Step Academy official

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Paper Date	

CLASS	1st Year
SUBJECT	Biology
TOTAL MARKS	
Paper Type	

Q1. Choose the correct answer.

1. Which of the following is the major advantage of using a light microscope of an electron microsope?

(A) superior resolving power **(B)** constant depth of focus **(C)** observation of living matter **(D)** use of very thin sections

2.
Some cellular organelles are bound by a single membrane, while other organelles have two membranes (envelopes) around them. Which one of the following is correct?

	Single membrane	Double membranes
(A)	peroxysomes, lysosome	nucleus, chloroplast
(B)	chloroplast, lysosome	nucleus, peroxysomes
(C)	nucleus, chloroplast	lysosome, peroxysomes
(D)	nucleus, lysosome	chloroplast, peroxysomes

3. Which of the following cell structures contains the highest concentration of RNA?

(A) centriole **(B)** lysosome **(C)** chromosome **(D)** nucleolus

4.
A tadpole's tail is gradually broken down during metamorphosis into an adult frog. Which organelle increases in number in the cells of the tail at this time?

(A) centriole **(B)** endoplasmic reticulum **(C)** Golgi complex **(D)** lysosomes

5. Which of the following organelles always contains DNA?

(A) centriole **(B)** Golgi complex **(C)** lysosome **(D)** mitochondria

6. Which distinguishes a prokaryotic cell from a eukaryotic cell?

(A) prokaryotic cell have a cell wall and a nucleus **(B)** prokaryotic cells have no membrane bound organelles **(C)** prokaryotic cells have a centriole **(D)** prokaryotic cells have no ribosomes

7. The elasticity of the plasma membrane demonstrates that it is made up in part of

(A) lipids **(B)** nucleic acids **(C)** carbohydrates **(D)** proteins

8. The cell wall of plant cell is different from that of prokaryotes in:

(A) both structure and chemical composition **(B)** structure only **(C)** chemical composition only **(D)** number of layers only

9. Which of the following are present in prokaryotic cells:

(A) chloroplast, DNA, nuclear envelope **(B)** chromosomes, mitochondria, nuclear envelope **(C)** cytoplasm, DNA, mitochondria **(D)** cytoplasm, DNA, ribosome

10. Which of the following is present in all eukaryotic cells:

(A) cell wall **(B)** diploid nucleus **(C)** flagellum **(D)** membrane bounded organelles

11. Which of the following would be more prominent in a secretory cell than non-secretory cell:

(A) lysosome **(B)** Golgi complex **(C)** mitochondrion **(D)** ribosome

12.
When a glycoprotein is being synthesized for secretion from a cell, which route is it most likely to take?

(A) Golgi complex → RER SER **(B)** RER→ Golgi complex → SER **(C)** RER SER→ Golgi complex **(D)** SER→ Golgi complex → RER

13. Which two of the groups combine to form a peptide link between two amino acids?

(A) 1 and 2 **(B)** 1 and 3 **(C)** 2 and 3 **(D)** 2 and 4

14. Which class of molecule is the major component of cell membrane.

(A) phospholipid **(B)** cellulose **(C)** wax **(D)** triglyceride

15. A fatty acid is unsaturated if it

(A) contains hydrogen **(B)** contains double bonds **(C)** contains an acid group **(D)** all of them

16. In RNA the nitrogen base that takes the place of thymine is

(A) adenine **(B)** cytosine **(C)** guanine **(D)** uracil

17. The ending-ose means a substance is a

(A) sugar **(B)** lipid **(C)** protein **(D)** nucleic acid

18. Glycolipids and lipoprotein are important components of

(A) cellular membrane **(B)** cell wall **(C)** both of them **(D)** none of them

19. When two amino acids are linked to form peptide linkage..... is removed

(A) hydroxyl **(B)** water **(C)** carbon **(D)** nitrogen

20. A polar molecule is ..... in water

(A) soluble **(B)** insoluble **(C)** reactive **(D)** innert

21. Which statement correctly describes a property of water?

(A)	**(B)**	**(C)**	**(D)**
a relatively large amount of heat is needed to increase its temperature	at normal room temperature, its molecules are bound together by ionic bonds	the highest density of water occurs below its freezing point	water acts as solvent for nonpolar molecules

22. Estrogen, vitamin-D and cholesterol are all examples of

(A) glycolipids **(B)** lipoproteins **(C)** terpenes **(D)** steroids

23. Which term includes all others?

(A) carbohydrate **(B)** starch **(C)** monosaccharide **(D)** polysaccharide

24. Choose the pair of terms that correctly completes this sentence: Nucleotide are to are to proteins.

(A)	**(B)**	**(C)**	**(D)**
nucleic acids; amino acids	amino acids; polypeptides	glycosidic linkages; polypeptide linkages	polymers; polypeptides

25. The enantiomer of D-glucose is

(A) D-galactose **(B)** L-galactose **(C)** both of them **(D)** none of them

26. The catalytic activity of an enzyme is restricted to its small portion called

(A) active site **(B)** passive site **(C)** regulation site **(D)** allosteric site

27. Which of the following has a coenzyme activity?

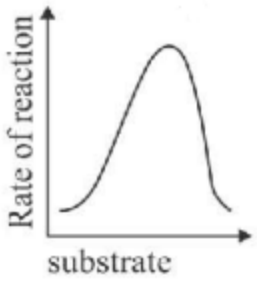
(A) NAD **(B)** Ca **(C)** both "a" and "b" **(D)** none of them

28. Non-competitive inhibitors react with enzymes at:

(A) active site **(B)** allosteric site **(C)** both "a" and "b" **(D)** none of them

29. Which graph shows the expected relationship between enzyme activity and substrate concentration?

(A)



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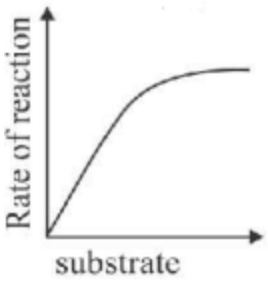

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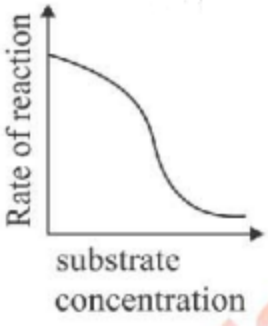

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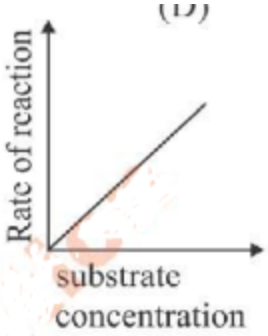
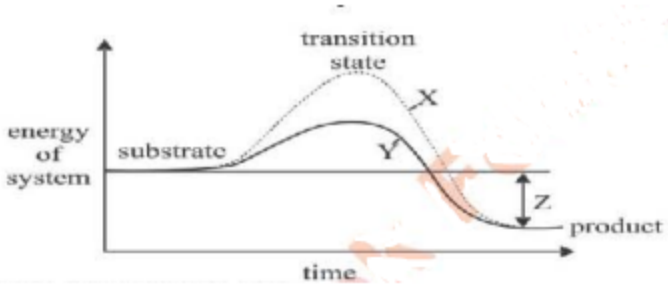


30.

The graph shows the effect of an enzyme on a reaction.



Which combination identifies X, Y and Z?

(A)	**(B)**	**(C)**	**(D)**
catalyzed reaction	catalyzed reaction	uncatalyzed reaction	uncatalyzed reaction

31. Combination of apoenzyme and coenzyme produces.

(A) prosthetic group **(B)** holoenzyme **(C)** enzyme **(D)** isoenzyme

32. The specificity of enzyme is due to their

(A) surface configuration **(B)** PH **(C)** hydrogen bonding **(D)** high molecular weight

33. An essential feature of a competitive inhibitor is its ability to

(A) activate an operator gene **(B)** combine with prosthetic group **(C)** modify a substrate **(D)** occupy an active site

34.
The reaction rate of salivary amylase with starch decreases as the concentration of chloride ions is reduced. Which of the following describe the role of the chloride ions?

(A) allosteric inhibitors **(B)** cofactors **(C)** coenzyme **(D)** competitive inhibitor

35. How does an enzyme increase the rate of a reaction?

(A)	(B)	(C)	(D)
by bringing the reacting molecules into precise orientation	by increasing the rate of random collisions of molecules	by shifting the point of equilibrium of the reaction	by supplying the energy required to start the reaction

36. Many enzymes are secreted in inactive form to protect

(A) cell proteins	**(B)** mitochondria	**(C)** cell membrane	**(D)** cell DNA

37. Erypsin is an example of?

(A) carbohydrases	**(B)** proteases	**(C)** lipases	**(D)** nucleases

38. Ribozymes consist of:

(A) only protein	**(B)** protein + none protein part	**(C)** only RNA	**(D)** none of them

39.
Removal of the source of carbon dioxide from photosynthesizing chloroplasts results in rapid changes in the concentration of certain chemicals. Which one of the following represents the correct combination of concentration changes?

	ATP	Ribulose bishposphate	Phosphoglyceric acid (PGA)
(A)	decreases	decreases	increases
(B)	decreases	increases	increases
(C)	increases	increases	decreases
(D)	increases	no change	decreases

40. What are the products of the light reactions in photosynthesis?

(A) ATP and NADP	**(B)** ATP, NADPH, and oxygen	**(C)** ATP, PGA and NADH,	**(D)** ATP, PGA and oxygen

41.
During the light dependent stage of photosynthesis, the photoactivated pigment removes an electron from the hydroxylation derived from the water molecule. The fate of the free hydroxyl radical is that it

(A)	(B)	(C)	(D)
is broken down into oxygen and a free radical of hydrogen	is used to raise the activation level of chlorophyll by donating a positive charge	is used to produce adenosine triphosphate from adenosine diphosphate	reduces carbon dioxide to sugar

42.

Carbon dioxide labeled with 14C has been used to identify the Intermediate compounds in the Calvin cycle, the light-independent stage in photosynthesis. Which compound would be the first to contain the 14C?

(A) glucose **(B)** PGA **(C)** RuBP **(D)** starch

43. During dark reactions the three carbon atoms of 3-PGA are derived from

(A) RuBP only **(B)** CO_2 only **(C)** RuBP + CO_2 **(D)** RuBP+CO_2 + PEP

44. Chlorophyll is soluble in

(A) water **(B)** organic solvent **(C)** water and organic solvent **(D)** not in any solvent

45. Photorespiration takes place only in

(A) root **(B)** mitochondria **(C)** green parts of the plant **(D)** all cells of the plant

46. In C4 plants, fixation of CO2 occurs in

(A) palisade tissue **(B)** cortex of stem **(C)** spongy mesophyll and bundle of sheath **(D)** phloem tissue

47. ATP synthesis during light reactions is

(A) oxidative **(B)** photolysis **(C)** substrate phosphorylation **(D)** photophosphoryation

48.
The rate of photosynthesis of a freshwater plant is measured using five spectral colours. Which sequence of colours would give an increasing photosynthetic response?

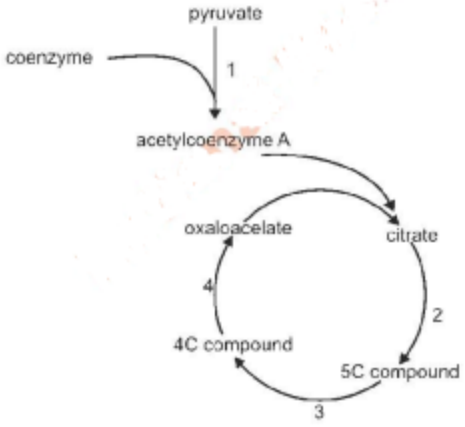
Smallest →Largest response			
(A)	**(B)**	**(C)**	**(D)**
blue green yellow orange red	green yellow orange red blue	red orange yellow green blue	yellow green orange blue

49. In C3 plants first stable product of photosynthesis during dark reaction is

(A) PGA **(B)** G3P **(C)** RuBP **(D)** oxaloacetate

50.

The diagram shows the Krebs cycle. At which numbereds stages does decarboxylation take place?



(A) 1 and 2 **(B)** 1,2 and 3 **(C)** 1,3 and 4 **(D)** 1,2,3 and 4

51. Viruses are considered non-living because

(A) do not mutate **(B)** they do not move **(C)** cannot reproduce Independently **(D)** have nucleic acid

52. Which of these are found in all viruses?

(A) envelope, nucleic acid, capsid **(B)** DNA, RNA and proteins **(C)** proteins and nucleic acid **(D)** protein, carbohydrate, lipids

53. Which step in the lytic cycle follows attachment of virus and release of DNA into the cell?

(A) production of lysosome **(B)** disintegration of host DNA **(C)** assemblage **(D)** DNA replication

54. Which of these is a true statement?

(A) viruses carry with them their own ribosome for protein formation **(B)** new viral ribosomes form after viral DNA enters the cell **(C)** viruses use the host ribosomes for their own needs **(D)** viruses do not need ribosomes for protein formation

55. Which part of an animal virus is not reproduced in multiple copies?

(A) envelope **(B)** protein **(C)** capsid **(D)** ribosome

56. Which of the following illness is caused by a retrovirus?

(A) typhoid **(B)** malaria **(C)** AIDS **(D)** sleeping sickness

57. The HIV primarily infects

(A) plasma cells **(B)** helper T cells **(C)** all white blood cells **(D)** red blood cells

58. Poliomyelitis affects

(A) motor neuron **(B)** sensory neuron **(C)** brain **(D)** muscles

59. HIV attaches to

(A) CD4 protein **(B)** nucleoprotein **(C)** lipoprotein **(D)** glycoprotein

60. Hepatitis D is caused by

(A) bacteria **(B)** virus **(C)** prions **(D)** viroids

Q2. Write short answers of the following questions.

1 . Describe that the cells are the basic unit of life with respect to seven properties of life.

2 .
2. What is the difference between the resolution and magnification of light microscope and electron microscope?

3 . Name three organelles revealed by an electron microscope.

4 . Why cell wall is not present in animal cells?

5 . What holds the ribosomes together in a polysome?

6 . Why lysosomes are called suicidal bags?

7 . How is a chloroplast similar to a bacterium?

8 . What organelles are single membrane bound, double membrane bound and lacking any membrane?

9 . Explain that nucleoli are the areas where ribosomes are assembled.

10 . What are vesicles and what function they perform?

11 . What are the techniques that can be used to study plasma membrane?

12 . How would you describe blochemistry?

13 . Describe the chemical composition of protoplasm.

14 . 4. What are the four fundamental kinds of biological molecules? Explain.

15 . Why is the covalent bond in water polar?

16 . Why water is regarded as universal solvent?

17 . What is the importance of hydrogen bonding?

18 . Why very large amount of heat can increase very little temperature in water?

19 . How water protects living things against sudden thermal change?

20 . Describe the classification of monosaccharides?

21 . Describe the conversion of open chain of ribase into ring chain.

22 . Draw and label the ring forms of alpha and beta glucose.

23 . 18. Describe the synthesis of peptide bond.

24 . Describe the four types of structure of proteins.

25 . Describe (a) globular proteins (b) fibrous proteins.

26 . What role do lipids play in living organisms?

27 . Why phospholipids form a thin layer. on the surface of an rion aqueous solution?

28 . What is Isoprene unit? Explain.

29 . Describe a steroid nucieus.

30 . How might an error in the DNA of an organism effect protein function?

31 .
Define gene is a sequence of nucleotides as part of DNA, which codes for the formation of a polypeptide.

32 . 28. Write the differences between:

(a) major and minor bioelements (b)dimer and polymer (c) polar and nonpolar covalent bond (d) polyhydroxy aldehyde and polyhydroxy ketone (e)alpha and beta glucose (f)D glucose and L-glucose (g) amylase and amylopectin (h) amylopectin and glycogen (1) primary and secondary structure of proteins (1) tertiary and quaternary structure of proteins (k) purine and pyrimidine (1) saturated and unsaturated fatty acids (m) DNA and RNA

33 . What are ribozymes?

34 . What is the structure of enzyme?

35 . Explain the enzyme pepsin which does not require cofactor.

36 . What is prosthetic group? Give an example.

37 . What is the mechanism of enzyme action?

38 . What is the role of free energy of activation in a chemical reaction?

39 . List the external conditions which affect rate of enzyme reaction.

40 . Compare the optimum temperatures of enzymes of human and thermophilic bacteria.

41 . Describe the range of pH at which human enzymes function.

42 . What are enzyme inhibitors? Name the molecules which act as enzyme inhibitors.

43 . What is the importance of competitive enzyme inhibitors?

44 . Describe cyanides as irreversible non-competitive inhibitor.

45 . Write the difference between;(a) binding site and catalytic site of an enzyme

(b) apoenzyme and holoenzyme(c) prosthetic group and coenzyme

(d) Inorganic cofactor and organic cofactor(e) lock and key model and Induced fit model of enzyme action

(f) competitive and noncompetitive enzyme inhibitors

(g) reversible non-competitive enzyme inhibitors and irreversible non-competivie enzyme inhibitors

46 . What is electromagnetic spectrum?

47 . What are the types of chlorophyll?

48 . What is the importance of carotene?

49 . Describe 'absorption spectrum in photosynthesis.

50 . What is photosystem? Explain.

51 . What is the role of carbon dioxide in photosynthesis?

52 .
How It was confirmed that 'plants split water as a source of hydrogen releasing hydrogen as a byproduct?

53 . What is the importance of G3P?

54 . What is the effect of temperature on the activities of RuBisCO?

55 . How photorespiration evolved?

56 . What are the living and non-living characteristics of viruses?

57 . Give the classification of viruses based on their hosts.

58 . What are the parasitic natures of virus?

59 . Justify why a virus must have a host cell to parasitize in order to complete its life cycle.

60 . Explain how a virus survives inside a host cell, protected from immune system.

61 .
Determine the method a virus employs to survive/ pass over unfavourable conditions when it does not have a host to complete the life cycle.

62 .
Justify the name of virus i.e., "Human Immunodeficiency Virus" by establishing T-helper cells as the basis of immune system.

63 . Reason out the specificity of HIV on its host cells.

64 . What are the symptoms of AIDS?

65 . Explain opportunistic diseases that may attack an AIDS victim.

66 . What are the common control measures against the transmission of HIV?

67 . Describe the structure of prions and name any two diseases caused by them.

68 . Describe the structure of viroids and name the diseases caused by them.

69 . What do you mean by AIDS, HIV, ART, CLCuD and TMV?

70 . Distinguish between:(a) bacteriophage and HIV virus(b) lytic and lysogenic cycle of bacteriophage

(c) prions and viriods

Q3. Write detailed answers of the following questions.

1 .
What are the locations, chemical compositions and significance of the following in a plant cell wall? (a) Primary cell wall (b) Secondary cell wall (c) Middle lamella.

2 .
2. Explain the (a) Chemical composition of plasma membrane (b) Role of plasma membrane in regulating cell's interactions with environment.

3 . Describe the lipid composition and variety of proteins of the plasma membrane.

4 . What are the functions of the plasma membrane proteins?

5 . What is the chemical nature of cytoplasm? Explain the metabolic roles of cytoplasm

6 . Describe the structures and functions of smooth and rough endoplasmic reticulum.

7 . Explain the structure, chemical composition and function of ribosomes.

8 . Explain the structure, and functions of the peroxisomes and glyoxisomes in animal and plant cells.

9 . What are the storage diseases? Explain with reference to the malfunctioning of lysosomes.

10 .
Describe the external and internal structure of mitochondrion? What are the functions of these structures present in mitochondria?

11 . Compare and contrast the structure and functions of mitochondria and chloroplasts.

12 . What are centrioles? Describe the structure, composition and functions of centriole.

13 . What is nuclear envelope? Describe the chemical composition and structure of nuclear envelope.

14 .
What is the relationship of endoplasmic reticulum with Golgi complex, lysosome and plasma membrane?

15 . Describe the pathway of protein signal and steroid signal from outside of a cell to inside.

16 .

Categorize and explain different types of stem cells.

17 . What are the advantages and disadvantages of using induced Pluripotent stem cells?

18 . Differentiate between prokaryotic and eukaryotic cells with diagram.

19 . Compare and contrast simple and facilitated diffusion.

20 . Explain the stages of mitosis with diagram.

21 . Explain the stages of melosis with diagram

22 . Describe the chemical composition of protoplasm.

23 .
Distinguish carbohydrates, proteins, lipids and nucleic acids as the four fundamental kinds of biological molecules.

24 . How the properties of water make it the cradle of life?

25 . Distinguish the properties and role of monosaccharides.

26 . Write the emperical formula of monosaccharides and classify them.

27 . Compare the stereoisomers of glucose.

28 . Distinguish the properties and role of disaccharides.

29 . Distinguish the properties and role of polysaccharides.

30 . Describe the properties and roles of starch, glycogen, cellulose and chitin.

31 . List examples and the roles of structural and functional proteins.

32 . Describe the molecular level structure of nucleotides.

33 . Distinguish among the nitrogenous bases found in the nucleotides of nucleic acids.

34 . Explain the formation of phosphodiester bond.

35 . What is a gene? How gene codes for the formation of a polypeptide?

36 . Explain general strucutre of RNA.

37 . Explain the structure and role of three types of RNA.

38 . Describe the roles of the following conjugated molecules:(a) Glycolipids(b) glycoproteins

(c) lipoproteins(d)nucleoproteins

39 . Write the properties of enzymes.

40 . Explain the role and component parts of the active site of an enzyme.

41 . Explain how an enzyme catalyzes specific reactions.

42 . Explain through graph how an enzyme speeds up reaction by lowering the energy of activation.

43 . Describe how the concentration of enzyme affects the rate of enzyme action.

44 . Explain the effect of substrate concentration on the rate of enzyme action.

45 . Describe enzymatic inhibition, its types and its significance.

46 . Classify enzymes on the basis of reactions catalyzed.

47 . Describe the structure of chlorophyll.

48 . Explain the arrangement of photosystems.

49 . Describe the mechanism of photosynthesis.

50 . Explain in detail the light dependent phase of photosynthesis?

51 . Describe the kinds of cellular respiration.

52 . Give an account of 'Glycolysis".

53 . Explain electron transport chain.

54 . Explain chemiosmosis and oxidative phosphorylation.

55 . Describe substrate level phosphorylation.

56 . Describe the structure of bacteriophage with diagram.

57 . Describe the structure of human immunodeficiency virus with diagram.

58 . Describe the Lytic and Lysogenic life cycles of a virus.

59 . Describe the usage of bacteriophage in genetic engineering.

60 . Describe the treatments available for AIDS.