

INSTRUCTION: CHOOSE THE MOST SUITABLE ANSWERS FROM THE GIVEN ALTERNATIVES.

1. The word 'cell' was first coined by Robert Hooke when he examined:

A. Living cells in cork tissue	C. dead cells in skin
B. Dead cells in cork tissue	D. living cells in skin
2. Anton van Leeuwenhoek saw what he called 'animalcules' and 'tiny animalcules'. These were, respectively:

A. Bacteria and viruses and viruses	C. protocistsans
B. Bacteria and protocistsans and bacteria	D. protocistsans
3. The first cell theory stated by Schleiden and Schwann was not completely accurate because it held that:

A. All living things are made of cells dual existence	C. the cell retains a
B. The cell is the basic unit of living things	D. cells form by
4. Which of the following is incorrect pairing of biologists and their contribution in the development of cell theories?

A. Robert hook- Coined the word cell	
B. Anton Van Leeuwenhoek - Animalcules and tiny animalcules	
C. Rudolf Virchow - Cell come from preexisting living cell	
D. Rene Dutrochet- Cell is structural and functional unit of life	

Cell size

5. 40 divisions on the scale of an eyepiece graticule correspond to 16 small divisions on the stage micrometer. Each small division on the stage micrometer = 10 μm . 8 cells fit across 40 divisions of the eyepiece graticule. The length of each cell is:

A. 10 μm	B. 40 μm	C. 30 μm	D. 20 μm
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6. The surface-area-to-volume ratio of a cell is important because it is a measure of:

A. How efficiently the cell releases energy in respiration	
B. How efficient the cell is in conserving energy	
C. How efficient the cell is in obtaining the oxygen it needs for respiration	
D. How efficiently the cell uses the energy it releases in respiration	
7. **How efficient the cell is in obtaining the oxygen it needs for respiration.** How efficiently the cell uses the energy it releases in If an object having a size of 0.005millimeter is magnified by an eye piece of 10x and objective lens of 10x. What is the magnified size of an object in micrometer?

What would happen if pure water was introduced into the body instead of saline?

A. The cell would gain water and swell

B. The cell would lose water and shrivel

C. The cell would become impermeable to Sodium ion.

D. The cell would become impermeable to Chloride ion.

16. If red blood cells are immersed in a hypotonic solution, they will:

A. Take in water by osmosis, swell and become turgid .

B. Lose water by osmosis and shrink

C. Lose water by osmosis and become flaccid

D. Take in water by osmosis, swell and burst

17. Suppose three potato cylinders are kept for sometimes in 15%, 8% and 4% sucrose solutions respectively and the 4th cylinder is kept in distilled water, which one of the cylinders will be more flaccid?

A. The cylinder in 4 %solution

C. The cylinder in

15%solution

D. The cylinder in 8%solution B.The cylinder in distilled water

18. Which of the following will happen if a plant cell is kept in a solution that is stronger than its protoplasm?

A. The cell will become turgid
brust

C. The cell will swell and

B. The central vacuole will expand
get plasmolysed

D. The protoplasm will

19. A sodium potassium pump within a cell membrane requires energy to move sodium and potassium ions into or out of a cell. The movement of glucose into or out of a cell does not require energy. Which statement best describes the movement of these materials across a cell membrane?

A. Sodium and potassium ions move by active transport, and glucose moves by osmosis.

B. Sodium and potassium ions move by active transport, and glucose moves by facilitated diffusion.

C. Sodium and potassium ions move by facilitated diffusion, and glucose moves by osmosis.

D. Sodium and potassium ions move by facilitated diffusion, and glucose moves by active transport.

20. In order for nerve cells and muscle cells to function properly, they require a high concentration of potassium ions inside the cells and a high concentration of sodium ions outside the cells. To maintain this condition, cells utilize sodium potassium pumps embedded within their cellular membranes to move the ions against their concentration gradients. Since sodium potassium pumps require an input of energy to operate, they are an example of...

A.Passive transport. B. filtration. C. facilitated diffusion. **D. active transport**

21. In many eukaryotic cells, DNA stored in the nucleus is transcribed into messenger RNA. The mRNA is then transported into the cytoplasm where ribosomes assist in their translation into proteins. Finally, these proteins are packaged and sorted in the Golgi apparatus for use in other parts of the cell or in preparation for secretion into other cells. Which of the following statements is supported by this description?
- A. Various organelles interact with each other to carry out life processes.**
 - B. Organelles within a cell act independently of each other at all times.
 - C. Some organelles are more important than other organelles within a cell.
 - D. Only up to three organelles may interact with each other at any given moment in time.
22. Which of the following statements concerning mitochondria and chloroplasts is correct?
- A. Only mitochondria are surrounded by two membranes.
 - B. The inner membrane of chloroplasts is folded into cristae.
 - C. Both organelles have a fluid interior.**
 - D. Mitochondria contain stacks of membranes called thylakoid.
23. The functions of the rough endoplasmic reticulum and the Golgi body are related because:
- A. Proteins synthesized by the rough endoplasmic reticulum are modified by the Golgi body**
 - B. Proteins synthesized by the Golgi body are modified by the rough endoplasmic reticulum
 - C. Lipids synthesized by the Golgi body are modified by the rough endoplasmic reticulum
 - D. Lipids synthesized by the rough endoplasmic reticulum are modified by the Golgi body
24. Which of the following is not part of the structure of mitochondria?
- A. double membrane surrounding the organelle
 - B. A fluid matrix inside the organelle
 - C. Stacks of membranes known as thylakoid**
25. In which of the following organelles is a cell's ATP produced?
- A. Mitochondrion**
 - B. Golgi apparatus
 - C. endoplasmic reticulum
 - D. Lysosome
26. Proteins are made on the
- A. Mitochondria.
 - B. Nucleus
 - C. Ribosomes.**
 - D. plasma membrane.
27. The packaging and distribution center of the cell is the
- A. Nucleus.
 - B. central vacuole.
 - C. Golgi apparatus.**
 - D. nuclear envelope.
28. The double membrane surrounding the nucleus is called the

- A. Nucleolus. B. nucleolus. C. nuclear wall. **D. nuclear envelope.**
29. All of the following are found in both plant and animal cells, except **A. A cell wall.** C. mitochondria.
B. A plasma membrane. D. the endoplasmic reticulum.
30. How are chloroplasts like mitochondria?
A. They can both use energy from sunlight. **C. They both contain DNA.**
B. They look alike. D. They are both found in animal cells.
31. The organelles associated with photosynthesis are the
A. Mitochondria. B. Golgi apparatus. **C. Chloroplasts.**
D. Vacuoles.
32. Plant cells have a large membrane-bound space in which water, waste products, and nutrients are stored. This place is known as a ____
A. Mitochondrion. B. Golgi apparatus. C. Chloroplast **D. Central vacuole.**
33. Plant cells
A. Do not contain mitochondria.
B. Have a large central vacuole instead of a Golgi apparatus.
C. Have a cell wall instead of a plasma membrane.
D. Have chloroplasts and cell wall.
34. Which of the following is NOT true about cells:
A. All cells have a plasma membrane
B. Animal cells are on average smaller than plant cells
C. All living things are composed of cells
D. Plant cells usually have a cell wall just inside the plasma membrane.
35. The cell's plasma membrane is best described as: **A. A lipid bilayer with imbedded proteins**
B. A carbohydrate bilayer with imbedded lipids
C. A protein bilayer with imbedded proteins D. A protein monolayer with an imbedded lipid bilayer
36. Which of the following is NOT true of proteins:
A. They can act as hormones
B. Their activity is altered by temperature changes
C. They store genetic information and pass it from generation to generation. D. Their activity is altered by pH changes
37. A researcher made an interesting observation about a protein made by the rough ER and eventually used to build a cell's plasma membrane. The protein in the membrane was actually slightly different from the protein made in the ER. The protein was probably changed in the:
A. Golgi apparatus. B. smooth ER. C. mitochondrion. D. nucleus.

38. Which of these organelles modifies cell products and then packages them for distribution?
- The nucleus
 - The mitochondrion
 - The cell membrane
 - The Golgi apparatus
39. Which of the following correctly matches an organelle with its function?
- mitochondrion -photosynthesis
 - Nucleus -creation of energy (ATP) from sugars.
 - Lysosome - movement
 - central vacuole - storage
40. During which stage of aerobic respiration carbon dioxide is produced?
- Link reaction and Krebs cycle**
 - Citric acid cycle and glycolysis
 - Link reaction and electron transport chain
 - Glycolysis and electron transport system
41. The oxidation of glucose molecule into two molecules of pyruvate, ATP, NADH is known as _____ and takes place in _____:
- Glycolysis and mitochondria
 - Glycolysis and cytoplasm**
 - link reaction and cytoplasm
 - Link reaction and mitochondria
42. Which of the following is **not true** concerning Adenosine triphosphate?
- It is formed in the same amount during aerobic & an aerobic pathway**
 - It releases energy in a single step of hydrolysis reaction
 - Used to couples energy releasing and energy requiring reaction
 - It is said to be nucleotide with two extra phosphate group
43. What is role of oxygen in the aerobic respiration?
- It combines with CO₂ to form citrate
 - Act as terminal electron acceptor in the electron transport chain**
 - It combines with acetyl coenzyme A to form oxalo acetate
 - It combines with ADP in the formation of ATP
44. Which of the following is true about the site where kreb cycle?
- It occur in the matrix of mitochondria**
 - It takes place in inner membrane of mitochondria
 - It occur in the intermembrane space of mitochondria
 - It occur in the Cytosol of cytoplasm
45. Among the following identify one that bestly explains respiration?
- Reductive ,catabolic and exergonic
 - Reductive ,endergonic and anabolic
 - Oxidative, exergonic and catabolic

- D. Oxidative ,exergonic and catabolic
46. Which phosphate group bond of ATP is broken when energy it contains needed for cellular process?
A.The second bond B. C-C bond C. The first bond D. The third bond
47. As electron passes down the electron transport chain of the mitochondria:- A.They produce reduced NAD to the next process
B. Carbon dioxide is produced & FAD^+ is reduced
C. They lose energy as they pass from one electron carrier to next.
D. They gain energy as they pass from one electron carrier to the next.
48. In which of the following pair's cellular respiration does substrate level phosphorylation occur?
a. Glycolysis and Chemiosmosis
b. Electron transport chain and Chemiosmosis
c. Krebs cycle and Glycolysis
d. Krebs cycle and Chemiosmosis
49. What does the fermentation of glucose by yeast normally yields:-
A. 2CO_2 , 2ATP & lactic acid C. 2CO_2 , 2ATP & ethyl alcohol
B. 2CO_2 , 36ATP& ethanol D. 2ATP and lactate
50. Which one of the following is NOT component of nucleotide during phosphorylation process?
a. Phosphate group C. Nitrogenous bases
b. Pentose sugar unit D. Amino acid sequence
51. How many ATP molecules is produced per complete oxidation of single glucose molecule during cellular respiration?
a. 4ATP B.24ATP C.30ATP D. 36ATP
52. Starting with two molecules of acetyl CoA and oxaloacetate, Krebs cycle after regeneration ends with:
a. 1ATP , 2CO_2 ,1FADH₂and 3NADH
b. 2pyruvate, 2ATP and 2CO_2
c. 10NADH,34ATP and 2FADH₂
d. 2ATP, 4CO_2 ,2FADH₂ and 6 FADH₂
53. During Krebs cycle, to which one of the following coenzyme does most of energy released from glucose molecule is transferred?
a. NAD B.NADP C.FAD D.AMP
54. What is role of oxygen in the aerobic respiration? It:-
a. Combines with CoAto form acetyl CoA
b. Used as final electron acceptor in the electron transport chain.
c. Combines with pyruvate to form acetyl CoA
d. Transfer proton from one carrier to next
55. During which one of the following processes of cellular respiration is most of ATP produced? A.Glycolysis B. Kreb cycle C.Link reaction D.Chemiosmosis
56. What chemiosmosis represent during aerobic respiration pathway?

- a. Passing of electron from one carrier to next
 - b. Splitting of glucose an aerobically
 - c. Diffusing of proton down concentration gradient
 - d. Regeneration of coenzymes under glycolysis
57. Among the following cellular process one releases carbon dioxide to the surrounding atmosphere:
- a. Assimilation B.Photosynthesis C.Respiration D. Feeding
58. Which one of the following is **NOT** true about oxidative level phosphorylation?
- A. It comprises ETC and chemiosmosis
 - B. It is catalyzed by ATP synthases enzyme
 - C. It depends on proton passing through rotor spin of ATP synthases
 - D. It produces ATP by substrate level phosphorylation
59. When athletes take part in short distance race, how does the cell generate energy needed? By:
- A. Aerobic respiration in muscle cell
 - B. anaerobic respiration in muscle cell
 - C. alcoholic fermentation in cytoplasm
 - D. aerobic respiration in inner membrane
60. When the muscle cells are in short supply of oxygen, which of the following compounds would be accumulate in them?
- A. Ethanol B. Acetic acid C. Pyruvic acid D. Lactic acid
61. One of the following molecule acts as a final/terminal electron acceptor of a respiration? A.NADP B. FADH₂ C. Water D. Oxygen
62. The first molecule produced when Acetyl COA combines with oxaloacetate in fluid matrix of mitochondria?
- A. Citrate B. Malate C. Isocitrate D .Succinate
63. Starting with two molecules of pyruvate and two coenzymeA, link reaction results which of the following end products?
- A. 2Acetyl COA , 2CO₂ and 2NADH
 - B. 2Acetyl COA, 2ATP and 2CO₂
 - C. 2Acetyl COA, 2ATP and 2NADH
 - D. 2Acetyl COA, 2CO₂ and 2FADH₂
64. From the oxidation of **10NAD** and **10FADH₂** molecule, how many proton pumped through ATP synthase and how many ATP synthesized in rotor spin respectively?
- A. 54H⁺ and 27ATP
 - B. 100H⁺ and 50 ATP
 - C. 60H⁺ and 30 ATP
 - D. 70 H⁺ and 35 ATP
65. All of the following are describes why chloroplast is suited to its function "**Except**"
- a. The chlorophyll & other photosensitive pigment molecules are arranged in photosystem.

- b. The molecules of photosystem & the ETC are fixed in the membrane of thylakoid.
 - c. It's composed of stroma provides fluid medium for the reaction of dark reaction.
 - d. **The inner membrane is folded to speed up reaction of light dependent stage.**
66. Which of the following is **true** regarding cyclic photophosphorylation?
- A. Only photosystem II is involved in the process.
 - B. **It produces oxygen & reduced NADP.**
 - C. The flow of electron is from PSI to PSI.
 - D. Is the most common type of photophosphorylation
67. Which of the following is **NOT true** about photosystem II?
- a. It contains the reaction center chlorophyll **a**
 - b. It absorbs maximum light at 680nm wave length
 - c. **It absorbs maximum light at 700nm wave length**
 - d. It contain reaction center molecule and antenna complex
68. From the following identify the **wrong** statement about PsII and PSI?
- A. Each photosystem linked with different ETC
 - B. PSI linked with '**fd**' to transfer excited electron to NADP
 - C. PsII involved in both cyclical and non-cyclical phosphorylation
 - D. Each photosystem have reaction center and antenna complex
69. Which one of the following pairs of plants is **NOT** photosynthesis by **C4** and **CAM** pathway respectively?
- a. Sugar cane and pineapple
 - b. Sorghum and Cacti
 - c. Maize and Cacti
 - d. cacti and sorghum
70. All of the following are generally true about photorespiration **EXCEPT** one?
- a. It involves RuBP binding with oxygen
 - b. It lower photosynthetic efficiency
 - c. It is reductive process that consume ATP and NADP
 - d. It is a condition in low [oxygen] and common in C₃ plants
71. Which one of the following pairs of photosynthetic pigment has maximum absorptive spectrum at which rate of photosynthesis is effective than else?
- a. Violet and Blue
 - b. Blue and Red
 - c. Green and Red
 - d. Yellow and Red
72. Which one of the following is **NOT** generally true about Non-cyclical phosphorylation?
- a. Chlorophyll molecule is initial and final donor and acceptor of a chain
 - b. It involves one way electron flow from water to NADP
 - c. It involves both PSII and PSI

- d. It ends up with generation of ATP, NADP and O₂
73. Which one of the following pairs of factors directly influences light dependent and light independent reaction respectively and indirectly influences each other vice versa?
- Light intensity and Carbon dioxide concentration
 - Temperature and chlorophyll molecule
 - Carbon dioxide concentration and light intensity
 - Temperature and light intensity
74. Which one of the following pigment in a photosystem is referred as a reaction center where light dependent reaction starts?
- Xanthophylls
 - Chlorophyll b
 - Chlorophyll a
 - Carotenoids
75. Which one of the following is **NOT** true about CAM pathway?
- Is adapted to desert (arid) condition with high temperature and low moisture
 - They open and close their stomata at different circadian rhythm.
 - They have needle leaved and long rooted plant with thick bark
 - They have no role in sugar production
76. Among the following reaction in C₃, C₄ and CAM Pathway, one similarly takes place in mesophyll cell:
- Fixation of carbon dioxide
 - Calvin cycle
 - Generation of ATP and NADP
 - Sugar production
77. In light dependent stage of photosynthesis light is essential for:
- Fixation of carbodioxide from the atmosphere
 - Synthesis of ATP and proton carrying coenzyme
 - Regeneration to ribulose biphosphate
 - Combination of carbodioxide and water
78. Which one of the following reactions commonly occurs in both Cyclical and Non-cyclical phosphorylation of photosynthesis in thylakoid membrane of chloroplast?
- Production of reduced NADP
 - Generation of ATP
 - Generation of O₂ and water photolysis
 - Involvement of both PsII and PsI
79. In what way chloroplast in bundle sheath cell of C₄ plants adapted for the pathway?
- Absence of Calvin cycle
 - Presence of thylakoid membrane
 - Absence of thylakoid membrane
 - Dependence on high oxygen concentration
80. Which one of the following organelles involved in photorespiration to convert phosphoglycolate into glycolate to be re-used in Calvin cycle respectively?
- Chloroplast, Mitochondria and Peroxisome

- b. Ribosome, Nucleus and Mitochondria
 - c. Chloroplast, Peroxisome and Mitochondria
 - d. Nucleus, Ribosome and Golgi body
81. What is the main advantage that a photosystem containing molecules of different types light sensitive pigments have?
- a. To increase amount/number of photosystem.
 - b. To absorb light of the different wave length
 - c. To increase amount of ATP in cell
 - d. To Increase number of chlorophyll molecule in the cell
82. Which of the following is true regarding cyclic photophosphorylation?
- a. Only photosystem II involved & red. NADP
 - b. The flow of electron is from PSI to PSI
 - c. It produces oxygen
 - d. There is ATP production
83. Under what conditions do C4 plants have more photosynthetic efficiency than C3 plants?
- a. Low temperature
 - b. Low light intensity
 - c. Low CO₂ concentration
 - d. High CO₂ concentration
84. Which of the following reaction represents photo respiration?
- A. $6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
 - B. $\text{CO}_2 + \text{RUBP} \rightarrow 2\text{G3P}$
 - C. $\text{O}_2 + \text{RUBP} \rightarrow 1\text{G3P} + \text{phosphoglycolate}$
 - D. $\text{CO}_2 + \text{phosphoenolpyruvate} \rightarrow \text{Oxaloacetic acid}$
85. Which one of the following molecules initially combines with CO₂ in stroma of chloroplast?
- a. Glycerate phosphate
 - b. Oxalo acetate
 - c. Phosphoenol pyruvate
 - d. Ribulose biphosphate
86. Which of the following plants carryout light dependent and primary CO₂fixation in separate time?
- a. C-3 plants
 - b. C-4 plants
 - c. CAM plants
 - d. Both CAM and C4 plants
87. Which of the following is the correct sequence of the reaction in Calvin cycle of photosynthesis?
- A. Regeneration of RuBP, reduction reaction and CO₂ fixation.
 - B. Regeneration of RuBP, CO₂fixation and reduction reaction.
 - C. CO₂fixation, regeneration of RuBP and reduction reaction.
 - D. CO₂fixation, reduction reaction and regeneration of RuBP