

ADDIS AKETEMA EDUCATION OFFICES, ADDIA ABEBA

GRADE 12 BIOLOGY MODEL EXAMINATIONS IN 2016 E.C

NUMBER OF QUESTIONS: 100

TIME ALLOWED: 2 HOUR

GENERAL DIRECTIONS

THIS BOOKLET CONTAINS **BIOLOGY** EXAMINATION. IN THIS EXAMINATION, THERE ARE A TOTAL OF **100 MULTIPLE CHOICE QUESTIONS**. CAREFULLY SELECTED THE BEST ANSWER AND **BLACKEN** ONLY THE LETTER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET PROVIDED. FOLLOW THE INSTRUCTIONS ON THE ANSWER SHEET AND THE EXAMINATION PAPER CAREFULLY. USE ONLY **PENCIL** TO MARK YOUR ANSWERS. YOUR ANSWER MARK SHOULD BE **HEAVY AND DARK**, COVERING THE ANSWER SPACE COMPLETELY. PLEASE ERASE ALL UNNECESSARY MARKS COMPLETELY INCLUDING ANSWERS YOU HAVE CHANGED FROM YOUR ANSWER SHEET.

YOU ARE ALLOWED TO WORK ON THE EXAM FOR **2 HOUR**. WHEN TIME IS CALLED, YOU MUST IMMEDIATELY STOP WORKING, PUT YOUR PENCIL DOWN, AND WAIT FOR FUTURE INSTRUCTIONS.

ANY FORM OF CHEATING OR AN ATTEMPT TO CHEAT IN THE EXAMINATION WILL RESULT IN AN AUTOMATIC DISMISAL FROM THE EXAMINATION HALL AND CANCELLATION OF YOUR SCORES.

PLEASE MAKE SURE THAT YOU HAVE WRITTEN ALL THE REQUIRED INFORMATION ON THE ANSWER SHEET BEFORE YOU START TO WORK ON THE EXAMINATION.

1. Professor Yalemtehay Mekonnen is a renowned biologist known for her contribution on:
 - A. Assessment of the impact of chemical pesticide hazards on humans
 - B. Preservation of different traditional crop varieties
 - C. The discovery of Endod as a control for schistosomiasis
 - D. The development of hybrid sorghum which is resistant to drought
2. Which one of the following group of organisms is correctly matched with its phylum?
 - A. Snail- phylum Annelida
 - B. Earth worm- phylum Mollusca
 - C. Star fish- phylum Echinodermata
 - D. Fish- phylum Arthropod
3. A grade 9 student wants to reduce the spread of HIV /AIDS within his community. Which of the following activity will helps him to minimize the spread of the diseases?
 - A. mobilizing the community to reduce environmental pollution
 - B. producing poster and leaflets that create awareness about the diseases
 - C. creating awareness with in the community to take vaccination
 - D. mobilizing the community to keep personal hygiene
4. Suppose you are observing a specimen under the microscope which is magnified 800X the actual size of the specimen. If the magnification power of the eye piece lens is 20X, what is the magnification of the objective lens?
 - A. 40X
 - B. 80X
 - C. 50X
 - D. 800X
5. What happens to human red blood cell when it is kept in hypertonic solution?
 - A. It became turgid
 - B. It might swell and burst
 - C. It might lose water and shrink
 - D. It will remain unchanged
6. If a sample of unknown food changes the color of iodine solution to blue black, it contain:
 - A. Starch
 - B. Protein
 - C. Fat
 - D. Vitamin
7. Which of the following enzyme is used to digest carbohydrates in the mouth?
 - A. Amylase
 - B. Lipase
 - C. Maltase
 - D. Trypsin
8. Which of the following structure of the heart is correctly matched with its function?
 - A. Right ventricle-contracts and forces blood in to the left ventricle
 - B. Left atrium-contracts and forces blood in to the right ventricle
 - C. Right atrium-contracts and forces deoxygenated blood in to the lung
 - D. Left ventricle-contacts and forces oxygenated blood around the body
9. Which one of the following diseases is correctly explained with its causes or symptom?
 - A. Gonorrhoea is caused by *Treponemapallidum*
 - B. Syphilis has sore ulceration on the genitals as a symptom
 - C. Syphilis is caused by *Nisseriagonorrhoeae*
 - D. Gonorrhoea has a burning sensation symptom while urination

10. Which of the following listed organisms can be placed in third trophic level?

- A. Hawk B. Snake C. Rabbit D. Grass

11. Which one of the following sentences explains the traditional use of biotechnology? Production of:

- A. Insulin using transgenic bacteria
B. Dairy product at household level
C. Vinegar using industrial fermenter
D. Myco-protein under a laboratory

12. The correct order of stages in mitosis is:

- A. Prophase→Anaphase→Metaphase→Telophase
B. Anaphase→Metaphase→Telophase→Prophase
C. Prophase→Metaphase→Anaphase→Telophase
D. Metaphase→Prophase→Anaphase→Telophase

13. How many chromosomes do human inherit from each of their parents?

- A. 23 pair of chromosome
B. 23 chromosome
C. 46 chromosome
D. 46 pair of chromosome

14. Which of the following are the results of a cross between pea plants homozygous for wrinkled and heterozygous for roundness (roundness is dominant)?

- A. 25% wrinkled, 75% round C. 75% wrinkled, 25% round
B. 50% wrinkled, 50% round D. 100% wrinkled

15. In a simple reflex arc, the path of the nerve impulse is:

- A. Sensory neuron→Motor neuron →Association neuron
B. Motor neuron→Association neuron →Sensory neuron
C. Association neuron→Sensory neuron →Motor neuron
D. Sensory neuron→Association neuron →Motor neuron

16. If you breathe deeply running a kilometer distance, the part of the brain that is mostly activated is:

- A. Hypothalamus B. Spinal cord C. Medulla oblongata D. Cerebrum

17. Taste bud located on the side of tongue detect:

- A. Sour taste B. Bitter taste C. Salty taste D. Sweet taste

18. When Kebede looks at a distance his eyes form a blurred image. As the object gets closer and closer to him the image become clearer and clearer. Kebedes eye defect is called

- A. Long sight B. Short sight C. Astigmatism D. Trachoma

19. The gland that swells in to a goiter as a result of iodine deficiency is:

- A. Adrenal gland B. pituitary gland C. Thyroid gland D. Salivary gland

20. The two hormone that act antagonistically to one another in regulating the level of glucose in the blood are:

- A. Glucagon and androgen
B. Gonadotropin and progesterone
C. Androgen and Insulin
D. Insulin and Glucagon

21. Which of the following contraceptive method can be used by a human male?
 A. Tubectomy B. Hormonal injection C. Vasectomy D. IUD
22. Which of the following is a means of reducing heat loss from the body?
 A. Vasoconstriction C. Panting like a dog
 B. Vasectomy D. Possessing large ears like that of elephants
23. Given the following animals
 1. Frog 2. Fox 3. Crocodile 4. Dog 5. Snake 6. Duck 7. Pigeon 8. Cat
 Which of the following group contain poikilothermic animal only?
 A. 1,4,7 B. 1,3,5 C. 3,5,7 D. 2,4,8
24. Which of the following leaf structure is not correctly matched with its function?
 A. Palisade mesophyll- the main photosynthetic tissue of the leaf
 B. Spongy mesophyll-have a lots of air space and gas exchange area of the leaf
 C. Waxy cuticle-control the entry of carbon dioxide in to the leaf
 D. Vascular bundle-containing xylem and phloem
25. The type of response by which root grow toward water is:
 A. Phototropism B. Geotropism C. Chemotropism D. Hydrotropism
26. What will happen if agricultural extension workers inject gibberellin into a dwarf plant? The:
 A. Root will be elongated C. Stem will grow
 B. Leaves fall D. Side shoot will grow fast
27. The tissue conducting manufactured food and water in vascular plants are:
 A. Phloem C. Xylem and phloem respectively
 B. Cambium and cortex respectively D. Phloem and xylem respectively
28. Which of the following gases results in global warming when accumulated in the atmosphere?
 A. Hydrogen B. Carbon dioxide C. Nitrogen D. Oxygen
29. Walia ibex is an endemic animal species to Ethiopia which is found in:
 A. Semien mountain national park C. Omo national park
 B. Bale mountain national park D. Nechisar national park
30. Which of the following activities is used to conserve vegetation?
 A. Encouraging deforestation C. Burning of forests
 B. Reducing indigenous plant D. Protecting natural resources
31. A variable in any experiment that might influence the result but you cannot control is:
 A. Independent variable C. Confounding
 B. Dependent variable D. Controlled Variable
32. An apparatus which is used to separate solid from liquid particles without the need of to filter is
 A) Petri dish B. Centrifuge C. Balance D. Cylinder

33. Which of the following factors refers to how measurement or count is precise?
- A. Accuracy B. Reliability C. Validity D. Fair test
34. Which one of the following criteria is used in classifying cells as eukaryotic and prokaryotic?
- A. Cell size C. Nature of nucleus
B. Cell number D. Cell nutrition
35. Which of the following statement is true?
- A. Pure water has negative water potential
B. Pure water has lower water potential than any solution
C. Water moves from high water potential to lower water potential
D. Water moves from more negative to less negative
36. Which characteristics of phospholipids contribute to the fluidity of the plasma membrane?
- A. Cholesterol B. Integral proteins C. Glycoprotein D. Channel proteins
37. Phospholipids bilayer sandwiched between two proteins is:
- A. Davson and Danielli model C. Langmuir model
B. Fluid mosaic model D. Nicolson model
38. The main advantage of the high level of branching in a molecule of amylopectin is:
- A. The many ends allow rapid hydrolysis C. Much can be stored in a small space
B. There are no osmotic effects D. It is insoluble
39. What kind of bond is formed between three fatty acid molecules and a glycerol molecule?
- A. Peptide bond B. Ester bond C. Glycosidic bond D. Hydrogen bond
40. The induced-fit model of enzyme action suggests that, when an enzyme and substrate bind, there is a conformational change in-----
- A. The active site C. The substrate
B. Both substrate and active site D. Neither substrate nor active site
41. How many classes of enzymes are there in the Enzyme Commission classification?
- A. 3 B. 4 C. 5 D. 6
42. Enzymes speed up biological reaction by:
- A. Increasing activation energy of the reaction
B. Reducing the kinetic energy of the reacting molecules
C. Reducing the activation of the reaction
D. Increasing the kinetic energy of the reacting molecules
43. The turnover rate of an enzyme is:
- A. The number of enzyme molecules used per second
B. The number of product molecules formed per second
C. The number of reactant molecule used per second

D. The number of enzymes formed per second

44. Which of the following terms best describes a plant cell that is full of water?

A. Flaccid B. Haemolysis C. Plasmolysed D. Turgid

45. From the following, which factors doesn't affect the rate of simple diffusion?

A. Concentration gradient C. Surface area of the membrane
B. Thickness of the membrane D. Number of transport proteins

46. Which of the following statements concerning with mitochondria is correct?

A. Mitochondria are surrounded by single membrane
B. The inner of mitochondria is cristea
C. The outer membrane of mitochondria is grana
D. The inner membrane of mitochondria is thalakoid

47. In cellular respiration which of the following molecules enters the Krebs cycle?

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

48. 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
B. The cell retains a dual existence
C. The cell is the basic unit of living things
D. Cells form by cell-free formation

49. Which of the following is correct about cyclic phosphorylation of photosynthesis?

A. NADPH is synthesized C. Oxygen is the by-product
B. ATP is produced D. Photolysis of water is present

50. Which one of the following molecules can be the source of energy which is used to produce ATP in photosynthesis? A. Food B. Water C. Carbon dioxide D. Air

51. Which one of the following sentences is correct about viruses? They are

A. Free living particles C. Ultramicroscopic in size
B. Affected by antibiotics D. Cellular particles

52. Which one of the following resources is/are renewable?

A) Cattles B) Fossil fuels C) Natural gas D) Coal

53. What do you think is a solution to the depletion of natural resources which is facing the world population currently? We should

A) Use natural resources wisely
B) Conserve only non-renewable resources
C) Extinct natural resources
D) Destruct organisms' habitat

54. What do you call a state in which all people have physical, social & economic access to sufficient, safe and nutritious food?
- A) Application B) Food security C) Stunting D) Conservation
55. "Rotting meat turned into flies & wine produced bacteria as it went sour". To which of the five theories of the origin of life on earth do you classify this term?
- A) Eternity of life C) Spontaneous generation
B) Special creationism D) Biochemical origin
56. Which one of the following sentences is correct about archaea? They are
- A. Used as sources of enzymes C. Completely aerobic
B. Eukaryotic organisms D. Intolerant to high temperatures & PH
57. To which division of fungi do you classify Zoospore producing fungi?
- A) Basidiomycota B) Zygomycota C) Chytridomycota D) Ascomycota
58. Which of the four stages in the aerobic respiration of glucose does not produce ATP?
- A) Krebs cycle B. Glycolysis C. Link reaction D. Electron transport chain
59. Which one of the following diseases is caused by more than one type of microorganisms?
- A) Cholera B) Gastroenteritis C) Tuberculosis D) Typhoid
60. Which one of the following structures is completely absent in all divisions of fungi?
- A) Chitin B) Hyphae C) Mycelium D) Chlorophyll
61. In which one of the following way/s do conscious global biologists in Ethiopia can be involved in ensuring sustainable development? Through
- A) Producing new pathogens C) Protecting & managing existing resources
B) Committing to initiate negative impact D) Increasing production of wastes
62. Which one of the following microorganisms was not yet used in Biotechnology?
- A) Viruses B) Protozoa C) Fungi D) Bacteria
63. Which one of the following is a physical method of controlling microorganisms?
- A) Disinfectants B) Heat C) Antiseptics D) Germicides
64. What do you think is the purpose of using different techniques rather than using a single common method in controlling microorganisms? This is because
- A. All microorganisms have same physiology
B. Viruses could be controlled easily
C. Microorganisms couldn't be controlled any way
D. Different microorganisms have different adaptations
65. Which one of the following molecules is not the product of aerobic & anaerobic respiration in yeast cells?
- A) Ethanol B) Water C) Carbon dioxide D) Oxygen
66. Which one of the following sentences is correct about energy?

- A. It enters ecosystem as light & leaves as heat
 - B. It can be recycled in an ecosystem
 - C. It is multidirectional
 - D. It can be created & destroyed
67. What is the effect of photorespiration on the rate of photosynthesis?
- A) Increasing effect B) No effect C) Reducing effect D) Not yet known
68. Which one of the following theories of evolution was proven to be wrong?
- A) Lamarck's use and disuse
 - B) Neo- Darwinism
 - C) Darwinism
 - D) Lamarck's inheritance of acquired traits
69. Which one of the following molecules functionally links the light dependent & light independent phases of photosynthesis?
- A) ATP B) NADH C) FADH₂ D) GTP
70. Stanley Miller conducted spark- discharge experiment by taking a mixture of gases that he thought to represent the primitive atmosphere of the earth. All of the following were found in his gas mixture EXCEPT:
- A) Hydrogen B) Methane C) Ammonia D) Oxygen
71. Struggle for existence & Variation under nature can be best explained as
- A. Basic postulates of Darwin C. Postulates of Neo-Darwinism
 - B. Significance of Lamarckism D. Speciation
72. Which one of the following stages of cellular respiration is the common path way of both aerobic & anaerobic respiration?
- A) Krebs cycle B) Electron transport chain C) Glycolysis D) Link reaction
- This question is based on the molecules listed below.
- I) NADH II) ATP III) FADH₂ IV) NADPH
73. Which of the molecules is/are produced in Respiration?
- A. A) I, III & IV B) I, II & III C) II, I & IV D) I & IV
74. On which one of the following cellular organelles do most of the cellular respiration processes takes place?
- A) Cytoplasm B) Mitochondria C) Cell Wall D) Ribosome's
75. From where does the energy to drive photosynthesis come?
- A) ATP B) Glucose C) Chloroplast D) Sunlight
76. Which one of the following sentences is correct about metabolism? It is
- A. The sum of chemical reactions that takes place in organisms
 - B. The set of reactions involved in synthesis of complex molecules
 - C. The sole constructive phase in energy production
 - D. The sole destructive phase in energy production

77. Suppose you are performing a Gram- Staining technique to identify bacteria based on their cell wall composition & in the process some bacteria loss the primary purple color while you add Ethanol/acetone. Later when you add safranin, its color was changed into the red color of the counter stain safranin. This bacteria is most probably
- A) Gram- negative B) Gram-positive C) Gram-intermediate D) Gram- variable
78. Which one of the following sentences is not correct about eubacteria?
- A) They are unicellular
B) They are domain prokaryotic
C) They can cause disease
D) They have DNA or RNA but not both as their genetic material
79. What is the importance of photosynthesis for ecosystem sustainability?
- A) Production of Nitrogen C) Discontinuities of life
B) Prevention of global warming D) Phosphorus production
80. To which one of the following genus of Protozoa do you classify the non-motile Protozoa?
- A) Ciliates B) Flagellates C) Amoeba D) Sporozoa
81. Assume you are performing bacterial isolation techniques & in the process you have identified a bacterium which can transform the toxic molecule into nontoxic molecules. In which area do you expect to use these types of microorganisms to get the best benefits of them?
- A. Nutrient recycling B) Agriculture C) Bioremediation D) Food production
82. Which one of the following applications of microorganisms in biotechnology can be described as an illegal action currently? The use of microorganisms in:
- A) Mining B) Health & Wellbeing C) Warfare D) Tissue Culture
83. Which one of the following sentences describes the use of microorganisms in health & wellbeings? The use of microorganisms in
- A) Forensic science B) Tissue Culture C) Biogas production D) Mining process
84. In the process of using microorganisms for agriculture to make your plants herbicide resistance by using Ti plasmid as a vector, which species of bacteria do you use to introduce transgenes into soybean crops?
- A) Leuconostoc B) Lactobacillus C) *Agrobacterium tumefaciens* D) Bacillus
85. What do you call microorganisms that live in your body without causing disease & even used to exclude other disease causing microorganisms by covering their attachment sites? They are
- A) Viruses B) Pathogens C) Antibiotics D) Normal micro biota
86. In which stages of photosynthesis sugar is synthesized from carbon dioxide?
- A. Light independent reactions
B. Light dependent reactions
C. Cyclic & non-cyclic photophosphorylation

D. None of the above

87. Which one of the following sentences is correct about reactions of the Krebs cycle?

- A. A total of 6ATP molecules are produced per Krebs cycle
- B. Each Krebs cycle has two decarboxylation reactions
- C. Krebs cycle happens on the inner membrane of mitochondria
- D. The first product of the Krebs cycle is oxaloacetate molecule

88. The different stapes for complete aerobic respiration are:

- A. Glycolysis & Krebs cycle
- B. Krebs cycle & terminal oxidation
- C. Glycolysis & oxidative phosphorylation
- D. Glycolysis, Krebs cycle & terminal oxidation

89. Which one of the following results in the production of oxygen during photosynthesis?

- A. Splitting of the water molecules
- B. Electron transfer system of photosystem II
- C. Electron transfer system of photosystem I
- D. Reducing NADP⁺

90. What happens during the election transport system of respiration? The

- A. Four carbon compound undergoes molecular transformation to generate oxaloacetate
- B. Hydrogen atoms carried by FADH & NADH are released & split into protons and electrons.
- C. Citrate losses a carbon atom to form a five- carbon compound & carbon dioxide
- D. Five carbon compounds are further decarboxylated to form a four carbon compound.

91. Which one of the following theories of evolution has incorporated our knowledge of genes & gene action and is currently the most accepted one?

- A) Neo- Darwinism B) Darwinism C) Lamarckism D) Survival of the fittest

92. C4 plants grown in Ethiopia are characterized by

- A. Low productivity in all parts of the country
- B. Poor yield in areas with high light intensity
- C. Efficient photosynthesis in areas with high carbon dioxide concentration
- D. Efficient photosynthesis in hot parts of the country

93. In which one of the following plants is formation of the C4 acids (malic acid) both temporally & spatially separated? In

- A) C3 plants B) CAM plants C) C4 plants D) Not well known

94. Which one of the following sentences is not correct about ATP? It is

- A. The energy currency of the cell
- B. The nucleotide consisting of an adenine base

- A) Chlorophyll b B) Chlorophyll c C) Chlorophyll a D) Carotenoids

