faculty for reviewing and indorsing it.

## REVIEWED & RECOMMENDED BY

### **Syed Jabran Ali Kamran**

LGS (JT, Phase 5 & paragon),  
LACAS (Barki, JT), Roots  
0336-4864345

### **Mirza Irshad Baig**

SICAS, Bloomfield Hall, LACAS, MGS  
0333-4205837

### **Aamir Mustafa**

LACAS, LGS (Gulberg & JT), BSS  
0321-4621091

### **Muhammad Javed Sulehri**

BDC, LGS (Paragon & Gulberg),  
ROOTS IVY, The City School (ALGC)  
0333-4224165

### **Muhammad Arshad Chaudhry**

Ex-Aithison, LGS (JT & 1A1), LACAS BSS  
ALJT, Pak Turk  
0300-9412902

### **Abdul Hakeem**

LGS, BSS, ALMA  
0300-4810136

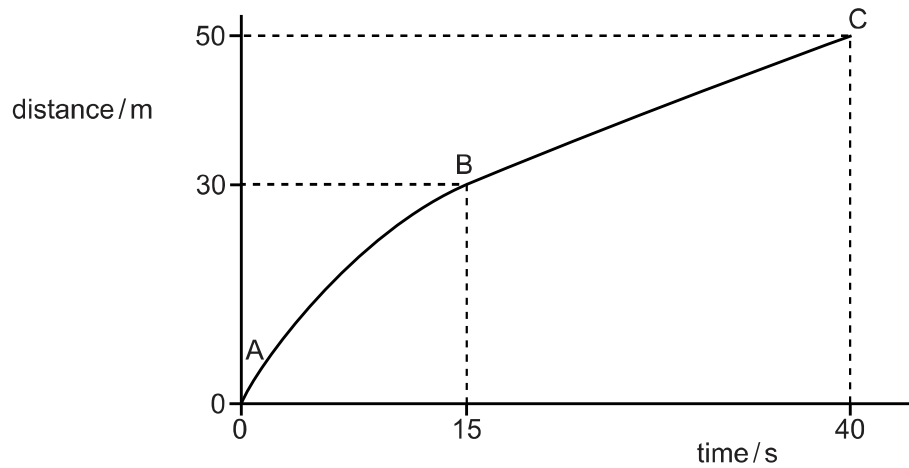
## TABLE OF CONTENTS

<b>Sr #</b>	<b>Chapters</b>	<b>Pg #</b>
<b>2</b>	Motion -----	<b>7</b>
<b>3</b>	Mass, weight, density -----	<b>78</b>
<b>4</b>	Effects of forces -----	<b>92</b>
<b>5</b>	Momentum -----	<b>122</b>
<b>6</b>	Scalars and Vectors -----	<b>147</b>
<b>7</b>	Work, power, energy -----	<b>157</b>
<b>8</b>	Pressure -----	<b>196</b>
<b>9</b>	Thermal properties And Temperature -----	<b>249</b>
<b>10</b>	General wave properties -----	<b>337</b>
<b>11</b>	Light -----	<b>380</b>
<b>12</b>	Sound -----	<b>437</b>
<b>13</b>	Electromagnetic spectrum -----	
<b>14</b>	Electric Quantities -----	<b>463</b>
<b>15</b>	Current Electricity -----	<b>482</b>
<b>16</b>	Electromagnetic Effect -----	<b>554</b>
<b>17</b>	Electronics -----	<b>617</b>
<b>18</b>	Nuclear physics -----	<b>652</b>

**MOTION**

Q1/32/M/J/14

1 Fig. 1.1 shows a distance-time graph for a moving object.

**Fig. 1.1**

(a) Describe the speed of the object between points

(i) A and B,

.....

(ii) B and C.

.....

[2]

(b) State whether the acceleration of the object is zero, negative or positive, as shown on the graph between points

(i) A and B,

.....

(ii) B and C.

.....

[2]

(c) Calculate the average speed of the object during the 40 seconds.

speed = ..... [2]

[Total: 6]

Q1/31/O/N/14

2 (a) Fig. 1.1 shows the distance-time graphs for three different objects A, B and C.

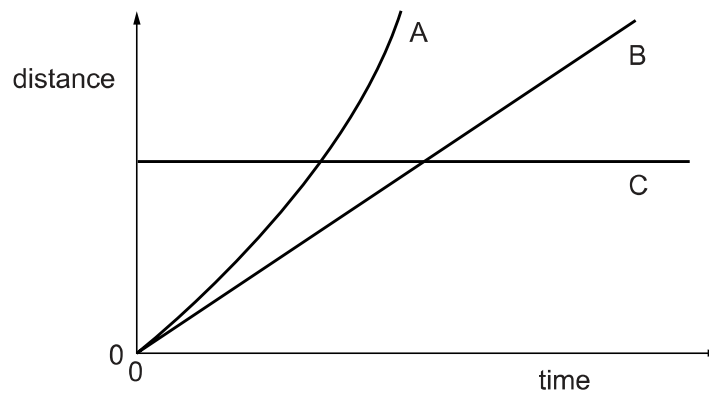


Fig. 1.1

Describe the motion of each of the objects A, B and C by selecting the appropriate description from the list below.

constant speed    increasing speed    decreasing speed    stationary

A .....

B .....

C .....

[2]

(b) Fig. 1.2 shows the speed-time graphs for three more objects D, E, and F.

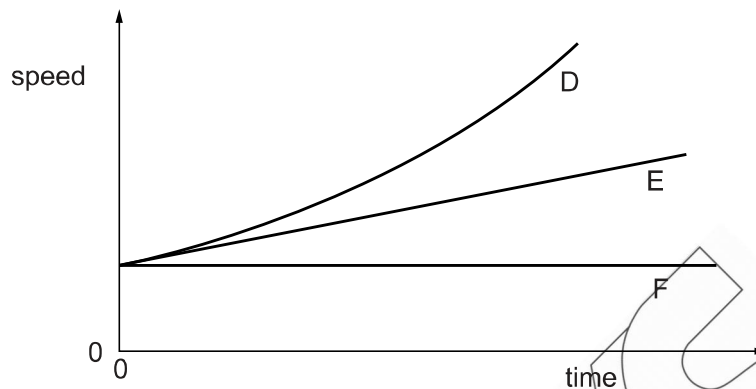


Fig. 1.2

Describe the motion of each of the objects D, E and F by selecting the appropriate description from the list below.

constant speed    constant acceleration    increasing acceleration    stationary

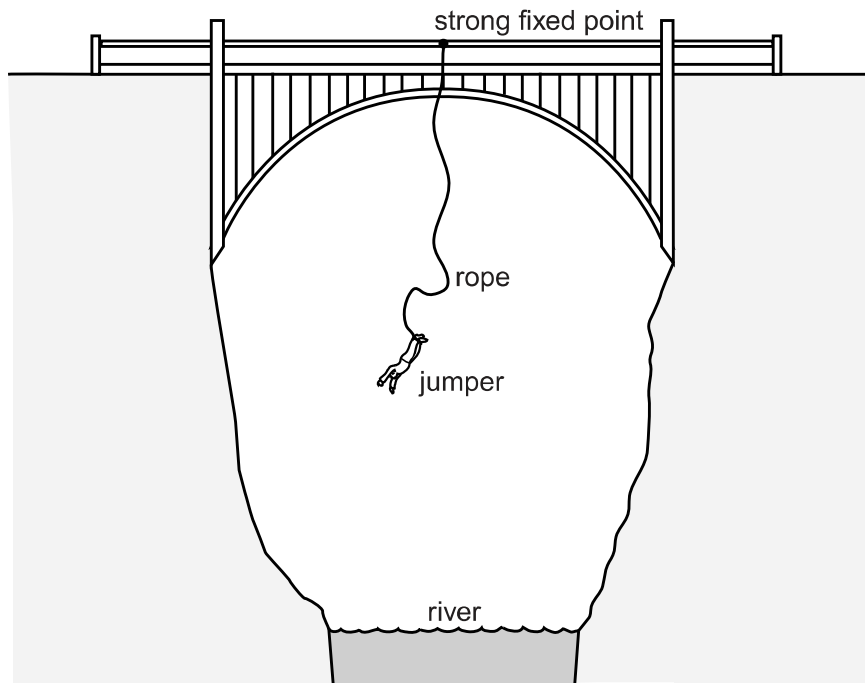
D .....

E .....

F .....

[2]

- (c) Fig. 1.3 shows a person bungee-jumping from a bridge. The person is attached to a long elastic rope.



**Fig. 1.3**

- (i) In 1.5s the speed of the jumper increases from zero to 10.5m/s.  
Calculate her average acceleration during this time.

acceleration = .....[2]

- (ii) At one point during the fall, she reaches her maximum speed.

1. State her acceleration at this point.

acceleration = .....[1]

2. What can be said about the forces acting on her at this point?

.....  
.....[1]

[Total: 8]

Q2/32/O/N/14

3 Fig. 2.1 shows a tanker lorry full of liquid.

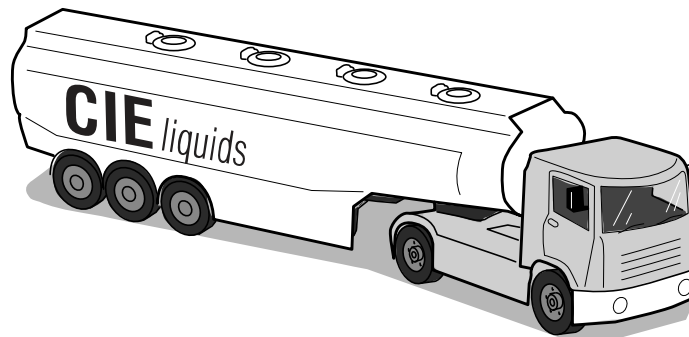


Fig. 2.1

The tanker delivers the liquid and drives away empty.

- (a) (i) Compare the acceleration of the empty tanker with the acceleration of the full tanker for the same resultant force. Tick **one** box.

- ☐ acceleration of full tanker is less than acceleration of empty tanker
- ☐ acceleration of full tanker is the same as acceleration of empty tanker
- ☐ acceleration of full tanker is more than acceleration of empty tanker

[1]

- (ii) Explain your answer.

.....

.....

.....

..... [2]

- (b) The empty tanker has a weight of 50 000 N. The forward force is 6000 N and the total resistive force is 2000 N.

Calculate the acceleration.

acceleration = ..... [3]

[Total: 6]



Q3/32/O/N/14

- 4 Fig. 3.1 shows the speed-time graph of a firework rocket as it rises and then falls to the ground.

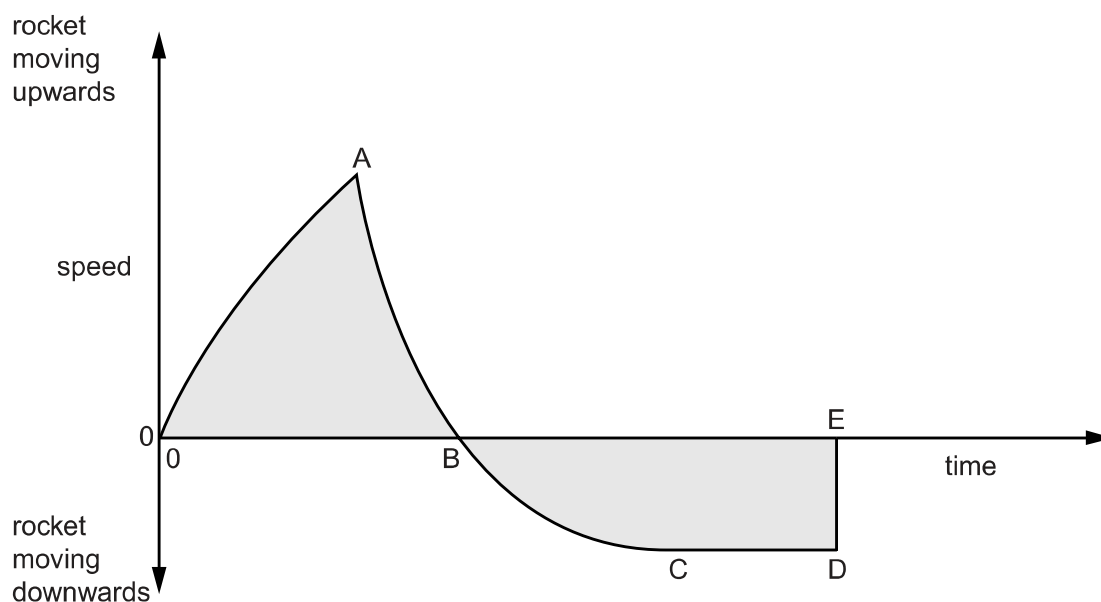


Fig. 3.1

The rocket runs out of fuel at A. It reaches its maximum height at B. At E it returns to the ground.

- (a) (i) State the gradient of the graph at B. gradient = ..... [1]

- (ii) State why the gradient has this value at B.

.....  
 ..... [1]

- (b) State and explain the relationship between the shaded areas above and below the time axis.

.....  
 .....  
 .....  
 .....  
 .....  
 ..... [3]

- (c) Another rocket, of the same size and mass, opens a parachute at point B.

On Fig. 3.1, sketch a possible graph of its speed from B until it reaches the ground. [3]

[Total: 8]

Q1/32/M/J/14

- 1 (a) (i) decreases / average speed 2 m/s B1  
 (ii) constant / speed 0.8 m/s B1  
 (b) (i) negative B1  
 (ii) zero B1  
 (c) uses  $v = d/t$  in any form or  $d/t$  C1  
 (av. vel =  $50/40 =$ ) 1.3 m/s or 1.25 m/s A1

[Total: 6]

Q1/31/O/N/14

- 2 (a) A increasing speed  
 B constant speed  
 C stationary B2  
 Note: one mark lost for e.e.o.o.  
 (b) D increasing acceleration  
 E constant acceleration  
 F constant speed B2  
 Note: one mark lost for e.e.o.o.  
 (c) (i) ( $a =$ )  $\Delta v/t$  OR  $(v-u)/t$  OR 10.5/1.5 C1  
 $= 7.0 \text{ m/s}^2$  A1  
 (ii) ( $a =$ )  $0 \text{ (m/s}^2\text{)}$  B1  
 (iii) upward and downward forces equal OR no resultant force  
 OR forces equal and opposite OR forces balanced  
 OR weight (of body) = tension (in rope) B1

[Total: 8]

Q2/32/O/N/14

- 3 (a) (i) less (1<sup>st</sup> box ticked) B1  
 (ii) any mention of mass/inertia B1  
 well-reasoned explanation involving less mass B1  
 special case B2: more weight/heavier AND more friction  
 (b) (resultant force =) 4000 N C1  
 $(M = 50\,000/10 =)$  5000 kg C1  
 $(a = 4000/5000 =)$   $0.80 \text{ m/s}^2$  e.c.f previous lines, accept 1 sig. fig. A1

[Total: 6]

Q3/32/O/N/14

- 4 (a) (i)  $10 \text{ m/s}^2$  ignore sign B1  
 (ii) (same as) acceleration (of rocket at B) OR gravitational acceleration B1  
 (b) same area B1  
 area represents distance travelled B1  
 distance up = distance down  
 OR overall displacement = 0  
 OR area above = distance up AND area below = distance below B1  
 (c) any three from:  
 • all of graph below x-axis after B  
 • final section horizontal and above CD AND gradient always  $\leq 0$   
 • continuous graph from B until time > at DE  
 • new area not clearly different from old B3

[Total: 8]