REV-01
MSB/10/15

2022/07

M.Sc. BOTANY
FOURTH SEMESTER
MICROBIOLOGY
MSB - 402E

(Use Separate Answer Scripts for Objective & Descriptive)

Duration: 3 hrs. **Full Marks: 70**

(PART-A: Objective)

Time: 20 min. **Marks: 20**

Choose the correct answer from the following: ***1X20=20***

1. Glycolysis can occur in
   a. anaerobic cells
   b. aerobic cells
   c. neither aerobic and anaerobic cells
   d. both aerobic and anaerobic cells

2. Which of the following types of association is present among *Staphylococcus aureus* and *Aspergillus terreous?*
   a. antagonism
   b. mutualism
   c. parasitism
   d. commensalism

3. The first hormone produced by Recombinant DNA technology is
   a. Thyroxine
   b. Estrogen
   c. Insulin
   d. Progesterone

4. Sulphates are reduced to hydrogen sulphide by
   a. Photosynthetic sulfur bacteria
   b. *Rhodospirillum*
   c. *Desulfotomaculum sp.*
   d. *Thiobacillus thiooxidans*

5. Cells where nitrogen fixation takes place in *Nostoc* are known as
   a. Hormogonia
   b. Heterocysts
   c. Akinetes
   d. Nodules

6. Which of the following is not an aerobic reaction?
   a. Glycolysis
   b. Citric acid cycle
   c. Oxidative phosphorylation
   d. Fermentation

7. Which is the location of electron transports systems in prokaryotes?
   a. the outer mitochondrial membrane
   b. the cytoplasm
   c. the inner mitochondrial membrane
   d. the cytoplasmic membrane

8. Respiration is
   a. Anabolic process
   b. Physical process
   c. Biophysical process
   d. Catabolic process

9. Sequence in Krebs cycle is
   a. a- Ketoglutaric acid → Isocitric acid → Oxalosuccinic acid
   b. Isocitric acid → a- Ketoglutaric acid → Oxalosuccinic acid
   c. Isocitric acid → Oxalosuccinic acid → a- Ketoglutaric acid
   d. Oxalosuccinic acid → Isocitric acid → a- Ketoglutaric acid

10. Site of glycolysis or EMP is
    a. Mitochondria
    b. Cytoplasm
    c. E.R.
    d. Ribosomes

11. Which of the following features differs archaebacteria from eubacteria?
    a. Cell shape
    b Mode of nutrition
    c. Cell membrane structure
    d All of the above

12. The substitution that prematurely stops the synthesis of protein by generating a stop codon is known as
    a. Nonsense mutation
    b. Missense mutation
    c. Alternation
    d. Frameshift mutation

13. The final product of Calvin cycle is
    a. RuBP
    b. Glucose
    c. Dihydroxy acetone phosphate
    d. Glyceraldehyde-3-phosphate

14. The region in which bacteriochlorophyll can absorb light is
    a. ultraviolet region
    b. infrared region
    c. visible region
    d. microwave region

15. The transfer of naked DNA from one cell to another is referred to as
    a. Transduction
    b. Lysogeny
    c. Conjugation
    d. Transformation

16. The cell in which the F factor carries along with it some chromosomal genes are known as
    a. F^+ cell
    b. F− cell
    c. F′ cell
    d. F‴ cell

17. Which of the following is not true about phagemid?
    a. Contain functional origin of replication of the plasmid and λ phage
    b. May be propagated as a plasmid or as phage in appropriate strain
    c. Contain λ att site
    d. Can only be propagated as phage

18. Extra chromosomal double stranded , circular DNA molecule present in bacteria which is widely used as vector is known as
    a cosmid
    b. phagemid
    b plasmid
    d. bacterial vector

19. Which of the following statement is true
    a. a vector should have an origin of replication
    b. vector should have selectable markers
    c. a vector should have unique restriction sites
    d. all of the above

20. The enzymes that cleaves DNA are known as
    a. ligase
    b. Restriction endonuclease
    c. lipase
    d. RNase

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PART-B :Descriptive

Time : 2 hrs. 40 min. Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. What is soil microbiology? Write briefly the factors affecting the distribution of microbes in soil. Describe the types of microbial interactions with example **1+4+5 =10**
2. Write a short account on the distinguishing features of Bacteria and Archae with example. Discuss the advantage of molecular taxonomy. **5+5=10**
3. Define nitrogen fixation? Discuss the different steps of biological nitrogen fixation **2+8=10**
4. What is recombination? Discuss the mechanism of bacterial recombination. **2+ 8=10**
5. Define mutagenesis and mutagens. Discuss the different types of mutations in bacteria. **2+8=10**
6. What is the difference between photophosphorylation and oxidative phosphorylation? Discuss the method of oxidative phosphorylation in the light of chemiosmotic hypothesis **3+7=10**
7. What is a cloning vector? Discuss the different types of cloning vectors used for cloning. Distinguish between cosmids and plasmids. **1+6+3 =10**
8. Write short notes on *(any two)* **10**
   a. Site directed mutagenesis
   b. Chemosynthesis
   c. Human growth hormone

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