MATIGO EXAMINATIONS BOARD

✓ Or ; Full mark

✓ Half a mark

P530/1
BIOLOGY
MARKING GUIDE 2023
PAPER 1

<table>
<tr><th>Qn</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1-40</td><td>
<table>
<tr><td>1</td><td>B</td><td>11</td><td>D</td><td>21</td><td>B</td><td>31</td><td>D</td></tr>
<tr><td>2</td><td>B</td><td>12</td><td>B</td><td>22</td><td>B</td><td>32</td><td>B</td></tr>
<tr><td>3</td><td>B</td><td>13</td><td>B</td><td>23</td><td>A</td><td>33</td><td>B</td></tr>
<tr><td>4</td><td>B</td><td>14</td><td>A</td><td>24</td><td>B</td><td>34</td><td>B</td></tr>
<tr><td>5</td><td>D</td><td>15</td><td>D</td><td>25</td><td>A</td><td>35</td><td>B</td></tr>
<tr><td>6</td><td>D</td><td>16</td><td>C</td><td>26</td><td>A</td><td>36</td><td>B</td></tr>
<tr><td>7</td><td>C</td><td>17</td><td>B</td><td>27</td><td>C</td><td>37</td><td>C</td></tr>
<tr><td>8</td><td>A</td><td>18</td><td>D</td><td>28</td><td>D</td><td>38</td><td>D</td></tr>
<tr><td>9</td><td>B</td><td>19</td><td>B</td><td>29</td><td>A</td><td>39</td><td>A</td></tr>
<tr><td>10</td><td>C</td><td>20</td><td>A</td><td>30</td><td>C</td><td>40</td><td>B</td></tr>
</table>
</td><td>One mark each</td></tr>
<tr><td>41(a)(i)</td><td>• Membrane is 2nm in thickness
• Consists of a bimolecular layer of phospholipids
• Perforated with protein pores;
• Cholesterol is found between layers;
• Proteins and phospholipids form amosaic pattern</td><td></td></tr>
<tr><td>(ii)</td><td>• have numerous/ many mitochondria;
• Respiration occurs at a high rate
• Stores large amount of ATP</td><td></td></tr>
</table>

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(b)	• Materials are taken into the cells by phagocytosis and pinocytosis, whereby the plasma membrane folds, to form pinocytic and phagocytic vesicles; which enclose tiny particles of fluid or sold food particles; which move to the Centre of the cell;	
42(a)(i)	• is a system of parallel and opposite flow of renal fluid in the descending and ascending limbs of the loop of henle in the kidney with active salt concentrations in the medullary interstitial tissue, an increase in salt concentration in the renal fluid of the descending limb and a decrease in salt concentration in the ascending limb to cause production of hypertonic urine.	
(ii)	• Descending limb has thin walls; which are permeable to water, increasing reabsorption of water; • Ascending limb has thick walls; which are impermeable to water preventing out flux of water; • The cells in the walls of loop of has numerous Mitochondria for production of large amounts of energy for active transport,. • Loop of henle is long; increasing the surface area for reabsorption of water; • The U-shaped of the loop also for close proximity between descending and ascending loops for rapid exchange of ions between them.	
(b)	• To prevent water imbalance • To prevent salt/ion imbalance	
43(a)(i)	• is the linear flow of energy in form of food a long trophic(feeding) levels in an ecosystem through eating and being eaten Moth caterpillars •	
(ii)	$= \frac{92}{806} \times 100\%$ $= 11.4\%$	
(iii)	$\text{KJm}^{-2}\text{year}^{-1}$	
(c)	• Each beech tree has many caterpillars living on it ; Making the beech block smaller in the pyramid of numbers; each beech is very large having a greater biomass and more energy than all the moth caterpillar together;	
(d)	• Lost in respiration • Lost as heat • Lost to decomposer/excretion/feaces /death / decay • Part of robin is not eaten/ not digested	
44(a)	• is the development of complex organisms; from pre-existing simple forms over a period of time;	
(b)(i)	• Old mammals (as revealed from fossils) hold a functional appendix; This is used in cellulose digestion; The human appendix and herbivore appendix are homologous.	
(ii)	• Urea is an adaptation to a hypertonic environment: Freshwater sharks must have evolved at later stage from marine sharks; but are not yet adapted to a hypertonic environment.	

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(iii)	• Suggests that all DNA had a common origin and ancestry; a self-replicating DNA once originated and survived selection pressure;	
45(a)	• is the passive movement of materials through the vascular tissues of plants as a result of turgor pressure or hydrostatic pressure gradient	
(b)	• A turgor pressure gradient between two points necessary • Positive hydrostatic pressure must exist between two points • A continuous supply of solutes at source and unloading at sink	
(c)	• In mass flow movement is unidirectional along the pressure gradient while cytoplasmic streaming movement is two way along the diffusion gradient. • Mass flow is within the vascular system while cytoplasmic streaming is within a cell • Massive flow is passive process whereas cytoplasmic streaming is active • Cytoplasmic streaming moves materials much slower than mass flow	
(d)	• Comparison cells in the Micro veins of the leaf take up the solutes from adjacent photosynthetic cells by active transport; this results into a more negative solute potential in companion cells and so water enters by osmosis rising their turgor pressure; leading to mass flow of solution through plasmodesmata into adjacent sieve tube element.	
46(a)	• Fibre accelerates the movement of food in the gut and absorbs feacal masses, it also absorbs water and swells feeling and stretching the gut, a stretched gut stimulates peristalsis hence waste food is held for a shorter time.	
(b)	• To prevent self-digestion of especially cells producing them and the cells of the ducts through which these enzymes pass	
(c)(i)	• inhibits further secretion of hydrochloric acid • triggers production of bile by the liver • stimulates pancreatic gland to secrete alkaline salts into the pancreatic juices	
(ii)	• delays stomach empting of acid chyme into duodenum • triggers the release of enzymes of from the pancreas to the pancreatic juice • stimulates constriction of the gall bladder to empty bile into the duodenum	

END

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