



SSC BIOLOGY ADVANCED PAPER

Candidate Name:	
Candidate Number :	
Centre Name:	
Centre Number :	

Paper 1: Biology

(2 hours) For Examination June 2025

It is necessary to respond on the answer sheets provided alongside this question paper. Additionally, you must have a soft pencil (preferably of type B or HB), a clean eraser and a dark blue or black pen.

INSTRUCTIONS:

- You must write your name, candidate number, Centre name and Centre number on the answer sheets in the designated spaces.
- Objective section consists of 25 questions, and it is essential that you attempt all of them.
- Each question has four options labelled A, B, C, and D. Select the option that you think is correct. Mark it on the multiple choice answer sheet using a soft pencil.
- Attempt all the questions from subjective section using a dark blue or black pen.
- It is important to follow the instructions provided on the answer sheets.
- Do not use correction fluid.
- Avoid writing on any bar codes.

INFORMATION:

- This paper has a total of 100 mark
- . • In objective section there are 25 questions, each carries one mark. There is no negative marking for incorrect responses.
- In subjective section, 45 marks are for extended theory and 30 marks for practical component. The number of marks assigned for every question or its parts is indicated within brackets []

OBJECTIVE SECTION (MCQ)

(25marks)

Choose the correct option from the following:

1. Which component of the visual system is affected in someone with colour blindness?

- A. Optic nerve
- B. Rod cells
- C. Cone cells**
- D. Damage to retina

2. Plants carry out photosynthesis to form glucose and oxygen. Releasing oxygen is used to which essential life function?

- A – Respiration**
- B- Nutrition
- C- Excretion
- D – Growth

3. Which row represents the correct structures found in animal cells?

A.	Nucleus	Chloroplast	Mitochondria	Cell wall
B.	Mitochondria	Cell membrane	Nucleus	Ribosomes
C.	Cell wall	Glycogen	Cell membrane	Ribosomes
D.	Glycogen	Chloroplast	Mitochondria	Golgi bodies

4. Viruses are not made of cells (a cellular). Which measurement unit is commonly used to express their size?

- A. um
- B. mm
- C. nm**
- D. pm

5. A section of DNA contains the order of bases TACCTCGTACGA. What would be the complementary sequence of this strand?

A – ATGGAGCATGCA

B– ATAGAGCATGCA

C – ATGGAGCATCCA

D – ATGGAGCATGCT

6. After muscular exercise, which blood vessel carries the **lowest** concentration of carbon dioxide?

A. hepatic artery

B. pulmonary vein

C. renal artery

D. vena cava

7. Which of the following is correct for chemical digestion of lipids by action of lipase?

A – Lipids → amino acids + glycerol

B – Lipids → fatty acids + fat globules

C – Lipids → fatty acids + glycerol

D – Lipids → fat globules + glycerol

8. Which sequence accurately traces the movement of oxygen from inhalation to absorption by red blood cells?

A – Larynx > bronchi > alveoli > bronchioles > red blood cells

B – Trachea > bronchi > alveoli > bronchioles > red blood cells

C – Larynx > trachea > bronchioles > alveoli > red blood cells

D – Larynx > bronchi > trachea > alveoli > red blood cells

9. Which mineral deficiency leads to Chlorosis in plants?

A – Phosphate

B – Nitrates

C – Potassium

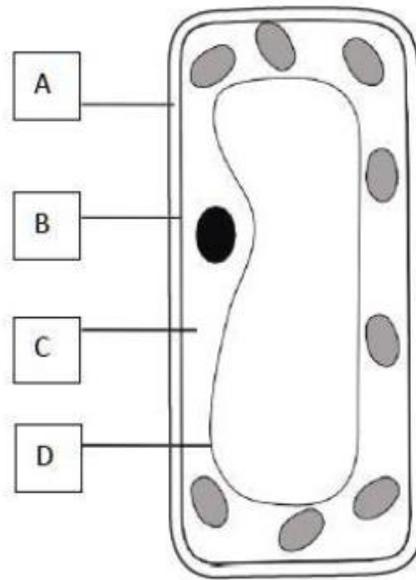
D – Magnesium

10. Antibiotics are medicines used to treat bacterial infections. Which option is **NOT** correct about antibiotics use to treat bacterial diseases?

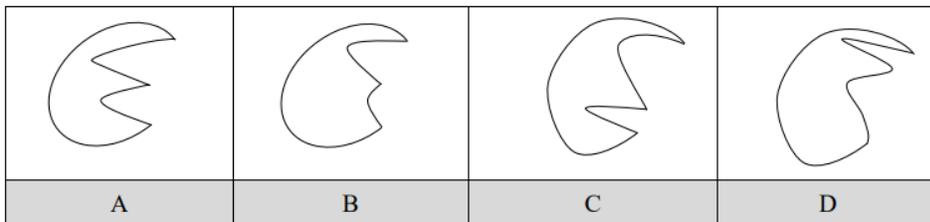
- A – Inhibiting Protein Synthesis
- B – Interfering with DNA Replication
- C- Inhibits cell wall formation
- D - Stop mitosis**

11. The diagram shows a plant cell. Which structure controls the passage of substances into and out of the cell?

Ans: B



12. The diagram represents a substrate and four enzymes, A, B, C and D. Which enzyme will act on this substrate?



13. Consider the given word equation:

I. Glucose \rightarrow lactic acid + energy

II. Glucose \rightarrow ethanol + carbon dioxide + energy

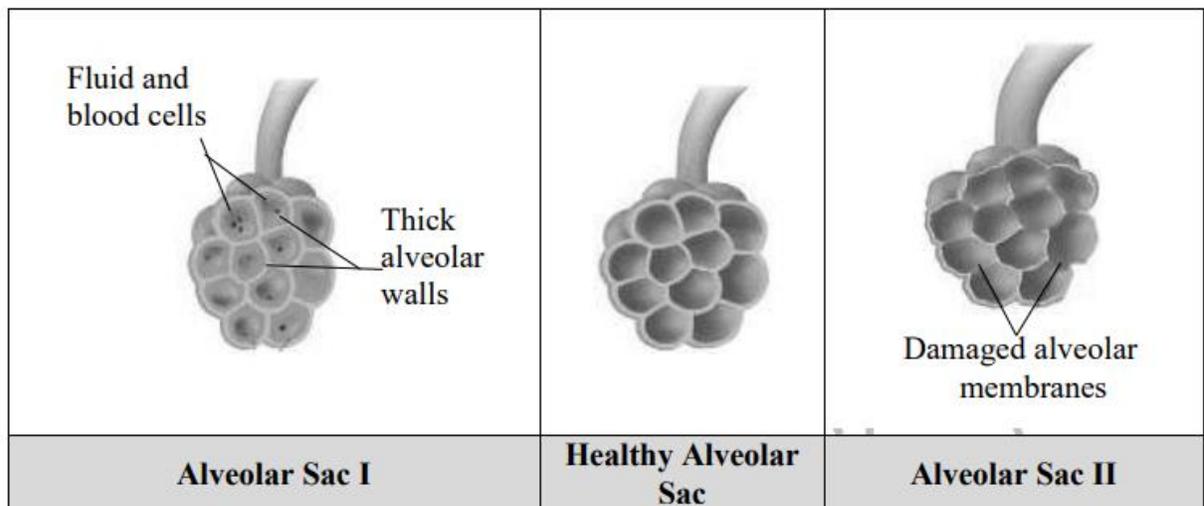
III. Glucose + oxygen \rightarrow carbon dioxide + water + energy

IV. Carbon dioxide + water + energy \rightarrow glucose + oxygen

The option that shows the equation for anaerobic respiration in humans and in yeast is

	Anaerobic Respiration in Human	Anaerobic Respiration in Yeast
A.	II	IV
B.	I	III
C.	I	II
D.	III	IV

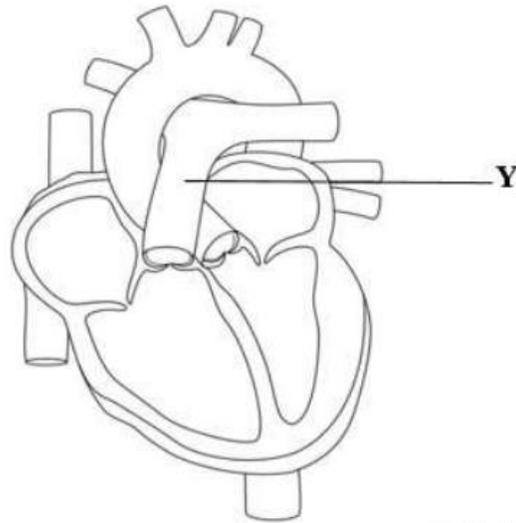
14. The given pictures are of healthy and diseased alveolar sacs in humans.



The alveolar sacs I and II represent which diseases in human?

	Alveolar Sac I	Alveolar Sac II
A.	emphysema	pneumonia
B.	asthma	bronchitis
C.	pneumonia	emphysema
D.	bronchitis	asthma

15. The given diagram shows longitudinal section of the human heart.

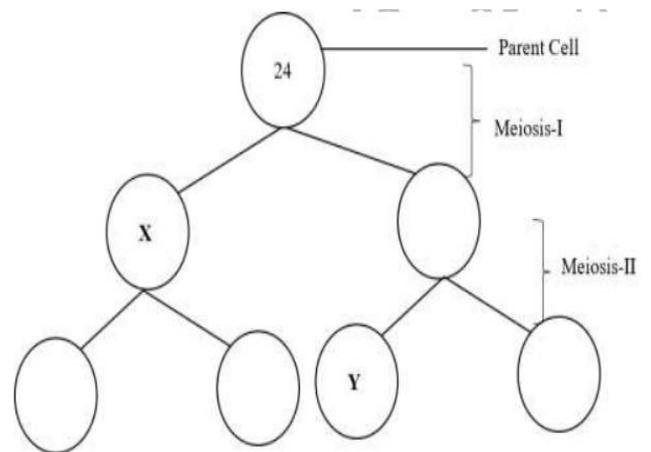


Which of the following option is CORRECT about the identification, concentration of carbon dioxide and blood pressure in the vessel labelled as Y?

	Vessel Y	Concentration of carbon dioxide	blood pressure
A.	Pulmonary vein	High	High
B.	Pulmonary artery	High	Low
C.	Aorta	High	Low
D.	Superior Vena cava	Low	High

16. The given diagram shows the process of meiosis in plants. The number of chromosomes in the cells X and Y is

	X	Y
A.	24	12
B.	12	6
C.	12	12
D.	6	6



17. In pea plants, the allele (R) for long stem is dominant over the allele (r) for short stem. Similarly, the allele (S) for the purple flower colour is dominant over the allele (s) for white flower colour.

Long Purple	Long white	Short purple	Short white
9	3	3	1

The genetic cross that is expected to produce phenotypic ratio as given in the table is

- A. RrSS x rrss
- B. RRSS x RrSs
- C. RrSs x RrSs**
- D. RRss x rrSS

18. Giraffe and koala live in the same forest and feed on grass. The ecological interaction between giraffe and koala is

- A. competition.**
- B. parasitism.
- C. predation.
- D. commensalism

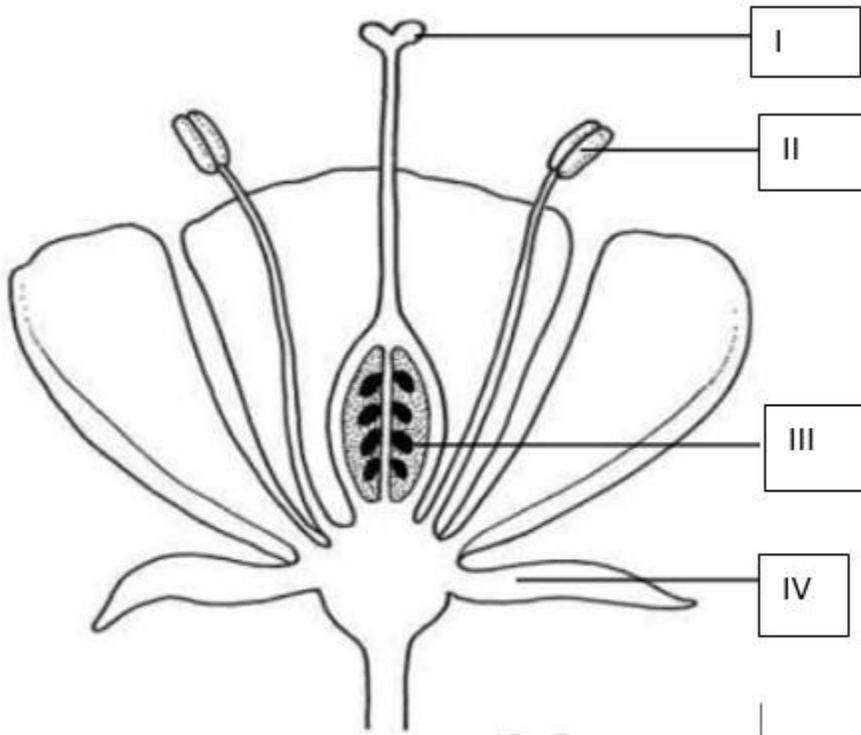
19. A child is frightened by a loud noise and shouts for help. In which order are the different types of neurons involved in this response?

	Involved First		Involved last
A.	Motor neuron	Relay neuron	Sensory neuron
B.	Sensory neuron	Relay neuron	Motor neuron
C.	Sensory neuron	Motor neuron	Relay neuron
D	Motor neuron	Sensory neuron	Relay neuron

20. Two containers X and Y were filled with equal amount of dough mixture for making bread. The container Y had yeast in it .The containers were then left in a warm place for two hours. Which substance produced by the yeast causes dough to rise?

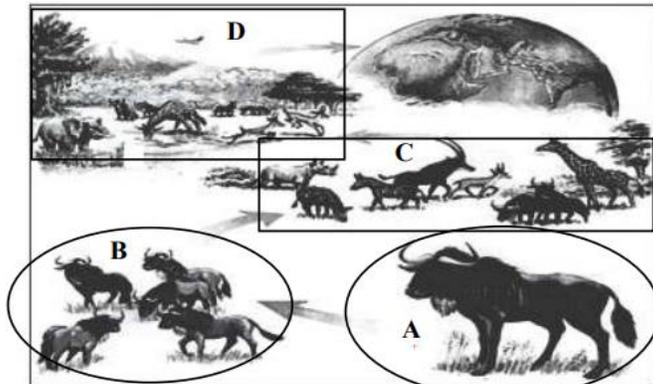
- A. alcohol
- B. Carbon dioxide**
- C. lactic acid
- D. oxygen

21. In pollination, pollens transfer from the labelled parts:



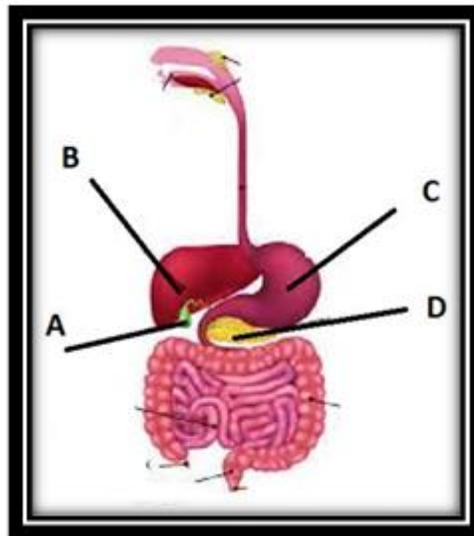
- A. II to I
- B. I to III.
- C. II to IV.
- D. III to IV

22. In the given diagram of biological level of organization, the population level is labelled as



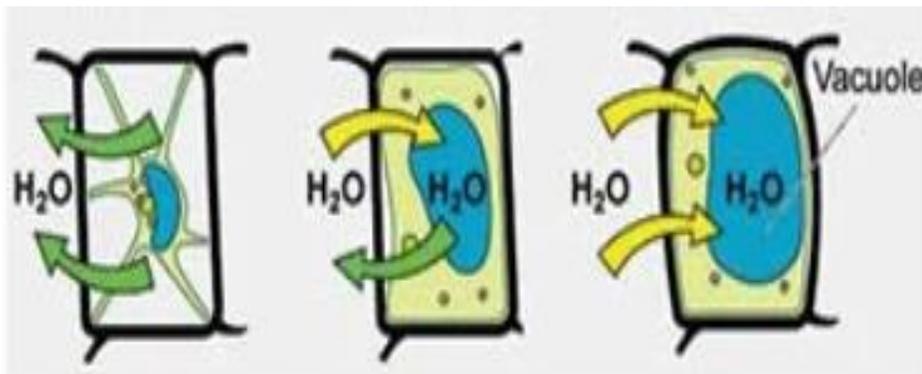
Ans:B

23. Which letter organ of the body is responsible for the production of enzyme trypsin for the digestion of protein?



Ans:D

24. Which process is being represented in the diagram below?



A – Active transport

B – Facilitated diffusion

C – Osmosis

D – Diffusion

25. Which component of the blood is responsible to transport nutrients around the body?

A – Red blood cells

B – Plasma

C – White blood cells

D – Platelets

Part 2: Extended Theory:

(45marks)

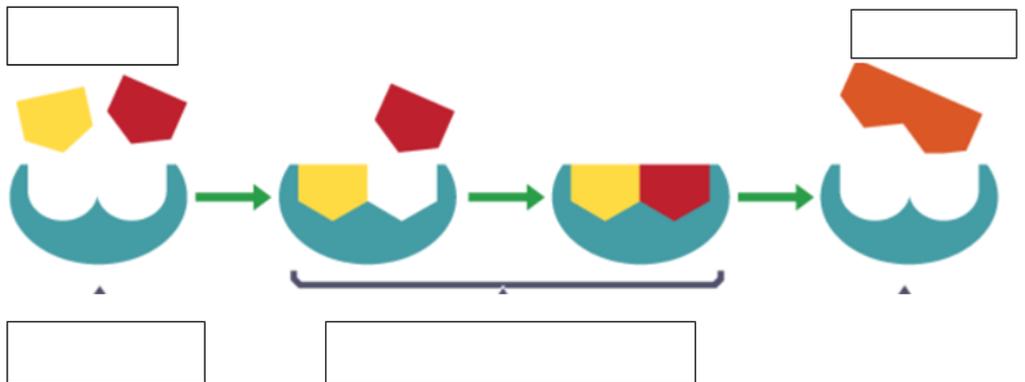
In chemical digestion enzymes play a crucial role in the digestion of carbohydrates, protein and fats.

Q1a) Complete the table below regarding proteases:

[2 marks]

	Name of enzyme	Site of production	Site of digestion
1.			
2.			

b. The diagram below is the picture illustration of enzyme reaction.



c- Label all the above boxes with the appropriate missing informations of the diagram?
(2 marks)

d- Explain what are the factors which can affect the rate of protein digestion in the body?

(3 marks)

e) Describe and explain the rate of protein digestion reaction when the temperature is increased?

(2 marks)

f) Why is pineapple used to tenderize meat?

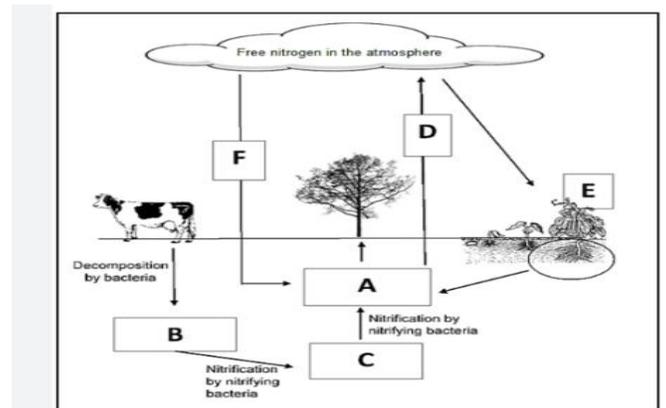
(2marks)

(Total marks 11)

Q2a. Nutrient cycles are vital for maintaining life on Earth. Identify the nitrogenous compound A, B and C in the process below.

(3 marks)

- A. _____
- B. _____
- C. _____



Q3. The given table demonstrates a genetic cross between two flowers:

Parents	Red	×	White	
F1 Generation	Pink			
F1 x F1	Pink	×	Pink	
F2 Generation	Red	Pink	Pink	White

a) Determine the genotype of the pick flowers produced in F1 generation.

(1mark)

b) Identify the type of dominance in the given cross.

(1mark)

c) Determine the phenotype and genotype of offspring flowers if two red flowers F2 generation are crossed.

(2marks)

d) Explain possible positive and negative effects on mutation forming new alleles in a population.

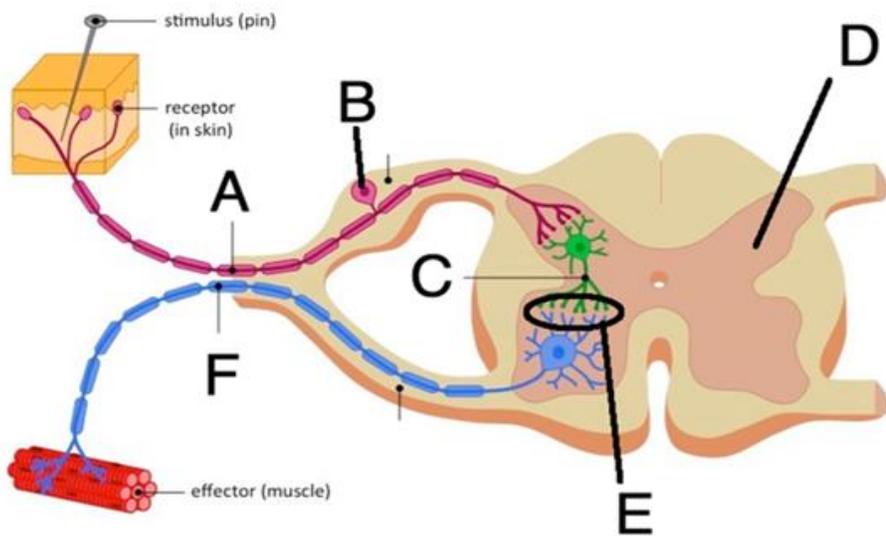
(3marks)

e) Describe the process of selective breeding/artificial selection. (4marks)

(Total marks 11)

Q4a) Identify the process which is going on at point E.

(1mark)



b) Complete the table below by writing the each alphabet role of the above picture.

(2marks)

	letter	Description
i.	A	
ii.	D	

c) Creams or moisturizers are also used as pain relievers which are directly applied on the skin as a pain killer? Explain how this topical application works to reduce discomfort after an injury.

(3marks)

d) Explain the structural adaptations of neurons that enable them to carry out their function effectively.

(5 marks)

c) What will be the Dependent variable for this experiment?

(1mark)

d) What will be the independent variable and control variables for this experiment?

(3marks)

e) After adding milk, and sodium carbonate solution to a test tube, phenolphthalein is added. The students took a picture but it was in black and white. State the correct colour that should be observed?



(1mark)

f) After adding enzyme B to the mixture the fats in the milk are broken down, which of the products will lead to a decolourisation of the phenolphthalein?

(1mark)

g) The investigation should be repeated to increase the reliability of the experiment? Explain why this is important?

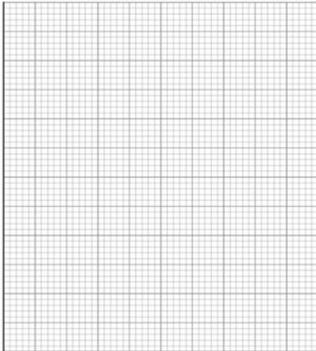
(2 marks)

h. In larger organisms the rate of decay can be measured in change in their masses. Below is the results of mass change of an organism over a period of 30 days.

	Time in days	Mass in kilograms
1.	0	20kg
2.	5	19.5
3.	10	18
4.	15	16.5
5.	20	15
6.	25	14
7.	30	14

i) Complete the graph by:

- **Suitable scale**
- **Correct plotting of data**
- **Drawing straight lines between the plots:**



Put mass in Kg on the Y axis do not put a scale

Put time in days on X axis do not put a scale

(3marks)

j) Describe and explain the relationship of graph?

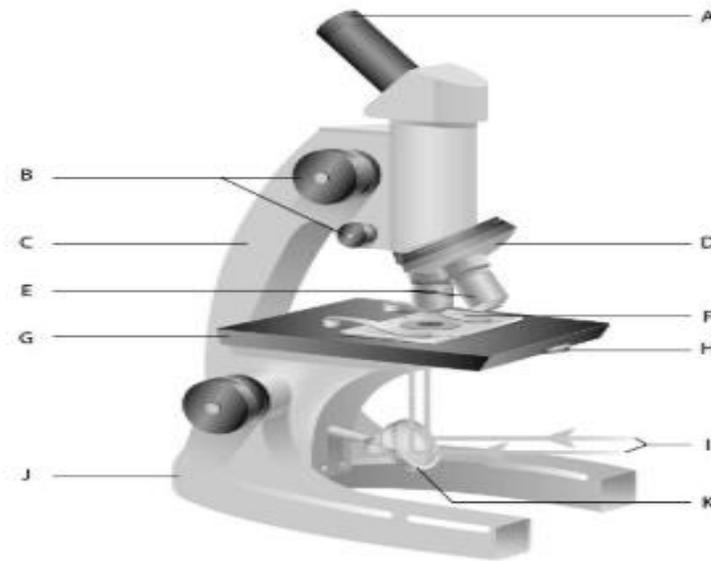
(2 marks)

(Total mark14)

Q2) Microscopes are used to observe very small living organisms and cells, during an investigation a student wishes to observe human cheek cells using a cotton swap to take a sample.

a. Label diagram of the light microscope from alphabet A to K.?

(4 mark)



b) State which chemical stain/dye is used to observe animal cells.

(1mark)

c) Explain why a dye or stain is needed to view the sample?

(1 mark)

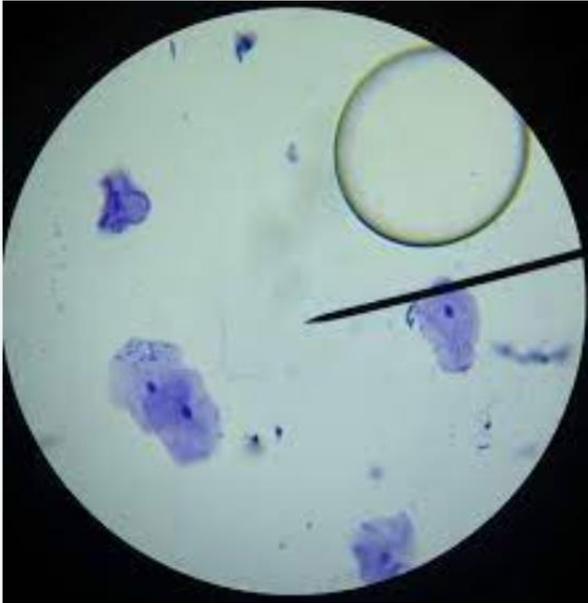
d) Describe in detail the process of slide preparation.

(3marks)

e) Write the names of equipment and safety precautions you should take when preparing the sample?

(3 marks)

f) Look at the image of temporary slide made by a student.



g) State the error the student had made in their slide preparation? (1 mark)

h) Suggest what the student can do to correct this mistake? (1 mark)

i) The actual diameter of cheek cells is 38 μ m. A student was asked to draw an image with a magnification of X2500.

j) Calculate the image diameter that should be drawn, select a suitable unit for your answer. (2 marks)

(Total 16marks)

ANSWERING KEY OF MCQs

1.	C
2.	A
3.	B
4.	C
5.	D
6.	B
7.	C
8.	C
9.	B
10.	D
11.	B
12.	C
13.	C
14.	C
15.	B
16.	C
17.	C
18.	A
19.	B
20.	B
21.	A
22.	B
23.	D
24.	C
25.	B

Table of specification:

Scheme of Assessment SSC Advanced					
Exam Specification					
Topic no.	TOPICS	AO1 MCQs (1m)	AO2	AO3	
1	Foundations of Biology: Cells, Life, and Organization		1	14	
2	Movement into and out of cells		1		
3	Biological Molecules and Nutrition		3	11	
4	Respiratory System and the Effects of Smoking		3		
5	Transport in Animals		3		
6	Disease, Immunity and Drugs		2	16	
7	Plant Nutrition and Transport		2		
8	Coordination, Hormonal Control and Excretion		3	11	
9	Cell Division and Reproduction		1		
10	Genetics, Classification, and Evolution		3	11	
11	Ecology and Human Impact on the Environment		1	12	
12	Biotechnology and Genetic Engineering		2		
		Total: 25	Total: 45	Total: 30	Total: 100