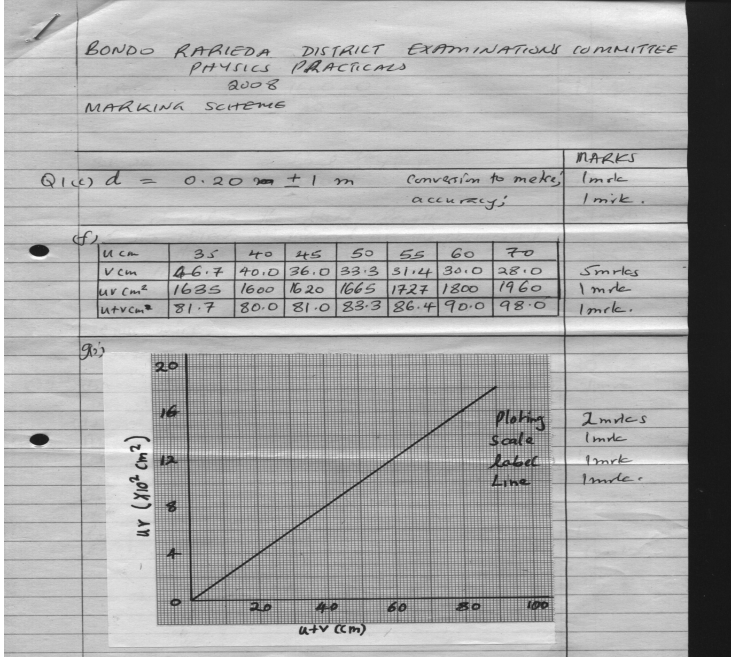
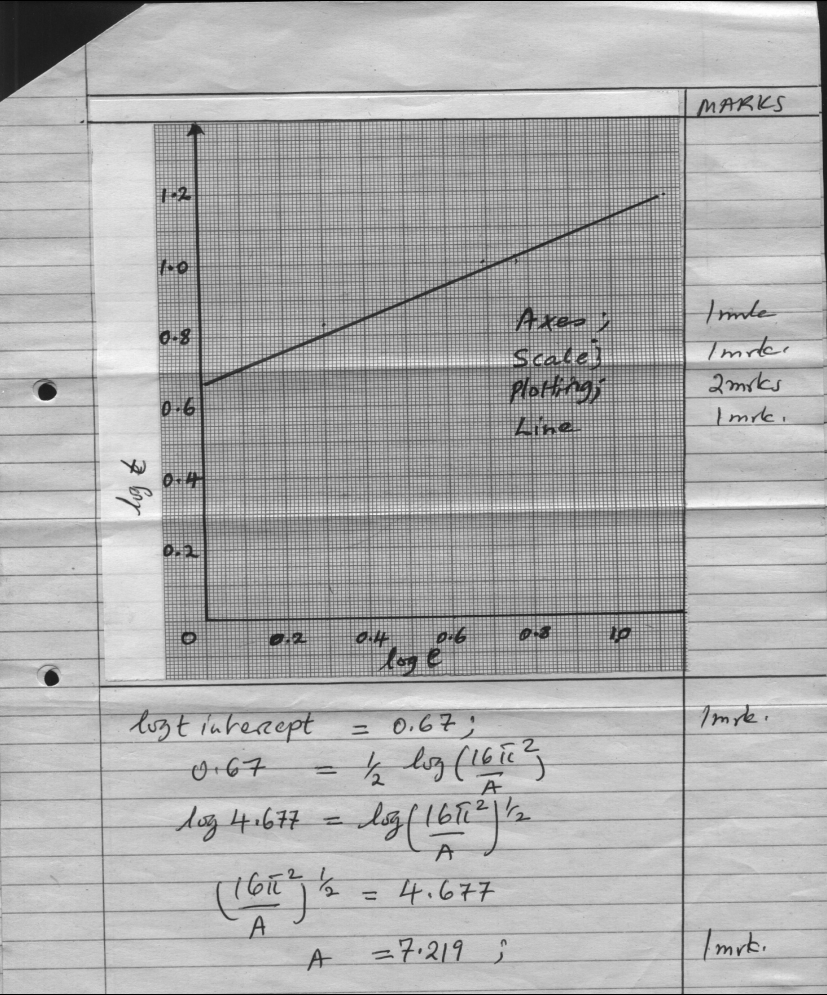


# PAVEMENT NATIONAL EXAMINATION FORM IV

OPENER EXAMINATION 2021/2022

PHYSICS PAPER 3 MS

Q.1 (i)	$d = 0.20 \pm 0.01 \text{ m}$ conversion to metre; accuracy	1 mark 1 mark																																										
(f)	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>ucm</td> <td>35</td> <td>40</td> <td>45</td> <td>50</td> <td>55</td> <td>60</td> <td>70</td> </tr> <tr> <td>vcn</td> <td>46.7</td> <td>40.0</td> <td>36.0</td> <td>33.3</td> <td>31.4</td> <td>30.0</td> <td>28.0</td> </tr> <tr> <td>uvc<math>m^2</math></td> <td>1635</td> <td>1600</td> <td>1620</td> <td>1665</td> <td>1727</td> <td>1800</td> <td>1960</td> </tr> <tr> <td>u + vcm</td> <td>81.7</td> <td>80.0</td> <td>81.0</td> <td>83.3</td> <td>86.4</td> <td>90.0</td> <td>98.0</td> </tr> </table>	ucm	35	40	45	50	55	60	70	vcn	46.7	40.0	36.0	33.3	31.4	30.0	28.0	uvc $m^2$	1635	1600	1620	1665	1727	1800	1960	u + vcm	81.7	80.0	81.0	83.3	86.4	90.0	98.0	5mks 1mk 1mk										
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G(i)		2mks  1mk 1mk 1mk  2mks 1mk 1mk 1mk																																										
	Slope = $\frac{1600 - 0}{80 - 0}$ ; = 20cm; + 2	1mk  1mk																																										
	Slope = Focal length; = 20cm;	1mk 1mk																																										
	d is also the focal length; if the object is placed at the principal focus, the rays emerge parallel. The rays are then reflected by the plane mirror along the same path and hence the image is next to the object cross-wire;	1mk  1mk																																										
		<b>20 mks</b>																																										
Q.2.	(b) $L_0 = 56.2\text{cm}$ (accept students value);	1mk																																										
	(d)																																											
	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td>Mass(g)</td> <td>50</td> <td>100</td> <td>120</td> <td>150</td> <td>200</td> <td>250</td> </tr> <tr> <td>L(cm)</td> <td>58.2</td> <td>60.3</td> <td>61.1</td> <td>62.2</td> <td>64.8</td> <td>66.6</td> </tr> <tr> <td><math>e = L - L_0</math>(cm)</td> <td>2.0</td> <td>4.1</td> <td>4.9</td> <td>6.0</td> <td>8.6</td> <td>10.6</td> </tr> <tr> <td>time , t for 20 oscillations (s)</td> <td>6.70</td> <td>8.74</td> <td>9.25</td> <td>10.25</td> <td>11.82</td> <td>13.20</td> </tr> <tr> <td>log t</td> <td>0.8261</td> <td>0.9415</td> <td>0.9661</td> <td>1.0107</td> <td>1.0726</td> <td>1.1212</td> </tr> <tr> <td>log e</td> <td>0.3010</td> <td>0.6128</td> <td>0.6902</td> <td>0.7782</td> <td>0.9345</td> <td>1.0253</td> </tr> </table>	Mass(g)	50	100	120	150	200	250	L(cm)	58.2	60.3	61.1	62.2	64.8	66.6	$e = L - L_0$ (cm)	2.0	4.1	4.9	6.0	8.6	10.6	time , t for 20 oscillations (s)	6.70	8.74	9.25	10.25	11.82	13.20	log t	0.8261	0.9415	0.9661	1.0107	1.0726	1.1212	log e	0.3010	0.6128	0.6902	0.7782	0.9345	1.0253	1 mk 2mks 3mks  1mk 1mk 1mk
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		<p>1mk</p> <p>1mk</p> <p>2mks</p> <p>1mk</p>												
	<p>log t intercept = 0.67;</p> $0.67 = \frac{1}{2} \log \left( \frac{16\pi^2}{A} \right)$ $\log 4.677 = \log \left( \frac{16\pi^2}{A} \right)^{\frac{1}{2}}$ $\left( \frac{16\pi^2}{A} \right)^{\frac{1}{2}} = 4.677$ $A = 7.219;$	<p>1mk</p> <p>1mk</p>												
(b)	<table border="1" data-bbox="247 1585 1279 1736"> <thead> <tr> <th>Current</th> <th>Voltage</th> <th>Resistance</th> </tr> </thead> <tbody> <tr> <td>0.04</td> <td>0.15</td> <td>3.75</td> </tr> <tr> <td>0.06</td> <td>0.20</td> <td>3.33</td> </tr> <tr> <td>0.08</td> <td>0.30</td> <td>3.75</td> </tr> </tbody> </table>	Current	Voltage	Resistance	0.04	0.15	3.75	0.06	0.20	3.33	0.08	0.30	3.75	<p>Readings</p> <p>2mks</p> <p>Resistance</p> <p>1mk</p>
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(c)	<p>Average resistance = <math>\frac{3.75 + 3.33 + 3.75}{3}</math></p> <p>= 3.61Ω;</p>	<p>1mk</p>												
<b>GRAND TOTAL</b>		<b>40MKS</b>												