

**2020 Biology 6093  
Suggested Answers**

**Paper 1**

|          |          |          |          |          |          |          |          |          |           |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| <b>1</b> | <b>2</b> | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> | <b>8</b> | <b>9</b> | <b>10</b> |
| D        | B        | B        | D        | C        | A        | C        | A        | B        | D         |

|           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>11</b> | <b>12</b> | <b>13</b> | <b>14</b> | <b>15</b> | <b>16</b> | <b>17</b> | <b>18</b> | <b>19</b> | <b>20</b> |
| C         | B         | A         | C         | A         | A         | D         | B         | D         | D         |

|           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>21</b> | <b>22</b> | <b>23</b> | <b>24</b> | <b>25</b> | <b>26</b> | <b>27</b> | <b>28</b> | <b>29</b> | <b>30</b> |
| C         | D         | B         | A         | D         | B         | B         | A         | C         | D         |

|           |           |           |           |           |           |           |           |           |           |
|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| <b>31</b> | <b>32</b> | <b>33</b> | <b>34</b> | <b>35</b> | <b>36</b> | <b>37</b> | <b>38</b> | <b>39</b> | <b>40</b> |
| D         | D         | A         | C         | B         | C         | B         | D         | A         | D         |

**Feedback for Paper 1**

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| 2  | Many candidates selected option D. This indicates they did not recognise that root hair cells have a need to absorb oxygen in order to carry out aerobic respiration and release energy.                                                                                                                                                                                                                                               |
| 7  | Hardly any candidate selected options A or D, proving that the majority were aware that the liver does not excrete urea. Candidates who selected option B were unclear about the role of the liver in glycogen metabolism. They were aware that glycogen is broken down by the liver, but did not recognise that the liver converts excess glucose in the blood into glycogen, which it then stores.                                   |
| 12 | Some candidates thought that option A was correct. This indicates that they hold two misconceptions: firstly, that plants do not expend energy in translocation and secondly, that transpiration needs energy from the plant in order to take place.                                                                                                                                                                                   |
| 14 | The vast majority of candidates selected either option C (correct) or option D. The candidates who selected option D did not appreciate that cells in the alveolus wall need to absorb glucose from the blood in the capillary in order to meet their own energy needs.                                                                                                                                                                |
| 15 | A minority of candidates selected options B, C or D. This indicates these candidates did not fully understand the sequence of events during a cardiac cycle, in particular there appears to be a lack of appreciation about pressure differences being responsible for whether the valves are open or closed.                                                                                                                          |
| 21 | Some candidates chose option B. These candidates did not appreciate that the kidney dialysis machine relies on the principle of diffusion. This being so, the dialysis fluid leaving the machine cannot have a higher concentration of urea than that of the blood entering it.                                                                                                                                                        |
| 25 | Option B was selected by some candidates. These candidates knew that the suspensory ligaments become slack when viewing a near object, so that the lens can assume a more convex shape. The difficulty of these candidates was in understanding how this was achieved. Some candidates thought the muscles in the ciliary body became longer, perhaps because they did not realise that the muscle fibres run in a circular direction. |
| 30 | Some candidates opted for option A, indicating that the approximate dates for the peak in oestrogen during the menstrual cycle are imprecisely known by these candidates.                                                                                                                                                                                                                                                              |
| 36 | Some candidates selected option D. This shows that they knew that human females possess two X chromosomes, but did not appreciate that these constituted part of the total chromosome number of 46.                                                                                                                                                                                                                                    |

## Paper 2

### Section A

| Q No     | Suggested Answers                                                                                                                                                                                                                                                                                                                                                  | Marks               | Feedback                                                                                                                                                                                                                                                                                                                                             |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1(a)     | A: ovary<br>B: fallopian tube<br>C: cervix                                                                                                                                                                                                                                                                                                                         | 1<br>1<br>1         | Most candidates correctly identified A and B. Weaker responses labelled C as 'vagina' or 'uterus', and a few as 'urethra'.                                                                                                                                                                                                                           |
| 1(b)     | On fallopian tube                                                                                                                                                                                                                                                                                                                                                  | 1                   | The vast majority of candidates could correctly identify where fertilisation normally occurs.                                                                                                                                                                                                                                                        |
| 1(c)     | Fertilised egg, also called a zygote, will travel down fallopian tube to uterus by the peristaltic movement in the wall of the fallopian tube and sweeping of cilia of the fallopian tube<br><br>Zygote will divide by mitosis to form a ball of cells called embryo<br><br>Embryo becomes embedded in the thickened uterine lining in the process of implantation | 1<br><br>1<br><br>1 | Most candidates showed good knowledge of the early development of the fertilised egg. Weaker responses suggested that meiosis took place. They also described the implantation of a zygote or fertilised egg itself.<br><br>Several candidates gave unnecessary extra detail of fertilisation, or hormone release, and subsequent fetal development. |
| 1(d)(i)  | Cilia sweep the zygote; along the fallopian tube to the uterus.                                                                                                                                                                                                                                                                                                    | 1                   | Most candidates were able to give the correct role of cilia in structure B. A small proportion incorrectly described the role of cilia in the respiratory system, removing mucus or dust.                                                                                                                                                            |
| 1(d)(ii) | Respiratory system                                                                                                                                                                                                                                                                                                                                                 | 1                   | The majority of candidates correctly stated that the respiratory system had cilia, but weaker responses only named an organ in the correct system, such as the trachea. A few responses confused cilia with villi and referred to the digestive system.                                                                                              |

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| 2(a)      | <p>D - DNA replication, the mass of the DNA doubles from 8 au to 16 au.</p> <p>E - Cell division.<br/>[Cytokinesis], a furrow develops in the cell membrane which eventually separates the two daughter cells, each 8 au mass of DNA.</p>                            | <p>1</p> <p>1</p>          | <p>For stage D, weaker responses only described what they could see in the graph, in terms of DNA doubling or increasing, rather than suggesting what was happening. Most responses recognised that replication was happening.</p> <p>The majority of candidates correctly suggested that cell division was occurring during stage E. A minority of candidates incorrectly described the process as cytokinesis.</p> |
| 2(b)(i)   | anaphase                                                                                                                                                                                                                                                             | 1                          |                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 2(b)(ii)  | <p>before: metaphase</p> <p>after: telophase</p>                                                                                                                                                                                                                     | <p>1</p> <p>1</p>          | Most candidates were confident with the order of the stages of mitosis.                                                                                                                                                                                                                                                                                                                                              |
| 2(b)(iii) | <p>3</p> <p>During anaphase, the sister chromatids separate to form chromosomes. Since there are 12 of them, diploid number is 6. (the cell is dividing mitotically.)</p> <p>Haploid number is always half the number of the somatic cells, <math>6/2 = 3</math></p> | <p>1</p> <p>1</p> <p>1</p> | <p>A significant number of candidates did not correctly determine the diploid or haploid numbers from the figure. Several responses did not realise that the cell shown in the figure had undergone DNA replication and gave the incorrect answer of six for the haploid number.</p>                                                                                                                                 |
| 2(c)      | During the prophase I of the meiosis, crossing over occurs in the chiasmata of the homologous chromosomes, allowing segments to switch, resulting in a new combination of alleles.                                                                                   | 1                          | Many candidates made correct reference to 'independent assortment' and 'crossing over'. Although the stages were not required, some responses incorrectly assigned these processes to the wrong stage. Weaker responses made no reference to the                                                                                                                                                                     |

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|      | <p><b>Random assortment</b> of homologous chromosomes occurs in metaphase I of meiosis, resulting in variation.</p> <p><b>Fertilisation</b> involves the fusion of the nuclei of a random haploid sperm and egg, allowing variation to occur in the <b>combination of chromosomes</b> in the zygote.</p>                                                                                                                                                                         | <p>1</p> <p>1</p>          | randomness of the fertilisation process.                                                                                                                                                                                                                                                                                                                                                                                                              |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3(a) | $  \begin{array}{ccccc}  I^A I^O & & X & & I^O I^O \\  I^A & & & & I^O \\  I^A I^O & I^A I^O & & I^O I^O & I^O I^O  \end{array}  $                                                                                                                                                                                                                                                                                                                                               | <p>1</p> <p>1</p> <p>1</p> | Most responses correctly completed the genetic diagram. Weaker responses gave the father's genotype as $I^A I^A$ , or described the parental genotypes as 'blood group A' and 'blood group O'.                                                                                                                                                                                                                                                        |
| 3(b) | <p>Codominance:<br/>Occurs when <b>two alleles are equally expressed</b> in the <b>heterozygous condition</b>. <math>I^A</math> and <math>I^B</math> are codominant and an individual with both alleles will have the AB blood group.</p> <p>Multiple alleles:<br/>Occurs when there are <b>three or more different alleles for a particular trait</b></p> <p>For example, the human blood group has three alleles: <math>I^O</math>, <math>I^A</math> and <math>I^B</math>.</p> | <p>1</p> <p>1</p> <p>1</p> | The term 'codominance' was understood by a large proportion of candidates and was usually described in terms of the alleles controlling blood group AB. Fewer responses described 'multiple alleles' correctly. For instance, few made reference to them as alleles of the same gene or locus. A number of responses only described the various genotypes of the ABO blood grouping system without making a clear statement naming the three alleles. |
| 3(c) | In discontinuous variation, there are <b>clearly defined/distinct differences</b> in a trait with few or <b>no intermediate forms</b> .                                                                                                                                                                                                                                                                                                                                          | 1                          | Weaker responses defined discontinuous variation in terms of a feature not being changed by the environment.                                                                                                                                                                                                                                                                                                                                          |
| 3(d) | A gene is a <b>segment of DNA</b> consisting of a specific                                                                                                                                                                                                                                                                                                                                                                                                                       | 1                          | A large number of responses were able to correctly                                                                                                                                                                                                                                                                                                                                                                                                    |

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|      | <p>sequence of nucleotides that code for a functional polypeptide.</p> <p>An allele refers to different forms of the same gene.</p>                                                                                                                                                                                                                                                                                | 1                          | define a gene, although fewer could correctly define an allele.                                                                                                                                                                                                                                                           |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                    |                            |                                                                                                                                                                                                                                                                                                                           |
| 4(a) | <p>The younger the age when men started smoking, the higher the relative death rate as compared to the non-smoker.</p> <p>The relative death rate of mean increase by 0.75 times, from 1.25 times of that of a non-smoker started at the age of 25-29, to 2 times when smoking started at the age of 10-14.</p>                                                                                                    | <p>1</p> <p>1</p> <p>1</p> | <p>Almost all responses correctly described the relationship between the age when smoking started and the number of middle age deaths. Most quoted the numerical evidence from the bar chart. Stronger responses manipulated the data, comparing different groups with non-smokers or calculating percentage changes.</p> |
| 4(b) | <p>The coronary arteries are responsible for transporting oxygenated blood from the aorta to the muscles of the heart.</p> <p>Occlusion of the coronary arteries restricts oxygenated blood flow to the muscles of the heart.</p> <p>With reduced supply of glucose and oxygen, the heart muscles are unable to release enough energy via aerobic respiration</p> <p>and will eventually lead to heart attack.</p> | <p>1</p> <p>1</p> <p>1</p> | <p>Stronger responses discussed the effects of coronary artery occlusion on the heart cells or cardiac muscle. Weaker responses focused on why the arteries became occluded, or the effects of artery occlusion on the whole body.</p>                                                                                    |
| 4(c) | <p>Cigarette smoke contains carbon monoxide, which irreversibly binds to haemoglobin to form carboxyhaemoglobin, reducing the ability of red blood cells to transport oxygen to the foetus.</p>                                                                                                                                                                                                                    | 1                          | <p>A large number of responses demonstrated good knowledge of the effects of carbon monoxide on haemoglobin and the subsequent reduction of oxygen supply to the fetus and its consequences.</p>                                                                                                                          |

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|      | <p>The carbon monoxide also increases the risk of atherosclerosis and blood clotting in the arteries. The narrowed arteries would results in reduced nutrients being transported to the foetus.</p> <p>The constant lack of oxygen and nutrients/glucose leads to slower growth rate of the foetus in the uterus, leading to low body mass.</p>                                                                                           | <p>1</p> <p>1</p>          | <p>Weaker responses stated that less oxygenated blood was being supplied to the fetus or discussed the lack of nutrients in the fetal blood supply and linked these directly to impaired growth.</p> |
|      |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                            |                                                                                                                                                                                                      |
| 5(a) | $40.00 / 0.04 = \times 1000$                                                                                                                                                                                                                                                                                                                                                                                                              | 1                          |                                                                                                                                                                                                      |
| 5(b) | <p>Insecticide remains in the body of organisms in the food chain as it non-biodegradable and not excreted → bioaccumulation over time</p> <p>As organisms of the higher trophic level eats multiple organisms of the lower trophic level, insecticide concentration increases → biomagnification up the food chain</p> <p>Water plants have 0.04ppm, while fish-eating have 40ppm, increase by x1000, reaching lethal concentrations</p> | <p>1</p> <p>1</p> <p>1</p> |                                                                                                                                                                                                      |
| 5(c) | <p>Population of large fishes increases</p> <p>as fish-eating bird is the only predator</p> <p>number of small fishes will decrease drastically as it is the ONLY prey of the large fishes</p>                                                                                                                                                                                                                                            | <p>1</p> <p>1</p> <p>1</p> |                                                                                                                                                                                                      |

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| 6(a)(i)           | <p>The thick elastic layer in the arteries enables the arteries to stretch to accommodate the surge in blood pressure as the heart pumps blood at high speeds.</p> <p>The recoil of the elastic tissue also helps maintain the pressure of the blood as it travels further away from the heart.</p>                            | <p>1</p> <p>1</p>                   | Many candidates understood the need to withstand high blood pressure in arteries.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 6(a)(ii)          | <p>Smaller arteries have the ability to vasoconstrict or vasodilate by contracting or relaxing the muscle fibre layer to regulate blood flow</p> <p>Distance: Since small arteries are further away from heart, main pressure drive is not present, hence need to be able to continuous contract and relax to propel blood</p> | <p>1</p> <p>1</p>                   | Most responses incorrectly stated that with reduced size of the lumen, blood pressure in small arteries would be even higher than in large arteries and consequently answered in terms of the ability to withstand high pressure. Few responses referred to muscle fibres contracting and relaxing or to the consequence of this on the artery, in terms of constriction and dilation. Stronger responses made the link with controlling blood pressure, diverting blood flow or as a temperature control mechanism. |
| 6(b)              | Veins have valves that close to prevent backflow of blood                                                                                                                                                                                                                                                                      | 1                                   | Almost all responses were correct. The weakest responses identified bicuspid or tricuspid valves.                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Section B:</b> |                                                                                                                                                                                                                                                                                                                                |                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 7(a)(i)           | size at least 50% of grid<br>axes labelled, with units<br>points accurately plotted, allow 1 misplot<br>line of best-fit                                                                                                                                                                                                       | <p>1</p> <p>1</p> <p>1</p> <p>1</p> | Most responses generally showed good graphical skills. Some responses did not draw a correct line of best-fit. A common error was not having a balance of data points on either side of the line.                                                                                                                                                                                                                                                                                                                    |
| 7(a)(ii)          | The number of people worldwide who had HIV increased steadily from 33.2 million in 2010 to 36.7                                                                                                                                                                                                                                | <p>1</p> <p>1</p>                   | Almost all responses clearly stated the trend shown by the data in the graph. Stronger performing candidates                                                                                                                                                                                                                                                                                                                                                                                                         |

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|         | million in 2016, by 3.5 million.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1                                            | compared or manipulated the data rather than simply quoting a series of data values, e.g. reference to the increase of 0.6 million per year.                                                                                                                                                                                                                                                                                                         |
| 7(b)    | <p>Use of condoms during sexual intercourse</p> <p>Avoid sharing syringe needles or any instruments that can break skin</p> <p>Keep to one sex partner</p>                                                                                                                                                                                                                                                                                                                                                                                                                            | <p>1</p> <p>1</p> <p>1</p>                   | This question was well answered by the majority of candidates. A few responses incorrectly stated that HIV could spread via sharing cups, glasses or eating utensils.                                                                                                                                                                                                                                                                                |
|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 8(a)    | <p>A few trees acquired a spontaneous mutation that enabled the trees to become more fire-resistant in a large population → increase variation</p> <p>The climate in that region became drier and forest fires became more common.</p> <p>Trees that are not fire-resistant are burnt and are unable to disperse seeds. (weeding)</p> <p>The few trees with the mutation will have a selective advantage and survive the fire.</p> <p>These trees will be able to reproduce and disperse seeds containing a favourable fire resistance gene and pass it onto the next generation.</p> | <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> | Most responses made a correct reference to mutation or natural selection, but few linked mutation to genetic variation in the population. Many went on to discuss the 'survival of fire-resistant trees' and the 'reproduction' of the resistant variety. However, several responses did not use specific scientific terms, for example, reference to fire acting as a 'selection pressure' rather than there being more fire-resistant individuals. |
| 8(b)(i) | Artificial selection involves the selection of organisms by human with a desirable trait to undergo selective breeding to produce offspring with the desirable trait.                                                                                                                                                                                                                                                                                                                                                                                                                 | 1                                            | Definitions of artificial selection often omitted critical features such as the involvement of humans or the idea that those organisms selected had beneficial                                                                                                                                                                                                                                                                                       |

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|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            | characteristics. Weaker responses suggested that the process involved the selection of 'genes', hinting at genetic engineering, rather than artificial selection.                                                                                       |
| 8(b)(ii) | Domestic cow<br>Ability to produce large quantities of milk/ high quality of meat<br><br>Corn<br>Ability to produce large and sweet corn kernels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1<br><br>1 | Most responses were able to name an animal and a plant and a feature that had been improved. Weaker responses incorrectly referred to genetically engineered or genetically modified organisms or gave an example which was not economically important. |
| 8(c)     | e.g. The idea of using animals in drug development<br><br>Mice can be genetically engineered to have a gene that causes cancer introduced to them, thereby acting as an animal model for novel cancer drug testing.<br><br>[social issues → related to human population]<br>One possible social implication would be more pronounced class distinction, where only relatively wealthier individuals would afford such novel cancer drugs that are priced higher due to extensive research that includes animal models.<br><br>[ethical issues → related to organisms used in the example]<br>One ethical implication would be the welfare of the transgenic mice as they develop cancer and suffer. | 1<br><br>1 | Most responses did not give a specific named animal example of genetic engineering or gave plant examples and merely listed the general social and ethical implications which could be applied to any example.                                          |
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                                                                                                                                                                                                                                                         |
| 9E(a)    | This individual is a female<br><br>with the presence of two X chromosomes, 23rd                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1<br><br>1 | The majority of candidates showed good interpretation and analysis skills when explaining what was meant by the chromosomes presented in the figure, readily                                                                                            |

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|       | <p>chromosome</p> <p>This individual also has Down syndrome due to the presence of 3 copies of chromosome 21</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1                          | <p>identifying the extra chromosome 21 and linking this condition to Down syndrome. A small number of responses wrongly identified the person as male or did not state that the person was female as they had two X chromosomes.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 9E(b) | <p>Radiation and chemicals increase the rate of mutation by randomly altering the DNA sequence or the number of chromosomes of an organism, leading to having a new allele that results in a trait that has a selective advantage for the organism over the others in the population. Due to mutation → increased variation</p> <p>This organism will have a better chance to survive and reproduce as compared to those without mutation, producing more offspring with the same mutation that has selective advantage.</p> <p>Over many generations, the frequency of individuals with mutated allele with advantageous trait will increase, leading to the evolution of the population.</p> | <p>1</p> <p>1</p> <p>1</p> | <p>Candidates found this a challenging question. Most responses recognised that radiation and chemicals cause mutations, but did not develop this idea any further. Many candidates confined their responses to humans and only described the effects of a mutation, such as the development of cancers and genetic conditions such as Down syndrome and sickle cell anaemia, without any reference to how evolution in a population might happen. Few responses used correct terminology to describe that individuals with a beneficial allele would be selected for, which would increase the frequency of that allele in the population</p>                               |
| 9E(c) | <p>A restriction enzyme is used to cut gene responsible for human insulin production from the human genome.</p> <p>The same restriction enzyme is used to cut a bacteria plasmid to produce the same sticky ends.</p> <p>The gene fragment and bacteria plasmid are mixed together to form recombinant plasmids, which are joined together by the added DNA ligase.</p> <p>The recombinant plasmids are introduced into bacteria such as E.coli via heat shock method.</p>                                                                                                                                                                                                                     | <p>1</p> <p>1</p> <p>1</p> | <p>This question was well answered with good use of correct terminology and understanding of the steps in this procedure. Some candidates gave more detail than the question required.</p> <p>Weaker responses talked about 'restrictive enzymes' or incorrectly referred to cutting out insulin itself, rather than the insulin gene, or that 'part' of the gene would be isolated.</p> <p>Most responses did not refer to large scale culturing of the bacteria in a fermenter or that the expression of the insulin gene would result in the production of insulin protein which would then be harvested.</p> <p>Weaker responses suggested that it was the gene that</p> |

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|       | These bacteria are cultured in fermenters to produce large quantities of human insulin.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                          | would be harvested from the bacteria. |
| 9O(a) | <p>Generally there are more different insecticides present in farmland than there are in cities.</p> <p>There are 4 more kinds of insecticides in farmlands as compared to cities.</p> <p>There are a total of 13 colonies of bees with insecticide in cities while there are 43 in farmlands, 30 more.</p>                                                                                                                                                                                                                                                                                                                                                                                          | <p>1</p> <p>1</p> <p>1</p> |                                       |
| 9O(b) | <p>any three from:</p> <ol style="list-style-type: none"> <li>1. Farmland are likely areas where greater agricultural activities are carried out as compared to cities e.g. crops/ vegetation grown</li> <li>2. Greater variety of insects, hence leading to greater usage of insecticides in farmland.</li> <li>3. Number of samples of honeybees is less in cities as compared to farmland would be due to death of bees in cities may be due to lost of habitats due <b>deforestation for housing etc or due to pollution</b></li> <li>4. Farmland has larger area, hence more habitats than cities, this may account for the higher number of honeybee colonies and insect varieties.</li> </ol> | <p>1</p> <p>1</p> <p>1</p> |                                       |
| 9(c)  | <p>Increase insecticide use will drastically decrease population of bees</p> <p>Honey bees are agents of pollination</p> <p>Less plants/ seeds/ fruits over time → less food for herbivores</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>1</p> <p>1</p> <p>1</p> |                                       |

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|--|----------------------------------------------------------------------|---|--|
|  | Food chains, food web/ ecosystems affected →<br>reduced biodiversity | 1 |  |
|--|----------------------------------------------------------------------|---|--|