ENTRANCE HUB ETHIOPIA
GRADE 11 UNIT 5
PAST ENTRANCE EXAMINATION

Energy transformation

1, Which of the needs of living organisms are provided by the sun?

A, Water and minerals B, Light and heat

C, carbon dioxide and minerals D, Oxygen and carbon dioxide

2, Which of the following terms refers to all the cellular process of breaking down and building up of molecules?

A, Catabolism B, Anabolism C, Metabolism D, Hydrolysis

3, If oxygen is continuously bubbled through fermentation mixture, Which one of the following would the yeast stop producing?

A, ATP B, Pyruvic acid C, Carbon dioxide D, Ethyl alcohol

4, where does oxygen we inhale ultimately end up?

A, In ATP formation B, In CO_2 formation C, In H_2O formation D, in glucose formation

5, What is the energy currency of a cell?

A, DNA B, Glucose C, Starch D, ATP

6, Choose the one that represents anabolic reaction?

A, Deamination B, Photosynthesis C, Digestion D, Aerobic respiration

7, Which of the following happens during the dark reaction of photosynthesis?

A, ATP is produced B, NADPH is produced C, Oxygen is split from water D, Carbon dioxide is fixed

8, In cellular respiration, which of the following molecules enters the kreb cycl?

A, Glucose B, Acetyl CoA C, Pyruvic acid D, Lactic acid

9, Which of the following compounds contain more energy per molecule than all the others?

A, ATP B, $FADH_2$ C, $NADH_2$ D, Acetyl CoA

10, In C3 plants(calvin cycle), the carbondioxide acceptor is

A, Oxaloacetic acid B, Ribulose diphosphate C, Phosphoglycerate D, Phosphoenol pyruvate

11, All of the following occur in the mitochondria of the cell except?

A, Keb cycle B, Pyruvate formation C, Oxidative phosphorylation D, Acetyl CoA formation

12, Under aerobic condition, what is the net energy gain from the glycolysis of one molecule of glucose?

A, 2ATP + 2NADH2 B, 2ATP + 4NADH2 C, 4ATP + 2NADH2 D, 3ATP + 4NADH2

13, Which of the following are produced in the light reaction of photosynthesis?

A, ATP B, NADPH C, PGA D, Only A and B are answer

14, Which of the following is not true about the light phase of photosynthesis?

A, Electron flow from photosystem II and I

B, the reactive molecule of photosystem I is P80

C, Electrons lost from the photosystems are replaced by electrons from water

D, ADP is converted to ATP

15, Which molecules in plant cells first capture the energy from the sun light during photosynthesis?

A, Adenosine triphosphate B, Chlorophyll C, Carbon dioxide D, Glucose

16, Which one of the following alternatives gives the products of fermentation of glucose by yeast?

A, lactic acid, Carbon dioxide, 2ATP B, CO_2, H_2O, 36ATP

C, Alcohol, CO_2, 2ATP D, Alcohol, CO_2, 36ATP

17, If a cell contains 10NADH + 10FADH2 molecules, a total of how many ATP molecules would it produce from them?

A, 20 ATP B, 30 ATP C, 50 ATP D, 60 ATP

18, Which of the following is not true of fermentation?

A, Net gain of only two ATP

B, NADH donates electrons to electron transport system

C, Occurs in the cytosol

D, Begins with glucose

19, Which one of the following compounds contains more energy than all the rest per molecule?

A, FADH2 B, Pyruvic acid C, NADH D, ATP

20, Which one of the following is correct sequence for the main processes of cellular respiration?

A, kreb cycle, electron transport system, glycolysis

B, glycolysis, Kreb cycle, electron transport system

C, Electron transport system, glycolysis, Kreb cycle

D, Glycolysis, Electron transport system, kreb cycle

21, Which of the following is most important pigment for photosynthesis?

A, Chlorophyll a B, Chlorophyll b C, Carotenoid D, Xanthophylls

22, The greatest contributor of electrons to electron transport system is

A, oxygen B, Kreb cycle C, The transition reaction D, Glycolysis

23, Which of the following molecules is known as the energy currency of the cell?

A, Glucose B, Starch C, Fat D, ATP

24, What is the source of oxygen that green plants release during photosynthesis?

A, Sugar B, Carbon dioxide C, water D, Chlorophyll

25, Choose the electron acceptor in electron transport chain during aerobic respiration of eukaryotic cell?

A, H_2O B, O_2 C, CO_2 D, NADP

26, Where in the plant cell does kreb cycle (citric acid cycle) takes place?

A, Nucleus B, cytoplasm C, Mitochondria D, Chloroplast

27, Which of the following id true about first stage of photosynthesis?

A, Light dependent B, Temperature dependent C, ATP driven D, Glucose driven

28, What is the process by which cells like amoeba and white blood cells engulf and internalize particles such as bacteria?

A, Osmosis B, Pinocytosis C, Phagocytosis D, Active transport

29, To which of the following molecule is most of energy released during the kreb cycle transferred?

A, ATP B, $FADH_2$ C, NADH D, ADP

30, Where in the mitochondria does the kreb cycle take place?

A, on the cristae B, On the matrix

C, between the outer and inner membrane D, On the outer surface of the outer membrane

31, Which process of respiration helps to release most of energy stored in glucose?

A, oxidative phosphorylation B, glycolysis C, Fermentation reaction D, Anaerobic reaction

32, What term is used to describe the chemical process of living organisms that involves both the joining up of monomers to produce polymers and the splitting of polymers to monomers?

A, Anabolism B, catabolism C, Metabolism D, polymorphism

33, Which of the following steps in cellular respiration can take place in the absence of oxygen?

A, Electron transport B, Glycolysis C, Kreb cycle D, Acetyl CoA formation

34, In aerobic respiration of cells, in which cellular part does the Kreb cycle (citric acid cycle) take place?

A, Chloroplast B, Mitochondria C, Nuclei Lysosome

35, What is the final electron acceptor in electron transport chain?

A, O_2 B, H_2 C, $NADP^+$ D, NAD^+

36, When the muscle cells are in short supply of oxygen, which of the following compounds would be accumulated in them?

A, ethanol B, Acetic acid C, Lactic acid d, Carbon dioxide

37, Which of the following processes of photosynthesis does not require the presence of light to take place?

A, the splitting of water B, ATP formation C, Reduction of NADP D, Carbon fixation

38, Which of the following is not one of the stages in cellular respiration?

A, Calvin cycle B, glycolysis C, electron transport system D, Kreb cycle

39, Among the molecules found in cells, which of the following contains less energy?

A, A glucose molecule B, An amino acid C, A Triglyceride D, A water molecule

40, What is the correct equation for cellular respiration?

A, $6CO_2 + 6H_2O + energy = 6H_2O + C_6H_{12}O_6$

B, $6CO_2 + C_6H_{12}O_6 = 6CO_2 + 6H_2O + energy$

C, $6O_2 + C_6H_{12}O_6 + energy = 6CO_2 + 6H_2O$

D, $6CO_2 + 6H_2O = 6O_2 + C_3H_{12}O_6$ + energy

41, What amount of net gain in ATP does glycolysis provide to a cell?

A, 2ATP molecule B, 4ATP molecule C, 18ATP molecule D, 36ATP molecule

42, How many moles of ATP would be generated as a result of the oxidation of one mole of $FADH_2$ in an actively respiring mitochondrion?

A, 0 B, 3 C, 2 D, 6

43, Which of the following is true for cellular respiration?

A, Restricted to plant cells B, restricted to animal cells

C, Occurs in all eukaryotic cells D, Occurs in prokaryotic cells only

44, In cyclic phosphorylation, what is the source of recycled electron?

A, Reduced NADP B, Chlorophyll molecule

C, Adenosine triphosphate D, Photolysis of water molecule

45, If there no free oxygen to breath, which one of the following steps of the respiration process can operate in our body?

A, Glycolysis B, Kreb cycle

C, Electron transport chain D, Link reaction

46, What is the source of the oxygen that is produced during the process of photosynthesis by higher plants?

A, CO_2 B, H_2O C, ATP D, Chlorophyll

47, Which energy rich organic compounds contain adenine in its molecule?

A, lipid B, Carbohydrate C, Glucose D, ATP

48, During chemiosmosis, what substance diffuses from one side to the other side of the membrane?

A, Water molecules B, Protons C, Electrons D, ATP molecules

49, Which of the following is not true about photosystem II?

A, the reaction center molecule is p680

B, It passes its excited electron to photosystem I

C, The energy lost from the excited electrons reduce NADP

D, It replenish its lost electron from photolysis of water

50, What is the importance of chemiosmosis in photosynthesis and cellular respiration?

A, Splitting the water molecule B, operating the proton pump

C, Combining hydrogen and carbon D, Synthesizing ATP

51, Where does the light dependent reaction of photosynthesis occur in chloroplast?

A, In the thylakoid membrane B, In the fluid of stroma

C, In all parts of the chloroplast D, In the stomata opening

52, For which of the following is the sugar produced by photosynthesis is not used?

A, To produce biomass B, To make new DNA

C, To produce ATP in respiration D, to produce enzymes

53, In which process is ATP generated during short distance high speed running?

A, Aerobic respiration B, Mitochondrial energy transformation

C, Anaerobic respiration D, The kreb cycle

54, How many net ATP molecules are generated through anaerobic respiration when a single glucose molecule is changed to pyruvate in the human body?

A, Two B, Three C, Four D, Six

55, During the kreb cycle, which of the following molecules temporarily stores most of the energy released from the food molecule?

A, ADP B, ATP C, NADH D, FADH

56, At which stage is most of ATP generated in aerobic respiration?

A, Glycolysis B, Link reaction C, Kreb cycle D, electron transport

57, If present in fermentation system, which one of the following could negatively affect alcohol production buy the yeast?

A, Water B, Oxygen C, Glucose D, Fermentation enzyme

58, Which substance is not necessary for photosynthesis to take place?

A, Chlorophyll B, Carbon dioxide C, oxygen D, water

59, Which of the following is an accurate representation of the relationship between terms metabolism, catabolism and anabolism?

A, Anabolism = catabolism B, Metabolism = catabolism

C, Anabolism = catabolism + metabolism D, Metabolism = catabolism + anabolism

60, Which is the ultimate source of energy for all organisms living on the earth?

A, water B, oxygen C, Nitrogen D, Sun light

61, Where exactly in the cell does the kreb's cycle takes place?

A, Mitochondrial matrix B, Inner mitochondrial membrane

C, Cytoplasmic fluid D, Outer mitochondrial membrane

62, The molecule of which pigment is located at the reaction center of photosystem?

A, chlorophyll a B,. Chlorophyll b C, Carotenoid D, Accessary pigment

63, In which of the following ways is the carbon dioxide of the atmosphere fixed into the carbon found in the organic molecule?

A, In the breathing process of all animals

B, In the decomposition of organic molecules

C, In the process of photosynthesis by green plants

D, In all cellular respiration p[processes of all organisms

64, Which of the following groups of plants carry out light dependent and light independent reaction of photosynthesis in separate cells?

A, C – 3 plants B, C- 4 plants C, CAM plants D, Plants without chlorophyll

65, During aerobic respiration, what is the route through which protons return from the mitochondrial inter membrane space back to its matrix?

A, Proton pump B, ATP synthase C, ion channel D, Membrane lipid

66, From which of the process cellular respiration is the majority of the ATP generated?

A, Anaerobic fermentation B, Glycolysis and link reaction

C, Electron transport and chemiosmosis D, Kreb's cycle and glycolysis

67, On which of the following does algal photosynthesis in a lake depend?

A, The oxygen content of the water B, the nitrogen content of the water

C, The elevation where the lake is found D, the amount of light that penetrate the lake water

68, Which of the following is a coenzyme?

A, NAD B, carbohydrate C, Water molecule D, Protein

69, Which of the following classes of organic molecule is the least important source of energy for cellular respiration?

A, Nucleic acid B, Lipids C, Carbohydrates D, proteins

70, Which of the following processes have decreasing effect on the concentration of atmospheric carbon dioxide?

A, Cellular respiration B, combustion of fossil fuel

C, Decomposition of dead organisms' D, photosynthesis

71, In which industrial products is pyruvate fermentation by yeast practically applied?

A, Brewing beer B, Swiss cheese making C, Production of vinegar D, yoghurt making

72, When athletes take part in short distance running, how do the cells generate most of the energy that is quickly needed?

A, Aerobic respirations in muscle cells B, Mitochondria respiration in any cells

C, Anaerobic respiration in muscle cells D, yeast fermentation in the stomach

73, Cells immediately use energy that electrons lose as they pass along the chain of electron carriers to:

A, produce ATP B, pump proton C, Spin the rotor of ATP synthesis D, Reduce NAD

74, Which of the following happens in both cyclic and non-cyclic phosphorylation?

A, ATP is formed B, oxygen is generated C, NADP is reduced D, Water molecule splits

75, What does the fermentation of glucose by yeast normally yield?

A, Lactic acid, CO_2 and 2ATP B, CO_2, H_2O and 36 ATP

C, Alcohol, CO_2 and 2 ATP D, Alcohol<CO_2, and 36 ATP

76, Which of the following is not true about C4 plants such as teff?

A, CO_2 is harvested during the night time

B, The bundle sheath cells contain chloroplast

C, Light dependent reactions occurs in the mesophyll cells

D, Chloroplast of bundle sheath cells lack thylakoid

77, What is the purpose of the in folding of the inner membrane of the mitochondrion?

A, Increasing the photosynthesis capacity of the cell

B, spending up the loss of CO2 during fermentation

C, spending up the process of glycolysis

D, increasing the surface area for ATP production

78, What is the molecule in plant cells that first captures the radiant energy from sun light?

A, ATP B, DNA C, Chlorophyll D, Carbon dioxide

79, From which of the following does oxygen released during the process of photosynthesis originate?

A, Pyruvic acid B, CO2 C, Sugar D, Water

80, What happens in the first reaction of kreb cycle during energy transformation?

A, A 2 – C compound is produced B, A 6– C compound is produced

C, A 4 – C compound is produced D, A 5 – C compound is produced

81, Under what condition do C4 plants have more photosynthetic efficiency than C3 plants

A, low water supply B, low temperature c, low light intensity D, low CO2 concentration

82, During which of the following process in cellular respiration are most of the ATPs formed?

A, Glycolysis B, Chemiosmosis C, Link reaction D, kreb cycle

83, Which of the following is the adaptation by C4 plant that helps them to avoid photorespiration?

A, Harvesting of CO2 at night

B, Using separate cells for light and dark reaction

C, Storing CO2 in the vacuole

D, keeping the stomata closed during the day

84, Which one of the following substance is not formed when glucose is fermented by yeast?

A, Alcohol B, ATP C, Lactic acid B, Carbon dioxide

85, Which phosphate bond of the ATP is broken when the energy it contains is needed for cellular activity?

A, The first bond B, the C-c bonds C, The second bind D, the third bond

86, What is the advantage of photosystem containing molecules of different types of light sensitive pigment having?

A, To absorb light of different wave length

B, to increase the size of photosystem

C, To increase the complexity of the photosystem

D, to increase the surface area for the light absorption

87, Which of the following plants use CAM photosynthesis?

A, Sugar cane B, sorghum C, Maize D, Cactus

88, The conversion of one molecule of glucose to two molecules of pyruvate results in the net formation of?

A, Two molecules of ATP B, Six molecules of water

C, Three molecules of ATP D, Thirty eight molecules of ATP

89, What happens human red blood cells are kept in hypertonic solution?

A, The same net gain and loss of water B, More water get into the cell than leaving it

C, More water goes out of the cell than getting in

D, The cells prevent water from getting in or leaving out

90, Anabolic metabolism refers to the generation of ATP

A, without the involvement of ADP B, Without the use of glycogen

C, without the use of oxygen D, By the conversion of pyruvate to lactate

91, Glycolysis occurs in the

A, Cytoplasm B, Mitochondria C, Nucleus D, Chloroplast

92, During alcohol fermentation, pyruvic acid is in the presence of pyruvate decarboxylases first converted to

A, Glucose B, Lactose C, Lactic acid D, Acetaldehyde

93, During which stage of aerobic respiration does oxidative phosphorylation occur?

A, Glycolysis B, Kreb cycler C, Link reaction D, Chemiosmosis

94, During kreb cycle, to which of the following molecules is most of the energy released from food transferred?

A, ATP B, NAD C, ADP D, AMP

95, For which of the following processes is ATP not required?

A, diffusion of oxygen into cells

B, Synthesis of molecules

C, Active transport of molecules from one sir another

D, Muscle contraction

96, Among the following four processes, identify the one that evolved before all the other three?

A, Aerobic respiration B, Anaerobic respiration c, Oxidizing atmosphere D, photosynthesis

97, During anaerobic respiration, what is the gross number of ATP molecules that are produced per glucose molecule?

A, Two B, Three C, Four D, Six

98, At which is most of the carbon dioxide released during aerobic respiration?

A, glycolysis B, kreb cycle C, Electron transport D, chemiosmosis

99, One of the following groups of plants carry out light dependent and light independent reaction of photosynthesis in separate cells of the leaf?

A, plants adapted to temperature regions

B, Carbon 3 plants

C, Carbon 4 plants

D, Cacti

100, Why is that longer races by athletes must be run slower than shorter races?

A, To give time for lactic acid fermentation in muscle cells

B, To avoid hunger as food is quickly converted to energy

C, To allow aerobic respiration to produce the required ATP

D, To adapt to the weather condition at the racing place

101, Witch of the following takes place under normal conditions, as electron flow down the electron transport chain of the mitochondria?

A, NADH and FADH2 are oxidized B, The PH of the matrix increase

C, The electrons lose free energy D, An electrochemical gradient is formed

102, In the process of photosynthesis light is necessary to

A, Split CO2 B, release energy

C, Combine CO2 and H20 D, Produce ATP and a reducing substance

103, which is the convergence point of metabolism of the building blocks of carbohydrates, lipids and protein?

A, Cytoplasm B, kreb cycle C, Calvin cycle D, Electron transport

104, Among the following crops, which one uses a non C- 4 photosynthesis?

A, Maize B, Sorghum C, Pineapple D, Sugarcane

105, which of the following molecules can provide the cell the least amount energy per molecule?

A, Glucose B, Reduced NAD C, Reduced FAD D, ATP

106, During photosynthesis, which one of the following is the first step in the transduction of light energy to chemical energy?

A, ATP formation B, carbon fixation D, Photolysis of water D, Glucose formation

107, Respiration is

A, Anabolic and exergonic B, Catabolic and exergonic

C, Anabolic and endergonic D, Catabolic and endergonic

108, What is the ultimate source of electrons that replace those lost from photosystem II during photosynthesis?

A, Photosystem I B, Water C, chlorophyll a D, Chlorophyll b

109, In which part of mitochondria does kreb cycle take place?

A,, In the inner membrane space B, on the inner membrane surface

C, on the outer membrane surface D, In the matrix

110, How many ATP molecules are produced during the complete cellular respiration of one glucose molecule?

A, 2 B, 4 C, 36 D, 18

111, Which procedure allows biologists to separate cellular organelles and study their structure and composition separately?

A, Dehydrogenation b, Polymerization C, Phosphorylation D, Cell fractionation

112, If the average diameter of the human red blood cells is 0. 000007m, which one is the correct diameter when expressed in a smaller unit?

A, 7000nm B, 0.007µm C, 7nm D, 0.000007µm

113, The different steps for complete aerobic respirations are?

A, Glycolysis and oxidative phosphorylation

B, Glycolysis and kreb cycle

C, Kreb cycle and terminal oxidation

D, Glycolysis, kreb cycle and terminal oxidation

114, Witch of the following indicates the process of photosynthesis?

A, Reductive, endergonic and anabolic

B, Reductive, endergonic and catabolic

C, Reductive, exergonic and catabolic

D, Reductive, exergonic and anabolic

115, In an experiment to study photosynthesis, a plant was provided with radioactive carbon dioxide as metabolic terrace and the radioactive carbon was incorporated first into oxaloacetate. Which one of the following would best characterize this plant?

A, C3 plant B, C4 plant C, CAM plant D, Heterotrophic plant

116, Which of the four stages in aerobic respiration of glucose does not produce ATP?

A, Glycolysis B, Kreb cycle C, The link reaction D, Electron transport and chemiosmosis

117, Which of the following results in the production of oxygen during photosynthesis?

A, Reducing NADP+

B, Electron transfer system of photosystem II

C, Electron transfer system of photosystem I

D, Splitting of the water molecules

118, Which one is fist inhibited if a cell contains excess of ATP?

A, Glycolysis B, Kreb cycle C, Oxidative phosphorylation D, Electron transport

Answer

No.	Answer	No.	Answer	No.	Answer	No.	Answer	No.	Answer
1	B	26	B	51	A	76	C	101	D
2	C	27	A	52	D	77	D	102	D
3	D	28	C	53	C	78	C	103	A
4	C	29	C	54	A	79	D	104	C
5	D	30	C	55	C	80	B	105	D
6	B	31	A	56	D	81	D	106	A
7	D	32	C	57	B	82	B	107	B
8	B	33	B	58	C	83	B	108	B
9	D	34	B	59	D	84	C	109	D
10	B	35	A	60	D	85	D	110	C
11	B	36	C	61	B	86	A	111	D
12	A	37	D	62	A	87	D	112	A
13	D	38	A	63	C	88	A	113	D
14	B	39	D	64	B	89	C	114	A
15	B	40	B	65	A	90	C	115	B
16	C	41	A	66	C	91	A	116	C
17	C	42	C	67	D	92	D	117	B
18	B	43	C	68	A	93	D	118	D
19	B	44	B	69	A	94	A	119	
20	B	45	A	70	D	95	A	120	
21	A	46	B	71	A	96	B	121	
22	B	47	D	72	C	97	C	122	
23	D	48	B	73	B	98	C	123	
24	C	49	C	74	C	99	A	124	
25	B	50	B	75	C	100	A	125	