

MARKING SCHEME OF MODEL PAPER BIOLOGY CLASS XI

Section: A

Marks: 18

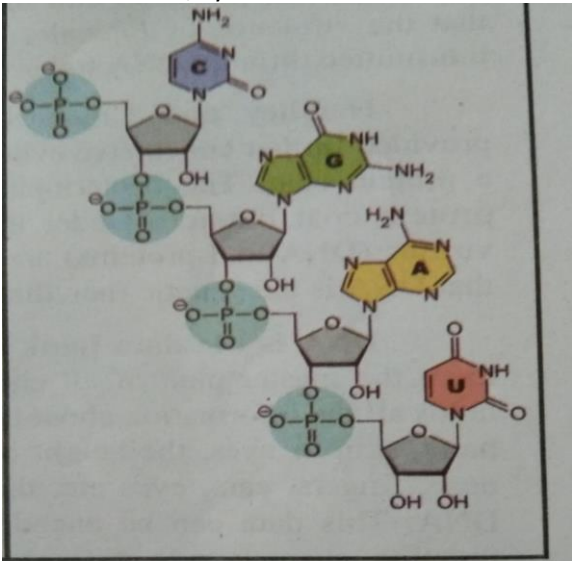
Question	Correct Answer	Key
1	Mg ⁺⁺	A
2	Mental retardation	A
3	Four polypeptide chains	C
4	Cytosine – Guanine	B
5	The first enzyme in the pathway	B
6	Chlorophyll a	A
7	Oxygen	C
8	Small pox	A
9	Crystal violet	A
10	Production of vitamins	B
11	Yeast	A
12	Bryophytes	D
13	Reptiles	D
14	Sieve tube cells	A
15	Pfr.	B
16	Helicobacter pylori	D
17	pulmonary artery.	B
18	Ankylosing spondylitis	C

Note: Each correct MCQ carries **ONE** mark

SECTION-B RRQs

MARKING RUBRIC

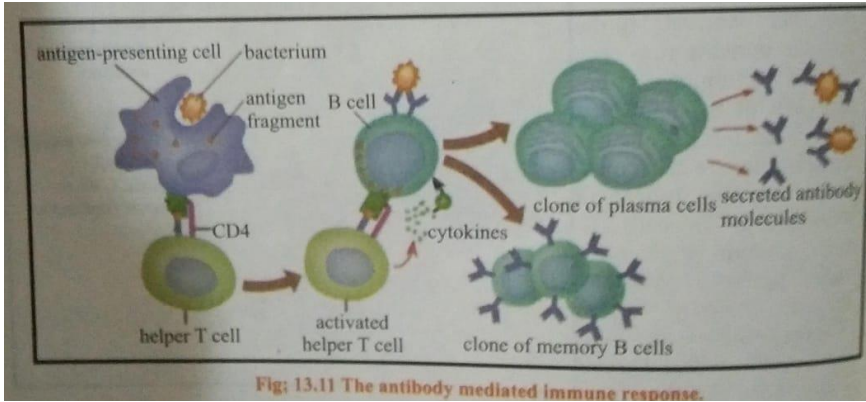
Q.1 i. Possible answer	Briefly describe Golgi bodies with respect to its structure and functions. Structure: Golgi complex consists of units called dictyosomes. Each dictyosome is formed of bundles of curved and flattened cisternae, associated tubules and secretory vesicles. Dictyosome has two distinct faces. The proximal or forming face present close to nucleus and a distal or maturing face located towards the cell membrane. Functions: Golgi bodies helps in the <u>storage</u>, <u>modification</u> and <u>packaging</u> of secretory products. In some cases polysaccharides may be <u>synthesized</u> in <u>Golgi apparatus</u>. Secretory vesicles produced by Golgi apparatus may play an <u>important role in adding surface area to the plasma membrane</u>. Note: Only two correct functions of Golgi bodies are required
Marking hints	Correct structure of Golgi bodies carries TWO marks. Correct functions of Golgi bodies carries TWO marks. Only 02 correct functions required. 2+1+1= 4 Total marks

ii. Possible answer	Explain structure of RNA with the help of diagram. Structure: RNA is a polymer of nucleotides. It is a single polynucleotide strand. The sugar present in RNA is ribose. RNA is formed of four different types of nucleotides. These nucleotides are given names after the base present in them, they are adenine ribonucleotide, guanine ribonucleotide, cytosine ribonucleotide and uracil ribonucleotide.  Fig: 2.22 Chemical structure of RNA
Marking hints	TWO marks for correct description of structure of RNA. TWO marks for correct diagram of chemical structure of RNA. 2+2= 4 Total marks

iii. Possible answer	Competitive and non-competitive inhibitors are two kinds of inhibitors. How these inhibitors are different from each other? Ans: <table border="1" data-bbox="349 359 1419 758"> <thead> <tr> <th data-bbox="349 359 883 411">Competitive inhibitors</th><th data-bbox="883 359 1419 411">Non-competitive inhibitors</th></tr> </thead> <tbody> <tr> <td data-bbox="349 411 883 758"> - Has a similar structure to the normal substrate molecule and it can fit into the active site of the enzyme - It competes with the substrate for the active site so the reaction is slower e.g. sulphonamide to an antibacterial drugs which act as competitive inhibitors. - A competitive inhibitor is reversible </td><td data-bbox="883 411 1419 758"> - It is quite different ins structure from the substrate molecule and does not fit into the active site. - It binds to another part of the enzyme molecule changing the shape of the whole enzyme including the active site and no longer bind substrate molecules. - Poisons like cyanide, heavy metal ions and some insecticides are all non-competitive inhibitors. </td></tr> </tbody> </table>	Competitive inhibitors	Non-competitive inhibitors	- Has a similar structure to the normal substrate molecule and it can fit into the active site of the enzyme - It competes with the substrate for the active site so the reaction is slower e.g. sulphonamide to an antibacterial drugs which act as competitive inhibitors. - A competitive inhibitor is reversible	- It is quite different ins structure from the substrate molecule and does not fit into the active site. - It binds to another part of the enzyme molecule changing the shape of the whole enzyme including the active site and no longer bind substrate molecules. - Poisons like cyanide, heavy metal ions and some insecticides are all non-competitive inhibitors.
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Marking hints	2 marks for correct difference between competitive and non-competitive inhibitors = Only 2 differences required. 4 marks 2+2= 4 Total marks				
iv. Possible answer	Relate visible spectrum to the absorption spectra of photosynthetic pigments. Ans: A portion of solar radiation that ranges from about <u>390 to 760 nm</u> in wavelength is termed as visible spectrum. Whereas The amount of <u>light absorbed</u> by photosynthetic pigments from a visible spectrum is termed as absorption spectrum. Most important pigments in photosynthesis are <u>chlorophyll a, chlorophyll b and carotenoids</u>. The chlorophyll chiefly absorb light in violet blue (390nm- 460nm) and <u>red parts (630nm-700nm)</u> of the visible spectrum. <u>The carotenoids absorb light between 430-470nm of light spectrum and transfer it to chlorophyll a molecule.</u> Note: The underline words/sentences must consider in student response.				
Marking hints	Correct description carries 4 marks				
v. Possible answer	Write any FOUR control measures against the transmissions of HIV. Ans: - Proper sterilization methods should be used. - Disposable needles should be used for procedures such as acupuncture tattooing, ear piercing etc. - Screen blood for HIV should be given in case of blood transfusion. - Get professional help for terminating the drug habit.				
Marking hints	ONE mark of each given correct control measures against the transmissions of HIV. Only FOUR required. 1+1+1+1= 4 Total marks				

vi. Possible answer	List FOUR chemical methods to control harmful bacteria. Ans: 1. Phenolics are used against Gram positive bacteria. 2. Chlorine is used to disinfect drinking water and pools. 3. Tincture iodine is used as antiseptics. 4. Ethylene oxide is used to kill all microbes and endospores.
Marking hints	ONE mark of each given correct chemical methods to control harmful bacteria. Only FOUR required. 1+1+1+1= 4 Total marks
vii. Possible answer	Briefly explain the role played by fungi and algae in lichens. Ans: Lichen is a symbiotic association between fungi and algae. It is an example of mutualism where both the partners get benefits from each other. Role of fungi: Fungal hyphae penetrate the cell wall of algal partner and transfer nutrients directly to fungus. Biological signals sent out by fungus to algal partners to produce metabolic substances that it does not produce independently. Role of algae: Algae is photosynthetic partner. It produces food by the process of photosynthesis and provide it to fungal partner.
Marking hints	TWO marks of Role of Fungi. TWO marks of Role of Algae. 2+2= 4 Total marks
viii. Possible answer	How racemose inflorescence is different from cymose inflorescence with reference to flower position? Ans: <u>In racemose inflorescence the main axis is continue to grow indefinitely until the last flower is formed at its apex. The oldest flowers are towards the base of inflorescence and the youngest ones toward the apex. Whereas in cymose inflorescence the main axis soon ends in a flower.</u> One, two or more branches develop below the terminal flower each ending in a flower like the main axis. In this case the terminal flower is the oldest and the lateral flowers are younger. Note: Underlines sentences must consider in students responses
Marking hints	Racemose: 2 marks, Cymose: 2 marks 2+2= 4 Total marks

ix. Possible answer	Differentiate between acoelomate and pseudocoelomate. Give ONE example of each. Ans: <table border="1" data-bbox="349 338 1419 808"> <thead> <tr> <th data-bbox="349 338 883 380">Acoelomate</th><th data-bbox="883 338 1419 380">Pseudocoelomate</th></tr> </thead> <tbody> <tr> <td data-bbox="349 380 883 663">Those animals which do not possess body cavity or coelom are called acoelomates. In these animals space between body wall and alimentary canal is filled with a loose cellular tissue called mesenchyma or parenchyma. These tissues support and protect the internal organs. Acoelomates do not have much developed body system</td><td data-bbox="883 380 1419 663">Those animals in which body cavity is present between body wall and alimentary canal but the cavity is not formed by mesoderm are called pseudocoelomates.</td></tr> <tr> <td data-bbox="349 663 883 808">Example: Animals of phylum platyhelminthes are classified as acoelomates.</td><td data-bbox="883 663 1419 808">Example: Aschelminthes are included in this group.</td></tr> </tbody> </table>	Acoelomate	Pseudocoelomate	Those animals which do not possess body cavity or coelom are called acoelomates. In these animals space between body wall and alimentary canal is filled with a loose cellular tissue called mesenchyma or parenchyma. These tissues support and protect the internal organs. Acoelomates do not have much developed body system	Those animals in which body cavity is present between body wall and alimentary canal but the cavity is not formed by mesoderm are called pseudocoelomates.	Example: Animals of phylum platyhelminthes are classified as acoelomates.	Example: Aschelminthes are included in this group.
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Example: Animals of phylum platyhelminthes are classified as acoelomates.	Example: Aschelminthes are included in this group.						
Marking hints	ONE mark for each correct difference between acoelomate and pseudocoelomate. 1+1 marks ONE mark for each correct each example of acoelomate and pseudocoelomate. 1+1 marks 1+1+1+1= 4 Total marks						
x. Possible answer	Briefly explain how annual are formed? Ans: Annual ring is simply a layer of <u>wood produced during one trees growing season. Each tree ring marks of line between a dark late wood that grew at the end of previous year and the relatively pale early wood that grew at the start of this year. One annual ring is composed of a ring of early wood and a ring of late wood.</u> Note: Underline words/sentences must consider in student response						
Marking hints	Correct description carries 4 marks						
xi. Possible answer	Write down the role of parietal cells in the structure of stomach. Ans: Parietal cells secrete hydrochloric acid and intrinsic factor. i Role of HCl Parietal cells contain a H ions ATPase. This transmembrane protein secretes H ions by active transport using the energy of ATP. The concentration of hydrogen ions in the gastric juice can be as high as 0.15M giving gastric juice a pH somewhere less than 1.						

	ii Role of intrinsic factor Intrinsic factor is a protein that binds ingested vitamin B12 and enables it to be absorbed by the intestine in intact form.
Marking hints	Role of HCl: 2 marks and role of intrinsic factors: 2 marks 2+2= 4 Total marks
xii Possible answer	Define cardiac cycle and briefly explain phases of heart beat. Ans: Cardiac cycle: One contraction and one relaxation is called as cardiac cycle. Contraction of heart is called systole and relaxation is diastole. One complete cycle takes 0.8 seconds. Phases of heart beat: In first phase called diastole blood flows all the four Chambers passively. In second phase i.e systole both the auricles contract together for about 0.1 second filling the ventricles completely with blood. In third phase the ventricles contract together for about 0.3 seconds pouring blood into aorta and pulmonary artery. Normal rate of heart beat in healthy human being is 72 beats per minute.
Marking hints	Cardiac cycle: 1 mark Each phase of heart beat carries ONE mark. Three phases of heart beat required: 3 marks 1+1+1= 4 Total marks
xiii Possible answer	Draw a diagram showing antibody mediated immune response.  The diagram illustrates the antibody-mediated immune response. It shows an antigen-presenting cell (APC) interacting with a B cell and a helper T cell. The APC presents an antigen fragment to the B cell. The helper T cell, which has a CD4 receptor, interacts with the B cell and secretes cytokines. This interaction leads to the activation of the B cell, which then produces a clone of plasma cells (secreting antibody molecules) and a clone of memory B cells. Fig: 13.11 The antibody mediated immune response.
Marking hints	Correct diagram and labeling Carries 4 marks

SECTION-C ERQs

MARKING RUBRIC

Q.2 Possible answer	i. Describe cytoskeleton with reference to the discovery, structure, chemical composition and functions. (4) Ans: Discovery: Cytoskeleton was first time discovered by Koltzoff in 1928. Later on Cohen confirmed the views of Koltzoff in 1977 by his electron microscopic studies. Structure: According to Cohen the cytoplasm of eukaryotic cells contains a cytoskeletal network made up of different types of microtubules microfilaments and intermediate filaments. Chemical composition: Cytoskeleton is chemically composed of tubulin actin myosin tropomyosin and some other proteins. Functions: Several cell organelles such as cilia flagella basal bodies and centrioles are derived from microtubules. Cyclosis and amoeboid movements are because of microfilaments. Intermediate filaments are involved in determination of cell shape and integration of cellular components. ii. Write down FOUR characteristics of monosaccharaides and also classify monosaccharaides on the basis of number of carbon atoms. (5) Ans: Characteristics of monosaccharaides. • Monosaccharaides are simple sugars made up of single sugar unit. • They cannot be further hydrolyzed into more simple units. • They are easily soluble in water. • They are sweet in taste. • They have the same ratio of hydrogen and oxygen as in water. • They contain either aldehyde or keto group. • They have carbon backbone. Note: Only FOUR required in student answer. Classification. Monosaccharaides have carbon backbone that may contain from three to seven carbon atoms. They have names which ends in-ose. Those with 3 carbon atoms are called trioses, with four atoms are tetroses, with 5 atoms pentoses and so on.
Marking hints	i. Discovery carries 1 mark Structure carries 1 mark Chemical composition carries 1 mark Functions carries 1 mark

	1+1+1+1= 4 Total marks ii. 4 Characteristics: 4 marks, Classification: 1 mark. 4+1=5 Total marks
Q. 3 Possible answer	i. Write FOUR comparison between Lock and Key Hypothesis and Induced Fit Hypothesis. (4) Ans: • According to Lock and Key Hypothesis active sites of enzymes are rigid structure but induced Fit Hypothesis says that active site is not a rigid structure. • Lock and Key Hypothesis says that enzyme and substrate must be spatial fit but induced Fit Hypothesis says that they should be spatial as well as chemically fit. • Lock and Key Hypothesis says that active site of enzyme cannot be modified but induced Fit Hypothesis says that active site of enzyme modify its shape according to the shape of substrate. • Lock and Key Hypothesis is explained with the example of lock and key while induced Fit Hypothesis is explained by “induced to fit”. ii. Write down the causes, symptoms and preventive measures of bacterial wilt in plants. (1+2+2) Ans: Causes: It is caused by <i>Ralstonia solanacearum</i>. Symptoms: • Wilting of the youngest leaves at the end of the branches. • Stunting of plants. Preventive measures. • Destroying the infected plants immediately. • Crop rotation • Control of nematodes • Use of disinfected farm tools
Marking hints	i. ONE mark of correct differences between Lock and Key Hypothesis and Induced Fit Hypothesis. Only FOUR required. 4 marks 1+1+1+1= 4 Total marks ii. One mark of causes = Only 01 cause are required TWO marks of symptoms. Only 02 symptoms are required. TWO marks of preventive measures. Only 02 preventive measures are required. 1+2+2= 5 Total marks

Q. 4 Possible answer	i. Define photorespiration and also write THREE steps involved in photorespiration. (4) Ans: The process in which oxygen combines with RuBP in the presence of sunlight and carbon dioxide is produced is called photorespiration The following steps are involved in photorespiration. 1. Oxygen combines with RuBP (present in stroma of chloroplast) and a compound called glycolate is produced. $\text{RuBP} + \text{O}_2 \rightarrow \text{Glycolate}$ 2. Glycolate is converted into glycine (simplest amino acid) in the peroxisome. $\text{Glycolate} \rightarrow \text{Glycine}$ 3. Glycine is transported to mitochondria where it is converted into serine and a molecule of CO₂ is produced. $\text{Glycine} \rightarrow \text{Serine} + \text{CO}_2$ ii. Write any FIVE general characters of animals. (5) Ans: General characters of animals. 1. Animals develop from two dissimilar haploid gametes i-e larger egg and smaller sperm. 2. The outermost covering of all their cells is cell membrane. 3. They have a multicellular body. 4. They are made of diploid eukaryotic cells. 5. They are heterotrophic and ingest their food. Note: Any other correct character of animal other than textbook may be consider
Marking hints	i. Definition carries= 1 mark and 3 steps {3 marks} 1+1+1+1= 4 Total marks ii. Each character of animals carries 1 mark. Only 5 required. 1+1+1+1+1= 5 Total marks
Q. 5 Possible answer	i. Justify the role of stomata in gaseous exchange and transpiration. (5) Ans: Transpiration is loss of water through the aerial parts of the plant into the atmosphere by evaporation. Over 90% of the total transpirational water loss from the plant take place through stomata. Stomata are structures found within the leaf blade and are responsible for facilitating the gaseous exchange of CO₂ and O₂ during photosynthesis. The exchange function of the stomata also leads to the loss of plant water through transpiration. Transpiration take place if stomata are opened. It also facilitate gaseous exchange.

	ii. What is atherosclerosis? Write down the factors that cause atherosclerosis. (4) Ans: Atherosclerosis: Hardening of the arteries due to the deposition of fatty material such as cholesterol is called atherosclerosis. Factors causing atherosclerosis. It develops from low density lipoprotein molecules (LDL) becoming oxidized by free radicals. When oxidized LDL comes in contact with the wall of an artery a series of reactions occurs to repair the damage to the artery wall caused by oxidized LDL. The body's immune sends specialized white blood cells that called microphages and T lymphocytes to absorb the oxidized LDL forming specialized foam cells. Unfortunately these white blood cells are not able to process the oxidized LDL. They grow and then rupture, depositing a greater amount of oxidized cholesterol into the artery wall. This triggers more white blood cells and the cycle continues. As a result, the artery becomes inflamed. The cholesterol plaque causes the muscles cells to enlarge and form a hard cover over the affected area. This hard cover causes the artery lumen to become narrow. Narrowing of artery reduces the blood flow and increases blood pressure.
Marking hints	i. Correct justification carries 5 Total marks ii. Definition of Atherosclerosis carries 1 mark and factors causing atherosclerosis carry 3 marks. 1+3= 4 Total marks