

## MARKING SCHEME MODEL PAPER BIOLOGY CLASS 10

### SECTION –A


#### KEY

| Question | Correct Answer                           | Key |
|----------|--|-----|
| 1        | Photosynthesis                           | A   |
| 2        | Presence of more calcium oxalate in food | C   |
| 3        | Motor neuron                             | C   |
| 4        | Negative feedback                        | D   |
| 5        | movement                                 | A   |
| 6        | Stop HIV epidemic                        | A   |
| 7        | Corms                                    | C   |
| 8        | Ear lobe                                 | D   |
| 9        | Dry soil                                 | B   |
| 10       | Oxides of nitrogen and particulates      | D   |
| 11       | Prolonged periods of time                | A   |
| 12       | Fish liver oil                           | B   |

### SECTION-B (RRQs)

#### MARKING RUBRICS

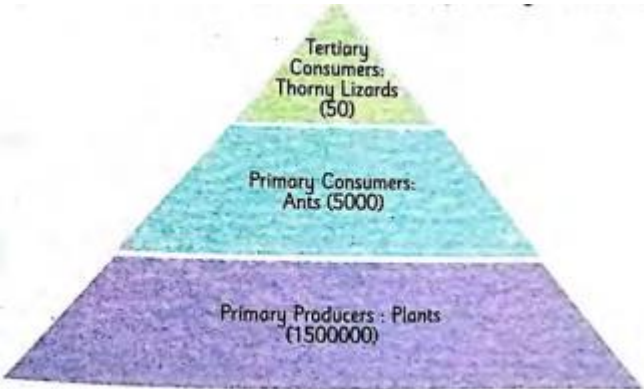
| <b>Q.1</b><br>i.<br><br><b>Possible answer</b> | <b>Write ONE cause of each given disease.</b>   |         |        |            |   |           |  |        |   |             |
|--|---|---------|--------|------------|---|-----------|--|--------|---|-------------|
|  | <table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">Disease</th> <th style="width: 50%;">Causes</th> </tr> </thead> <tbody> <tr> <td>Bronchitis</td> <td>Viruses, bacteria and their particles that irritate bronchial tubes</td> </tr> <tr> <td>Emphysema</td> <td>Cigarette smoke is the most common cause</td> </tr> <tr> <td>Asthma</td> <td>Allergy causing factors e.g. pollens, cold, smoke or other chemicals in the air</td> </tr> <tr> <td>Lung cancer</td> <td>Carcinogens, Smoking, industrial carcinogens and air pollution</td> </tr> </tbody> </table> <p style="text-align: center;"><b>Note:</b> Only one correct cause of each disease is required</p> | Disease | Causes | Bronchitis | Viruses, bacteria and their particles that irritate bronchial tubes | Emphysema | Cigarette smoke is the most common cause | Asthma | Allergy causing factors e.g. pollens, cold, smoke or other chemicals in the air | Lung cancer |
| Disease  | Causes  |         |        |            |   |           |  |        |   |             |
| Bronchitis                                     | Viruses, bacteria and their particles that irritate bronchial tubes   |         |        |            |   |           |  |        |   |             |
| Emphysema                                      | Cigarette smoke is the most common cause  |         |        |            |   |           |  |        |   |             |
| Asthma   | Allergy causing factors e.g. pollens, cold, smoke or other chemicals in the air   |         |        |            |   |           |  |        |   |             |
| Lung cancer                                    | Carcinogens, Smoking, industrial carcinogens and air pollution  |         |        |            |   |           |  |        |   |             |
| <b>Marking hints</b>                           | One mark for each correct cause of disease. Only FOUR required<br><b>1+1+1+1= 4 marks</b>   |         |        |            |   |           |  |        |   |             |
| ii.<br><b>Possible answer</b>                  | <b>Find out the location of renal tubule in nephron. Also write names of its THREE parts.</b><br>Ans: It is long tube <b>attached with the Bowman’s capsule.</b><br>It has three parts. The first part is convoluted and is called the <b>proximal convoluted tubule.</b> The middle part is U-shaped and is called the <b>Loop of Henle.</b> The last part is again convoluted and is called the <b>distal convoluted tubule.</b>  |         |        |            |   |           |  |        |   |             |
| <b>Marking hints</b>                           | One mark for correct location of renal tubule.<br>One mark for each part of nephron. 3 required<br><b>1+1+1+1= 4 marks</b>  |         |        |            |   |           |  |        |   |             |
| iii.<br><b>Possible answer</b>                 | <b>Briefly explain skin as thermostatic organ with reference to its role in cold conditions.</b><br>Ans:<br><u>In cold conditions muscles attached at the base of the hair on the skin contracts. As a result the hairs on the skin stand up and goose bumps are formed on the skin. These goose bumps and hair makes a blanket of warm air. It does not allow the body’s heat to go out.</u>   |         |        |            |   |           |  |        |   |             |
| <b>Marking hints</b>                           | Each underline correct sentence contains <b>ONE</b> mark. Only <b>FOUR</b> correct sentences required<br><b>1+1+1+1= 4 marks</b>  |         |        |            |   |           |  |        |   |             |
| iv.<br><b>Possible answer</b>                  | <b>Briefly explain TWO types of coordination in living organisms.</b><br>Ans: There are two types of coordination i.e. nervous coordination and chemical coordination. <b>Nervous coordination:</b> It is performed by the <u>nervous system.</u> <b>Chemical coordination</b> take place through certain chemicals called <u>hormones.</u> <u>Animal possess both these types of</u>   |         |        |            |   |           |  |        |   |             |

|                                 | <u>coordination. Plants and other organisms (unicellular organisms, fungi etc.) have only chemical coordination.</u>   |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
|---------------------------------|--|--|-----------------------------|------------------------------|-----------------------|------------|----------|--------------|-----------------------|------------------|-----------|--------------------|--|--------------------|---------|-------|
| <b>Marking hints</b>            | Each underline sentence contains <b>ONE</b> mark. Only <b>FOUR</b> sentences required.<br><b>1+1+1+1= 4 marks</b>  |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| v.<br><b>Possible answer</b>    | <p><b>Differentiate between nervous coordination and chemical coordination with reference to their modes of coordination, coordinators, effectors and carrier of message.</b></p> <p>Ans:</p> <table border="1"> <thead> <tr> <th></th> <th><b>Nervous coordination</b></th> <th><b>Chemical coordination</b></th> </tr> </thead> <tbody> <tr> <td>Modes of coordination</td> <td>Electrical</td> <td>Hormonal</td> </tr> <tr> <td>Coordinators</td> <td>Brain and spinal cord</td> <td>Endocrine glands</td> </tr> <tr> <td>Effectors</td> <td>Muscles and Glands</td> <td>Many parts (e.g. kidneys liver stomach etc.)</td> </tr> <tr> <td>Carrier of message</td> <td>Neurons</td> <td>Blood</td> </tr> </tbody> </table> |  | <b>Nervous coordination</b> | <b>Chemical coordination</b> | Modes of coordination | Electrical | Hormonal | Coordinators | Brain and spinal cord | Endocrine glands | Effectors | Muscles and Glands | Many parts (e.g. kidneys liver stomach etc.) | Carrier of message | Neurons | Blood |
|                                 | <b>Nervous coordination</b>  | <b>Chemical coordination</b>                 |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| Modes of coordination           | Electrical   | Hormonal                                     |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| Coordinators                    | Brain and spinal cord  | Endocrine glands                             |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| Effectors                       | Muscles and Glands   | Many parts (e.g. kidneys liver stomach etc.) |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| Carrier of message              | Neurons  | Blood  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| <b>Marking hints</b>            | ONE mark of each given correct difference between nervous coordination and chemical coordination. FOUR required.<br><b>1+1+1+1= 4 marks</b>  |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| vi.<br><b>Possible answer</b>   | <p><b>Briefly explain the location and movement of hinge joints. Also draw its diagram.</b></p> <p><b>Movement</b> Allow movements only in two directions.<br/><b>Location.</b> They are present in the elbow and the knee<br/>Diagram of hinge joints</p>   |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| <b>Marking hints</b>            | One mark of correct movement of hinge joints. 1 mark<br>One mark of correct location of hinge joints. 1 mark<br>Two marks of correct diagram of hinge joints 2 marks<br><b>1+1+2= 4 marks</b>  |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| vii.<br><b>Possible answer</b>  | <p><b>Write ONE function of the following seed parts:</b><br/><b>a. Seed coat b. Hilum c. Plumule d. Micropyle</b></p> <p>Ans: <b>a. Seed coat:</b> It protects the embryo<br/><b>b. Hilum:</b> It indicates the place of attachment of the seed in the fruit.<br/><b>c. Plumule:</b> It gives rise to the future stem<br/><b>d. Micropyle:</b> Seed absorb, water through the micropyle at the time of germination.</p>   |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| <b>Marking hints</b>            | ONE mark of correct function of given parts of seed.<br><b>1+1+1+1= 4 marks</b>  |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| viii.<br><b>Possible answer</b> | <p><b>Briefly describe the composition of chromatin material in eukaryotes.</b></p> <p>Ans: In eukaryotes, the chromatin material is <b>composed of DNA and histone proteins</b>. Long molecule of DNA is wrapped around the bundle of histones <b>The structure made of histones and the DNA wrapped around them is called nucleosome. Nucleosomes are arranged in the form of beads on a string. The string of beads coils forms the structure of chromosomes.</b></p>   |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |
| <b>Marking hints</b>            | Bold sentences must consider. Overall correct brief description is required. Bold words or sentences must consider. Each bold sentence contains ONE mark.<br><b>1+1+1+1= 4 marks</b>   |  |                             |                              |                       |            |          |              |                       |                  |           |                    |  |                    |         |       |

|                                    |  |  |
|------------------------------------|--|--|
| <b>ix.<br/>Possible<br/>answer</b> | <b>Differentiate mutualism and commensalism with one example each.</b>   |  |
|                                    | <b>Mutualism</b>   | <b>Commensalism</b>  |
|                                    | In this type of relationship, both the partners are mutually benefitted and none of them is harmed<br><b>Example:</b> The roots of the leguminous plants (pea, bean etc.) have small nodules which contain Nitrogen bacteria. These bacteria get food from these plants. In return, bacteria convert the atmospheric nitrogen into nitrates and pass them on to the host plant.  | In this type of relationship only one partner is benefitted and other is neither benefitted nor harmed.<br><b>Example:</b> Many epiphytes such as orchids are found growing on the branches of other trees. These epiphytes use the tree only for the attachment They prepare their own food by photosynthesis. Here the orchids are benefitted but the tree is neither benefitted nor harmed. |
| <b>Marking<br/>hints</b>           | ONE mark for each correct difference between mutualism and commensalism. 2 required<br>ONE mark for each correct each example of each mutualism and commensalism. 2 required<br><p style="text-align: right;"><b>2+2= 4 marks</b></p>  |  |
| <b>x.<br/>Possible<br/>answer</b>  | <b>Define biotechnology and also write its THREE importance.</b>   |  |
|                                    | <b>Ans: Definition of biotechnology:</b> refers to the use of living organisms or their products for the welfare of human beings.<br><b>Importance of biotechnology:</b> <ul style="list-style-type: none"> <li>• Due to advancement in biotechnology scientists began to explore more about genes and characters.</li> <li>• With the discovery of the structure of DNA in 1953 modern technology emerged.</li> <li>• New techniques being used in modern biotechnologies includes fermentation, genetic engineering and tissue culture.</li> <li>• It finds best possible technological measures that prove beneficial for the humankind without disturbing nature.</li> <li>• Biotechnologists use microorganisms in various ways for obtaining benefits related to food production health and the environment</li> </ul> |  |
| <b>Marking<br/>hints</b>           | ONE mark of correct definition of biotechnology. 1 mark<br>THREE marks of correct importance of biotechnology. Only THREE required. 3 marks<br><p style="text-align: right;"><b>1+1+1+1= 4 marks</b></p>   |  |
| <b>xi.<br/>Possible<br/>answer</b> | <b>List any FOUR behavioural symptoms of drug addiction.</b>   |  |
|                                    | <b>Ans: Behavioural symptoms of drug addiction</b> <ul style="list-style-type: none"> <li>• Drop in attendance and performance at work or school</li> <li>• Unexplained need for money or financial problem</li> <li>• Engaging in secret or suspicious behavior</li> <li>• Sudden change in friends and hobbies</li> <li>• Frequently getting into trouble ( fights accidents illegal activities)</li> </ul>  |  |
| <b>Marking<br/>hints</b>           | ONE mark of each correct behavioral system of drug addiction. Only FOUR required.<br><p style="text-align: right;"><b>1+1+1+1= 4 marks</b></p>   |  |

**SECTION-C ERQs**  
**MARKING RUBRICS**

| <b>Q.2<br/>Possible<br/>answer</b>  | <p>i. <b>Write down the contributions of Abul-Qasim and Al-Farabi in introducing the method of removing stone from the urinary bladder. ( 4 )</b></p> <p><b>Ans: Abul-Qasim:</b> He is best known for his early and original breakthrough in surgery. <b>His famous medical encyclopedia is called Al-Tasrif is composed of thirty volumes.</b> In this encyclopedia he <b>described various aspects of surgical treatments based on the operations performed by him including the removal of stone from the urinary bladder.</b></p> <p><b>Al-Farabi:</b> He is known as <b>Alpharabius</b> and wrote many books. <b>He provided a lot of information about kidney diseases including stones in the urinary bladder.</b></p> <hr/> <p>ii. <b>Define hormone and where they are synthesized in animals? ( 3 )</b></p> <p><b>Ans: Hormone:</b> Chemical coordination is done through special chemicals called hormones. In animals hormones are <b>synthesized in endocrine glands</b> which are also called ductless glands.</p>   |  |      |           |                  |  |  |                 |  |  |
|-------------------------------------|--|--|------|-----------|------------------|--|--|-----------------|--|--|
| <b>Marking<br/>hints</b>            | <p>i. Two marks of correct contribution of Abdul-Qasim. 2 marks<br/>Two marks of correct contribution of Al-Farabi. 2 marks<br/><b>2+2= 4 marks</b></p> <p>ii. Two marks of correct definition of hormone. 2 marks and ONE mark of correct place where hormones are synthesized in animals. 1 mark<br/><b>2+1= 3 marks</b></p> <p><b>Total marks of Q.1 part ( i + ii) 2+2+ 2+1= 7 marks</b></p>   |  |      |           |                  |  |  |                 |  |  |
| <b>Q. 3<br/>Possible<br/>answer</b> | <p>i. <b>Differentiate between bone and cartilage with reference to structure and function.(4)</b></p> <p>Ans:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;"></th> <th style="width: 40%;">Bone</th> <th style="width: 40%;">Cartilage</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><b>Structure</b></td> <td> <ul style="list-style-type: none"> <li>• Hardest and rigid form of connective tissue in the human body.</li> <li>• The internal portion of many bones produce red blood cells, platelets and white blood cells.</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• It is a specialized connective tissue, which is firm and flexible and does not stretch.</li> <li>• There are no blood vessels present in the ground substances of cartilage.</li> </ul> </td> </tr> <tr> <td style="text-align: center;"><b>Function</b></td> <td> <ul style="list-style-type: none"> <li>• Give shape and structure of our body.</li> <li>• It provides support and protect delicate internal organs.</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>• It supports the flexible portion of the nose and in pinna of external ear.</li> <li>• Some cartilage types keep bones from rubbing together.</li> </ul> </td> </tr> </tbody> </table> <p>ii. <b>Write environmental conditions necessary for germination of seed. (3)</b></p> <p>Ans: <b><u>Environmental conditions necessary for germination of seed.</u></b></p> <ol style="list-style-type: none"> <li><b>1. Water:</b> Seeds absorb water through the micropyle. <u>Water softens the seed coat and makes it burst. Water also helps to activate enzyme that digest the food of seeds and make it available to the growing embryo.</u></li> <li><b>2. Oxygen:</b> Oxygen is also necessary for seed germination. The cells of the seed embryo use oxygen for cellular respiration so that they can get energy from stored food.</li> <li><b>3. Suitable temperature:</b> Germination of seeds occurs over a <u>wide range of temperature between 5°C to 30°C. A suitable temperature is necessary for the enzymes to function properly.</u></li> </ol> <p><b>Note:</b> In students response the underline words or sentences must consider.</p> |  | Bone | Cartilage | <b>Structure</b> | <ul style="list-style-type: none"> <li>• Hardest and rigid form of connective tissue in the human body.</li> <li>• The internal portion of many bones produce red blood cells, platelets and white blood cells.</li> </ul> | <ul style="list-style-type: none"> <li>• It is a specialized connective tissue, which is firm and flexible and does not stretch.</li> <li>• There are no blood vessels present in the ground substances of cartilage.</li> </ul> | <b>Function</b> | <ul style="list-style-type: none"> <li>• Give shape and structure of our body.</li> <li>• It provides support and protect delicate internal organs.</li> </ul> | <ul style="list-style-type: none"> <li>• It supports the flexible portion of the nose and in pinna of external ear.</li> <li>• Some cartilage types keep bones from rubbing together.</li> </ul> |
|                                     | Bone   | Cartilage  |      |           |                  |  |  |                 |  |  |
| <b>Structure</b>                    | <ul style="list-style-type: none"> <li>• Hardest and rigid form of connective tissue in the human body.</li> <li>• The internal portion of many bones produce red blood cells, platelets and white blood cells.</li> </ul>   | <ul style="list-style-type: none"> <li>• It is a specialized connective tissue, which is firm and flexible and does not stretch.</li> <li>• There are no blood vessels present in the ground substances of cartilage.</li> </ul> |      |           |                  |  |  |                 |  |  |
| <b>Function</b>                     | <ul style="list-style-type: none"> <li>• Give shape and structure of our body.</li> <li>• It provides support and protect delicate internal organs.</li> </ul>   | <ul style="list-style-type: none"> <li>• It supports the flexible portion of the nose and in pinna of external ear.</li> <li>• Some cartilage types keep bones from rubbing together.</li> </ul>                                 |      |           |                  |  |  |                 |  |  |

|                                    |   |
|------------------------------------|---|
| <p><b>Marking hints</b></p>        | <p>i. TWO marks of correct differences between structure of bone and cartilage. ONE correct difference of bone structure and ONE of cartilage is required. 1+1= 2 marks<br/>TWO marks of correct differences between functions of bone and cartilage. ONE correct difference of bone function and ONE of cartilage is required. 1+1= 2 marks<br/><b>2+2= 4 marks</b></p> <p>ii. ONE mark of each correct environmental condition necessary of seed germination. THREE required. 1+1+1= 3 marks<br/><b>TOTAL MARKS: Q.3 parts( i + ii) 2+2+1+1+1= 7 marks</b></p>  |
| <p><b>Q. 4 Possible answer</b></p> | <p>i. <b>When two Japanese 4 O' clock plants crossed with each other. One of them has red colour flower (R) and other has white flower (r). What will be their F<sub>1</sub> and F<sub>2</sub> generation result? (4)</b></p> <p><b>Ans: F<sub>1</sub> generation result:</b><br/>When a red flower (RR) Japanese 4 O' clock plants is crossed with a white flower (rr) Japanese 4 O' clock plants, all of the F<sub>1</sub> offspring have pink flowers (Rr). All these F<sub>1</sub> offspring are heterozygous (Rr).</p> <p><b>F<sub>2</sub> generation result:</b><br/>When two pink flowers (Rr) are crossed the genotype ratio of F<sub>2</sub> plants is:<br/>1RR: 2Rr: 1rr.<br/>1 red flower plant (RR): 2 pink flowers plants (Rr), (Rr): 1 white flower plant (rr).</p> <p>ii. <b>With the help of pyramid diagram shows the number of organisms at each trophic level in an ecosystem. (3)</b><br/><b>Ans:</b></p> <div style="text-align: center;">  <p>Pyramid of numbers</p> </div> |
| <p><b>Marking hints</b></p>        | <p>i. TWO marks of correct result of F<sub>1</sub> generation. 2 marks<br/>TWO marks of correct result of F<sub>2</sub> generation. 2 marks<br/><b>2+2= 4 marks</b></p> <p>ii. ONE mark of correct numbers of primary producers in Pyramid. 1 mark<br/>ONE mark of correct numbers of primary consumers in Pyramid. 1 mark<br/>ONE mark of correct numbers of tertiary consumers in Pyramid. 1 mark<br/><b>1+1+1= 3 marks</b><br/><b>TOTAL MARKS: Q.4 parts( i + ii) 2+2+1+1+1= 7 marks</b></p>   |
| <p><b>Q. 4 Possible answer</b></p> | <p>i. <b>Discuss FOUR most significant uses of single-cell protein. (4)</b><br/><b>Ans:</b></p> <ul style="list-style-type: none"> <li>• It is a rich source of protein (60 to 72%), vitamins, amino acids, minerals and crude fibers</li> <li>• It is a popular healthy food.</li> <li>• It provides valuable protein-rich supplement in human diet.</li> <li>• It lowers blood sugar level of diabetics and prevent the accumulation of cholesterol in human body.</li> </ul> <p>ii. <b>Define hallucinogen. Also give ONE example of hallucinogen.( 3)</b><br/><b>Ans: Definition of Hallucinogens:</b> Hallucinations can be defined as intensive distortions in a person's perceptions of reality. Under the influence</p>   |

|                      |  |
|----------------------|--|
|                      | <p>of hallucinogens, people see images, hear sounds and feel sensations that seem real actually do not exist.</p> <p><b>Examples:</b> Marijuana, Psilocybin, Mescaline and Dextromethorphan.</p>   |
| <b>Marking hints</b> | <p>i. ONE mark of each correct most significant use of single-cell protein. Only FOUR required. <b>1+1+1+1= 4 marks</b></p> <p>ii. TWO marks of correct definition of Hallucinogens. 2 marks<br/> ONE example of correct example of Hallucinogens. Only ONE required. 1 mark</p> <p style="text-align: right;"><b>2+1= 3 marks</b></p> <p><b>TOTAL MARKS: Q.5 parts( i+ ii) 1+1+1+1+2+1= 7 marks</b></p> |