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1st PRE BOARD EXAM-2025-26

Class: 12 **Subjects: Biology (044)**

Time: 3 Hours **M.M.:70**

General Instructions:

(i) All questions are compulsory.
(ii) The question paper has five sections and 33 questions. All questions are compulsory.
(iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4 marks each; and Section–E 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. Identify the characteristics of IUDs.

(i) Increase phagocytosis of sperms.
(ii) Releases Cu ions that suppress sperm motility and fertilizing capacity of sperms.
(iii) Make the uterus unsuitable for implantation.
(iv) Make the cervix hostile to sperms.
(v) Prevent semen from entering the female reproductive tract.

(A) (i), (ii), (iii), (iv) and (v)

(B) (i), (ii), (iii) and (iv)

(C) (i) and (ii)

(D) (v) ,(ii), (i)

2. Which of the following infections can also be transmitted by sharing of injection needles surgical instruments, etc., with infected persons, transfusion of blood, or from an infected mother to the fetus too?

A) Hepatitis B and HIV

B) Genital herpes and HIV

C) Syphilis and Hepatitis B

D) Chlamydiasis and Trichomoniasis

3. Which enzymes will be produced in a cell in which there is a nonsense mutation in the lac Y gene?

A) Lactose Permease

B) Transacetylase

C) Lactose permease and transcetylase

D) **β-galactosidase**

4. The Miller-Urey abiotic synthesis experiment (and other subsequent, similar experiments) shows that:

A) simple organic molecules can for spontaneously under conditions like those thought to prevail early in the earth's history.

B) The earliest life forms introduced large amounts of oxygen to the atmosphere.

C) Life can be created in a test tube.

D) Long chains of DNA can form under abiotic conditions.

5. Which one of the following statements is correct about T-lymphocytes in mammals?

A) These are produced in thyroid.

B) There are three main types - cytotoxic T-cells, helper T-cells and suppressor T-cells.

C) These are originated in lymphoid tissues.

D) They scavenge damaged cells and cellular debris.

6. Citric acid is obtained from:

A) Aspergillus niger

B) Rhizobium nigricans

C) Penicillium citrinum

D) Lactobacillus bulgaricus

7. Baculoviruses are excellent pathogens for:

A) species-specific narrow spectrum pesticidal applications.

B) species-specific broad spectrum pesticidal applications.

C) species-specific narrow spectrum insecticidal applications.

D) species-specific broad spectrum insecticidal applications.

8. Restriction enzymes are used in genetic engineering because:

A) they can join different DNA fragments.

B) they can cleave DNA at a specific target.

C) they are nucleases that cut DNA at variable sites.

D) they are proteolytic enzymes which can degrade harmful enzymes.

9. Which of the following type of interactions occur in predation and parasitism?

A) (+, +)

B) (+, 0)

C) (+, -)

D) (-, -)

10. In an age pyramid, the number of individuals of reproductive age is lesser than pre-reproductive but higher than post reproductive ones. The population is:

A) Growing

B) Declining

C) Stable

D) Cannot be predicted

11. Which statement explains the concept of Allen's rule?

A) Aquatic mammals have blubber as insulator.

B) Mammals of colder climate have shorter ears and limbs.

C) Mammals of humid and warmer region have more melanin in their skin.

D) The bear undergoes hibernation during winter.

12. Food chains differ from food webs in that:

(i) food chains are single sequence of who eats whom in a community.
(ii) food chains better represent the entire community.
(iii) food webs represent the complex interaction among food chains.
(iv) food chain is the flow of energy in a population.

A) (i) and (iii)

B) (i) and (iv)

C) (i), (ii) and (iii)

D) (i), (ii), (iii) and (iv)

13. Assertion: Newer antibiotics are required to be produced regularly. Reason: Pathogens often develop resistance to existing antibiotics.

A. If both the assertion and the reason are true and the reason is a correct explanation of the assertion
B. if both the assertion and reason are true but the reason is not a correct explanation of the assertion
C. if the assertion is true but the reason is false
D. if both the assertion and reason are false

14. Assertion: In *Ophrys* one petal of the flower bears an uncanny resemblance to the female bee. Reason: Two closely related species competing for the same resource can coexist simultaneously.
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

15. Assertion : Endosperm is a nutritive tissue and it is triploid.

Reason : Endosperm is formed by fusion of secondary nucleus to second male gamete. It is used by developing embryo.

A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion

B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion

C) If the assertion is true but the reason is false

D) If both the assertion and reason are false

16. Assertion : Central dogma is the flow of information from DNA to mRNA and then decoding the information present in mRNA in the form of protein. Reason : In retroviruses, reverse of central dogma occurs.

A) If both the assertion and the reason are true and the reason is a correct explanation of the assertion

B) If both the assertion and reason are true but the reason is not a correct explanation of the assertion

C) If the assertion is true but the reason is false

D) If both the assertion and reason are false

SECTION-B

17. Name an IUD that you would recommend to promote the cervix hostility to sperms.

18. State a difference between a gene and an allele.

19. When does a human body elicit an anamnestic response?

20. Biotechnological techniques can help to diagnose the pathogen much before the symptoms of the disease appear in the patient. Suggest any two such techniques.

21. What are the key functions of the ecosystem? OR What are ecosystem services?

SECTION -C

22. With a neat labelled diagram, write the function of the any three parts of a typical angiosperm ovule?

23. Write the functions of following:
(i) Sertoli cells
(ii) Leydig cells

(iii) Seminal vesicle

24. What is DNA fingerprinting? Mention its applications.

25. Write Hardy-Weinberg principle.How can Hardy-Weinberg equilibrium be affected? Explain giving three reasons.

26. Draw a flow chart of sewage treatment plant.

OR

Given below is a list of six microorganisms. State their usefulness to humans.
(i) Nucleopolyhedrovirus
(ii) Saccharomyces cerevisiae
(iii) Monascus Purpureus
(iv) Trichoderma polypore
(v) Penicillium Notatum
(vi) Propionibacterium shamanic.

27. Show the processes involved in the decomposition of detritus.

28. write the steps in the formation of rDNA.

SECTION -D

29. ***Read the following and answer any four questions from 29 (i) to 29 (iv) given below:***

Sickle cell anemia is a genetic disorder where the body produces an abnormal hemoglobin called hemoglobin S. Red blood cells are normally flexible and round, but when the hemoglobin is defective, blood cells take on a "sickle" or crescent shape. Sickle cell anemia is caused by mutations in a gene called HBB. It is an inherited blood disorder that occurs if both the maternal and paternal copies of the HBB gene are defective. In other words, if an individual receives just one copy of the defective HBB gene, either from mother or father, then the individual has no sickle cell anemia but has what is called "sickle cell trait". People with sickle cell trait usually do not have any symptoms or problems but they can pass the mutated gene onto their children. There are three inheritance scenarios that can lead to a child having sickle cell anemia:
- Both parents have sickle cell trait
- One parent has sickle cell anemia and the other has sickle cell trait
- Both parents have sickle cell anemia

(i) Sickle cell anemia is a/ an _____ disease.
a. X linked
b. autosomal dominant
c. autosomal recessive
d. Y linked

(ii) I f both parents have sickle cell trait, then there is _____of the child having sickle cell anemia.

a. 25 % risk
b. 50 % risk
c. 75% risk
d. No risk

(iii) If one parent has sickle cell anemia and the other has sickle cell trait, there is _____that their children will have sickle cell anemia and _____will have sickle cell trait.
a. 25 % risk, 75% risk
b. 50 % risk, 50% risk
c. 75% risk, 25% risk
d. No risk

(iv) the point mutation in sickle cell anemia lead to a change in codon

a. UGA to UAA
b. AUG to GAG
c. GAG to GUG
d. GUG to CAG

30. ***Read the following and answer any four questions from 30 (i) to 30 (iv) given below:***

Every day we are exposed to large number of infectious agents. However, only a few of these exposures result in disease. Why? This is due to the fact that the body is able to defend itself from most of these foreign agents. This overall ability of the host to fight the disease-causing organisms, conferred by the immune system is called immunity. Immunity is of two types: (i) Innate immunity and (ii) Acquired immunity. Innate Immunity Innate immunity is non-specific type of defence, that is present at the time of birth. This is accomplished by providing different types of barriers to the entry of the foreign agents into our body. Innate immunity consist of four types of barriers. These are — (i) Physical barriers: Skin on our body is the main barrier which prevents entry of the micro-organisms. Mucus coating of the epithelium lining the respiratory, gastrointestinal and urogenital tracts also help in trapping microbes entering our body. (ii) Physiological barriers: Acid in the stomach, saliva in the mouth, tears from eyes–all prevent microbial growth. (iii) Cellular barriers: Certain types of leukocytes (WBC) of our body like polymorpho-nuclear leukocytes (PMNL-neutrophils) and monocytes and natural killer (type of lymphocytes) in the blood as well as macrophages in tissues can phagocytose and destroy microbes. (iv)Cytokine barriers: Virus-infected cells secrete proteins called interferons which protect non-infected cells from further viral infection.

Que. 1) A skin barrier that protects our body from entering micro-organisms is a …….. barrier.

(a) Cellular barrier

(b) Physical barrier

(c) Physiological barrier

(d) Both (a) and (c)

Que. 2) A non-specific type of defence is also known as …….

(a) Innate immunity

(b) Acquired immunity

(c) Pathogen specific

(d) PMNL

Que. 3) When the host is able to fight against disease-casing organisms, then the ability is known as …….

(a) Microbial growth

(b) Immunity

(c) Barriers

(d) Interferons

Que. 4) Which type of barrier include interferons that protects non-infected cells from further viral infection?

(a) cytokine

(b) Immunity

(c) PMNL

(d) CMI

SECTION -E

31. Explain the different phases of menstrual cycle and correlate the phases with the different levels of pituitary hormones in a human female.

OR

(i) Draw a diagram of the adult human female reproductive system.
(a) Label the different parts of human female reproductive system
(b) write the function of layers of uterus wall

32. List the characteristics of DNA molecules. What criteria required for genetic material.

OR

Explain the components lac operon in E. coil with suitable diagram and write the role of z,y,a gene in Lac Operon.

33. (i) Why are transgenic animals so called?

(ii) Explain the role of transgenic animals in (a) vaccine safety (b) biological products with the help of an example for each.

OR

Explain the various steps involved in the production of artificial insulin by suitable diagram.

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