GENERAL CERTIFICATE OF EDUCATION (GCE) BOARD

General Certificate of Education Examination

0710 BIOLOGY 1

JUNE 2021 **ADVANCED LEVEL**

Candidate Number	http://www.gcerevision.com
Centre Name	
Candidate Identification No.	
Subject Code and Paper Number	gcerevision.com

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.**

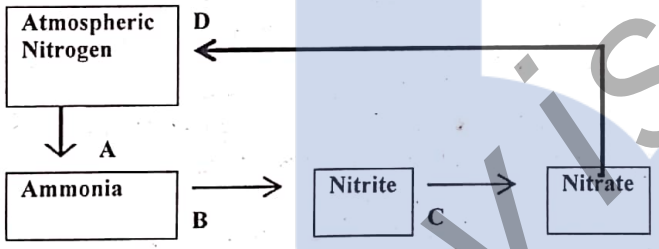
1. The bucal cavity of the human is functionally similar to the:
   A rumen of a sheep.
   B gizzard of a chicken.
   C caecum of the guinea pig.
   D bucal cavity of the fish.

2. These mineral elements are essential in the growth of the skeleton and teeth:
   A Calcium and phosphorus.
   B Magnesium and calcium.
   C Iron and calcium.
   D Fluorine and chlorine.

3. This nitrogen base is found only in RNA:
   A Adenine
   B Uracil
   C Guanine
   D Cytosine

4. A DNA helix is 136nm long. If one turn of the helix is 3.4nm, how many nucleotides make up this DNA molecule?
   A 40
   B 462
   C 34
   D 400

5. The flow diagram below depicts a simplified nitrogen cycle.



Which of the reactions A to D is carried out by the bacterium *Nitrosomonas spp?*
   A A
   B B
   C C
   D D

6. That part of the striated muscle that does not have actin myofilaments is called?
   A A-band
   B Z-line
   C H-zone
   D I-band

7. This hormone ensures that there is no miscarriage during pregnancy:
   A Gonadotrophin.
   B Progesterone.
   C Oxytocin.
   D Oestrogen.

8. In living cells these organelles are known as suicide bags:
   A Microbodies
   B Lysosomes
   C Centrioles
   D Golgi bodies

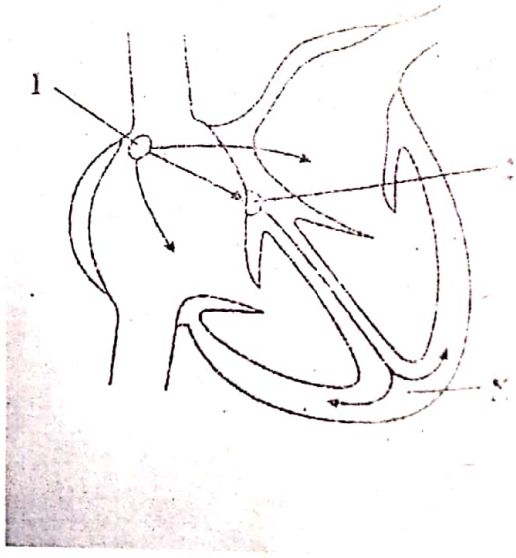
9. This gland of the mammal plays both a hormonal as well as a digestive role:
   A Spleen
   B Pancreas
   C Pituitary
   D Adrenal

10. These are plants adapted to resist water loss from their dry surroundings without shedding their leaves:
   A Xerophytes
   B Mesophytes
   C Hydrophyes
   D Halophytes

11. The word clone as used in genetic engineering refers to:
   A reproduction of animals.
   B identical replica of cells and / or organisms.
   C plants whose genes have been altered.
   D animals grown with hormones.

12. The main biotic reservoir of carbon in nature is found in the kingdom:
   A Animalia
   B Plantae
   C Protoctista
   D Fungi

13. The diagram below shows the innervations of the mammalian heart so that it functions in heart beats.



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Which part(s) eventually ensure the ventricular systole?
A 1
B 1 and 2
C 2 and X
D X

14. A parenchyma cell of solute potential of -1,500Kpis placed in a solution of sucrose of water potential of -800Kp for an hour. Calculate the pressure potential of the cell at the time of removal:
A -800Kp
B 700Kp
C 800Kp
D -2300Kp

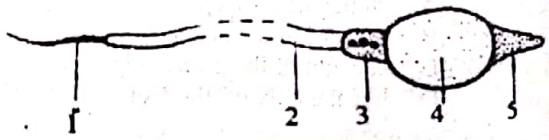
15. The part in the inner ear of a mammal that is directly responsible for hearing is called the:
A saculus
B utriculus
C ampulla
D organ of corti

16. In a population of guinea pigs, 16% show the recessive trait of grey fur. Assuming that this population obeys the Hardy-Weinberg equilibrium, calculate the frequency of the dominant allele of this trait.
A 0.4
B 0.36
C 0.6
D 256

17. Which of the following pigment is essential for the proper functioning of the visual purple rhodopsin?
A Ascorbic acid
B Riboflavin
C Retinol
D Calciferol

18. Skeleton and muscles are important in causing movement in most organisms. Which of these organisms makes use of the hydrostatic skeleton in movement?
A Earthworm
B Cockroach
C Snake
D Planaria

19. The diagram below is that of a mature mammalian sperm cell.



Which part (s)of the sperm causes the acrosomal reaction?
A 4 and 5
B 2 and 3
C 5
D 4

20. A certain flowering plant cell has 15 pairs of homologous chromosomes. How many chromosomes will be present in an endosperm cell of the seed of this plant?
A 15 chromosomes
B 45 chromosomes
C 30 chromosomes
D 60 chromosomes

For questions21 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. During inspiration movements in a mammal, the:
(i) external intercostal muscles contract
(ii) ribs move downwards and inwards
(iii) diaphragm muscles contract
(iv) elastic lungs contract and expand

22. The alveoli of the mammalian lungs ensures that:
(i) there is a large surface area.
(ii) there are blood capillaries.
(iii) the inner linings are moist.
(iv) the air in them is warm.

23. The mechanics of root pressure created by the endodermal cells is made possible by:
(i) their Casparian strip.
(ii) the Apoplast pathway.
(iii) the Starch grains in the cytoplasm.
(iv) the transpiration stream in the xylem.

24. The specificity of enzymes is brought about by:
(i) the shape of the enzyme protein.
(ii) the cofactors they carry.
(iii) the class of protein.
(iv) their peculiar active sites.

25. Genetic variability is as a result of which of the following in cell division?
(i) Chromosome reshuffling at metaphase I
(ii) Chromosome movement in Anaphase I
(iii) Crossing over at prophase I
(iv) Chromosomes arriving the poles in Telophase II

26. Differential mortality as used in evolution is when individuals die because:
(i) of absence of food.
(ii) they are weaker and cannot compete.
(iii) of absence of sex mates.
(iv) they are easily killed by predators.

27. The hormone florigen in plants is responsible for:
(i) leaf fall.
(ii) leaf expansion.
(iii) root sprouting.
(iv) flowering.

28. The following is/are responsible in detecting and for controlling breathing rate in mammals:
(i) The carotid body.
(ii) The aortic body.
(iii) CO_2 concentration in the blood.
(iv) The altitude and atmospheric pressure of the air.

29. The maximum number of ATP molecules that can be produced in complete oxidation of a molecule of glucose in a living cell is:
A 30
B 32
C 36
D 38

30. These are white blood corpuscles from mammalian blood.

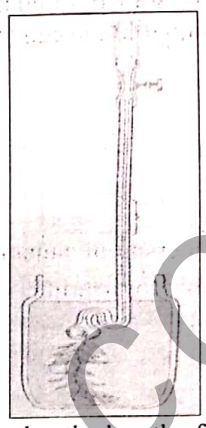
1 2 3 4 5

Which of them (numbered from 1 to 5) are concerned with phagocytic activity?
A 1, 2 and 3
B 4 and 5
C 1 and 4
D 2 and 3

31. This part of the mammalian brain in fondly called a "physiological thermostat".
A Hypothalamus
B Pons
C Medulla oblongata
D Pituitary

32. The evolutionary theory of Jean-Baptist Lamarck was based on:
A the survival of the fittest.
B the inheritance of acquired parts.
C the acquisition of lost parts.
D natural selection.

33. This is an experiment to show that photosynthesis produces oxygen as by product.



Assuming that the length of oxygen collected by the capillary having a bore of 0.05mm diameter, is 15mm in 10 seconds, calculate the rate of oxygen production in a minute by this water plant.
A $75mm^3min^{-1}$
B $7.5mm^3min^{-1}$
C $0.177mm^3min^{-1}$
D $3{,}000mm^3min^{-1}$

34. Considering a single pair of contrasting genes, the probability of producing a double recessive individual in the cross between a dominant heterozygote and a dominant homozygote is:
A 25%
B 0%
C 75%
D 50%

35. Which of these enzymes work in the lowest pH value?
A Pepsin
B Chymotrypsin
C Pancreatic amylase
D Nucleases

36. The speed of propagation of an impulse across a neuron is high when the neuron is:
A large and myelinated.
B small and myelinated.
C large and non myelinated.
D small and non myelinated.

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37. A section of unwound DNA during mRNA replication produced the following sequence:
3'AAUGGCGUUGAACGCGUUGUGAG5'
Assuming that during translation in the cytoplasm the message is read from 3' to 5' and starting with the triplet AUG and ending with the triplet UGA. How many amino acids subunits will be in the product?
A 7
B 5
C 8
D 6

38. This nitrogenous waste product requires very large amounts of water for its dilution and elimination from the body of organisms.
A Urea
B Ammonia
C Trimethlamine oxide
D Uric acid

39. Mendel succeeded in his use of Pea plants to study genetics because Pea plants are cleistogamic meaning Pea plants:
A are short and tall varieties.
B Produce better characters in plants.
C have many genes that are similar.
D pollinate in bud without the flower opening.

40. The indicator of eutrophication is the:
A Biological Oxygen Demand (BOD).
B number of algae.
C species of algae.
D amount of detritus formed.

41. The passage and loading of sieve tubes at the leaves from neighbouring parenchyma cells is mainly through the:
A symplast pathway and vacuolar pathway.
B symplast pathway and sieve areas.
C vacuolar pathway and apoplast pathway.
D apoplast pathway and sieve areas.

For questions 42 to 50 there are two 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.	Every living cell has a potential difference across its cell surface membrane.	The cell surface membrane of any cell is made up of a bipolar lipid layer and sandwiched by a protein layer
43.	Mineral ions are taken up by root hairs by simple diffusion.	Mineral ions needed by plant leaves reach them through the transpiration stream.
44.	The red blood cell of the mammal carries more oxygen than carbon dioxide.	In the red blood cell, haemoglobinic acid ensures that more carbon dioxide is carried by the blood
45.	The mammalian skin is responsible for heat modulation in the body.	The sweat gland ensures that there is heat loss by latent heat of vaporization.
46.	Breast milk is the best milk for mammalian babies.	Breast milk especially collustrum serves as a means of immunity for mammalian babies.
47.	Quornhas more health advantages over conventional meat.	Quorn is a genetically modified beef product.
48.	Red blood cells in pure water undergo crenation.	Haemoglobin molecules are found in solution when red blood cells are put into pure water.
49.	In a warm and moist forest floor, plants suffer from physiological wilting.	Transpiration rate is higher in moist equatorial forests.
50.	Mitochondria are self replicating.	Mitochondria are known to have their own DNA and Ribosomes.

STOP

GO BACK AND CHECK YOUR WORK