

GENERAL DIRECTION

THIS EXAM PAPER CONTAINS **BIOLOGY MODEL EXAM FOR GRADE 12**. IN THIS EXAM PAPER, THERE ARE TOTAL OF 100 MULTIPLE CHOICE QUESTIONS.

THERE IS ONLY ONE BEST ANSWER FOR EACH QUESTION. CHOOSE THE BEST ANSWER FROM THE GIVEN ALTERNATIVES AND WRITE THE LETTER OF YOUR CHOICE ON THE ANSWER SHEET PROVIDED.

YOU ARE ALLOWED TO WORK ON THE EXAM FOR **2:00** HOURS ONLY. WHEN TIME IS CALLED, YOU MUST IMMEDIATELY STOP WORKING ON THE QUESTIONS AND PUT DOWN YOUR PEN OR PENCIL AND WAIT FOR WHAT YOU MIGHT BE TOLD TO DO.

ANY FORM OF CHEATING OR AN ATTEMPT TO CHEAT WILL DISMISS YOUR RESULT.

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

- Who has been honored for his work in developing new, high yielding strains of sorghum which grow well in our conditions?
 - Dr Gebissa Ejeta
 - Professor Yalemtehay Mekonnen
 - Dr Melaku Worede
 - Dr Aklilu Lemma
- Which institute holds one of the leading gene banks in the whole of Africa with over 300 plant species? Institute of
 - Biodiversity Conservation.
 - Agricultural Research.
 - Health and Nutrition Research.
 - Armauer Hansen Research institute.
- A special magazines that biologists use to publish their new work or research in called
 - peer review.
 - hypothesis
 - journals.
 - evaluation.
- Which of the following is used to focus the electrons when using an electron microscope?
 - Stage
 - Glass lens.
 - Magnetic lens.
 - Mirror.
- Most organelles in a eukaryotic cell are found in the
 - cell wall
 - nucleus
 - cytoplasm
 - cell membrane
- Which one of the following stain is used to stain the nucleus of the cell from human cheek?
 - Haematoxylin
 - Methylene blue
 - Acetocarmine
 - Iodine

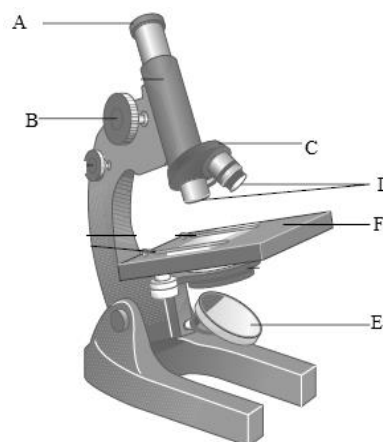
Answer question 7 & 8 using the following diagram.

7. In the above diagram, “A” represents:

- eyepiece lens
- stage
- rotating nosepiece
- mirror

8. In the above diagram, part where sample is placed is represented by:

- E
- F
- D
- B



9. A biologist applied the scientific method repeatedly, gathered a large amount of supporting experimental data and finally described a pattern or relationship between different factors. What is the best term refers to facts established in this way?
- A. Theory B. Hypothesis C. predication D. Law
10. What is the total magnification of an object viewed under the microscope using a 10x ocular and a 20x objective?
- A. 200x B. 20x C. 20x D. 10x
11. Cells like muscle cells which require lots of energy would probably have many
- A. nuclei B. flagella C. mitochondria D. lysosomes

Answer the following question using the information given in the table below.

	Characteristics	Bacterial cell	Plant cell	Animal cell
1	Cell type	Eukaryotic	Prokaryotic	Prokaryotic
2	Membrane bounded organelles	Absent	Present	Present
3	Nucleus	Present	Present	Present
4	Cell membrane	Present	Present	Present
5	Ribosome	Present	Present	Present

12. Which one of the above comparisons is correct?
- A. 1, 2 & 3. B. 2, 4 & 5. C. 4 & 5. D. 3 & 5.
13. From the given structures, which one absorbs the light energy needed for photosynthesis?
- A. Chlorophyll. C. Mitochondria.
B. Nucleus. D. Cell wall.
14. If a new anti-HIV drug is to be developed to prevent the virus from converting its RNA to DNA, which one of the following processes should be drug target?
- A. Reverse transcriptase.
B. Binding of Gp-120 and CD4.
C. Integration of viral DNA into host DNA.
D. Assembly of viral parts into a whole virus.
15. Intravenous saline injection is often given as a treatment for severe dehydration. The concentration of saline (0.9%NaCl) in these injections is the same as that present in human cells. 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. Which one of the following is advantage of electron microscope over light microscope?
- Smaller sub cellular structures can be viewed in great detail .
 - Living cell can be observed.
 - Constant temperature and pressure is needed.
 - Always fixation is needed.
17. All of the following sentences state cell theory, except:
- all cell come from non-living things spontaneously.
 - cells are the basic units of life.
 - all cells have the same basic chemical composition.
 - cells contain hereditary information which is passed from cell to cell during cell division.
18. Why it's necessary for unspecialized cells to have different organelles? It's because to:
- carry out clear and specific functions.
 - be healthy.
 - to grow big.
 - be alive.
19. All of the followings affect the rate of the diffusion, except:
- concentration gradient.
 - temperature.
 - turface area.
 - time.
20. All of the followings are roles of osmosis in plants, except
- It moves water into plant cells.
 - It keeps the leaves and stems of the plant rigid and firm.
 - Helps the plant to absorb mineral from the soil.
 - Helps the plant to keep upright.
21. Spherical shaped bacteria are called
- bacilli
 - streptobacilli
 - cocci
 - spirilla
22. Which compound contains Nitrogen in addition to Carbon, Hydrogen and Oxygen?
- Amino acid.
 - Sugar.
 - Nucleic acid.
 - Lipid.
23. Which of the following nutrient is **NOT** correctly paired with its deficiency disease?
- Vitamin D→ Ricket
 - Iodine → Goiter
 - Vitamin C → Survey
 - Vitamin B1 → Pellagra
24. Which one of the following pair of food substance and its property is incorrectly paired?
- Cellulose – forms plant cell wall.
 - Glycogen – animal carbohydrate.
 - Lipid – major component of cell membrane.
 - Starch – found in fungal cell wall.

25. Which one of the following pairs of food stuff and reagent used to test it is correct?
- A. Starch- iodine.
 - B. Simple / reducing sugar- Benedict's solution.
 - C. Vitamin C- DCPIP solution.
 - D. Lipids- Biuret reagent.
26. Which mineral is vital to make the haemoglobin found in red blood cells that carry oxygen around the body?
- A. Calcium
 - B. Iron.
 - C. Phosphorus.
 - D. Iodine.
27. A fatty acid is called unsaturated if it
- A. contains hydrogen.
 - B. contains carbon-carbon double bonds.
 - C. contains carbon-carbon single bonds.
 - D. contains oxygen.
28. Which association is incorrect?
- A. Monosaccharide ----- glucose
 - B. Polysaccharide ----- lactose
 - C. Disaccharide ----- maltose
 - D. Lipids ----- fatty acids
29. Which one of the following kinds of fungi is associated with plant's roots in mutualism relationship?
- A. Yeasts
 - B. Mycorrhizae
 - C. Candida
 - D. Puffball
30. Which one of the following foods does not contain carbohydrate?
- A. Potato
 - B. Sugar
 - C. Meat
 - D. Rice
31. Which one of the following provides the greatest energy value per gram of nutrient?
- A. Carbohydrate
 - B. Fat
 - C. Protein
 - D. Water
32. Which one is true about a molecule of an enzyme that has a high turnover number?
- A. Can easily be denatured.
 - B. Can easily be replaced with another enzyme.
 - C. Converts substrate to product very rapidly.
 - D. Needs a constant supply of cofactors
33. Which of the following enzyme properties is explained by the lock-and-key model for enzyme action?
- A. High turnover rate
 - B. Susceptibility to denaturation
 - C. Absolute specificity
 - D. Susceptibility to deactivation.

Answer the following question using the information given in the table below.

No.	Enzyme	What it digests	Where it works
1	Salivary amylase	Starch	Mouth
2	Pepsin	Protein	Small intestine
3	Trypsin	Proteins	Small intestine
4	Lipase	Lipids	Stomach

34. Which one of the above information is describing the correct relationship?
 A. 1 & 2 B. 1 & 3 C. 3 & 4 D. 2 & 4
35. The protein portion of a conjugated enzyme is called a (n)
 A. Apoenzyme. B. Coenzyme. C. Holoenzyme. D. Cofactor
36. During which one of the following processes of cellular respiration is most of ATP produced?
 A. Glycolysis B. Krebs cycle C. Link reaction D. Chemiosmosis
37. Which one of the following is the major role of bile made by the liver cells?
 A. emulsifies the fats in our food. C. acidifies food in our stomach.
 B. kills bacteria. D. brings about chemical digestion.
38. During vigorous exercise, human muscles begin to function under anaerobic conditions and accumulate the waste product that causes muscles cramp called
 A. ATP. B. NADH. C. carbon dioxide. D. lactic acid.
39. The site of gaseous exchange in the lungs is called
 A. trachea B. alveoli C. bronchiole D. nasal passage
40. Which one of the following will happen during inhalation?
 A. The diaphragm contracts and becomes inflated.
 B. The intercostal muscle moves down and in ward.
 C. Volume of chest cavity decreases.
 D. Pressure in the lung decreases.
41. Which one is the addictive drug found in tobacco smoke?
 A. Nicotine. B. Carbon monoxide. C. Tar. D. Nitrous oxide.
42. Which one of the following is a not Smoking-related disease?
 A. Bronchitis. C. Lung cancer.
 B. Chronic obstructive pulmonary diseases (COPD). D. Pneumonia.

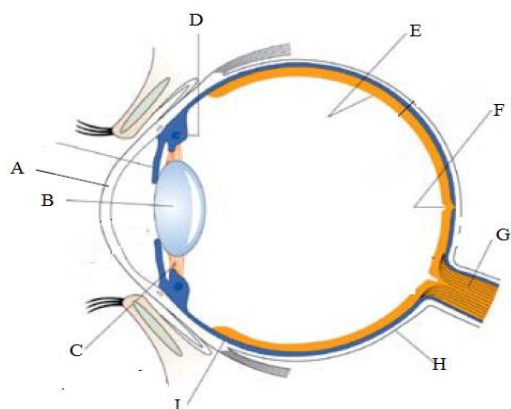
43. Which of the following structure of the heart is correctly matched with its function?
- Right atrium – contracts and forces deoxygenated blood into the lungs
 - Left ventricle – contracts and forces oxygenated blood around the body
 - Right ventricle - contracts and forces blood into the left ventricles
 - Left atrium – contracts and forces blood into the right ventricles
44. An adult human with average health has systolic and diastolic pressure about:
- 120mmHg and 80 mmHg
 - 80 mmHg and 90 mmHg
 - 140 mmHg and 90 mmHg
 - 70 mmHg and 120 mmHg
45. Aerobic cellular respiration requires an adequate supply of
- carbon dioxide.
 - oxygen.
 - ethyl alcohol.
 - starch.
46. Which blood transfusion is impossible?
- O into A
 - A into O
 - A into AB
 - O into B
47. The main role of the platelets in our blood is:
- clotting blood.
 - carrying of oxygen.
 - carrying of carbon dioxide.
 - producing of antibodies.
48. Which one of the following methods is the best method used to treat milk, beer and other foodstuffs and make them safe?
- Autoclaving.
 - Ultra high temperature.
 - Pasteurisation.
 - Incineration.
49. Which one of the following is **NOT** correct about disinfectant?
- fast acting.
 - effective against all types of infectious agents without destroying tissues.
 - acting as a poison on the person using it.
 - able to easily penetrate material to be disinfected.
50. Which one of the following is a taxonomic tool which used to identify and group living organisms based on their external features?
- Five kingdom system
 - Dicotomous key
 - Taxa
 - Taxon
51. The type of immunity that our body develops after exposed to pathogen and works for longer period is known as:
- Natural active immunity.
 - Artificial active immunity.
 - Natural passive immunity.
 - Artificial passive immunity.

52. One of the following is **NOT** characteristics of viruses
- A. They are obligate intracellular parasites.
 - B. They have either DNA or RNA as genetic material.
 - C. They can reproduce without host cells.
 - D. They do not carry out of the functions of normal living organisms.
53. Which of the following STDs are caused by viruses?
- A. HIV/AIDS
 - B. Gonorrhoea
 - C. Chancroid
 - D. Syphilis
54. Biologists classify living things for all of the following reasons, except:
- A. to simplify their study.
 - B. to bring order out of chaos or confusion.
 - C. to try to understand how life originated.
 - D. to know their common name.
55. In which kingdom of life are the unicellular prokaryotes grouped?
- A. Monera
 - B. Protista
 - C. Fungi
 - D. Plantae
56. Which one of the following is false about binomial name?
- A. It is Latin.
 - B. It was developed by Carl Linnaeus.
 - C. The first name, the genus is written with a capital letter.
 - D. The second name, the species is written with a capital letter.
57. What is the purpose of iodine treatment in Gram's staining?
- A. To stain the cell pink.
 - B. To stain the cell purple.
 - C. To decolorize the stain
 - D. To stain the cell blue black.
58. Which of the following is **NOT** feature of mammals make them different from other vertebrate groups?
- A. Produces milk for its young in mammary glands.
 - B. They sweat to help control their body temperature.
 - C. They have two pairs of pentadactyl limbs.
 - D. They are poikilothermic.
59. In a food chain: - grass → rodents → snakes → eagles .Which group contains the high amount of energy?
- A. Grass
 - B. Snakes
 - C. Eagles
 - D. Rodents

60. Which of the following statement is **NOT** true about C4 plants such as maize?
- Light dependent reactions occur in mesophyll cell.
 - The bundle sheath cell contains chloroplast.
 - Chloroplast of bundle sheath cell lack thylakoid.
 - They harvest CO₂ at night time.
61. What is the important role played by microorganisms such as bacteria and fungi in the ecosystem?
- Antibiotic production.
 - Forming organic substances.
 - Decomposing and recycling nutrients.
 - Supplying energy to the ecosystem.
62. Which superficial fungal infection affects the scalp, eyebrows and eyelashes?
- Tinea pedis*
 - Tinea capitis*
 - Tinea corporis*
 - Tinea barbae*
63. Which of the following is not a component of biogas?
- Carbon dioxide.
 - Methane.
 - Oxygen.
 - Water.
64. Which of the followings are advantages of using ethanol as a fuel?
- It is a carbon-neutral activity.
 - It takes a lot of plant material to produce the ethanol.
 - It does not produce toxic gases when burnt.
 - It can be mixed with conventional petrol to make gasohol.
65. Genetically modified bacteria produce the following products except
- enzymes for the food industry.
 - thermostable enzymes for washing powders.
 - human insulin.
 - vaccine.
66. A special form of cell division where the chromosome number is reduced by half is:
- cytokinesis
 - mitosis
 - meiosis
 - karyokinesis
67. Which one of base pairing in DNA is incorrect?
- C -- G
 - G--C
 - A--U
 - T--A
68. In pea plants, the allele for yellow seeds (Y) is dominant to green seeds (y). If two hybrids are crossed, what is the chance that the F1 will share the same phenotype as the parent?
- 0%
 - 25%
 - 50%
 - 75%
69. A mutation in which a single base is added or deleted or replaced by another base is called
- substitution mutation
 - deletion mutation
 - point mutation
 - a frame shift mutation

70. All the following are uses of biotechnology in agriculture, except:
- developing better crops.
 - developing plants that contain their own pesticide.
 - developing better livestock.
 - developing antibiotics.
71. If a new anti-HIV drug is to be developed to prevent the virus from converting its RNA to DNA, which one of the following processes should be drug target?
- Reverse transcriptase.
 - Binding of Gp-120 and CD4.
 - Integration of viral DNA into host DNA.
 - Assembly of viral parts into a whole virus.
72. Among the following reaction in C3, C4 and CAM Pathway , one similarly takes place in mesophyll cell:
- Fixation of carbon dioxide
 - Generation of ATP and NADP
 - Calvin cycle
 - Sugar production
73. Which part of neuron is covered by myelin sheath which provides it insulating property?
- dendrites
 - cell body
 - nucleus
 - axon
74. What are the products of light-reaction that are used the light-independent reaction of photosynthesis as sources of energy?
- CO₂ and RuBP.
 - O₂ & CO₂.
 - ATP & NADPH.
 - Electron and photons.
75. Which one of the following is very strong hallucinogenic drug?
- Cannabis
 - Marijuana
 - LSD
 - Heroin
76. Which one of the following sensory receptors and their functions are incorrectly matched?
- Retina - provides vision
 - Cochlea- organ of hearing
 - Semi-circular canals - organ of smell
 - Taste buds - enable us to taste

Answer question 77 and 78 using the given diagram.



77. Which structure is represented by letter 'A'?
- Cornea
 - Lens
 - Retina
 - Iris
78. Part of the eye where image is formed is represented by:
- D
 - F
 - B
 - C

89. The loss of water in the form of water vapours from the areal parts of a plant through the stomata is called
- A. transportation
 - B. transpiration
 - C. absorption
 - D. conduction
90. The state in which all people have physical, social and economic access to sufficient, safe and nutritious food is called
- A. Food security
 - B. Nutritional security
 - C. Health security
 - D. Political security
91. Which one of the food processing and the microorganism involving is miss-matched?
- A. Pruteen - *Methylophilus methylotrophus*
 - B. Mycoprotein- *Fusarium venenatum*
 - C. Yoghurt - *Sacchromyces - serevesiea*
 - D. Fermented meat - *Lactobacillus plantarum*
92. Which one of the following is **NOT** practical application of transgenic technology in livestock?
- A. Enhancing the prolificacy.
 - B. Increasing susceptibility to diseases.
 - C. Increasing feed utilization.
 - D. Increasing carcass and milk composition.
93. Which one of the following processes takes place in the cytoplasm of a cell?
- A. Glycolysis
 - B. Krebs cycle
 - C. Electron transport
 - D. All of the above
94. In the forensic science, which one of the following is more reliable and easier to gather evidence regarding a particular crime scene?
- A. Bioinformatics
 - B. Fingerprint
 - C. DNA
 - D. PCR
95. Which of the following pairs are ANALOGOUS structures?
- A. The human arm and the front leg of mule.
 - B. The front leg of a frog and the wing of a bat.
 - C. The wing of bird and the wing of butterfly.
 - D. The wing of bat and the wing of a bird.
96. Suppose a fossil initially contains 100,000 atoms of a certain radioactive elements whose half- life is 10,000 years, after how many years would the number of atoms be 12,500?
- A. 10,000 years
 - B. 20,000 years
 - C. 30,000 years
 - D. 40,000 years
97. The half- life of carbon-14 is 5,730 years. If a fossil is 17,200 years old, about what percent of it's original carbon is still present?
- A. 75%
 - B. 50%
 - C. 25%
 - D. 12%

98. What is significant about Lucy?
- A. it showed that Bipedalism evolved before large brains.
 - B. it showed that the common ancestor of humans and chimpanzee cannot have resembled a chimpanzee.
 - C. It proved that brain size has decreased as hominids have evolved.
 - D. Explained the evolution of modern human from chimpanzee.
99. What do we call the selection that often operates against both extremes to reduce the variability in the population and to make the population more uniformly adapted?
- A. stabilizing selection
 - B. disruptive selection
 - C. directional selection
 - D. opportunistic selection.
100. All of the following gases were used in S.L Miller's experiment except
- A. hydrogen
 - B. methane
 - C. ammonia
 - D. oxygen