Mock Board Exam

STD: XII | **SUBJECT: Biology** | **ASSESSMENT: Mock Test**

Maximum marks : 35 | **22/3/2022 11:00 - 22/3/2022 23:30** | **Time Limit : 150 Minutes**

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.

vi) A students has to answer a question either by typing it out, in the space provided, or writing down each answer on paper, and uploading a picture of it using the upload option.

vii) A student is advised to write the answers in a clear, legible handwriting using a blue/black ball point pen before uploading it.

Section A

12 Marks

12 Marks

1 Humans have the organs where origin, maturation and proliferation of lymphocytes occur. Name two such categories of organs and give their respective examples. **2 M**

2 Identify the figure given below and what is it used for? **2 M**

3 Identify the plant shown in the diagram and specify the drugs extracted from it. State any three properties or the features associated with the drug. **2 M**

4 What are biofertilizers? Name any two free living bacteria (in soil) capable of fixing atmospheric nitrogen. **2 M**

5 Define homeostasis. How do humans maintain their body temperature in summers and winters? **2 M**

6 State Gause's competitive exclusion principle. How are organisms avoiding this competitive exclusion? **2 M**

OR

Explain co-extinction with the help of an example. **2 M**

Section B

18 Marks

18 Marks

7 Explain systematically how replication of retrovirus takes place during HIV infection with the help of a diagram. **3 M**

OR

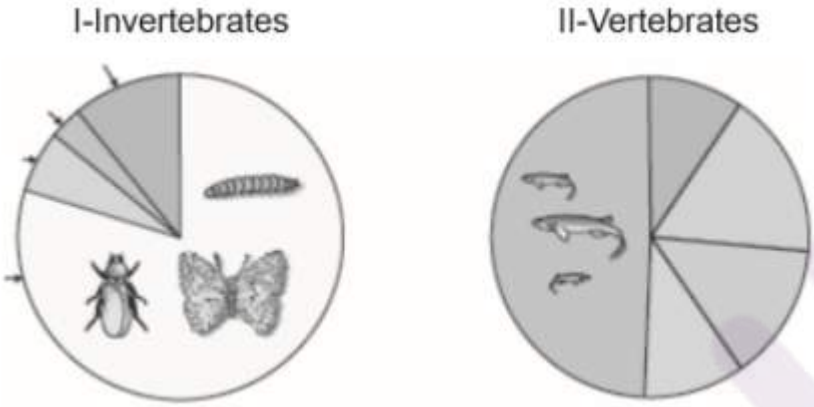
A person is advised to take anti-retroviral drugs. Which infection is he suffering from? Name the causative organism and its mode of transmission. **3 M**

8 Explain two types of acquired immune response. Which type of immune response is responsible for the graft rejection and what are the prerequisites before undertaking any graft/transplant? **3 M**

9 A palaeontologist has recovered a bit of tissue from the 500-year-old preserved skin of an extinct reptile. To compare a specific region of the DNA from a sample with DNA from living reptiles, which method would be most useful for increasing the amount of extinct reptile DNA available for testing? Describe the steps involved in the technique used. **3 M**

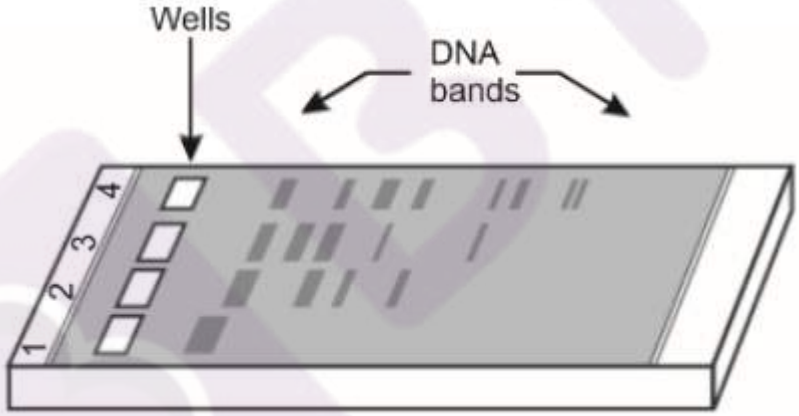
10 (a) Define ex-situ conservation of biodiversity. **3 M**
(b) What is altitude sickness? Write down the symptoms associated with it?
(c) What behavioral means are followed by a desert lizard to manage its body temperature?

11 The figure represents global diversity among invertebrates (I) and vertebrates (II). **3 M**
Answer the following questions on the basis of it.



(a)Which is the most species rich taxonomic group among animals? Do insect and plant species show mutualism? Explain.
(b)Why is there no exact estimate of species richness of prokaryotes? Write any three reasons.

12 The image below depicts the result of a typical agarose gel electrophoresis. **3 M**



(a)Explain how gel electrophoresis is used to separate DNA fragments of different length. What does lane 1 and lane 4 indicate in the set up?
(b)After DNA fragments are separated by gel electrophoresis, how can they be visualized?

Section C

5 Marks

5 Marks

13 Some restriction enzymes break a phosphodiester bond on both the DNA strands in such a manner that cut ends have regions of single-stranded DNA. PstI is one such restriction enzyme which binds at the recognition sequence, 5' –CTGCAG–3' and cleaves this sequence between adenine and guanine.

a (a)What is the objective behind this action? **1 M**

b (b)A gene 'X' was introduced into E.coli cloning vector pBR322 at the PstI site. What will be the result of this on recombinant plasmid containing host cells? Suggest a possible way by which one can differentiate between recombinant and non-recombinant host cells? **3 M**

c (c)Explain different ways in which recombinant DNA is inserted into the host cells. **1 M**

OR

Ram suffering from diabetes mellitus was administered with insulin 'X' but it caused an allergy in Ram. He consulted the doctor and the doctor suggested that he change his treatment with insulin 'X' to treatment with insulin 'Y' which was developed by Eli Lilly in 1983.

a (a)What could be the possible reason for allergy due to insulin 'X'? **1 M**

b (b)In what form insulin was administered to Ram and why? **1 M**

c (c)Identify the type to which insulin 'Y' belongs to and the procedure behind its manufacture. **3 M**