MARINE SCIENCE **5180/03**

Paper 3 **For Examination from 2014**

SPECIMEN MARK SCHEME

1 hour 30 minutes

MAXIMUM MARK: 60

1 **(a)** Drawing correct size ; [accept range 15 to 16 cm]
Correct proportions ; [head in relation to body, length and width proportions approximately correct]
Neat lines ; [continuous rather than sketchy lines]
Correct number of features ; [5 fins and lateral line shown]   **[4]**

(b) (i) Any five of:

Mouth ;
Eye ;
Operculum ;
Lateral line ;
Pelvic fin ;
Anal Fin ;
Caudal fin ;
Dorsal fin(s) ;   **[5]**

(ii) Scale line on drawing correctly showing the length of the specimen as 30 cm ;   **[1]**

(c) Any two of:

Scales;
paired fins;
lateral line;
operculum ;   **[2]**

[Total: 12]

2 **(a)** D ;
A ;
B ;
E ;
C ; **[5]**

(b)

Sea urchin	Starfish
Spherical / eq	5 arms / eq ;
Long spines present	No spines ;
Tube feet not visible / eq	Tube feet visible / eq ;
All one colour	Two colours / eq ;

[3]

(c) **(i)** 5.6 cm (+ or – 1 mm) ; **[1]**

(ii) Calculation (e.g. 5.6 ÷ 14) ;
= ×0.4 ;

[correct answer only gains both marks] **[2]**

[Total: 11]

3 **(a)** Add iodine (solution) ;
Colour change described ; **[2]**

(b) Add biuret reagent ;
Colour change described ; **[2]**

(c) Add dilute (hydrochloric) acid ;

Heat ;
Then cool ;
Add alkali / sodium hydrogencarbonate ;
To neutralise acid ;
Add Benedict's reagent / Fehling's ;
Heat ;
Colour change described ; **[6]**

[Total: 10]

4 **(a)** Neat table ; [lines drawn with a ruler]
Column heading Fish number ;
Column heading Fork length in cm / eq ;
Column heading Mass in g / eq ;
Data correctly tabulated ; **[3]**

(b) Axes labelled correctly ;
Points plotted accurately ;; [all 8 points gains two marks, 1 or 2 errors gains 1 mark]
Neat line of best fit ; **[4]**

(c) Comment on direct relationship between length and mass / eq ; **[1]**

[Total: 8]

5 **(a)** Carry out investigation on same day / same time of day ;
Avoid trampling ;
Reference to use of quadrat ;
Suitable stated size (e.g. 0.5 m^2) ;
Use of tape measure / eq ;
Reference to a line transect / belt transect ;
Place quadrat at stated distance from water's edge / at top of shore ;
Count number of burrows (within quadrat) ;
Repeat at stated intervals (e.g. every 1 metre) ;
Reference to repeating transect ; **[8]**

(b) Reference to tabulation of results ;
Headings for columns, distance from water in metres / eq ;
Number of ghost crab burrows ;
Reference to calculation of means ;
Reference to suitable graph ; [accept graph appropriate for data]
Both axes labelled ;
Reference to calculating number of burrows per unit area;
Reference to results in relation to hypothesis ; **[6]**

(c) Difficult to identify burrows / eq ;
Some burrows may not contain a crab ;
(Therefore) number of burrows may not indicate the actual number of crabs ;
Reference to need for more samples to support hypothesis ;
Repeat investigation at different times of the year ;
Investigate distribution of crabs in relation to another factor (e.g. distribution of organic matter) ;
Investigate distribution of crabs on different shores / eq ; **[5]**

[Total: 19]