

Roll Number

SET C



INDIAN SCHOOL MUSCAT
FINAL EXAMINATION
BIOLOGY

CLASS: XII

Subject Code: 044

Time Allotted: 3 Hrs.

01.02.2021

Max. Marks: 70

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.
- (v) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION A

1. Why are green algae not likely to be found in the deepest strata of the ocean? 1
2. What is apomixis? 1
3. Suppose in mRNA strand the third base of a codon UAU is mutated to G. what will happen during translation process now? 1
4. Name the temporary store house of the sperm in human male. 1
5. Name the following; 1
 - a) Residual, persistent nucellus in a seed.
 - b) Cotyledon in monocot

6. How the genetic disorder ADA deficiency be cured permanently? 1
7. How many pollen grains and ova are likely to be formed in the anther and the ovary of an angiosperm bearing 50 microspore mother cells and 50 megaspore mother cells respectively? 1
8. Fill in the blank: 1
Alpha I-antitrypsin is used to treat the disease.....
9. Characters such as Skin colour and height in human show gradients and are not distinct. Also they are controlled by multiple genes. What is the inheritance of these characters known as? 1
10. A family has three children with blood group A, B, AB. What would be genotypes of the parents? 1
11. **Assertion:** Predators can help in maintaining species diversity in a community. 1
Reason: It is by reducing the intensity of competition among competing prey species.
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false
12. **Assertion:** *Plasmodium vivax* is responsible for malaria. 1
Reason: Malaria is caused by polluted water.
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false
13. **Assertion:** Plasmids are extra chromosomal DNA. 1
Reason : Plasmids are found in bacteria and are useful in genetic engineering
a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
b. Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
c. Assertion is true but reason is false.
d. Both assertion and reason are false

14. **Assertion:** Lactose is inducer in Lac operon.

1

Reason: Glucose acts as repressor.

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

OR

Assertion: UTRs are present at both 5' end and 3' end in mRNA.

Reason: UTRs are required for efficient translation process.

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

OR

- a. Both assertion and reason are true, and the reason is the correct explanation of the assertion.

15. Read the following and answer any four questions from 15(i) to 15 (v) given below:

4

The environment is incomplete without microorganisms. With every breath you take, there are millions of microscopic organisms that you breathe in. Apart from that, the human body hosts a plethora of microbes both inside and outside. Besides this, they are a crucial part of the ecosystem and take part in activities like production of minerals like nitrogen, gases like oxygen, carbon dioxide, taking care of dead and decaying materials etc. microorganisms are beneficial for humans in various ways. They play an important role in human welfare and for the environment. These include processing and preservation of food, production of biomolecules, manufacture of pharmaceutical products, cosmetics industries, recycling the nutrients in the soil and so on.

- (i) The Dough used for making Idlis, Dosa and Bread are fermented by
 - a) *Saccharomyces cerevisiae* and *Monascus purpureus*
 - b) *Monascus purpureus* and bacteria
 - c) Bacteria and *Saccharomyces cerevisiae*
 - d) Yeast and Bacteria

- (ii) Citric Acid is produced by
- Aspergillus niger*
 - Clostridium butylicum*
 - Trichoderma polysporum*
 - Acetobacter acetii*
- (iii) Methanogens are present in rumen of the cattle to
- Produce methane gas
 - Break down cellulosic materials
 - Break down lipids
 - Produce methanoic acid.
- (iv) *Trichoderma* are free living soil fungi found in soil ecosystem which facilitate
- Availability of nutrients to plants.
 - in protecting plants from soil pathogens
 - nitrogen cycle
 - solubilizing phosphorus.
- (v) **Assertion:** Biofertilisers are preferred to chemical fertilisers.

Reason: Chemical fertilisers are more expensive than Biofertilisers and more hazardous to environment.

- Both assertion and reason are true, and the reason is the correct explanation of the assertion.
 - Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
 - Assertion is true but reason is false.
 - Both assertion and reason are false
16. *Haemophilia* is characterized by uncontrolled bleeding and the inability of the blood to clot properly. Even a small cut or a minor injury can result in severe bleeding. *Haemophilia* is one among the man X-linked recessive inherited genetic disorders, Where the gene causing the disorder or dysfunction is located on the X-chromosome.
- When a haemophilic woman is married with a normal man, all the boy offspring will be haemophilic whereas all the girl offspring will be carrier of haemophilia. In other words 50% offspring will be haemophilic and 50% offspring will be carrier.
- When a haemophilic woman is married with a normal man, all the boys offspring will be haemophilic where as all the female offsprings will be carrier of haemophilia. In other words, 50% offsprings will be haemophilic and 50% will be carriers.

- (i) Haemophilia is caused by
 (a) Bacteria (b) Virus (c) Genetic mutation (d) Caused unknown
- (ii) Rarely females experience the physiological defect of Haemophilia as they do so only when they are
 (a) Carrier for the defect (b) wives of haemophiliac husbands
 (c) homozygous for the defect (d) heterozygous for the defect
- (iii) *Haemophilia* is
 (a) X-linked (b) Y-linked (c) Z-linked (d) Autosomal
- (iv) The reason why Haemophilia is more commonly observed human males than in females is due to
 (a) the disease is due to Y-linked recessive mutation
 (b) the disease is due to X-linked recessive mutation
 (c) as a huge population of girls die in infancy
 (d) the disease is due to X-linked dominant mutation.
- (v) When a Haemophilia woman is married with a normal man, then what percentage of boys will be haemophilic?
 (a) 100% (b) 50% (c) 25% (d) 75%

SECTION B

17. Write two salient features of 'biological hot spots'. Name any two such biological hot spots that cover our country. 2
18. What type of biological diversity the following will be : 2
 a) Western Ghats has more amphibians than Eastern Ghats.
 b) 50000 strains of rice varieties in India.
19. What are *Baculoviruses*? To which genus it belongs? Why are desirable in IPM program? 2
20. Karyotype of person shows XO chromosomes. Name the genetic disorder/disease likely to occur for a person and state two characteristic features of it. 2
21. How do you measure the population density of 2
 a) Fish in a pond.
 b) Tiger in a National park
22. Explain the role of enzymes in the extraction of DNA from *Rhizopus* in its purest form. 2
23. Eco RI is a restriction endonuclease. What do E, Co, R, I represent? 2

OR

The DNA fragments can be separated using gel electrophoresis.

- Name the gel used in this technique and the source of the raw material used in this gel.
- Write the name of technique used to remove the DNA from the gel.

24. Bioreactors help for the large production of recombinant proteins. Name the two commonly used bioreactors. What is the purpose of stirring mechanism in a bioreactor? 2

OR

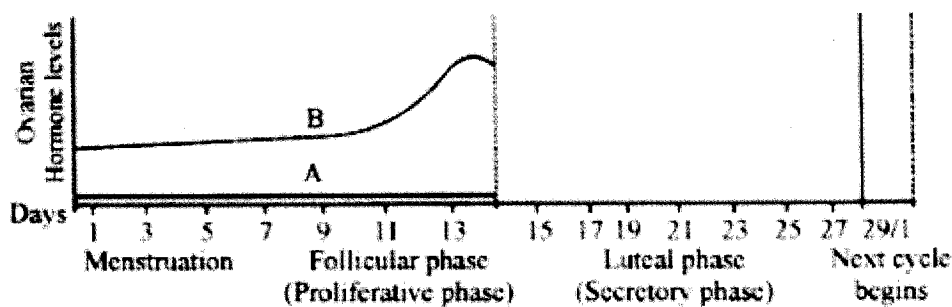
Bt cotton contains cry genes from a bacterium

- Name that bacterium
- Give two examples for cry genes.

25. (a) Expand ART. 2
- (b) Suggest the ART which may be successful in the following condition:
- Inability of the male partner to inseminate the female.
 - Female cannot produce ovum but can provide suitable environment for fertilisation and further development.

SECTION C

26. The graph given below shows the level of ovarian hormones in a normally menstruating woman during follicular phase. 3



- Name 'A' and 'B'.
 - Reconstruct the graph showing the level of hormones in luteal phase.
 - Name the hormone secreted by Corpus Luteum and mention its function.
27. On which step of sewage treatment, activated sludge is formed? What is it formed of? What will happen once this sludge is sent to anaerobic sludge digesters? 3

28. *Meloidogyne incognita* is a nematode parasite infects the root of tobacco plants. its infection can be prevented by biotechnological methods. Name the strategy. Explain the principle behind this strategy.
29. In a Snapdragon plant, when a plant with red colour is crossed to a plant with white colour flower, pink coloured flowers are produced. What is this phenomenon known as? Which Mendel's law is not followed in this cross? When a plant with pink colour flower is self-crossed how many types of flower phenotypes will appear? Write down the genotype of this cross. Show your working for F1 selfing of this cross. 3
30. Draw different types of age pyramids for human population and name them. 3

OR

State Gause's "Competitive Exclusion Principle". On which condition this would apply? Mention an exemption to this principle.

SECTION D

31. Why is tobacco in any form injurious to the health? Explain.

OR

Explain the replication of retrovirus (HIV) with suitable diagram

32. (a) Where does spermatogenesis occur in human testes? Describe the process of spermatogenesis up to the formation of spermatozoa.
- (b) Trace the path of spermatozoa from the testes up to the ejaculatory duct only.

OR

- (a) Explain the events taking place at the time of fertilization of an ovum in a human female.
- (b) Trace the development of the zygote up to its implantation in the uterus.

33. Meselson and Stahl provided experimental proof that DNA replication is semi conservative.
- a) What is meant by DNA replication is 'semiconservative'?
- b) In this experiment which part of the DNA gets labelled with ^{15}N ?
- c) In Meselson and Stahl experiment, a culture is grown on media with ^{15}N , and switched to light ^{14}N at time=0. After two generation of replication how many band(s) of DNA is seen and what are they?
- d) On what basis, DNA is measured?

OR

Explain the salient features of Genetic code.

End of the Question Paper