



ST. MARGARET SR. SEC. SCHOOL
MID TERM EXAMINATION 2023-24
BIOLOGY (044)
CLASS XII
SAMPLE PAPER

Allowed Time: 3Hr

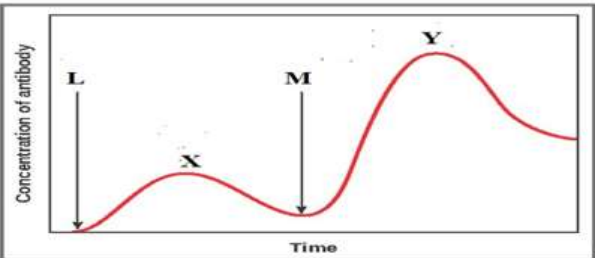
Max.Marks: 70

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E has 3 questions of 5 marks each.
- (iv) There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
- (v) Wherever necessary, neat and properly labeled diagrams should be drawn.

Q.No.	Question	Marks								
1	Which of the following is a viral disease? (a) Diphtheria (b) Filariasis (c) Leprosy (d) Influenza	1								
2	The earliest geological time period among the following is _____ (a) Cambrian (b) Permian (c) Jurassic (d) Quaternary	1								
3	Functional megaspore in a flowering plant develops into (a) Endosperm (b) Ovule (c) Embryo-sac (d) Embryo	1								
4	The primer in DNA replication is (a) Small ribonucleotide polymer (b) Helix destabilizing protein (c) Small deoxyribonucleotide polymer (d) Enzyme joining nucleotides of new strands	1								
5	The proofreading enzyme in DNA replication is (a) Primase (b) DNA Polymerase I (c) Ligase (d) DNA Polymerase II	1								
6	Match the following list of bacteria and their commercially important products. Choose the correct match: <table border="1" style="width: 100%; margin: 5px 0;"> <tbody> <tr> <td style="width: 50%;">(i) Aspergillus niger</td> <td style="width: 50%;">(A) Lactic Acid</td> </tr> <tr> <td>(ii) Acetobacter aceti</td> <td>(B) Butyric acid</td> </tr> <tr> <td>(iii) Clostridium butylicum</td> <td>(C) Acetic acid</td> </tr> <tr> <td>(iv) Lactobacillus</td> <td>(D) Citric acid</td> </tr> </tbody> </table> Choose the correct option: (a) i-B, ii -C, iii-D, iv- A (b) i-B, ii -D, iii-C, iv- A (c) i-D, ii -C, iii-B, iv- A (d) i-D, ii -A, iii-C, iv B	(i) Aspergillus niger	(A) Lactic Acid	(ii) Acetobacter aceti	(B) Butyric acid	(iii) Clostridium butylicum	(C) Acetic acid	(iv) Lactobacillus	(D) Citric acid	1
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7	Bacillus thuringiensis is widely used as: (a) Insecticide (b) Weedicides (c) Rodenticide (d) None of the above	1								
8	In sickle cell anaemia glutamic acid is replaced by valine. Which one of the following triplets codes for valine ? (a) GGG (b) AAG (c) GAA (d) GUG	1								

9	Which of the following factors affect human health ? (i) Infections (ii) Silent mutation (iii) Life style (iv) Genetic disorders (a) (i), (ii) and (iv) (b) (i) and (ii) (c) (i), (iii) and (iv) (d) (i), (ii), (iii) and (iv)	1
10	Immediately after ovulation, the mammalian egg is covered by a membrane known as (a) chorion (b) zona pellucida (c) corona radiata (d) vitelline membrane.	1
11	The technique called Gamete Intra Fallopian Transfer (GIFT) is recommended for those females (a) who cannot produce an ovum (b) who cannot retain the foetus inside uterus (c) who cannot provide suitable environment for fertilisation (d) all of these	1
12	In the F ₂ generation of a Mendelian dihybrid cross the number of phenotypes and genotypes are (a) phenotypes – 4; genotypes – 16 (b) phenotypes – 9; genotypes – 4 (c) phenotypes – 4; genotypes – 8 (d) phenotypes – 4; genotypes – 9.	1
	Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: a) Both A and R are true and R is the correct explanation of A. b) Both A and R are true and R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.	
13	Assertion: Pollen grains are shed at 3-celled stage in some angiosperms Reason: In some species, the vegetative cell of pollen grain divides mitotically to form two male gametes.	1
14	Assertion: Artificial insemination is the method of introduction of semen inside the female. Reason: This technique is used in those cases where males have low sperm count.	1
15	Assertion: A test cross is used to determine the phenotype of an organism. Reason: F ₂ generation of a monohybrid test cross produces one or two phenotypes depending upon the genotype of the unknown organism.	1
16	Assertion: Hardy Weinberg principle explains the occurrence of variation in population and species. Reason- It concludes that disturbances in genetic equilibrium results in evolution.	1
Section – B		
17	Write the location and functions of following in human testes (i) Sertoli cells (ii) Leydig cells	2

18	Why is it not possible for an alien DNA to become part of chromosome anywhere along its length and replicate normally?	2															
19	<p>The graph given below indicates the administration of the first (L) and second dose (M) of a vaccine. The corresponding response of the body is indicated by X and Y. Interpret the graph and explain the reason for such a response shown by the body.</p> 	2															
20	Draw a schematic diagram of a part of double-stranded dinucleotide DNA chain having all the four nitrogenous bases showing the correct polarity.	2															
21	<p>A bilobed, dithecous anther has 100 microspore mother cells per microsporangium. How many male gametophytes this anther can produce?</p> <p style="text-align: center;">OR</p> <p>Select two pairs from the following which exhibit divergent evolution. Give reasons for your answer.</p> <p>(i) Forelimbs of cheetah and mammals. (ii) Flippers of dolphins and penguins. (iii) Wings of butterflies and birds. (iv) Forelimbs of whales and mammals.</p>	2															
Section – C																	
22	Explain the interpretation of Charles Darwin who observed a variety of small black birds on Galapagos Islands.	3															
23	<p>(i) Draw a sectional view of human ovary and label the following parts</p> <p>(a) Primary follicle (b) Secondary oocyte (c) Graafian follicle (d) Corpus luteum</p> <p>(ii) Name the hormones influencing follicular development of corpus luteum.</p>	3															
24	Suggest and explain any three Assisted Reproductive Technologies (ART) to an infertile couple.	3															
25	Describe the experiment that helped Louis Pasteur to dismiss the theory of spontaneous generation of life.	3															
26	Secondary treatment of the sewage is also called biological treatment. Justify this statement and explain the process.	3															
27	<p>The following table shows certain diseases, their causative organisms and symptoms. Fill the gaps</p> <table border="1"> <thead> <tr> <th>Name of the Disease</th> <th>Causative Organism</th> <th>Symptoms</th> </tr> </thead> <tbody> <tr> <td>(i) Ascariasis</td> <td>Ascaris</td> <td>-----</td> </tr> <tr> <td>(ii) -----</td> <td>Trichophyton</td> <td>Appearance of dry, scaly lesions on various parts of the body</td> </tr> <tr> <td>(iii) Typhoid</td> <td>-----</td> <td>High fever, weakness, headache, stomach ache, constipation</td> </tr> <tr> <td>(iv) Pneumonia</td> <td>Streptococcus</td> <td>-----</td> </tr> </tbody> </table>	Name of the Disease	Causative Organism	Symptoms	(i) Ascariasis	Ascaris	-----	(ii) -----	Trichophyton	Appearance of dry, scaly lesions on various parts of the body	(iii) Typhoid	-----	High fever, weakness, headache, stomach ache, constipation	(iv) Pneumonia	Streptococcus	-----	3
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(iii) Typhoid	-----	High fever, weakness, headache, stomach ache, constipation															
(iv) Pneumonia	Streptococcus	-----															

		pneumoniae		
	(v)	----- Rhino virus	Nasal congestion and discharge, sore throat, cough, headache	
	(vi)	Filariasis	----- Inflammation in lower limbs	
OR				
Mention one application for each of the following				
(i) Passive immunisation				
(ii) Antihistamine				
(iii) Colostrum				
28	In a dihybrid cross, white-eyed, yellow-bodied female <i>Drosophila</i> crossed with red-eyed, brown-bodied male <i>Drosophila</i> produced in F ₂ -generation 1.3% recombinants and 98.7% progeny with parental type combinations. This observation of Morgan deviated from Mendelian F ₂ -phenotypic dihybrid ratio. Explain, giving reasons Morgan's observation.			3
Section - D				
Q. No. 29 and 30 are case-based questions. Each question has 3 subparts with internal choice in one subpart.				
29	The base sequence in one of the strands of DNA is TAGCATGAT. (i) Give the base sequence of the complementary strand. (ii) How are these base pairs held together in a DNA molecule? (iii) Explain the base complementarity rule. Name the scientist who framed this rule.			4
30	a) Mention the 'Nonsense codons'. b) If any mRNA is as written as below then how many Amino acid will the polypeptide contain? 5' AUGCAGGGUUCAAAAUAGGAUCCGGACUA 3' c) Genetic code is degenerate. Take help of this table to explain it. OR c) Which codon initiates translation? Does it have any other function?			4
Section - E				
31	A large number of married couples in the world are childless. It is shocking to know that in India, the female partner is often blamed for the couple being childless. (i) Why in your opinion the female partner is often blamed for such situations in India? Mention any two values that you as a biology student can promote to check this social evil. (ii) State any two reasons responsible for the cause of infertility. (iii) Suggest a technique that can help the couple to have a child where the problem is with the male partner. OR (i) What precaution(s) would you recommend to a patient requiring repeated blood transfusion? (ii) If the advice is not followed by the patient there is an apprehension that the patient might contract a disease that would destroy the immune system of his/her body. Explain with the help of schematic diagram only how the immune system would get affected and destroyed.			5
32	(i) Write any two places where methanogens can be found. (ii) Name the type of association that the genus <i>Glomus</i> exhibits with higher plants. (iii) State one reason for adding blue-green algae to the agricultural soil. What makes the Nucleopolyhedrovirus a desirable biological control agent?			5

	<p>OR</p> <p>With the help of one example, explain the phenomena of codominance and multiple allelism in human population.</p>	
33	<p>a) Draw a labelled diagram of reproductive system in a human female.</p> <p>b) When do the oogenesis and the spermatogenesis initiate in human females and males, respectively?</p> <p style="text-align: center;">OR</p> <p>a) Draw a diagram of a section of a megasporangium of an angiosperm and label funiculus, micropyle, embryo sac and nucellus.</p> <p>b) Differentiate between the two cells enclosed in a mature male gametophyte of an angiosperm.</p>	5
