رقم الورقة	
رقم المغلف	

☐ حاضر

☐ غائب

سلطنة عمان

وزارة التربية والتعليم

امتحان شهادة دبلوم التعليم العام للمدارس الخاصة (ثنائية اللغة)

للعام الدراسي ١٤٣٣/١٤٣٤ هـ - ٢٠١٢ / ٢٠١٣ م

الدور الأول - الفصل الدراسي الثاني

تنبيه:
- المادة: الأحيـــاء.
- الأسئلة في (١٣) صفحة.
- زمن الإجابة: ثلاث ساعات.
- الإجابة في الورقة نفسها.

تعليمات وضوابط التقدم للامتحـان:

- الحضور إلى اللجنة قبل عشر دقائق من بدء الامتحان للأهمية.
- إبراز البطاقة الشخصية لمراقب اللجنـة.
- يمنع كتابة رقم الجلوس أو الاسم أو أي بيانات أخرى تدل على شخصية الممتحن في دفتر الامتحان، وإلا ألغي امتحانه.
- يحظر على الممتحنين أن يصطحبوا معهم بمركز الامتحان كتبا دراسية أو كراسات أو مذكرات أو هواتف محمولة أو أجهزة النداء الآلي أو أي شيء له علاقة بالامتحان كما لا يجوز إدخال آلات حادة أو أسلحة من أي نوع كانت أو حقائب يدوية أو آلات حاسبة ذات صفة تخزينية.
- يجب أن يتقيد المتقدمون بالزي الرسمي (الدشداشة البيضاء والمصر أو الكمة للطلاب والدارسين والزي المدرسي للطالبات واللباس العماني للدارسات) ويمنع النقاب داخل المركز ولجان الامتحان.
- لا يسمح للمتقدم المتأخر عن موعد بداية الامتحان بالدخول إلا إذا كان التأخير بعذر قاهر يقبله رئيس المركز وفي حدود عشر دقائق فقط.
- يتم الالتزام بالإجراءات الواردة في دليل الطالب لأداء امتحان شهادة دبلوم التعليم العام.
- يقوم المتقدم بالإجابة عن أسئلة الامتحان المقالية بقلم الحبر (الأزرق أو الأسود).
- يقوم المتقدم بالإجابة عن أسئلة الاختيار من متعدد بتظليل الشكل (☐) وفق النموذج الآتي:

س - عاصمـة سلطنة عمـــان هي:

☐ القاهرة ☐ الدوحة

■ مسقط ☐ أبوظبي

ملاحظة: يتم تظليل الشكل (■) باستخدام القلم الرصاص وعند الخطأ، امسح بعناية لإجراء التغيير.

صحيح ■ غير صحيح ☐ ◉ ◥ ☒ ☑

Question 1 (28 marks)

Shade the best correct answer for each of the following questions.

1. **The final number of ATP molecules released from an anaerobic respiration of a 6 carbon-sugar is:**

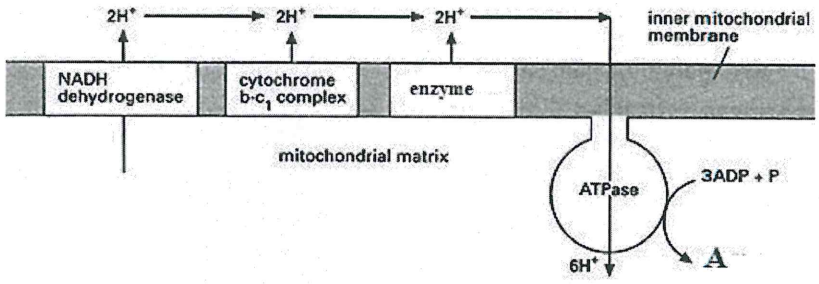
- ☐ 8
- ☐ 6
- ☐ 4
- ☐ 2

2. **The final amount of energy in (kJ/mol) released after aerobic respiration of 3 fructose molecules is:**
Note: each fructose molecule consists of two glucose molecules and each ATP = 60 kJ/mol.

- ☐ 19200
- ☐ 13680
- ☐ 9600
- ☐ 9120

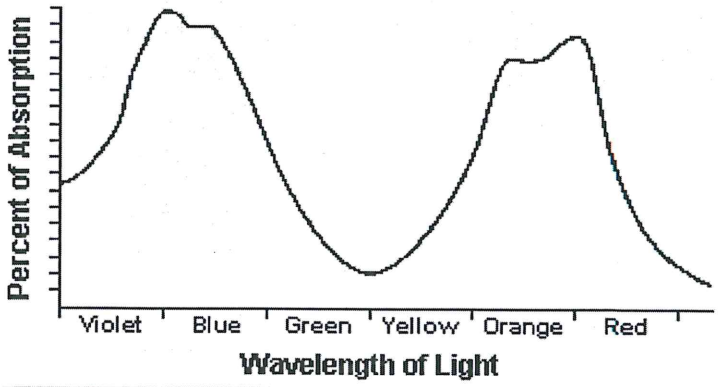
3. **The following diagram shows the chemiosmotic theory in mitochondria, the potential energy needed to produce compound A is:**

- ☐ chemical.
- ☐ mechanical.
- ☐ electrical.
- ☐ kinetic.



4. **The graph represents the absorption spectrum of chlorophyll. The energy used in photosynthesis is most likely obtained from the absorption of light in two regions of the spectrum which are:**

- ☐ yellow and orange-red.
- ☐ violet-blue and green.
- ☐ violet-blue and orange-red.
- ☐ green and yellow.



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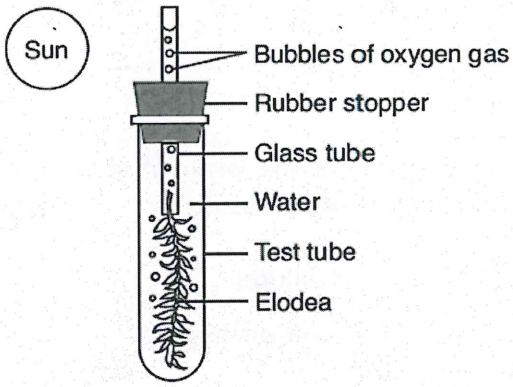
5. **The electrons that are passed to NADP+ during the non-cyclic pathway are obtained from:**

- ☐ photosystem I.
- ☐ photosystem II.
- ☐ sunlight.
- ☐ ATP.

6. **A small water plant (elodea) was placed under bright sunlight for five hours: as shown below. Bubbles of oxygen gas have been released which can be inferred that the plant is:**

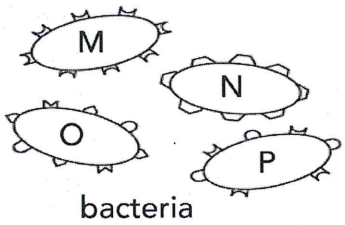
- ☐ releasing CO_2.
- ☐ making protein.
- ☐ producing glucose.
- ☐ carrying on active transport.



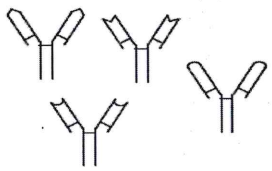
7. **All of the followings are ways of transmission of Salmonella EXCEPT:**

- ☐ un-pasteurized milk.
- ☐ airborne droplets.
- ☐ handling raw chicken.
- ☐ inadequate cooking of meat.

8. **The following diagrams show bacteria and a range of antibodies that were present in a blood of a person.**



bacteria


antibodies

The microorganism most likely to cause a severe infection is:

- ☐ M.
- ☐ N.
- ☐ O.
- ☐ P.

9. **One of the following immunities occurs when pre-formed antibodies injected in to the body:**

- ☐ natural active.
- ☐ artificial active.
- ☐ natural passive.
- ☐ artificial passive.

10. During a bacterial growth, a scientist found that the number of bacteria changed from 2300 cell/mm^3 to 10^5 cell/mm^3. This phase defined as:

- ☐ lag.
- ☐ log.
- ☐ stationary.
- ☐ death.

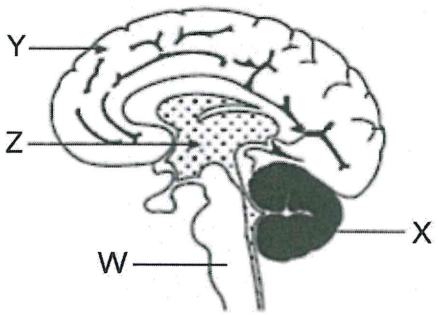
11. The antigens that do not activate an immune response, found on the cell surface of:

- ☐ liver.
- ☐ fungi.
- ☐ bacteria.
- ☐ protozoa.

12. The part in the brain that provide a balance link between nervous impulse and hormones secretion is:

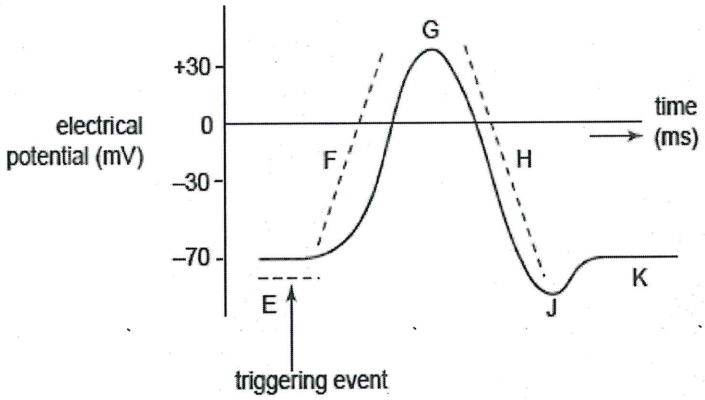
- ☐ cerebellum.
- ☐ medulla oblongata.
- ☐ hypothalamus.
- ☐ cerebral hemispheres.

13. The diagram below shows the main parts of the brain as seen in vertical section. Which of the options below correctly identifies the functions mentioned in the table?



	Balance and Coordination	Reasoning
☐	W	X
☐	Z	W
☐	X	Y
☐	W	Y

14. The graph below shows the pattern traced by placing electrodes at the axon of a nerve cell as it is stimulated.

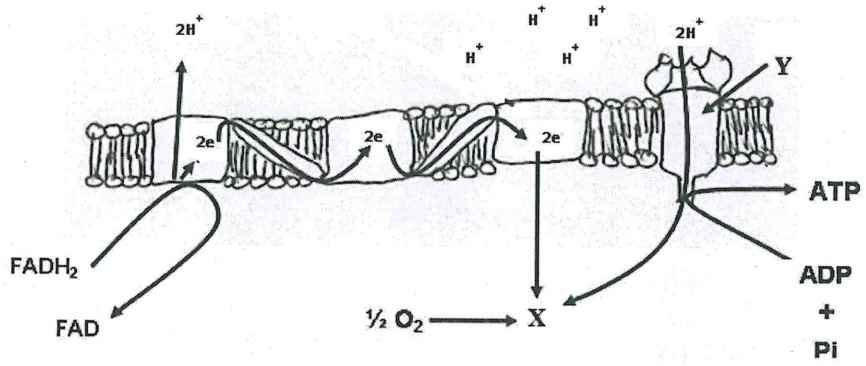


It is reasonable to claim that:

- ☐ the lowest potential, J, represents the resting potential of the nerve.
- ☐ during phase F, more sodium ions are entering the cell than leaving it.
- ☐ during phase K, the membrane will fail to respond to further stimulation.
- ☐ during phase H, more potassium ions are entering the cell than leaving it.

Question 2 (14 marks)

1. **The following diagram shows electron transport chain of the inner membrane of mitochondria.** (4 marks)



a. Name the compound labeled X.

_____

b. What is the main function of part Y?

_____

c. What is the enzyme that catalyze the formation of compound X?

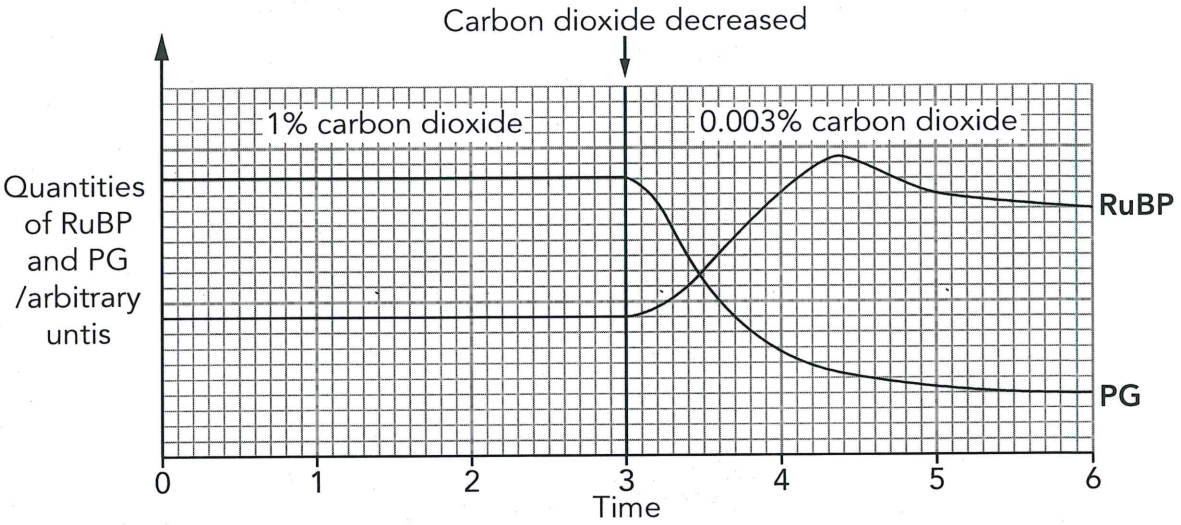
_____

d. If the number of $FADH_2$ that entered this stage were 20, how many $NADH+H^+$ will be their?

_____

_____

2. An investigation of photosynthesis in cells taken from a green alga was carried out. The quantities of PG and RuBP in these cell samples were measured as shown in the graph below. (3 marks)



The effects of the decrease in the concentration of carbon dioxide on the quantities of:
Shade the correct answer:

PG:

☐ Increase. ☐ Decrease.

Give reason for your choice.

_____

RuBP:

☐ Increase. ☐ Decrease.

Give reason for your choice.

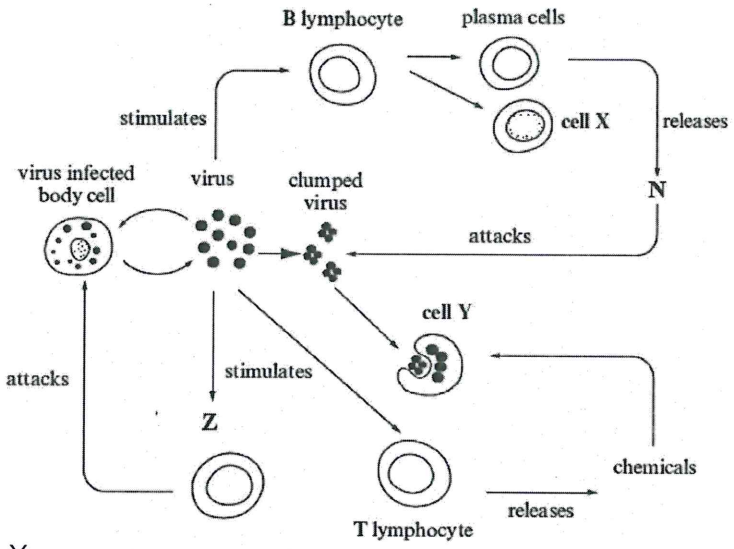
_____

3. The table below shows samples of blood of each group A, B, AB and O that were tested with anti-A and anti-B antibodies.
Complete the table with (✓) or (X) to show the results you would expect for blood groups B, AB and O. (3 marks)

Blood group	A	B	AB	O
Antibody: Anti-A	✓			
Antibody: Anti-B	X			

✓	Agglutination
X	Non-agglutination

4. The diagram below shows some of the events occurring during the process of immunity. (4 marks)



a) Name cell X.

_____

b) Name product labeled N:

_____

c) What is the type of T-lymphocyte labeled Z?

_____

d) What is the function of cell Y?

_____

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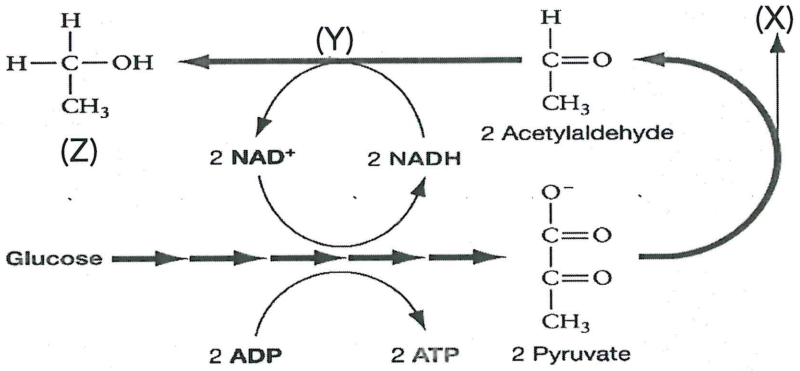
Do not write in this space

Question 3 (14 marks)

1. The following diagram shows the fermentation in yeast. (3 marks)



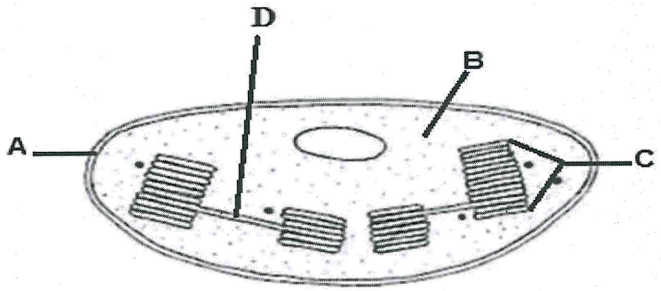
a) Name compound labeled:

X: _____ Z: _____

b) What is the importance of process Y in the reaction?

_____

2. The diagram below shows the structure of a chloroplast. (2 marks)



a) Name the labeled parts:

A: _____

B: _____

b) Write the letter of the structure where:

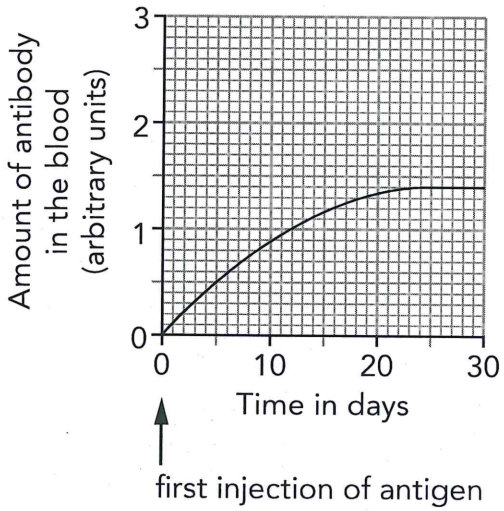
(i) the light-dependent reactions of photosynthesis take place.

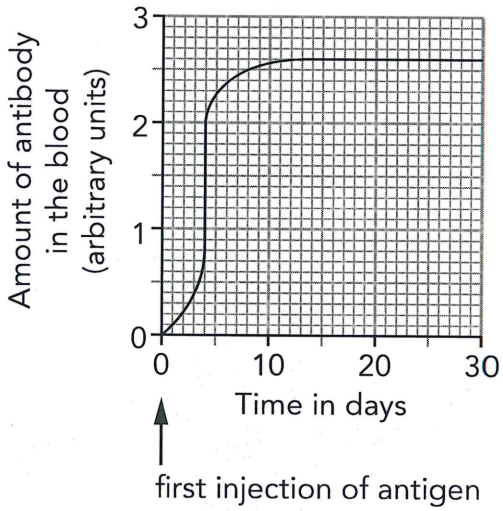
_____

(ii) the light-independent reactions take place.

_____

3. The graphs below show the effect of two injections of antigen on the formation of antibodies of a person. (4 Marks)





a) Complete the table below.

Injection	Maximum amount of antibodies	Time required
1st		
2nd		

b) Explain why the secondary injection of antigen gives faster and longer-lasting immunity.

_____

_____

_____

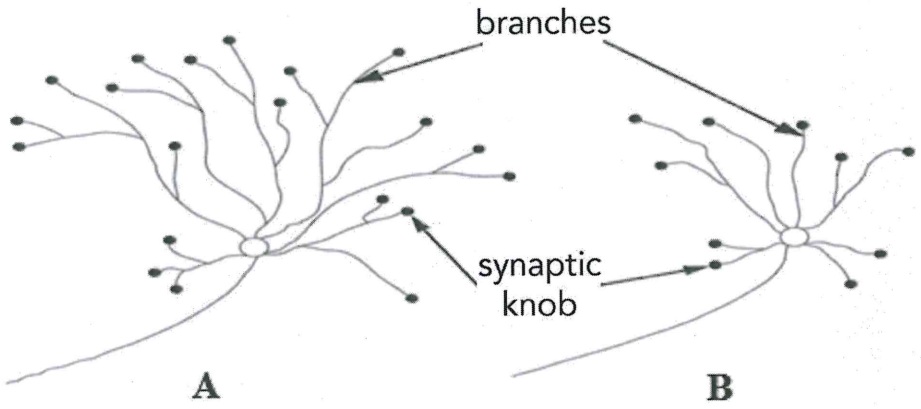
4. Alzheimer's disease is a complex, degenerative disease that affects the brain over the age of 65. One symptom of Alzheimer's disease is a reduction in the level of an enzyme in the brain that synthesizes acetylcholine (3 marks)

a) State the function of acetylcholine synapses in the brain.

_____

_____

The diagram below shows neurones from the brains of a healthy 70 year old person labeled A, and a 70 year old person with Alzheimer's disease labeled B.



b) State two differences between the neurones shown in the diagrams.

(i) _____

_____

(ii) _____

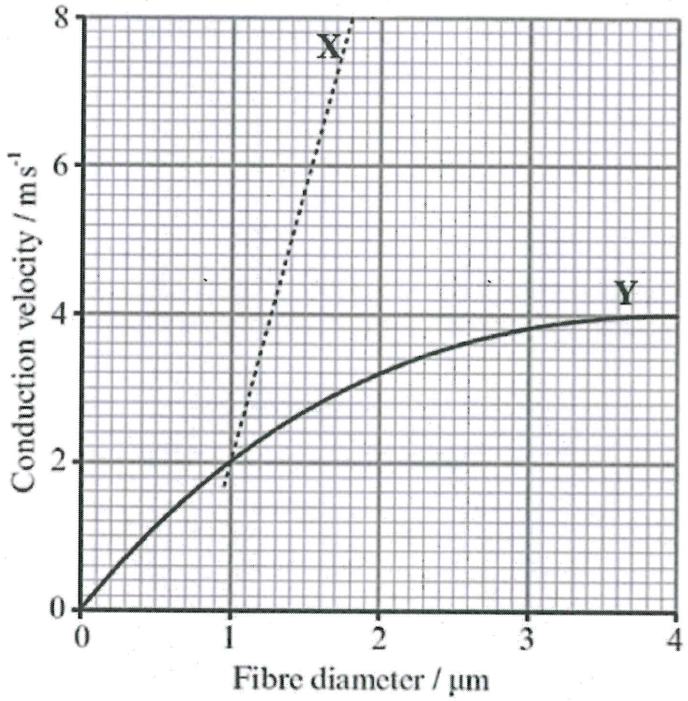
_____

c) explain how acetyl- cholinesterase inhibitors may act to reduce the symptoms of Alzheimer's disease.

_____

_____

5. The graph shows the relationship between fibre diameter and the conduction velocity in myelinated and un-myelinated neurones in the cat. (2 marks)



a) Indicate which lines (X and Y) represents:

(i) Myelinated:

_____

(ii) myelinated:

_____

b) Why X fibres are never less than 1.0 µm in diameter?

_____

_____

_____

Question 4 (14 marks)

1. **Calculate the number of light independent cycles needed to produce 5 molecules of disaccharide sugar ?** (2 marks)

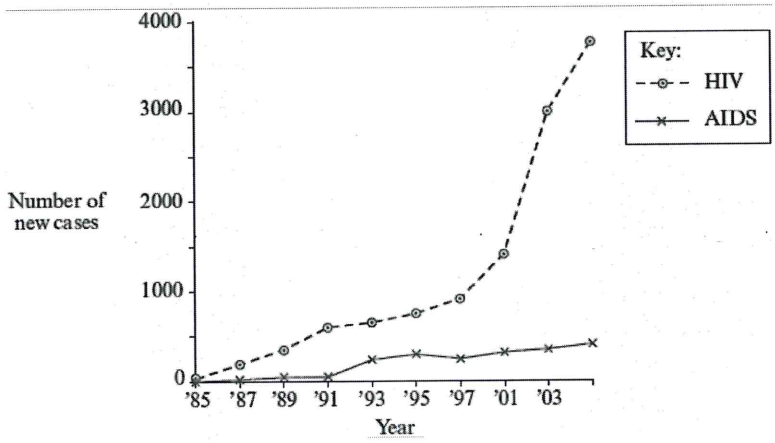
2. **Define the followings:** (3 marks)

   a) invasiveness:

   b) infectivity:

   c) carrying capacity:

3. **The graph below shows the number of people were infected with HIV and diagnosed by AIDS between 1985 and 2003.** (3 marks)



   a) What the graph shows about the number of people infected with HIV.

b) Why the curve for AIDS does not follow the same pattern as the curve for HIV?

_____

_____

c) It has not been possible to develop a vaccine for AIDS. Why?

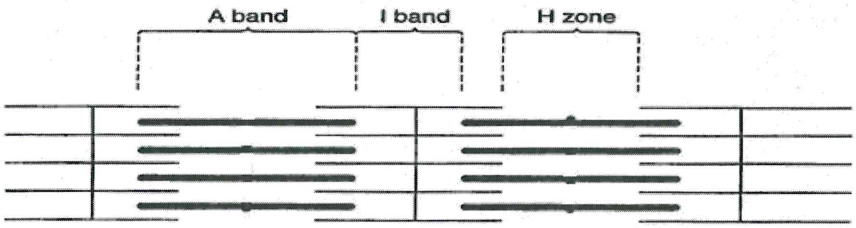
_____

_____

4. Complete the following table. (2 marks)

	Penicillin	Streptomycin
Mode of action		

5. The diagram below represents part of a muscle fibril (myofibril). (4 marks)



a) Name two proteins found in the I band.

(i) _____

(ii) _____

b) Label one sarcomere on the diagram.

c) State two evidence shown on the diagram which indicate that the myofibril is shown in the relaxed state.

(i) _____

(ii) _____

END OF EXAMINATION

مُسَوَّدَة