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MONTHLY TEST (OCTOBER)
CLASS-XII
SUBJECT: BIOLOGY (044)

TIME: 90 MINUTES

M.M.: 40

Instructions:

- i. There are five sections in this question paper.
- ii. Section A includes 5 questions each with 1 mark.
- iii. Section B includes 6 questions each with 2 Marks.
- iv. Section C includes 3 questions each with 3 Marks.
- v. Section D includes case-based questions of 4 Marks and Section E includes 2 questions of 5 Marks each.

Section-A

1. Darwin's finches are an excellent example of 1
(a) Seasonal migration (b) brood parasitism (c) adaptive radiation (d) connecting links
2. Colostrum provides passive immunity to human infants as it contains antibody 1
(a) IgA (b) IgM (c) IgE (d) IgG
3. Morphine is extracted from 1
(a) *Atropa belladonna* (b) *Papaver somniferum* (c) *Erythroxylum coca* (d) *Cannabis sativa*
4. Some cyanobacteria in aquatic and terrestrial environment that enrich the soil by fixing nitrogen are 1
(a) *Rhizobium* and *Azotobacter* (b) *Azospirillum* and *Glomus*
(c) *Anabaena* and *Nostoc* (d) *Azospirillum* and *Azotobacter*
5. **Instruction:** Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below: 1
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Assertion is False but reason is true.

Assertion: The enzymes exonucleases are not useful in recombinant DNA technology.

Reason: Exonucleases make blind ends and not sticky ends.

Section-B

- E
-
- 6 Amongst pea tendrils, *Opuntia* spines, lemon thorn and *Cucurbita* tendrils, which ones are homologous structures? Why do you call them homologous? $\frac{1}{2} + \frac{1}{2} + 1 = 2$
- 7 Give the sum total of all the allelic frequencies in a stable population. List any two factors which disturb the stability of a population. How does this disturbance affect the population? 2

8 Identify a, b, c and d in the following table:

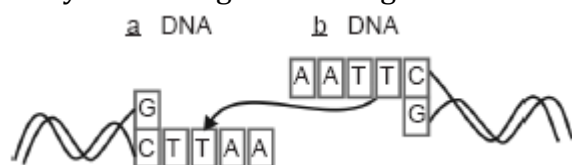
$\frac{1}{2} \times 4 = 2$

Name of the human disease	Name of the causal bacteria/virus	Specific organ or its part affected
1. Typhoid	<i>Salmonella typhi</i>	a
2. Common cold	b	c
3. Pneumonia	<i>Streptococcus pneumoniae</i>	d

9 Name the source of cyclosporin A. How does this bioactive molecule function in our body? $1+1=2$
Or

Give an example of a fungus and an insect that are used as biocontrol agents. $1+1=2$

10 Study the linking of DNA fragments shown above.



(i) Identify 'a' and 'b' DNA in the given picture.

$\frac{1}{2} \times 2 = 1$

(ii) Name the restriction enzyme that recognises this palindromic sequence.

$\frac{1}{2}$

(iii) Name the enzymes that use to link these two DNA fragments.

$\frac{1}{2}$

11 Write any four ways used to introduce a desired DNA segment into a bacterial cell in recombinant DNA technology experiments.

$\frac{1}{2} \times 4 = 2$

Section-C

12 Explain the increase in the numbers of melanic (dark-winged) moths in the urban areas of post-industrialisation period in England.

3

Or



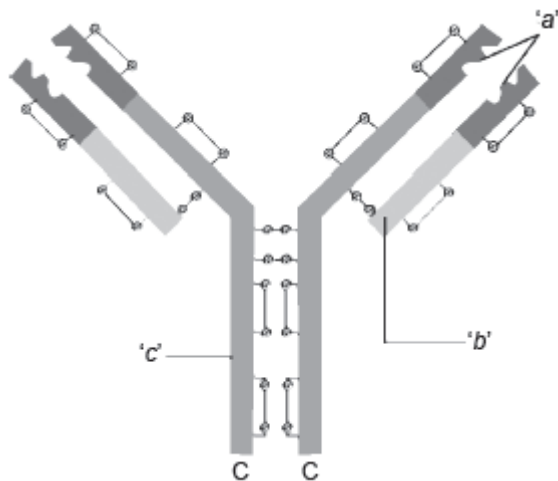
(a)



(b)

What do these pictures (a) and (b) illustrate with reference to evolution? Explain.

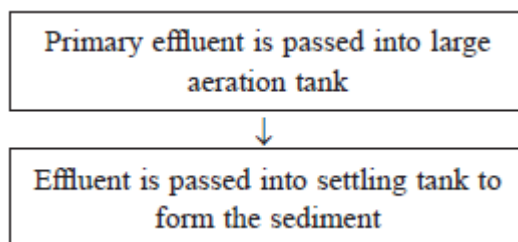
- 13 Identify a, b and c in the schematic diagram of an antibody given and answer the questions. $\frac{1}{2} \times 6 = 3$



- (i) Write the chemical nature of an antibody.
(ii) Name the cells that produce antibodies in humans.
(iii) Mention the type of immune response provided by an antibody.
- 14 Enumerate the main sources of biofertilisers, giving one example of each. $1+1+1=3$
- Or
- Some microbes act as very good biofertilisers. Explain with the help of three suitable examples.

Section-D

- 15 Read the following passage. Sewage is generated in large quantities in the urban areas. It is treated in Sewage Treatment Plants (STPs) to make it less polluted, before discharging into any natural water body. Observe the flow-chart given below and answer the questions that follow: $1+1+2=4$



- (a) What is primary effluent?
(b) Name the two groups of microbes present in the primary effluent.
(c) Why is the primary effluent passed into large aeration tanks? Mention the treatment given to it.

Or

- (c) Where is the sediment transferred to, for further treatment? What happens to the sediment there?

Section- E

- 16 (a) Cancer is one of the most dreaded diseases of humans. Explain 'contact inhibition' and 'metastasis' with respect to the disease. $1+1=2$
(b) Name the group of genes which have been identified in normal cells that could lead to cancer and

- how do they do so. 1
- (c) Name any two techniques which are useful to detect cancer of internal organs. 1
- (d) Why are cancer patients often given α -interferon as part of the treatment? 1

- 17 Unless the vector and source DNAs are cut, fragments separated and joined, the desired recombinant vector molecules cannot be created.
- (a) How are the desired DNA sequences cut? 2
- (b) Explain the technique used to separate the cut fragments. 2
- (c) How are the resultant fragments joined to the vector molecule? 1
