



## INDIAN SCHOOL AL WADI AL KABIR

FIRST REHEARSAL EXAMINATION-2023-24

CLASS: XII  
DATE: 07-12-2023


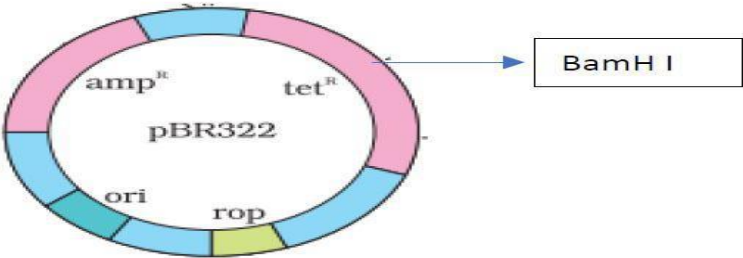
Sub: BIOLOGY (044)  
Set -I

MAX.MARKS: 70  
TIME: 3 HOURS

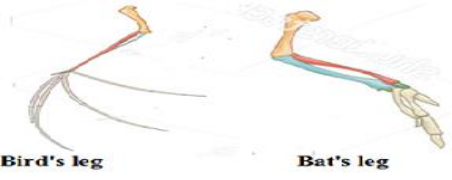
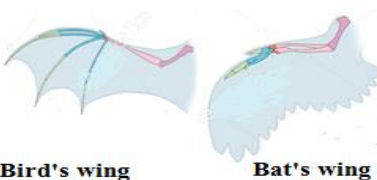
**General Instructions:**

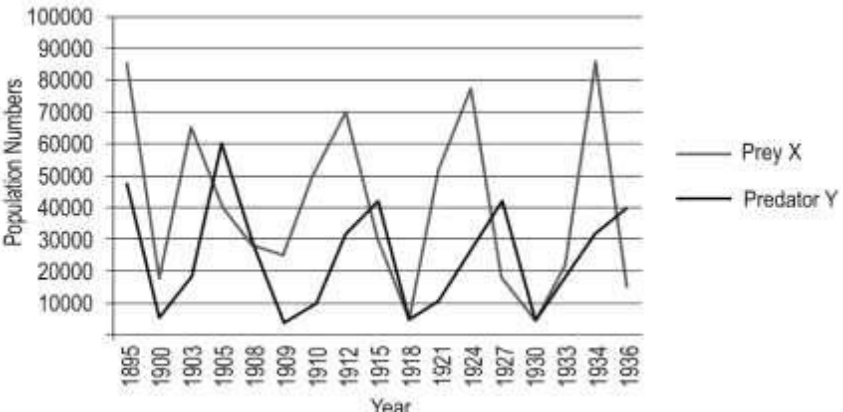
- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (iii) **Section–A** has 16 questions of 1 mark each; **Section–B** has 5 questions of 2 marks each; **Section– C** has 7 questions of 3 marks each; **Section– D** has 2 case-based 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

Sl. No.	SECTION A QUESTION	M K S
1	How does human sperm locomote? a) Flagella b) Cilia c) Neutrophils d) None of the above	1
2	In sickle cell anaemia glutamic acid is replaced by valine. Which one of the following triplets' codes for valine? a) GAG b) AAG c) GAA d) GUG	1
3	ZZ/ZW type of sex determination is seen in a) Platypus b) Snails c) Cockroach d) Peacock	1

4	<p>The two nuclei at the end of the pollen tube are called</p> <p>a) Tube nucleus and a generative nucleus  b) Sperm and ovum  c) Generative nucleus and stigma  d) Tube nucleus and sperm</p>	1
5	<p>The first genetic material could be</p> <p>a) Protein  b) Carbohydrates  c) DNA  d) RNA</p>	1
6	<p>Identify the interaction as shown in the figure below between the clown fish and sea anemone.</p>  <p>a) Parasitism  b) Mutualism  c) Commensalism  d) Prey Predator</p>	1
7	<p>A dioecious flowering plant prevents</p> <p>a) Geitonogamy and xenogamy  b) Autogamy and xenogamy  c) Autogamy and geitonogamy  d) Cleistogamy and xenogamy</p>	1
8	<p>Statins act as a blood cholesterol lowering agent, its source is</p> <p>a) Streptococcus  b) Trichoderma polysporum  c) Aspergillus niger  d) Monascus purpureus</p>	1
9	<p>The figure below shows the structure of a plasmid.</p> 	1

	<p>A foreign DNA was ligated at BamH1. The transformants were then grown in a medium containing antibiotics tetracycline and ampicillin. Choose the correct observation for the growth of bacterial colonies from the given table</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th><i>Medium with Tetracycline</i></th> <th><i>Medium with Ampicillin</i></th> </tr> </thead> <tbody> <tr> <td>(a)</td> <td>Growth</td> <td>No growth</td> </tr> <tr> <td>(b)</td> <td>No growth</td> <td>Growth</td> </tr> <tr> <td>(c)</td> <td>No growth</td> <td>No Growth</td> </tr> <tr> <td>(d)</td> <td>Growth</td> <td>Growth</td> </tr> </tbody> </table>		<i>Medium with Tetracycline</i>	<i>Medium with Ampicillin</i>	(a)	Growth	No growth	(b)	No growth	Growth	(c)	No growth	No Growth	(d)	Growth	Growth	
	<i>Medium with Tetracycline</i>	<i>Medium with Ampicillin</i>															
(a)	Growth	No growth															
(b)	No growth	Growth															
(c)	No growth	No Growth															
(d)	Growth	Growth															
10	<p>Bacteria protect themselves from viruses by fragmenting viral DNA with</p> <p>a) Ligase b) Endonuclease c) Exonuclease d) Gyrase</p>	1															
11	<p>Southern blotting is</p> <p>a) Attachment of probes to DNA fragments b) Transfer of DNA fragments from electrophoretic gel to a nitrocellulose sheet c) Comparison of DNA fragments to two sources d) Transfer of DNA fragments to electrophoretic gel from cellulose membrane</p>	1															
12	<p>Oysters are generally either dark or light in colour. Dark oysters excel in dark environments, while light oysters thrive in bright environments. Intermediate- colored oysters are disadvantaged, lacking effective camouflage in either setting. Which type of natural selection does this phenomenon exemplify?</p> <p>a) Directional b) Stabilizing c) Disruptive d) The phenomenon described does not exemplify natural selection.</p>	1															
	<p>Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</p> <p>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.</p>																
13	<p>Assertion: Tropical latitudes have greater biological diversity than temperate latitudes. Reason: Tropical regions remain relatively undisturbed as compared to the temperate latitudes.</p>	1															
14	<p>Assertion: Dope test is used to estimate the level of blood alcohol by analyzing the breath of the person. Reason: The chronic use of alcohol damages the nervous system and the liver</p>	1															
15	<p>Assertion: Darwin's finches show a variety of beaks suited for eating large seeds, flying insects and cactus seeds.</p>	1															

	Reason: Ancestral seed-eating stock of Darwin's finches radiated out from South America main land to different geographical areas of the Galapagos Islands.	
16	Assertion: Low temperature and anaerobiosis help in decomposition. Reason: Decomposition require the presence of oxygen.	1
SECTION B		
17	A couple is trying to conceive and start a family. If the woman's period, which is regular, is scheduled to start on July 19, a) What could be the estimated date of ovulation for the previous cycle? b) Name the two important reproductive hormones and state whether their levels will be high or low on the date identified in (a).	2
18	With the help of diagrams illustrate the stages of a microspore maturing into a pollen grain.	2
19	a) What is replication and how is it different from transcription process. b) What is the role of DNA polymerase and DNA ligase in replication of DNA.	2
20	The infection of the roots in tobacco plant was stopped using a novel mechanism. a) What is this novel mechanism and why is it called so.	2
21	Draw a neat and labelled diagram of a simple stirred tank bioreactor OR Draw a neat and labelled diagram of a Sparged stirred bioreactor.	2
SECTION C		
22	Explain the Oogenesis process from the oogonia formation till formation of the secondary oocyte in human females.	3
23	a) State any two goals of HGP. b) How would the knowledge of HGP benefit mankind. c) Name the two methods involved in HGP OR a) State any two salient features of genetic code. b) What type of disease is Thalassaemia, briefly explain its genetic defect.	3
24	In cats, the allele for grey fur is dominant over the allele for beige fur. The allele for solid coat is dominant over the allele for a striped coat. A pure breeding solid, beige cat is crossed with a pure breeding striped, grey cat. a) State the genotype of the parents, the genotype and the phenotype of the F <sub>1</sub> individuals produced as the result of this cross. b) Calculate the phenotypes resulting from a cross between a pure breeding solid beige cat and an F <sub>1</sub> offspring.	3
25	The figure given below illustrates the analogous and homologous organs, observe the diagrams carefully and answer the questions that follow. <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>(A)</p>  <p><b>Bird's leg</b>                      <b>Bat's leg</b></p> </div> <div style="text-align: center;"> <p>(B)</p>  <p><b>Bird's wing</b>                      <b>Bat's wing</b></p> </div> </div>	3
	a) Identify the type of organs depicted in the groups A and B.	

	b) Identify the evolution shown by group A and group B and give any two points of difference between them.	
26	<p>Modern society has used insecticides and pesticides for controlling plant disease and pests. These chemicals are toxic and extremely harmful to both humans and the environment as well.</p> <p>Why is Biological control of pest and disease in agriculture a better option, justify your reasons with an example?</p>	3
27	<p>Lymphocytes are an integral part of our immune system and help in the humoral and cell-mediated immune response process.</p> <p>a) Specify the type of lymphocytes that mediate humoral immune response and the ones that mediate cell-mediated immunity.</p> <p>b) What is the chemical nature of antibodies? Identify the antibody released during an allergic reaction.</p> <p>c) How is an organ rejected by the body due to 'unmatched' transplant?</p>	3
28	<p>Predator Y shown in the image below is a type of wild cat that inhabits the</p>  <p>forests and preys primarily on prey X which are herbivores. Shown below is the data on their respective populations over time.</p> <p>(a) What is the likely cause for the pattern seen in the prey and predator populations through the years?</p> <p>(b) Consider a situation where another similar species of predator immigrates to the forest. What is likely to happen over time and why?</p> <p>(c) Give one example each of the morphological and chemical defenses the plants have evolved against the herbivores.</p>	3
<b>SECTION D</b>		
	Q.no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart	4
29	Orchids show a bewildering diversity of floral patterns many of which have evolved to attract the right pollinator insect. The figure given below shows a male bee attracted to an orchid flower.	



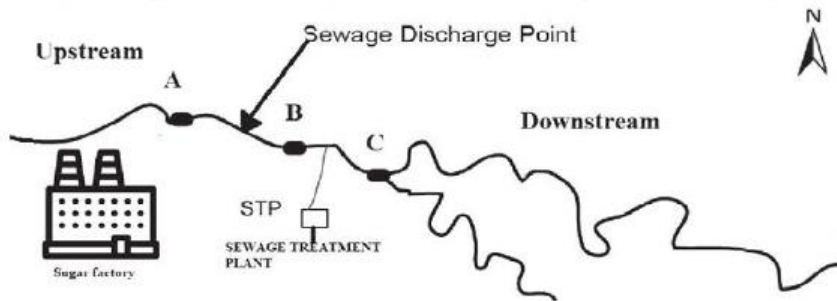
- a) Identify the interaction shown between the Orchid and the Bee species with reason.
- b) Why must this interaction operate coevolution.
- c) How does the Mediterranean orchid get pollinated, briefly explain.

OR

In the fig species, there is a tight one to one relationship with the pollinator briefly explain this plant pollinator interaction.

1  
1  
2

30 Water samples were collected from points A, B and C in a segment of a river near a sugar factory and tested for BOD level. The BOD levels of samples A, B and C were 400mg/L, 480mg/L and 8mg/L respectively.



- a) What is BOD.
- b) What is the value of the sample's indicative of in relation to pollution.
- c) The BOD level gets reduced considerably at the collection point C, briefly explain the method used in sewage treatment for reducing the BOD levels.

OR

c) Explain what would be the consequences on human health if the sewage was not treated before it got released downstream.

1  
1  
2

SECTION E

31 Management of adult-onset diabetes is possible by taking insulin at regular time intervals.

If you discuss this, you would soon realize that one would have to isolate and use Insulin from other animals. Now, imagine if bacterium were available that could make human insulin. Suddenly the whole process becomes so simple.

You could easily grow large quantity of the bacteria and make as much insulin as you need.

i. Name the source from which insulin was extracted earlier. Why is this insulin no more

5

	<p>used by diabetic people?</p> <p>ii. Explain the process of synthesis of insulin by Eli Lilly company. Name the technique used by the company.</p> <p>iii. How is the insulin produced by human body different from the insulin produced by the above-mentioned company?</p> <p>iv. Explain the maturation of proinsulin to insulin.</p> <p style="text-align: center;">OR</p> <p>a) What does PCR stand for and what is the principle behind this technique.</p> <p>b) Explain the steps involved in this technique.</p> <p>c) Explain the role of primers in this process.</p>	
32	<p>Explain the discovery made by Hershey and chase using radioactive Sulphur and Phosphorus in their experiment.</p> <p style="text-align: center;">OR</p> <p>Explain Meselson and Stahl's Experiment done on E. coli.</p>	5
33	<p>A village health worker was taking session with women. She tells the women that one has to be very careful while using oral pills as method of birth control.</p> <p>a) Analyze the statement and compare the merits and demerits of using oral pills and surgical methods of birth control.</p> <p>b) Name new oral pill made in India and why is it very popular female oral contraceptive.</p> <p>c) Village women was confused as to how a thin metallic copper loop can provide protection against pregnancy. Justify the use explaining the mode of action of IUDS.</p> <p style="text-align: center;">OR</p> <p>With the help of neat and clear labelled diagrams illustrate the transport of ovum, fertilization, passage of growing embryo through the fallopian tube and implantation in the uterus.</p>	5