GENERAL CERTIFICATE OF EDUCATION BOARD
General Certificate of Education Examination

0710 BIOLOGY 1

JUNE 2022 **ADVANCED LEVEL**

Candidate Number	
Centre Name	
Candidate Identification No.	
Subject Code and Paper Number	

Mobile phones are NOT allowed in the examination room.

MULTIPLE CHOICE QUESTION PAPER

One and a half (1 ½) hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed **" 0710 Biology 1 – ADVANCED LEVEL".**
4. Fill in the information required in the spaces above.
5. Fill in the information required in the spaces provided on the answer sheet using your HB pencil: **Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number.** Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination

6. Answer **ALL** the **50** questions in this Examination. All questions carry equal marks.
7. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide which answer is appropriate. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.
   For example, if **C** is your correct answer, mark **C** as shown below:

[A] [B] [~~C~~] [D]

8. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
9. Avoid spending too much time on any one question. If you find that a question is difficult, move on to the next question. You can come back to this question later on.
10. Do all rough work in this booklet using the blank spaces in the question booklet.
11. **At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.**

1. Identify the organelle from which DNA is absent.
   A Nucleus.
   B Mitochondrion.
   C Chloroplast.
   D Ribosome.

2. A newly transcribed mRNA molecule is usually longer than the sections of the gene that actually code for the protein. The actual codes in a eukaryotic gene are known as:
   A Introns.
   B Punctuation codons.
   C Exons.
   D Nonsense codons.

3. The presence of a perivisceral cavity in the mesoderm of triploblastic multicellular organisms makes them to be called:
   A Acoelomates.
   B Coelenterates.
   C Coelomates.
   D Pseudo coelomates.

4. Which of these passive mechanisms is responsible for the movement of substances across the cell surface membrane?
   A Diffusion.
   B Endocytosis.
   C Exocytosis.
   D Active transport.

5. The type of relationship between living organisms of different species in which both partners benefit is called:
   A Predation.
   B Mutualism.
   C Commensalism.
   D Parasitism.

6. Algal blooms that occur in a fresh water lake is caused by_____ and leads to _____:
   A - an accumulation of soil in lakes;
   - a rise in temperature.
   B - an accumulation of dead material;
   - an increase in decomposition.
   C - discharge of sewage;
   - eutrophication limiting primary productivity.
   D - an accumulation of sand;
   - eutrophication which makes navigation difficult.

7. Expiration in humans is usually stimulated by:
   A the ventral or lower portion of the breathing center.
   B the internal intercostal nerve.
   C the external intercostal nerve.
   D the phrenic nerve.

8. If the water potential of a root hair cell is - 2000kPa and the pressure potential is 400kPa, the solute potential of the cell would be:
   A - 2400kPa.
   B - 1600kPa.
   C + 2400kPa.
   D + 1600kPa.

9. In C_3 plants such as groundnut:
   A the CO_2 acceptor is PEP.
   B the first product of photosynthesis is oxaloacetate.
   C the CO_2 fixing enzyme is RUBP carboxylase.
   D the initial product of photosynthesis is triose phosphate.

10. What is the genotype of the offspring from a marriage between an albino man and a carrier woman?
   A All the offspring obtained will have a normal genotype.
   B All the offspring produced will have the carrier genotype.
   C Half of the offspring produced will have the carrier genotype while the other half will have normal genotype.
   D Half of the offspring produced will have carrier genotype while the other half will have the albino genotype.

11. Epithelial tissues arise from:
   A Mesoderm, Endoderm and Ectoderm.
   B Mesoderm.
   C Endoderm.
   D Ectoderm.

12. Darwin's statement 'survival of the fittest', means that:
   A the species most adaptable to changes survives.
   B the largest of the specie survives.
   C the most intelligent of the species survives.
   D the strongest of all species survives.

13. Which of these statements correctly compares blood plasma and tissue fluid in a healthy person?
A Blood plasma contains protein but tissue fluid lacks it.
B Both blood plasma and tissue fluid contain red blood cells.
C Tissue fluid contains white blood cells whereas blood plasma does not.
D Tissue fluid is formed from blood plasma and is not returned to blood plasma.

14. Choose the nucleoside amongst the following:
A Adenosine.
B Nicotinamide adenine dinucleotide.
C Adenosine monophosphate.
D Adenosine triphosphate.

15. Which driving force moves mineral salts in the xylem vessel of a plant?
A Osmosis.
B Root pressure.
C Translocation.
D Active transport.

16. Deduce the number of chromosomes in the microspore mother cells of maize plant having 20 chromosomes in the cells of the leaf.
A 10.
B 40.
C 15.
D 20.

17. A type of classification which avoids the problem of establishing evolutionary relationships is:
A Artificial classification.
B Phenetic classification.
C Numerical classification.
D Phylogenetic classification.

18. The speed of transmission of a nerve impulse is increased in a vertebrate neuron by:
A a low temperature of less than 20°c.
B a smaller axon diameter.
C presence of a myelin sheath.
D a high stimulus intensity.

19. Which of these is the best description of a transgenic organism?
A New genes that have been inserted into the embryos of plants and animals.
B New genes that have been inserted into plant embryos.
C New genes that have been inserted into animal embryos.
D Organisms containing new genes.

20. The growth pattern observed in mammals e.g. man is known as:
A Limited growth.
B Isometric growth.
C Allometric growth.
D Unlimited growth.

For questions 21 to 28, one or more of the responses is/are correct. Choose:
A If (i), (ii) and (iii) are correct.
B If (i) and (iii) are correct.
C If (ii) and (iv) are correct.
D If only (iv) is correct.

21. The frequency of the dominant and recessive allele in a population will remain constant if:
(i) the population is small.
(ii) there is random mating.
(iii) some genotypes are not fertile.
(iv) no mutation occurs.

22. The transmission of impulses across a synapse gives the following advantages to the body:

(i)	enables information from different parts of the nervous system to be identified.
(ii)	provides a mechanism for filtering out trivial or non-essential information.
(iii)	slows down transmission leading to short reaction time.
(iv)	ensures that nerve impulses are in a one-way motion.

23. Which of these processes occur by mitosis?
(i) Cloning of plasma cells.
(ii) Gamete production.
(iii) Replacing damaged cells.
(iv) Formation of spores in the moss plant.

24. Select the description which best defines the Xiphoid cartilage.
(i) Serves as an attachment point for organs and large muscles of the diaphragm.
(ii) Indicates where chest compressions may be ministered.
(iii) Is the smallest region of the sternum also called metasternum.
(iv) Develops into bone at adulthood especially in guinea pigs.

25. Which of the following occurs when the eye is exposed to bright light?
(i) The circular muscles of the iris contract reducing the pupil size.
(ii) The radial muscles contract increasing the pupil size.
(iii) The radial muscles contract increasing the pupil size.
(iv) Much light enters the eye.

26. Sympatric speciation may occur when:
(i) there is fusion of gametes.
(ii) the gametes are prevented from meeting.
(iii) the genitalia of two groups are compatible.
(iv) the development of the embryo is impossible.

27. Identify the relationship that can best define interspecific competition.
(i) Toads, birds, humans and weaver birds catching termites.
(ii) Human beings from different villages competing for land.
(iii) Pear trees, eucalyptus trees, coffee plants and kola nut trees competing for mineral salts in the soil.
(iv) Guinea pigs scrambling over banana leaves that have been introduced in to a room.

28. Choose the statement(s) that is/are applicable to both onion epidermis and human red blood cells.
(i) Have a nucleus.
(ii) Possess a cell membrane.
(iii) Chloroplast absent.
(iv) Presence of pyrenoids.

29. At which stage of development is the egg ready for ovulation?
A Oogonium.
B Primary follicle.
C Primary oocyte.
D Secondary oocyte.

30. The juxtaglomerular complex which is under control of the sympathetic nervous system is responsible for the secretion of:
A Progesterone
B Aldosterone
C Angiotensinogen.
D Renin.

31. The synthesis of ATP in a cell requires one of the following:
A Deoxyribose.
B Hexose sugar.
C Ribulose bisphosphate.
D Ribose.

32. The light independent stage of photosynthesis is sometimes referred to as a "dark" reaction because:
A it requires the product of the light stage.
B it does not require light.
C it occurs simultaneously with the light stage in the chloroplast.
D it occurs in the stroma of the chloroplast only at night.

33. Identify the correct order of the sequence of electrical impulses passing through the cardiac musles of the heart during contraction.
A Right and left atria → sinoatrial node → atrioventricular node → ventricular → walls.
B Sinoatrial node → right and left atria atrioventricular node → Purkinje's tissue.
C Sinoatrial node right and left atria → Purkinje's tissue → atrioventricular node.
D Right and left atria → sinoatrial node → Purkinje's tissue → ventricular walls.

34. Where is the filtrate from the glomerulus deposited?
A Loop of Henle.
B In the Bowman's capsule.
C Distal convoluted tubule.
D Proximal convoluted tubule.

35. Choose the reagents used, and the color of the end product obtained for a positive test for reducing sugars.
A - Fehling's A and B + test solution + heat;
- brick red.
B - Benedict + test solution;
- orange.
C - $CuSO_4$ + NaoH + test solution + heat;
- Purple.
D - Fehling's A and B + test solution;
- brick red.

36. Which of the following is the most suitable medium for breeding *Drosophila melanogaster?*
A Ripe pineapple peelings.
B Agar agar.
C Moist bread.
D Cow dung.

37. Chlorosis in older leaves of plant is a deficiency disease due to the lack of:
A Calcium.
B Manganese.
C Sodium.
D Nitrogen.

38. The characteristics that proves that frogs have evolved from fishes is:
A their ability to swim in water.
B their feeding on aquatic plants.
C tadpole larva in frogs
D similarity in the shape of the head.

39. What structure separates the outer and middle ear?
A Tympanic membrane.
B Cochlea.
C Pinna.
D Oval window.

40. The amount of air that can be inhaled or exhaled during one respiratory cycle is called:
A Lung capacity.
B Residual volume.
C Tidal volume.
D Inspiratory and expiratory reserve volumes.

41. The correct sequence for urine formation in the kidney is:
A Filtration, Reabsorption, Secretion.
B Secretion, Reabsorption, filtration.
C Filtration, Secretion, Reabsorption.
D Reabsorption, Filtration, Secretion.

For questions 42 to 50 there are two statements. Read through the statements. Read through the statements and then choose:

A if both statements are true and the second explains the first.
B if both statements are true but the second does not explain the first.
C if the first statement is true and the second is false.
D if the first statement is false and the second is true

	First Statement		Second Statement
42	Antigens are cell identity markers that stimulate the production of specific antibodies.		Artificial passive immunity is obtained by a foetus obtaining antibodies through the placenta.
43	When temperature falls in man, the best way to trigger the natural homestatic mechanism to bring it to norm is to take in hot coffee.		High temperature in man resulting from the release of merozoites by schizogony is treated by bathing with very cold water.
44	The epiphysis of a typical long bone like the femur contains trabeculae.		Osteocytes arise from chondroblast and possess canaliculi.
45	In recombinant DNA technology, human genes are often transferred into bacteria (prokaryotes) or yeast (eukaryote).		Both bacteria and yeast multiply very fast to form huge populations, which express the desired gene.
46	Synergism occurs in plants when the combined action of two growth factors produces a greater effect.		Auxins (IAA) and cytokinins promote mitotic cell division at the meristems.
47	The petals of the plant commonly called "Queen of the night" close at night but open during the day.		Nastic responses are non-directional responses to stimuli.
48	Diseases like Measles and Tuberculosis only attack people once.		A previous infection induces the primary immune response to produce specific memory cells making the individual immune to future infections.
49	Asexual reproduction is a very fast process and produces offspring that are identical to the parents.		Asexual reproduction is more common in animals than in plants and that is why there are more animals on earth than plants.
50	Hemolytic disease of the new born (HDN) is a blood disorder which occurs as a result of incompatibility between the blood types of a mother and her baby.		HDN most frequently occur when a rhesus negative mother has a baby with a rhesus positive father.

GO BACK AND CHECK YOUR WORK