PRACTICE Paper 02 (2020-21) Class 12
Biology

Maximum Marks: 70 **Time Allowed: 3 Hours**

General Instructions:

i. All questions are compulsory.
ii. The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.
iii. Section—A has 14 questions of 1 mark each and 02 case-based questions. Section—B has 9 questions of 2 marks each. Section—C has 5 questions of 3 marks each and Section—D 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. Wherever necessary, neat and properly labeled diagrams should be drawn.**

Section –--- A

1. Which fetal membrane and part of the female reproductive system take part in the formation of the placenta in foetus?
2. Name the stage of the human embryo that gets implanted in the uterus and draw its labelled diagram.
3. In a dihybrid cross, when would the proportion of parental gene combinations be much higher than non-parental types, as experimentally shown by Morgan and his group?
4. If 8 individuals in a laboratory population of 80 fruit flies died in a week, then what would be the death rate of population for the said period?
5. Mention any two activities of animals, which get cues from diurnal and seasonal variations in light intensity.
6. What will be the possible blood groups likely to be inherited by children born to a mother having “A” blood group and father having “B” blood group if both parents are heterozygous for the trait?
7. Mention any two contrasting traits with respect to seeds in pea plants that were studied by Mendel.
8. Name the organism responsible for the formation of ‘Statin’?
9. How are the two chains of protein insulin linked?
10. How are lactic acid bacteria beneficial to us other than helping in curdling the milk?

11. **Assertion**: The cross between red and white flower bearing snapdragon plants results in a pink coloured flower.
Reason: Incomplete dominance of red and white flowers results in pink coloured flowers.

a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both Assertion & reason are false.

OR

Assertion: Chromosomes and genes both occur in pairs.
Reason: The two alleles of the gene pair are located on homologous sites on homologous chromosomes.

a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both Assertion & reason are false.

12. **Assertion**: Many visitors to the hills suffer from skin and respiratory allergy problems.
Reason: Conifer trees produce a large quantity of wind-borne pollen grains.

a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both Assertion & reason are false.

1**3. Assertion**: Regulation of lac operon by a repressor is referred to as negative regulation.
Reason: Lac operon is under the control of positive regulation as well.

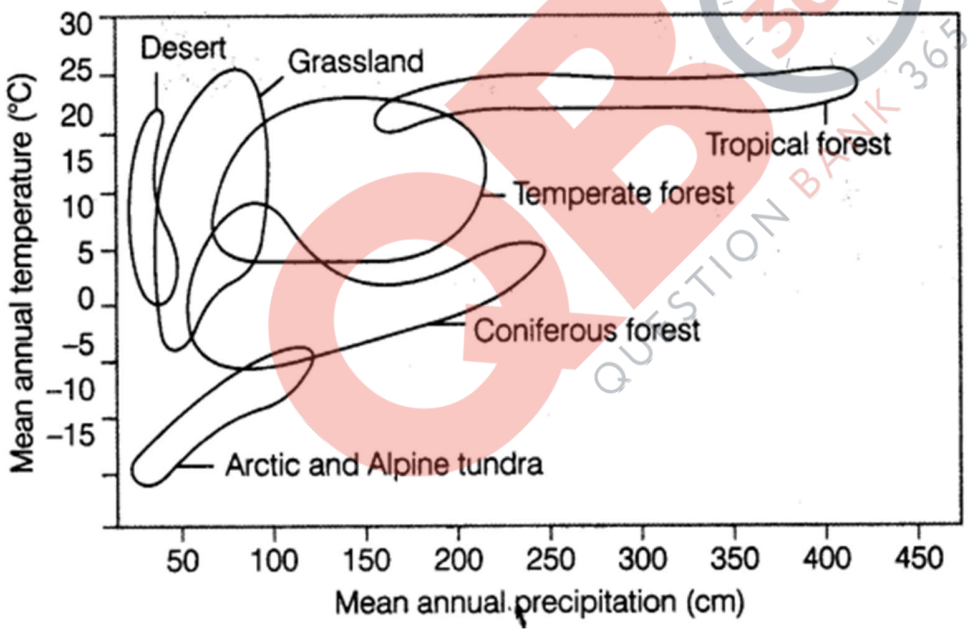
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both Assertion & reason are false.

14. **Assertion**: Diversity observed in entire geographical area is called gamma diversity.
Reason: Biodiversity decreases from high altitude to low altitude.

a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, and the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both Assertion & reason are false

15. Read the following and answer any four questions:

Ecology is the interactions among organisms, between the organism and its abiotic environment. Ecology at the organism level is essentially physiological ecology which tries to understand how different organisms are adapted to their environments in terms of not only survival but also reproduction. The rotation of the planet around the Sun results in variation. These variations together with annual variation in precipitation account for the formation of major biomes such as desert, rain forest, and tundra. Regional and local variations within each biome lead to the formation of a wide variety of habitats. Major biomes of India are shown below



i. Which of the following is not a part of an organism's physical environment?
a. Temperature
b. Light
c. Other organisms
d. Humidity

ii. The variations together with annual variation in precipitation account for the formation of major biomes is:
a. temperature
b. precipitation
c. incident solar radiation
d. all of these

iii. Seasonal variations on Earth occur due to its
a. revolution around the sun and tilted axis
b. rotation around its own axis
c. due to other planets
d. none of these

iv. Formation of tropical forests needs mean annual temperature and mean annual precipitation as:
a. 18 — 2S°C and 150 — 40D cm
b. 5 — 15°C and 50 — 100 cm
c. 30— S0°C and 100- 150 cm
d. 5 — 1S°C and 100 — 200 cm

v. **Assertion**- Regional and local variations within each biome lead to the formation of a wide variety of habitats.
Reason- life exists not just in a few favourable habitats but even in extreme and harsh habitats.
a. Both Assertion and Reason are true and Reason is the correct explanation of the Assertion
b. Both Assertion and Reason are true but Reason is not the correct explanation of the Assertion
c. The Assertion is true but the Reason is false
d. Both the statements are false

16. **Read the following and answer any four questions:**
The gynoecium represents the female reproductive part of the flower. The gynoecium may consist of a single or more than one pistil. They may be fused or may be free. The placenta is located inside the ovarian cavity. Megasporangium (ovule) consists of a small structure attached to the placenta by a stalk called a funicle. The body of the ovules fuses with a funicle in the region called hilum. The nucleus is located in the embryo sac. The process of formation of megaspore from the megaspore mother cell is called megasporangium. Meiosis result in the formation of four megaspore.

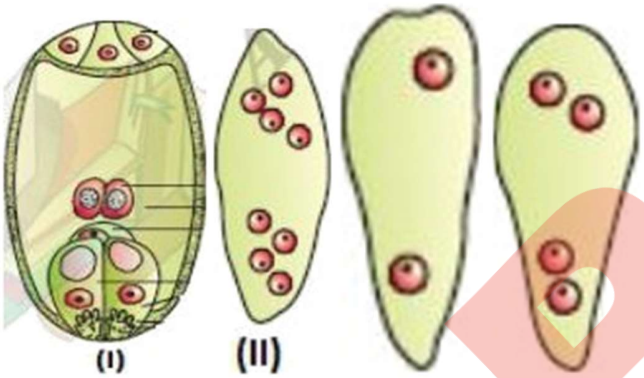
i Gynoecium with a single pistil is known as:
a. multicarpellary
b. monocarpellary
c. syncarpous
d. apocarpous

ii. Which of the following is not part of the ovary?
a. Stigma
b. Style
c. Ovary
d. Stamen

iii. The protective envelope of the ovule is called:
a. integument
b. Micropyle
c. chalaza
d. hilum

iv. Which of the following have only one ovule in the ovary?
a. Papaya
b. Watermelon
c. Mango
d. Orchids

V. Which of the following shows the mature embryonic sac?

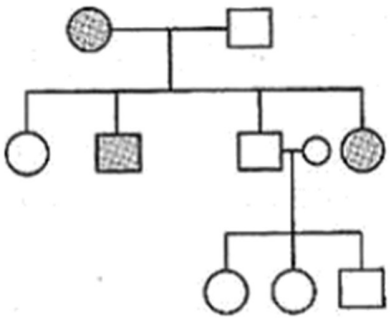


a. Only (I)
b. Both (I) and (II)
c. Only (III)
d. None of these

SECTION ----B

17. What is the way the advent of the birth control pill have resulted in an increase in STDs?

18. In the following pedigree chart, state if the trait is Autosomal dominant, Autosomal recessive or sex-linked. Give reason.



19. Tobacco plants are damaged severely when infested with ***Meloidegyne incognita.*** Name and explain the strategy that is adopted to strip this infestation.

20. How does dsRNA gain entry into eukaryotic cells to cause RNA interference?

OR

Why are yeasts used extensively for functional expression of eukaryotic genes?

21. Name the category of virus that carries reverse transcriptase? What is the purpose of this enzyme?

22. Give the technical terms for the following:

(1) Molecular scissors
(2) Molecular sieve
(3) Molecular gun
(4)Autonomous replicating circular DNA
(5)First Isolated restriction endonuclease
(6) Extraction of DNA fragments from gel

OR

Explain the importance of the selectable marker, with the help of a suitable example.

23. Tropical regions are likely to have more biodiversity than the temperate ones. Give two reasons.

24. Identify the type of association between the following:

(a) Lichens
(b) Orchid and Mango
(c) Cuscuta and shoe flower bush

25. How do scientists extrapolate the total number of species on Earth?

SECTION----- C

26. Define point mutation? Give one example.

27. Would it be appropriate to use DNA probes such as VNTR in DNA fingerprinting of a bacteriophage?

28. Name and explain the two types of immune responses in humans.

29. Explain the three post transcriptional changes which occur in immature heterogenous mRNA of eukaryotes.

30. Pollen banks are playing a very important role in promoting plant breeding programs the world over. How are pollen preserved in the pollen banks? Explain how such banks benefitting our farmers? Write any two ways.

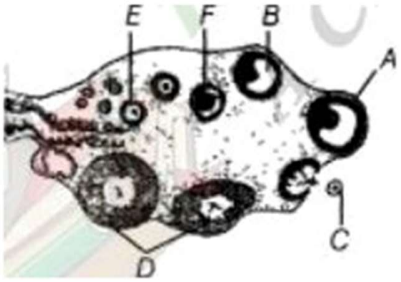
OR

Rita and her parents were watching a TV serial in the evening. During a commercial break, an advertisement flashed on the screen which was promoting the use of sanitary napkins. Rita was still watching the TV. The parents got embarrassed and changed the channel. Rita objected to her parents' behaviour and explained the need for these advertisements.

I. What values did the parents show?
II. Briefly describe the phases of a menstrual cycle.

Section--- D

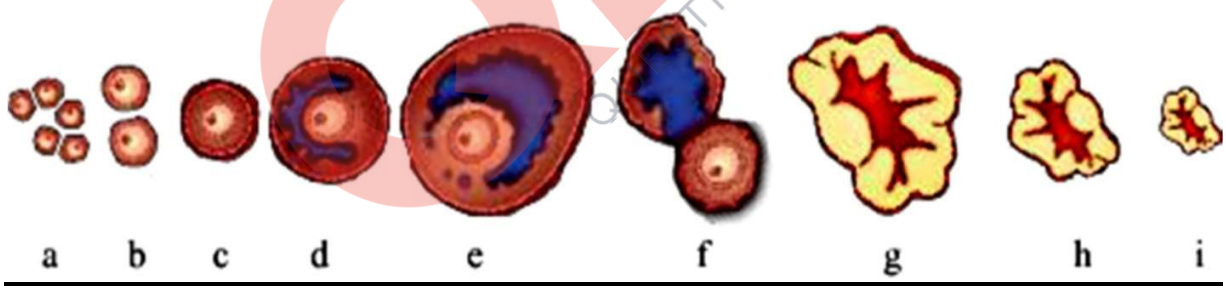
31. (i) Given below is the TS of human ovary. Identify the following in the diagram.



Corpus luteum, Secondary oocyte, Antrum, Primary follicle and Primary oocyte

(ii) Explain the changes the primary oocyte undergoes, while in different follicular stages before ovulation.

OR



i) Identify the figure that illustrates ovulation and mention the stage of oogenesis it represents.
(ii) Name the ovarian hormone and the pituitary hormone that have caused the above mentioned event.
(iii) Explain the changes that occur in the uterus simultaneously in anticipation.
(iv)Write the difference between ‘c’ and ‘h’.
(v) Draw a labeled sketch of the structure of a human ovum prior to fertilization.

32. i Write the palindromic nucleotide sequence for the following DNA segment. 5' - GAATTC-3'
ii. Name the restriction endonuclease that recognizes this sequence.
iii. How are sticky ends produced? Mention their role.

OR

If a desired gene is identified in an organism for some experiments, explain the process of the following:

i Cutting this desired gene at a specific location.

ii. Synthesis of multiple copies of this desired gene.

33. Explain the process of sewage water treatment before it can be discharged into natural water bodies. Why is this treatment essential?

OR

List the events that reduce the Biological Oxygen Demand (BOD) of a primary effluent during sewage treatment.