

CANDIDATE  
NAME

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**MARINE SCIENCE**

**9693/01**

Paper 1 AS Structured Questions

**October/November 2017**

**1 hour 30 minutes**

Candidates answer on the Question Paper.

No Additional Materials are required.

**READ THESE INSTRUCTIONS FIRST**

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Write your answers in the spaces provided on the Question Paper.

Electronic calculators may be used.

You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **16** printed pages and **4** blank pages.

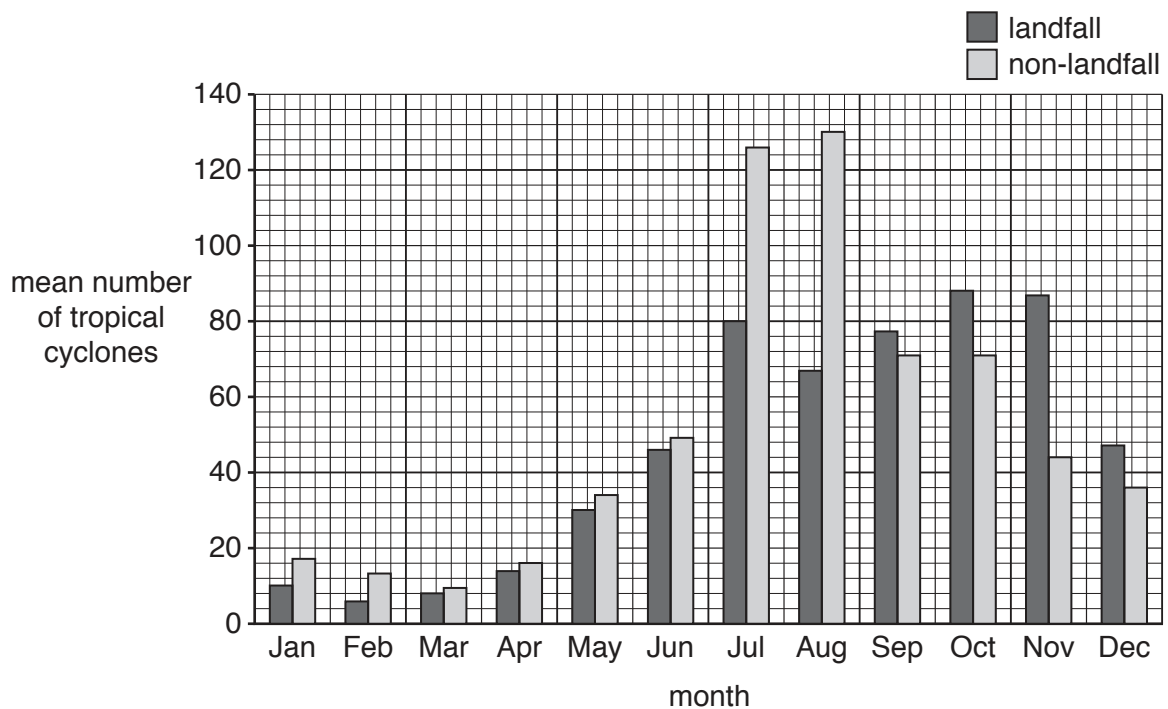
Answer **all** the questions in the spaces provided.

- 1 (a) Fig. 1.1 shows the location of the Philippines.



**Fig. 1.1**

Fig. 1.2 shows the mean number of tropical cyclones per month in the Philippines between 1948 and 2010. It also shows the number of tropical cyclones that made landfall and the number that did not make landfall.



**Fig. 1.2**



(b) (i) Suggest **two** harmful effects of a tropical cyclone on a country.

1 .....

.....

2 .....

.....

[2]

(ii) Suggest **two** beneficial effects of a tropical cyclone on a country.

1 .....

.....

2 .....

.....

[2]

(c) Suggest why the wind speed falls as a tropical cyclone makes landfall.

.....

.....

.....

.....

[2]

[Total: 11]







3 (a) Fig. 3.1 shows four stages in the formation of an atoll.

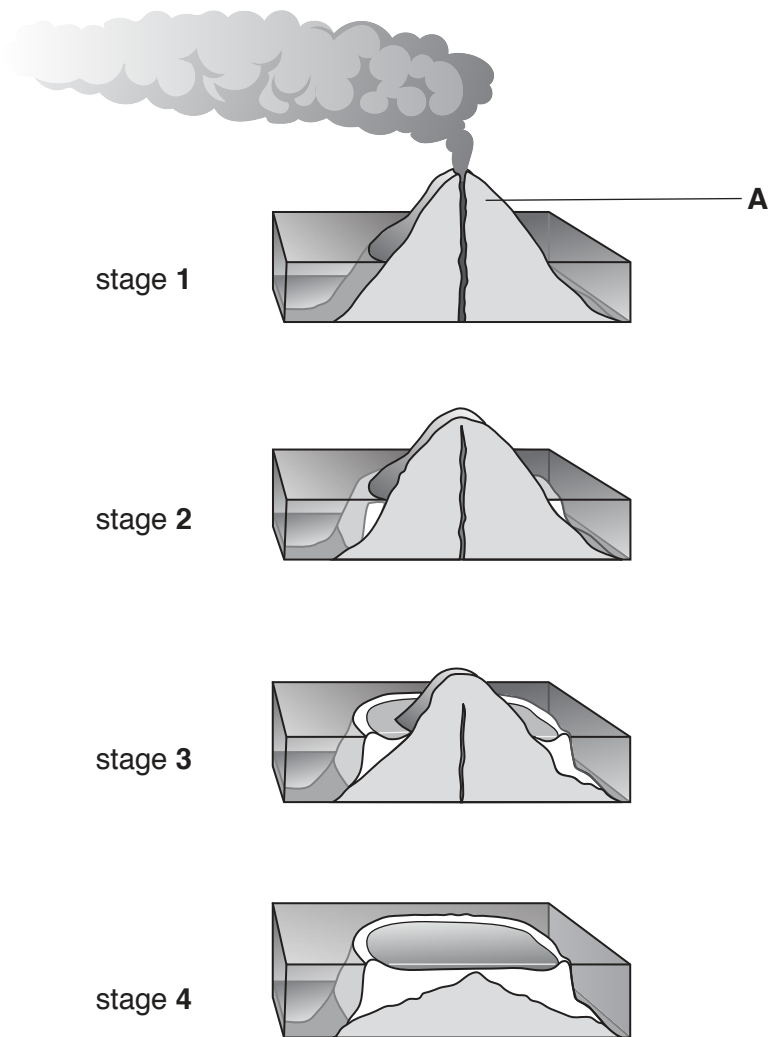


Fig. 3.1

(i) Name the part labelled **A**.

.....[1]





- (c) The age of coral can be estimated using carbon dating. This method can be used to date a sample of coral to within an accuracy of 100 years.

The atmosphere contains a very small quantity of radioactive carbon ( $^{14}\text{C}$ ), which is absorbed into living organisms. Over time, this changes to  $^{12}\text{C}$ .

Fig. 3.2 shows the relationship between the percentage of  $^{14}\text{C}$  that is left in a once-living material and the age of the material.

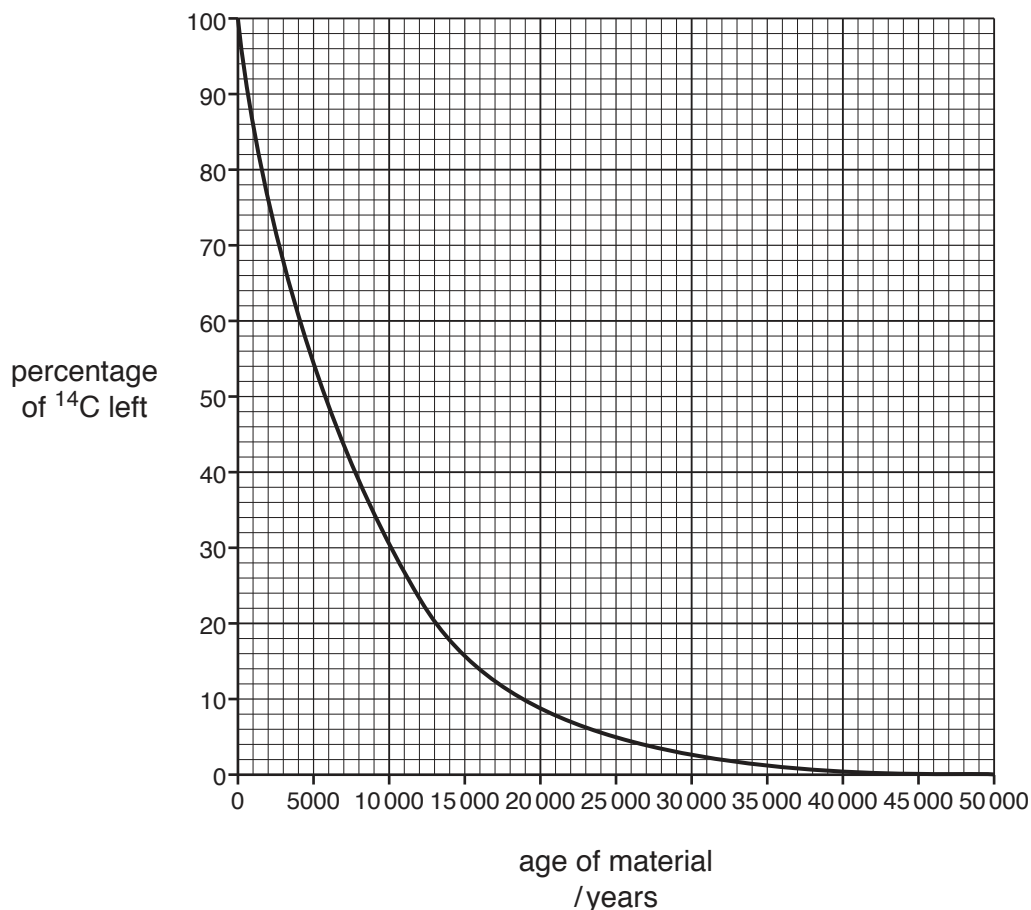


Fig. 3.2

- (i) Describe the relationship between the age of a material and the percentage of  $^{14}\text{C}$  in the material.

.....  
 .....[1]

- (ii) State the age of a material which contains 30%  $^{14}\text{C}$ .  
**Show** on Fig. 3.2 how you decided on this value.

.....  
 [2]

- (iii) The half-life of a substance is the time taken for the amount of a radioactive substance to decrease by half.

Use Fig. 3.2 to determine the half-life of  $^{14}\text{C}$ .

.....  
[1]

- (iv) Coral aged more than 35 000 years old cannot be dated accurately.

With reference to Fig. 3.2, suggest a reason for this.

.....  
.....[1]

[Total: 12]

4 (a) Fig. 4.1 shows part of a marine food web.

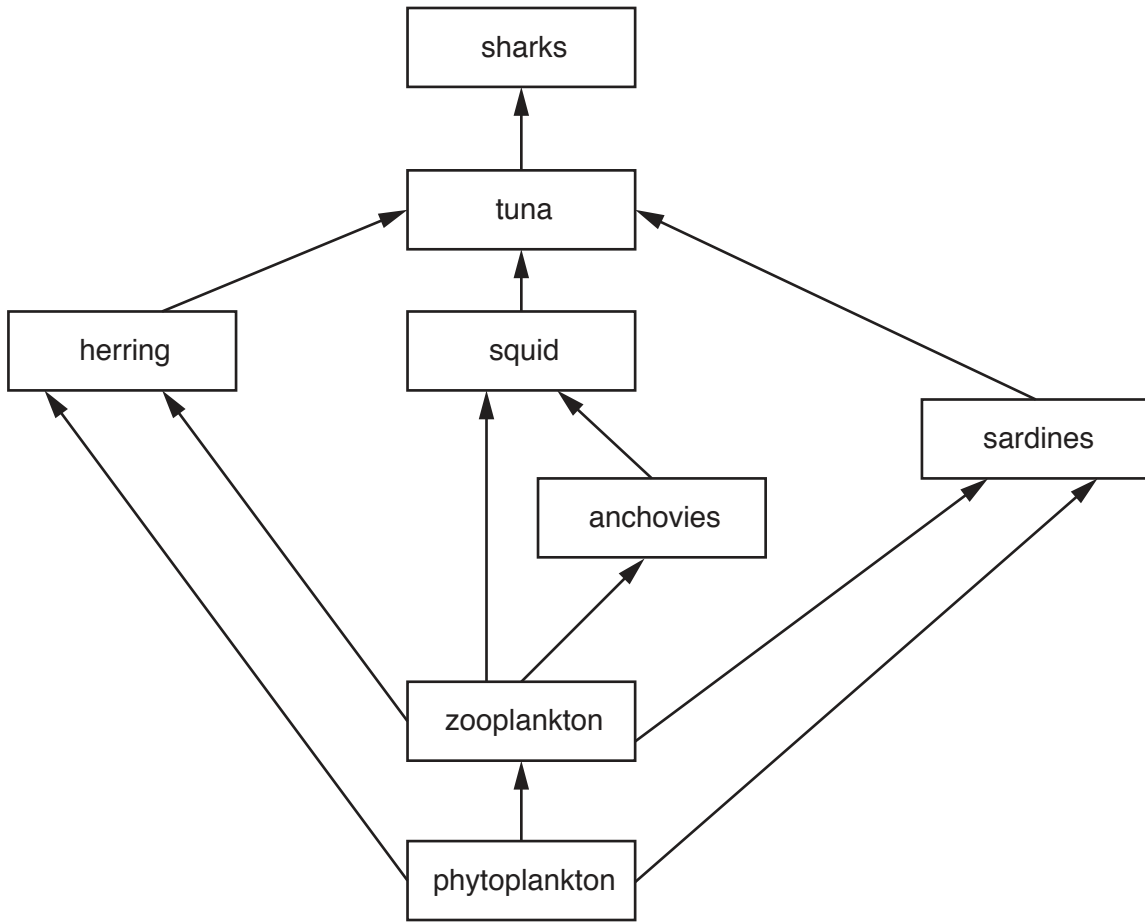


Fig. 4.1

(i) Complete Table 4.1 by placing a tick (✓) or ticks in each row to indicate if each organism is a predator, a primary consumer, a secondary consumer or a prey organism.

Table 4.1

organism	predator	primary consumer	secondary consumer	prey organism
tuna				
zooplankton				
squid				
sardines				

[4]

(ii) Name **two** organisms at the third trophic level in this food web.

..... and .....

[1]







6 (a) State **three** pieces of evidence which support the theory of plate tectonics.

1 .....

.....

2 .....

.....

3 .....

.....

[3]

(b) Fig. 6.1 shows a hydrothermal vent.

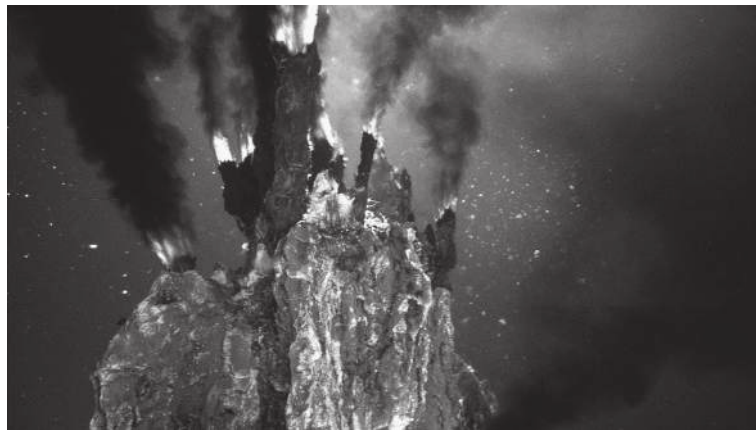


Fig. 6.1

(i) Explain how hydrothermal vents are formed.

.....

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.....

.....

.....

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.....

.....

[4]



(ii) Suggest how conditions at a hydrothermal vent make it impossible for plants to grow.

.....  
.....  
.....  
.....  
.....  
.....  
.....[3]

(iii) Hydrothermal vents sustain many food chains.

Describe the process that is used by organisms found at hydrothermal vents to provide energy for these food chains.

.....  
.....  
.....  
.....  
.....  
.....  
..... [3]

[Total: 13]





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