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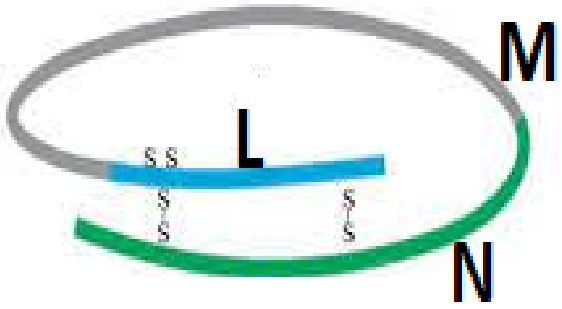
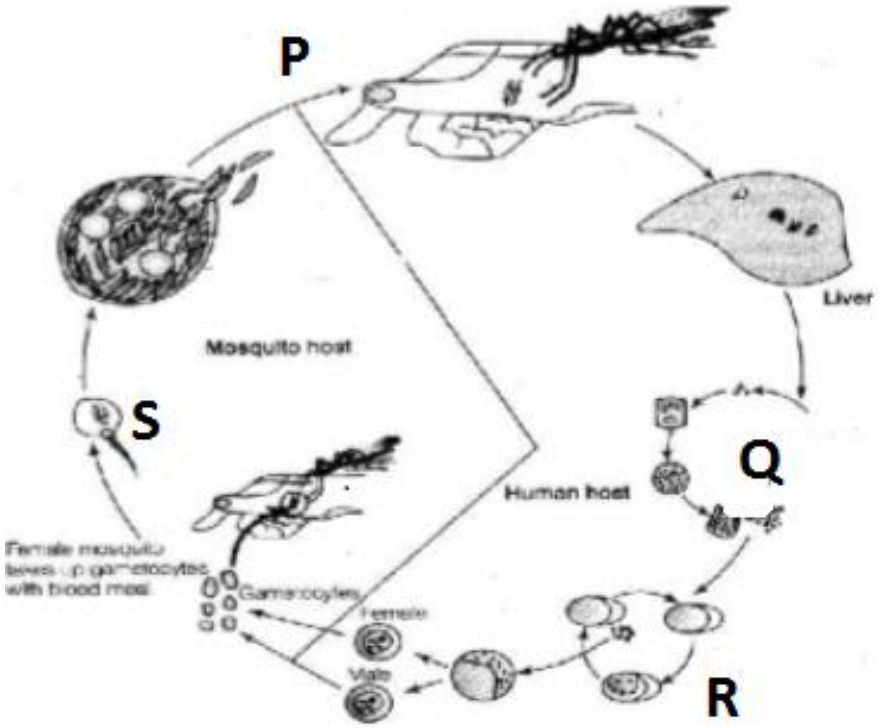
INDIAN SCHOOL SOHAR
PRE-BOARD II EXAMINATION (2021-22)
BIOLOGY THEORY (044)

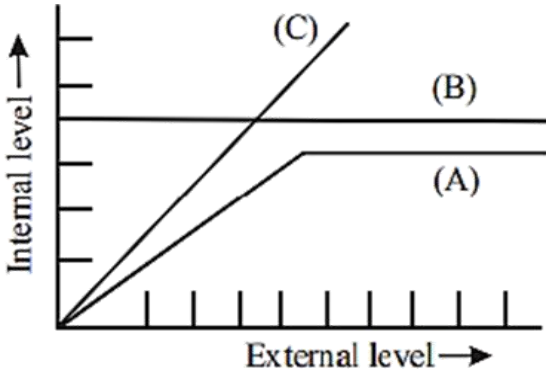
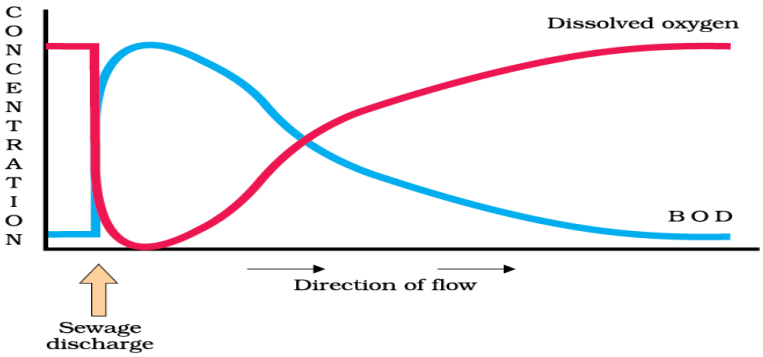
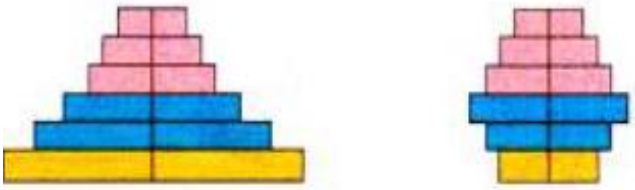
CLASS: XII **MAX. MARKS: 35**
DATE: 24 .03.22 **TIME ALLOWED: 2 HOURS**

General Instructions:

i) All questions are compulsory.
ii) The question paper has **three** sections and **13** questions. All questions are compulsory.
iii) Section– **A** has **6** questions of **2** marks each; Section–**B** has **6** questions of **3** marks each; and Section– **C** has a case-based question of **5** marks.
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	SECTION A	Marks
1.	a) How do cytokine barriers provide innate immunity in humans? b) The immunity that a baby is born with is different from the one he gets from the mother's milk after birth. Justify.	2
2.	Prior to sports events, blood and urine samples of sportspersons are collected for drug tests. a) Why is there a need to conduct such tests? b) Write the generic name of two plants from which these drugs are obtained. **OR** Very often when some human organs like heart, kidney etc. fails to function satisfactorily, transplantation is the only remedy to enable the patient to lead a normal life. a) Why does the patient's body reject the grafts? b) A person who has undergone an organ-transplant and has to take immunosuppressant's all through his life. Name the bioactive molecule that is used in such patients and the source organism from which it is extracted.	2
3.	You have been deputed by your school to visit a biogas plant in a nearby village and learn more about it from the people. Draw a labelled sketch of a typical biogas plant.	2
4.	In a bacterial culture some of the colonies produced blue colour in the presence of a chromogenic substrate and some did not due to the presence or absence of an insert (rDNA) in the coding sequence of galactosidase. a) Mention the mechanism and the steps in the above experiment. b) Why are genes encoding resistance to antibiotics considered as useful selectable markers for E,coli cloning vectors?	2
5.	a) Why do farmers prefer biofertilisers to chemical fertilisers these days? b) How do Anabaena and Mycorrhizae act as biofertilisers?	2
6.	a) State Gause's 'Competitive Exclusion Principle'. b) An evidence for the occurrence of competition in nature comes from what is called 'competitive release'. Explain this taking an example. **OR** How do you describe the interaction between- i) The orchid and the mango tree. ii) The Mediterranean orchid *Orphrys* and insect pollinators.	2

	SECTION B	
7.	Insulin in the human body is secreted by the pancreas as prohormone/proinsulin. The schematic polypeptide structure of proinsulin is given below. This proinsulin needs to undergo processing before it becomes functional in the body. Answer the following questions:  a) In the given figure label the parts marked L and N . b) Explain the technique the American company Eli Lilly used for the commercial production of human insulin. c) Can insulin be orally administered to diabetic people or not. Why?	3
8.	A useful gene was identified in bacteria. Prepare a flow chart depicting the steps that you would follow to transfer this gene to a plant.	3
9.	Consider the given stages P, Q , R and S in the life cycle of a malarial parasite and answer the questions that follow: a) Explain briefly the events occurring at **P, Q , R** and **S.** b) Mention two eco-friendly precautions that are important in the light of recent widespread incidences of the vector-borne diseases.  	3

10.	The graph given below represents the organisms response to temperature as an environmental condition.  a) Which one of the three lines in the figure represents conformers and why? b) Heat loss or gain is a function of the surface area. Justify giving an example. c) How do mammals living in colder regions and seals living in polar regions able to reduce the loss of their body heat? . **OR** Study the graph given below and answer the questions that follow:  a) What is the relationship between dissolved oxygen and biochemical oxygen demand? b) During the secondary treatment of the primary effluent, how does the significant decrease in BOD occur? c) Mention the role of activated sludge once the BOD of sewage water is reduced significantly.	3
11.	a) A vector is any vehicle, often a virus or a plasmid that is used to ferry a desired DNA sequence into a host cell. Mention the role of vectors in recombinant DNA technology. b) With the help of a diagrammatic representation only, show the steps in recombinant DNA technology.	3
12.	A population at any given time is composed of individuals of different ages. Study the representation of age pyramids for human population given below and answer the following questions:  'A' 'B'	3

	a) Identify the age-pyramids 'A' and 'B'. b) How is analysis of age-pyramids helpful for the human population? c) In a pond there were20 lotus plants last year and through reproduction 8 new plants are added taking the current population to 28. Calculate the birth rate of lotus per year.	

SECTION C

This section has a case-based question. Each case is followed by four sub-questions (a, b, c and d). Parts a, b and c are compulsory. However, an internal choice has been provided in part d.

13.	<u>Read the following and answer the questions given below:</u> The diversity of plants and animals is not uniform throughout the world but shows a rather uneven distribution. Species richness contributes to the well-being of an ecosystem. While it is doubtful if any new species are being added (through speciation) into the earth's treasury of species, there is no doubt about their continuing losses. The biological wealth of our planet has been declining rapidly and the accusing finger is clearly pointing to human activities. The colonisation of tropical Pacific Islands by humans is said to have led to the extinction of more than 2,000 species of native birds. The IUCN Red List (2004) documents the extinction of 784 species (including 338 vertebrates, 359 invertebrates and 87 plants) in the last 500 years. Biodiversity knows no political boundaries and its conservation is therefore a collective responsibility of all nations. It is our moral responsibility to take good care of earth's biodiversity and pass it on in good order to our next generation. a) State the analogy used to explain the importance of species diversity to the ecosystem? Name the ecologist who proposed it? b) The accelerated rate of species extinction is largely due to human activities. Give two examples of recent extinctions. c) In situations where an animal or plant is endangered or threatened and needs urgent measures to save it from extinction. How do we conserve biodiversity? Explain giving an example followed in recent years. d) Co-extinction and introduction of alien species are responsible for the loss of biodiversity. Justify taking an example for each. **OR** Forests have been the lifelines for forest-dwelling communities since ancient times. One method for conservation of this green resource was the creation of sacred groves, Such sacred groves are found in India. a) Explain with an example, how human involvement has helped in the preservation of these biodiversity rich regions. b) Value of Z (regression coefficient) is considered for measuring the species richness of an area. If the value of Z is 0.7 for area A, and 0.15 for area B. Which area has higher species richness? What do steeper slopes mean in the context of species area relationship?	5

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