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P.O.- Belur Math, Dist. Howrah

Admission test-2013

**Microbiology (Honours)**

Full Marks: 50

Date:

Time:

Name:

Regn. No.:

**Question-cum-Answerbook**

**Group-A**

*Put tick marks in the appropriate option. Each question carries one mark. One mark will be deducted for three wrong answers.*

1. Virus capsid with icosahedral symmetry possesses the number of planes
  - a) 14
  - b) 18
  - c) 20
  - d) 22
2. Which cell organelle is osmotically inactive?
  - a) Ribosome
  - b) Lysosome
  - c) Plastid
  - d) Mitochondria
3. Glycosylation of proteins takes place in
  - a) Endoplasmic reticulum
  - b) Lysosome
  - c) Golgi complex
  - d) Ribosome
4. A couple has five daughters. What is the probability of the sixth offspring to be a daughter?
  - a) 75%
  - b) 100%
  - c) 50%
  - d) 10%

5. In human, blood group is determined by three alleles at the same loci (multiple allele), namely  $I^A$ ,  $I^B$  and  $I^O$  where  $I^O$  is recessive to  $I^A$  &  $I^B$ . What is the number of genotypes governing blood grouping in human?

- (a) 4
- (b) 6
- (c) 8
- (d) 10

6. The two strands of DNA are antiparallel. This is due to

- (a) H-bond
- (b) Glycosidic bond
- (c) Phosphodiester bond
- (d) All of these

7. The number of ATP molecules generated for each turn of the citric acid cycle and for complete oxidation of one molecule of glucose, respectively, are

- (a) 8 and 24
- (b) 8 and 38
- (c) 12 and 24
- (d) 12 and 38

8. Which isotope is not radioactive?

- (a)  $C^{14}$
- (b)  $H^3$
- (c)  $O^{18}$
- (d)  $P^{32}$

9. Electron microscope has revealed the occurrence of

- (a) Chromosome
- (b) Ribosome
- (c) Chloroplast
- (d) Cell wall

10. An angiosperm leaf carries 16 chromosomes. The number of chromosomes in its endosperm will be

- (a) 8
- (b) 16
- (c) 24

(d) 32

11. Which group is rapidly destroyed by antibiotics?

- (a) Gram positive bacteria
- (b) Gram negative bacteria
- (c) Viruses
- (d) Fungi

12. Enzyme activity is facilitated through

- (a) Reduction in activation energy
- (b) Increase in activation energy
- (c) Altering pH
- (d) Formation of an enzyme-substrate complex

13. The value of numerical aperture depends on

- (a) Wavelength of light used
- (b) Wavelength of light & the medium between the objective & object
- (c) The medium between the objective & object and the angle between the optical axis & the peripheral rays
- (d) All of these

14. What will happen, if an algal (*Chlorella*) suspension is illuminated in presence of potassium ferricyanide?

- (a) The suspension will show fluorescence
- (b) The suspension will show phosphorescence
- (c) Photo oxidation leading to evolution of CO<sub>2</sub>
- (d) Oxygen will be evolved

15. Which one remains same in plant cells before and after osmosis?

- (a) Osmotic pressure (OP)
- (b) Diffusion pressure (DP)
- (c) Diffusion pressure deficit (DPD)
- (d) Turgor pressure (TP)

16. Which series progresses from the thinnest to thickest in diameter

- (a) DNA > Histone > Chromosome > Nucleosome
- (b) Histone > Chromosome > DNA > Nucleosome
- (c) Nucleosome > Histone > DNA > Chromosome

(d) DNA > Histone > Nucleosome > Chromosome

17. The most abundant protein in mammals is

- (a) Albumin
- (b) Haemoglobin
- (c) Collagen
- (d) ATPase enzyme

18. Which of the following is a polyunsaturated fatty acid?

- (a) Palmitic acid
- (b) Palmitoleic acid
- (c) Linoleic acid
- (d) Oleic acid

19. Gene expression occurs when the

- (a) DNA is replicated
- (b) Cell divides
- (c) Protein is made
- (d) Ribosome engages both the mRNA and tRNA

20. In mammalian cells, ribosomal RNA is produced mainly in the

- (a) Endoplasmic reticulum
- (b) Ribosome
- (c) Nucleolus
- (d) Nucleus

21. The immunity develops in baby by mother's milk is an example of

- a) Natural active immunity
- b) Artificial passive immunity
- C) Artificial active immunity
- d) Natural passive immunity

22. If 30% of an organism's DNA is Thymine, then

- (a) 70% is Guanine
- (b) 20% is Guanine
- (c) 30% is Adenine

(d) Both b & c

23. The carbons of pentose utilized for nucleotide formation are

- a) 1', 3', 5'
- b) 3', 5'
- c) 1', 2', 3', 5'
- d) 1', 5'

24. Outer membrane is the structural component of

- a) Gram positive bacteria
- b) Gram negative bacteria
- c) Fungi
- d) Virus

25. Haemoglobin contains

- (a) One protoporphyrin ring and 4 ferrous ions
- (b) Four protoporphyrin rings and one ferrous ion
- (c) Four protoporphyrin rings and 4 ferrous ions
- (d) One protoporphyrin ring and one ferrous ion

26. Metabolism of 100g of carbohydrate, 25g of fat, and 20g of protein yields approximately how many kilocalories?

- (a) 300
- (b) 500
- (c) 700
- (d) 900

27. What will be the phenotypic ratio in  $F_2$  generation of a dihybrid experiment if both the pair of alleles show incomplete dominance

- (a) 9:3:3:1
- (b) 3:6:3:1:2:1
- (c) 1:2:1:2:4:2:1:2:1
- (d) 12:3:1

28. Which one of the following diseases is caused by virus?

- (a) Cholera
- (b) Diphtheria

(c) Measles

(d) Whooping cough

29. Genetic material found in HIV is

(a) ds RNA

(b) ss RNA

(c) ds DNA

(d) ss DNA

30. A chemical substance produced by a microorganism for inhibiting the growth of another is

(a) Antibody

(b) Antibiotic

(c) Aflatoxin

(d) Antiallergic

31. A type of phagocytic cell under R-E system present in liver is

a) Kupffer cell

b) Osteoclast

c) Microglia

d) Histiocyte

32. The long lived cells associated with immunity are

a) Plasma cells

b) Helper T cells

c) B lymphocytes

d) Memory cells

33. The process which can not take place in the absence of virus is

(a) Transformation

(b) Translocation

(c) Conjugation

(d) Transduction

34. Which one is correctly matched?

(a) Oncogenes - ageing

(b) Replication fork – mRNA

(c) HIV – reverse transcriptase

(d) Initiation factors – amino acid activation

35. To create a transgenic plant, which vector is used?

a) Ti plasmid

b) Cosmid

c)  $\lambda$  phage

d) pBR 322

36. Which statement is wrong?

(a) Sucrose is a disaccharide

(b) Cellulose is a polysaccharide

(c) Glycine is a S-containing amino acid

(d) Uracil is a pyrimidine

37. Phospholipids are

(a) Amphipathic

(b) Amphibolic

(c) Hydrophobic

(d) None of these

38. The principal cations of extracellular and intracellular fluids, respectively, are

(a)  $\text{Ca}^{++}$  and  $\text{K}^+$

(b)  $\text{Na}^+$  and  $\text{Ca}^{++}$

(c)  $\text{K}^+$  and  $\text{Na}^{++}$

(d)  $\text{Na}^+$  and  $\text{K}^+$

39. According to IUPAC system of nomenclature, thymine is

a) 2-amino, 6-oxo purine

b) 2, 4- bisoxo pyrimidine

c) 2, 4- bisoxo, 5-methyl pyrimidine

d) 2-oxo, 4-amino pyrimidine

40. Both photosynthesis & respiration require

(a) Green cells

(b) Organic substrate

(c) Cytochromes

(d) H<sub>2</sub>O

### Group-B

*Each question carries two marks.*

1. **Assertion (A):** Lysosome contains hydrolases (digestive enzymes)

**Reason (B):** All kinds of digestion take place in lysosome

**Correct options:**

- (a) "A" is correct & "B" is the right explanation of "A".
- (b) "A" is correct & "B" is not the right explanation of "A".
- (c) "A" is wrong & "B" is correct.
- (d) Both "A" & "B" are wrong.

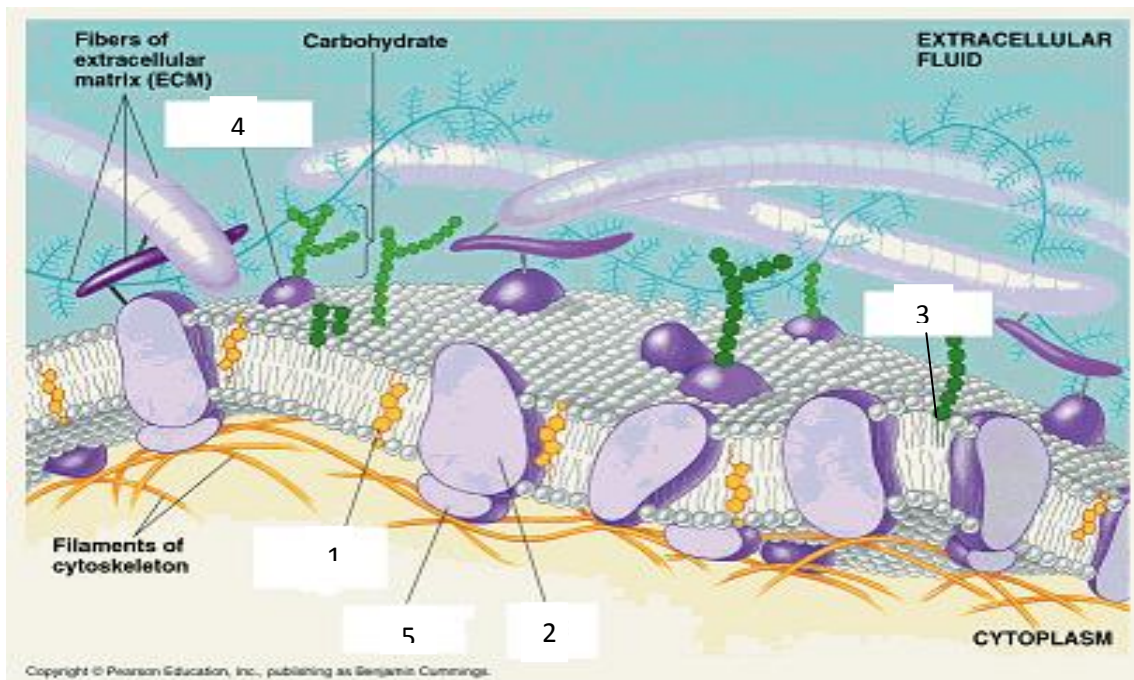
2. Match the column and find the correct combination:

(A) Carboxylation	i) Oxygen evolution
(B) phosphorylation	ii) photorespiration
(C) photolysis of water	iii) Rubisco
(D) phosphoglycolate	iv) chemosynthesis
(E) <i>Nitrosomonas</i>	V) ATP

- a) A-i, B-ii, C-iii, D-iv, E-v
- b) A-iii, B-v, C-i, D-ii, E-iv
- c) A-ii, B-iii, C-v, D-iv, E-i
- d) A-i, B-iii, C-iv, D-ii, E-i
- e) A-v, B-iv, C-iii, D-ii, E-i

3. In the following figure, which combination is correct?





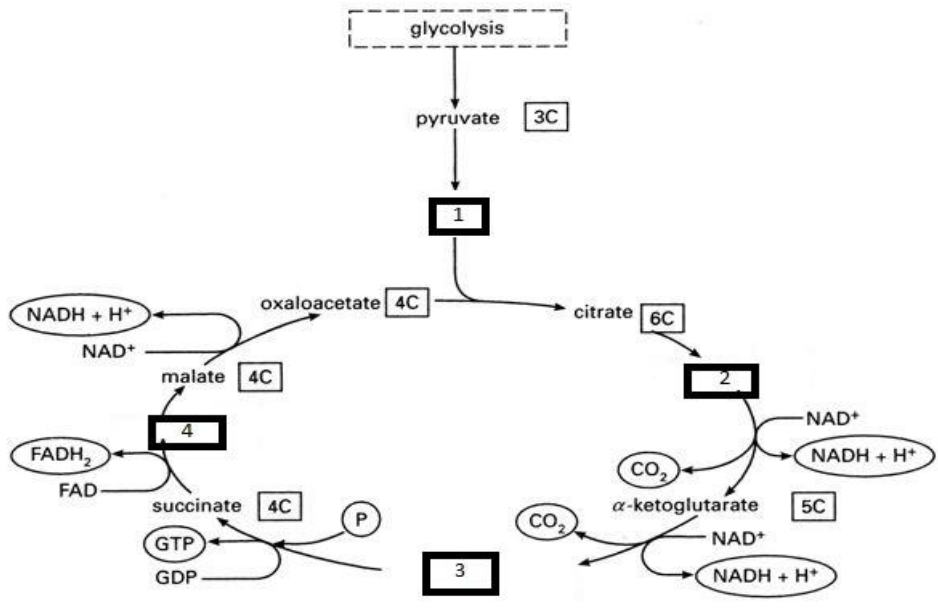
- a) 1-Cholesterol, 2- integral protein, 3- glycolipid, 4- glycoprotein, 5-peripheral protein
- b) 1-carbohydrate, 2- integral protein, 3- glycolipid, 4- glycoprotein, 5-peripheral protein
- c) 1-Cholesterol, 2- peripheral protein, 3- glycolipid, 4- glycoprotein, 5- integral protein
- d) 1-phospholipid, 2- integral protein, 3- glycolipid, 4- glycoprotein, 5-peripheral protein

4. Match the followings and choose the right combination

A.	tRNA	1. Linking of amino acids
B.	mRNA	2. Nucleolar organising region
C.	rRNA.	3. Transfer of genetic information
D.	Peptidyl transferase	4. Transfer of amino acid from cytoplasm to ribosome

- a) A-2, B-3, C-4, D-1
- b) A-4, B-3, C-2, D-1
- c) A-4, B-3, C-1, D-2
- d) A-2, B-4, C-3, D-1

5. In the following metabolic pathway, the missing compounds are



- a) 1-Acetyl CoA, 2-Isocitrate, 3-Succinyl CoA, 4-Fumerate
- b) 1-Acetyl Coenzyme, 2-Isocitrate, 3-Succinyl CoA, 4-Fumerate
- c) 1-Acetyl CoA, 2-*cis*-Aconitate, 3-Succinyl CoA, 4-Fumerate
- d) 1-Acetyl Coenzyme, 2- *cis*-Aconitate, 3-Succinyl CoA, 4-Fumerate