PRE BOARD-I (2017 – 18)
CLASS: XII

Subject: BIOLOGY **Date: 11.12.17**

Time Allowed: 3 Hours Maximum Marks: 70

General instructions:

1. There are a total of 26 questions and five sections in the question paper. All questions are compulsory.
2. Section A contains question number 1 to 5, Very Short Answer type questions of one mark each.
3. Section B contains question number 6 to 10, Short Answer type I questions of two marks each.
4. Section C contains question number 11 to 22, Short Answer type II questions of three marks each.
5. Section D contains question number 23, Value Based Question of four marks.
6. Section E contains question number 24 to 26, Long Answer type questions of five marks each.
7. There is no overall choice in the question paper, however, an internal choice is provided in one question of two marks, one question of three marks and all three questions of five marks. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.

Section A

1. Name the enzyme that transcribes hnRNA in eukaryotes. 1
2. In what way is monocyte a cellular barrier with reference to immunity ? 1
3. What is the use of a test cross? 1
4. Name the type of cell division that takes place in zygote of an organism exhibiting haplontic life cycle. 1
5. State the purpose for which the Indian Government has set up GEAC. 1

Section B

6. During his studies on genes in *Drosophilla* that were sex-linked, T.H. Morgan found population phenotypic 2

ratios deviated from expected 9:3:3:1. Explain the conclusion he arrived at.

7. Explain the role of inner and middle walls of the human uterus. 2

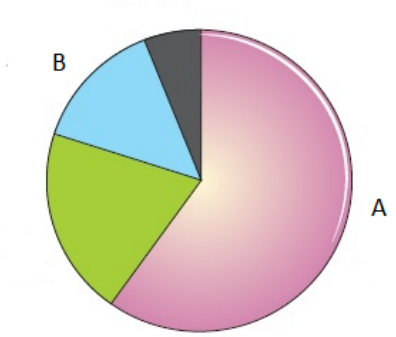
8. Describe how biogas is generated from activated sludge. Name the major component of biogas. 2

9. Name the cells that act as HIV factory in humans when infected by HIV. Explain the events that occur in the infected cell. 2

10. The figure below shows the relative contribution of four greenhouse gases to global warming: 2

    (i) Identify the gases A and B

    (ii) Why are these four gases called the greenhouse gases?



Section C

11. (i) Draw a diagrammatic sectional view of a mature anatropous ovule and label the following parts in it: 3

    (a) that develops into seed coat.

    (b) that develops into an embryo after fertilization.

    (c) that develops into an endosperm in an albuminous seed.

    (d) through which the pollen tube gains entry into the embryo sac.

    (ii) Write an two characteristic features of wind pollinated flowers.

12. A woman has certain queries as listed below, before starting with contraceptive pills. Answer them. 3

    (i) What do these pills contain and how do they act as contraceptives?

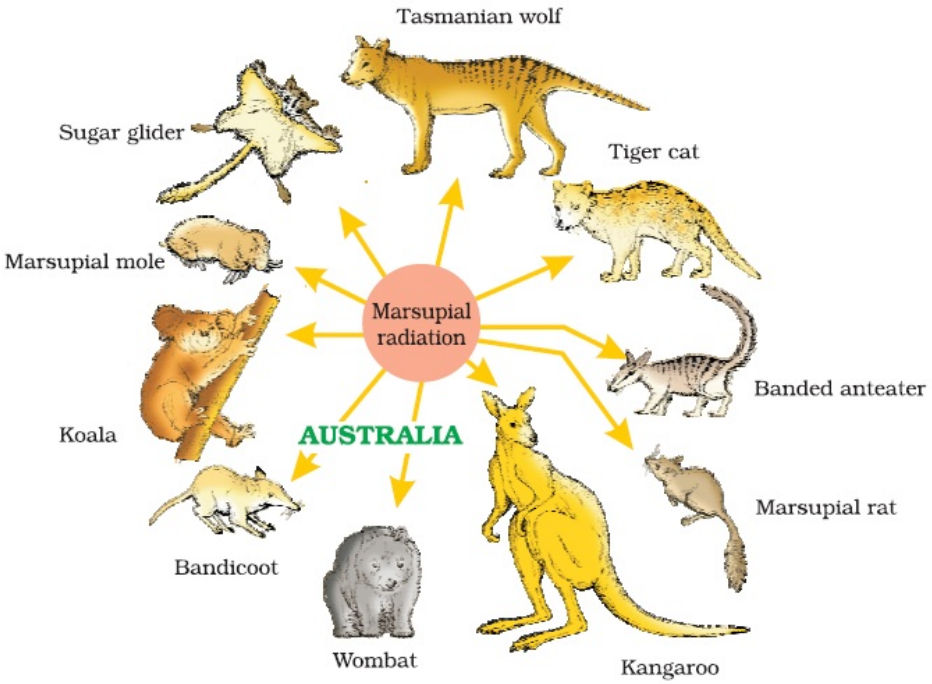
(ii) What schedule should be followed for taking these pills?

13. Observe the following figure and answer the following questions 3

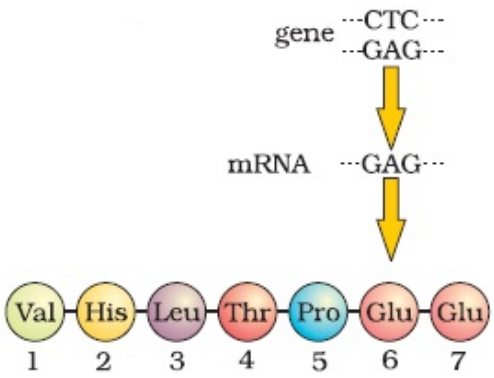
(i) Mention the specific geographical region where these organisms are found.

(ii) Name and explain the phenomenon that has resulted in the evolution of such diverse species in the region.

(iii) Explain giving reasons the existence of placental wolf and Tasmanian wolf sharing the same habit.



14. Given below is the representation of amino acid composition of the relevant translated portion of beta chain of haemoglobin, related to the shape of red blood cells in humans. 3



(i) Is this representation indicating a normal human or a sufferer from certain related genetic disease? Give reason in support of your answer.

(ii) What difference would be noticed in the phenotype of the normal and the sufferer related to this gene?

(iii) Who are likely to suffer more from the defect related to the gene represented; the males or the females? And why?

15. "Unambiguous", "degenerate" and "universal" are some of the salient features of genetic code. Explain. 3

16. Under polio prevention programme, infants in india were given polio vaccines on a large scale at regular intervals to eradicate polio from the country. Explain how does the vaccine impart immunity to children against the disease. 3

17. What is biofortification? Enumerate four objectives for which this process is done. 3

18. Describe the various stages involved in gene transfer for the commercial production of human insulin by Eli Lily. 3

19. Name the blank spaces a, b, c, d, e and f given in the following table.

Type of microbe	Name	Commercial product

Bacterium	a	Lactic acid
Fungus	b	Cyclosporin A
c	*Monascus purpureus*	d
e	*Penicillium notatum*	f

20. (i) In pBR322, foreign DNA has to be introduced in tet^r region. From the restriction enzymes given below, which one should be used and why: PvuI, EcoRI, BamHI. 3
(ii) What is the importance of ori in a plasmid.
OR
Diagrammatically represent the steps in recombinant DNA technology.

21. What are cry proteins? Name an organism that produces it. How has man exploited this protein to his benefit? 3

22. The regions of maximum biodiversity lie in the tropics. Discuss the reasons for this. 3

Section D

23. Sampat and Ganpat are partners and established a factory. After a few months electrostatic precipitator became out of order. Ganpat wanted to replace it but sampat expressed the view that they have no effect of it on productivity as well as income; therefore they should not waste money to replace it. 4
Answer the following questions based on the above information.
    (i) Out of these two partners whom do you support and why?
    (ii) Suggest any two measures to stop such negligence.
    (iii)What values are exhibited by Ganpat?

Section E

24. (i) Name the source of gonadotropins in human females. Explain the changes brought about in the ovary by these hormones during menstrual cycle. 5
(ii) Placenta acts as an endocrine gland. Explain.
OR
    (i) Explain the hormonal control of spermatogenesis in humans.
    (ii) Draw a well labeled diagram of human sperm.

25. (i) What would happen if histones were mutated and made rich in amino acids aspartic acid and glutamic acid in place of basic amino acids? 5

(ii) A DNA segment has a total of 1500 nucleotides, out of which 410 are guanine containing nucleotides. How many Pyrimidine bases this DNA segment possesses?

OR

Study the schematic representation of the genes involved in the *lac* operon given below and answer the following questions.

p	i	p	O	z	y	a

(i) Name the regulatory gene in this operon. Explain its role in switching off the operon.

(ii) Name the inducer molecule and the products of gene 'z' and 'y' of the operon. Write the functions of these gene products.

26. (i) Differentiate between primary and secondary ecological successions. 5

(ii) Explain the different steps of xerarch succession occurring in nature.

OR

Name and explain the type of interaction seen in each of the following examples:

i) *Ascaris* worms living in the intestine of humans.
ii) Wasp pollinating fig flowers.
iii) Clown fish living in the tentacles of sea anemone.
iv) Disappearance of smaller barnacles when Balanus dominated in the coast of Scotland.
v) Cuckoo lays her eggs in the crow's nest.