

RAMAKRISHNA MISSION VIDYAMANDIRA

Belur Math, Howrah – 711 202

ADMISSION TEST – 2022**MICROBIOLOGY (Honours)**

Date : 02-07-2022

Full Marks : 50

Time: 3:00 p.m – 4:00 p.m

Instructions for the candidate

Answer all the questions given below. Each MCQ type question carries **2 mark**. **½ mark** will be deducted for one wrong answer. Each Assertion type question carries **2 marks**. **½ mark** will be deducted for one wrong answer. Tick (✓) the correct option on the **OMR SHEET** using either Black or Blue ink. The Ticks (✓) must be very clear and non-overlapping and if it is smudgy or not clear, no marks will be awarded.

A. MCQ type questions

1. Study the following table carefully and select the correct options for 1,2,3 and 4.

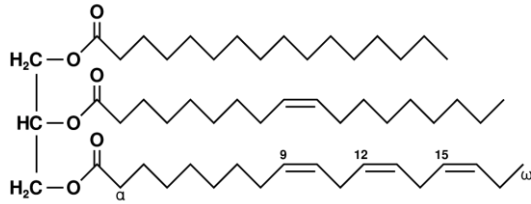
<i>Characters</i>	<i>Monera</i>	<i>Protista</i>	<i>Fungi</i>	<i>Plantae</i>	<i>Animalia</i>
Cell type	1	Eukaryotic	Eukaryotic	Eukaryotic	Eukaryotic
Cell wall	2	Present in some	Present	Present	Absent
Nuclear membrane	Absent	Present	Present	Present	3
Body organization	Cellular	Cellular	4	Tissue/organ	Tissue/organ/organ system

<i>Options</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
(a)	Prokaryotic	Absent	Absent	Unicellular
(b)	Prokaryotic	Present	Present	Multicellular
(c)	Eukaryotic	Present	Present	Multicellular
(d)	Eukaryotic	Absent	Absent	Unicellular

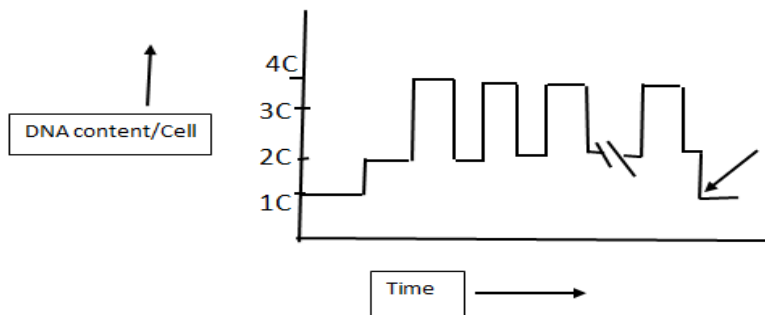
2. The correct sequence of layers of a bacterial cell envelope from outward to inward is,

- a) Cell Wall → Glycocalyx → Cell membrane b) Cell membrane → Glycocalyx → Cell Wall
 c) Glycocalyx → Cell Wall → Cell membrane d) Glycocalyx → Cell membrane → Cell Wall

3. The given structural formula is correctly identified along with its related function by which of the following options ?



- a) Cholesterol – a component of animal cell membrane
 b) Lecithin – A component of cell membrane
 c) Triglyceride – an energy source
 d) Adenosine – a component of nucleic acid
4. Which of the following is not a homopolymer?
 a) Protein b) Cellulose c) Glycogen d) Chitin
5. Enzymes catalyze the biochemical reactions by _____ the activation energy.
 a) Lowering b) Increasing c) Unaltering d) Either (a) or (b)
6. The given diagram shows variations in the amount of DNA of a developing eukaryote. What does the arrow denote?



- a) First Meiotic Anaphase b) Second Meiotic Anaphase
 c) Mitotic Anaphase c) Mitotic Telophase
7. Please refer to the given reaction,

$$\alpha\text{-ketoglutaric acid} + \text{NH}_4^+ + \text{NADPH} \xrightarrow{\text{Glutamate Dehydrogenase}} \text{Glutamate} + \text{H}_2\text{O} + \text{NADP}$$
- It represents,
- a) Oxidative deamination b) Reductive amination
 c) Transamination d) Deamination
8. Photosynthetic pigments such as chlorophyll a, chlorophyll b, xanthophyll and carotene can be separated by which of the following techniques?
 a) Paper Chromatography b) Gel Electrophoresis c) X-ray Diffusion d) ELISA test

9. The pathway of respiration common in all living organisms is “X”; it occurs in the “Y” and the products formed are two molecules of “Z”.

<i>Options</i>	<i>X</i>	<i>Y</i>	<i>Z</i>
(a)	EMP pathway	mitochondrion	Pyruvic acid
(b)	EMP pathway	cytoplasm	Pyruvic acid
(c)	Kreb’s cycle	cytoplasm	Acetyl CoA
(d)	Kreb’s cycle	mitochondrion	Acetyl CoA

10. What is the oxidation state of iron in haemoglobin?

a) Fe^- b) Fe^{2+} c) Fe^{3+} d) Fe^{4+}

11. A recessive allele is expressed in

a) Heterozygous condition only b) Homozygous condition only
c) F_3 generation d) Both homozygous and heterozygous conditions

12. Match column I with Column II and select the correct option from the given codes

	<i>Column I</i>		<i>Column II</i>
A.	Dihybrid test cross	(i)	9:3:3:1
B.	Law of Segregation	(ii)	Dihybrid cross
C.	Law of Independent Assortment	(iii)	1:1:1:1
D.	ABO blood group in man	(iv)	Purity of gametes
		(v)	Multiple Allelism

a) A-(iii), B-(iv), C-(ii), D-(v) b) A-(i), B-(iv), C-(ii), D-(v)
b) A-(iii), B-(ii), C-(iv), D-(v) c) A-(ii), B-(v), C-(iii), D-(i)

13. If a double stranded DNA has 20% of cytosine, what will be the percentage of adenine in it?

a) 20% b) 40% c) 30% d) 60%

14. DNA replication takes place at _____ phase of cell cycle.

a) G_1 b) S c) G_2 d) M

15. During expression of an operon, RNA polymerase binds to

a) Structural gene b) Regulator gene c) Operator d) Promoter

16. Which of the following is the bacterial disease in humans?

a) Pneumonia b) Malaria c) Plague d) Both (a) and (c)

17. A person has developed interferons in his body, he seems to carry an infection of

a) Tetanus b) Malaria c) Measles d) Typhoid

18. Which of the following components does not participate in Innate immunity?
a) Neutrophils b) Macrophages c) B-lymphocytes d) Natural killer cells
19. Lactic Acid bacteria grow in milk and convert it to curd and also improve its nutrition quality by increasing
a) Vitamin A b) Vitamin B₁₂ c) Vitamin B₆ d) Vitamin C and A
20. If a plasmid vector is digested with EcoRI at a single site, then
a) One sticky end will be produced b) Two sticky ends will be produced
c) Four sticky ends will be produced d) Six sticky ends will be produced

PART B: ASSERTION AND REASONING QUESTIONS [2×5=10]

Direction for Assertion (A) and Reasoning (R) type questions:

In this type of questions, a statement of ASSERTION (A) is followed by a statement of REASON (R) .

Mark the correct choice as,

- a) If both the ASSERTION (A) and REASON (R) are true and the REASON (R) is the correct explanation of the ASSERTION (A)
b) If both the ASSERTION (A) and REASON (R) are true and the REASON (R) is not the correct explanation of the ASSERTION (A)
c) If ASSERTION (A) is true but REASON (R) is false
d) If both ASSERTION (A) and REASON (R) are false

21. ASSERTION (A) : Plasmid DNA acts as a genetic factor
REASON (R) : Plasmid DNA carries vital genes necessary for normal functioning of cell
22. ASSERTION (A) : Bt toxin which are derived from *Bacillus thuringiensis*, kills certain insects.
REASON (R) : Insects ingest active form of Bt toxin and die because of damage of their gut.
23. ASSERTION (A) : All parts of biosphere are not equally inhabited.
REASON (R) : Some parts of biosphere do not contain life.
24. ASSERTION (A) : Autotrophs are also called transducers.
REASON (R) : Autotrophs change one form of energy to another.
25. ASSERTION (A) : Uric acid and Creatinine can be detected in normal urine of an adult man.
REASON (R) : Uric acid and Creatinine are the chief components of human urine.

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