GEO.SK2 Ordnance Survey Map Skills: Relief, Contours and Cross Sections

Total Marks

AQA 8035 · Calculators not allowed · about 40 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Define a contour line as used on an Ordnance Survey map, in the context of showing relief on a 1:25 000 map extract.

(Total for Question 1 is 1 mark)

---

2 Define a spot height on an Ordnance Survey map extract and state what it shows.

(Total for Question 2 is 1 mark)

---

3 State what a trigonometrical point (trig point) symbol indicates on a map extract.

(Total for Question 3 is 1 mark)

---

4 Figure 1 extract context: a fictional 1 km square of upland terrain is described below. Contours are at 20 m intervals. Features listed: trig point TP at 260 m at grid 24 63; spot height SH1 200 m at 22 60; spot height SH2 80 m at 28 58. Using this information only, state which named point is highest on the extract.

(Total for Question 4 is 1 mark)

---

5 Using Figure 1 description: at grid reference 22 60 the map shows spot height SH1 labelled 200 m. Write down the elevation recorded at 22 60.

(Total for Question 5 is 1 mark)

6 Figure 1 extract description: The central area shows closely spaced contours (220 m, 240 m, 260 m) around TP at 24 63, with contours spreading wider to the east where they are 160 m, 140 m, 120 m. To the south-west a series of V-shaped contours point towards grid 26 61, with lowest contour 80 m at the valley. Describe the relief shown in the central to eastern part of Figure 1, commenting on height and steepness.

(Total for Question 6 is 3 marks)

---

7 Figure 1 extract description: In the south-west quadrant contours form a clear V shape pointing north-east towards grid 26 61, with contours 120 m, 100 m, 80 m in the V. Describe the relief and shape of the land in this south-west area and explain what the V-shaped contours indicate.

(Total for Question 7 is 3 marks)

---

8 Identify the landform shown at grid reference 24 63 on Figure 1, given the presence of a trig point at 260 m surrounded by roughly circular, closely spaced contours.

(Total for Question 8 is 2 marks)

---

9 Identify the landform at grid reference 26 61 on Figure 1, where contours form a V shape pointing towards that grid square and lowest contour there is 80 m.

(Total for Question 9 is 2 marks)

10 Complete a simple cross-section along transect A-B on Figure 1. Transect A-B runs east to west. Given the following elevations at successive points along A-B every 0.6 km: A at 220 m, then 180 m at 0.6 km, 120 m at 1.2 km, 80 m at 1.8 km, and B at 140 m at 2.4 km. Using these five elevations, sketch the shape in words by listing the sequence of slope features the cross-section would show from A to B and give one numerical check showing the lowest point.

(Total for Question 10 is 4 marks)

---

11 Using the transect A-B heights from Question 10, A is 220 m and B is 140 m horizontal distance along the transect is 2.4 km. Calculate the average gradient from A down to B expressed as a ratio 1 in n, rounded to the nearest whole number.

(Total for Question 11 is 3 marks)

---

12 On Figure 1 contours drop from 200 m at SH1 down to 80 m at the valley over a horizontal distance of about 1.6 km. Calculate the total change in elevation between SH1 and the valley floor and give the average slope in m per km (show calculation).

(Total for Question 12 is 2 marks)

---

13 Explain briefly how contour spacing distinguishes a convex slope from a concave slope on a cross-section or map extract.

(Total for Question 13 is 2 marks)

14 Give TWO limitations of using only contour lines on a map to interpret ground conditions and relief.

(Total for Question 14 is 2 marks)

---

15 Considering the eastern area of Figure 1 where contours are widely spaced between 160 m and 120 m, give one suitable human land use and briefly explain why the gentle slope makes it appropriate.

(Total for Question 15 is 1 mark)

Mark scheme · GEO.SK2 Ordnance Survey Map Skills: Relief, Contours and Cross Sections

Question 1

- **B1** a line joining points of equal elevation above sea level, oe
- **Answer: A line joining points of equal elevation above sea level.**

Question 2

- **B1** a number giving the exact elevation of a specific point on the map, oe
- **Answer: A number giving the exact elevation of a specific point on the map.**

Question 3

- **B1** a fixed surveying station marked with its precise elevation, usually at the highest local point, oe
- **Answer: A fixed surveying station marked with its precise elevation, usually at the highest local point.**

Question 4

- **B1** TP at 260 m
- **Answer: The trig point TP at 260 m is the highest.**

Question 5

- **B1** 200 m
- **Answer: 200 m.**

Question 6

- **B1** central area is high, eg with contours to 260 m at TP, indicating a local high point, oe
- **B1** contours are closely spaced around TP, so slopes are steep there, oe
- **B1** to the east contours are wider spaced (160 m down to 120 m), indicating gentler slopes and lower ground to the east, oe
- **Answer: The central area is a high point rising to about 260 m at the trig point; contours are closely spaced around it showing steep slopes. To the east the contours spread out from 160 m to 120 m, showing gentler, lower ground.**

Question 7

- **B1** relief is lower in the south-west with contours down to about 80 m, oe
- **B1** V-shaped contours pointing towards 26 61 indicate a valley or stream channel, oe
- **B1** the narrowing of contours into a V shows the valley is relatively steep-sided at that point, oe
- **Answer: The south-west is lower ground down to about 80 m; the V-shaped contours pointing towards 26 61 show a valley or stream channel. The tight V shape shows the valley has relatively steep sides at that location.**

Question 8

- **B1** a hilltop or summit
- **B1** reason, eg surrounded by concentric contours and a trig point at the highest contour, oe
- **Answer: A hilltop or summit, shown by concentric, closely spaced contours with a trig point at the top.**

Question 9

- **B1** a valley or a stream channel
- **B1** reason, eg V-shaped contours pointing to the grid reference and lower elevation inside the V, oe
- **Answer: A valley or stream channel, indicated by V-shaped contours pointing to the grid reference and lower elevation inside the V.**

Question 10

- **B1** description of first slope from A, eg steep descent from 220 m to 180 m, oe
- **B1** continuing descent to valley bottom, eg further steep or moderate slope down to 120 m then to 80 m, oe
- **B1** ascent from valley to B, eg rising from 80 m to 140 m showing a slope up towards B, oe
- **B1** numerical check naming the lowest point as 80 m (cao), oe
- **Answer: From A the cross-section slopes down steeply from 220 m to 180 m, continues descending to the valley bottom via 120 m to the lowest point 80 m at 1.8 km, then rises up to 140 m at B. Lowest point is 80 m.**

Question 11

- **M1** change in height 220 - 140 = 80 m seen, oe
- **M1** horizontal distance 2.4 km = 2400 m used, oe
- **A1** gradient 80 / 2400 = 1 in 30 cao
- **Answer: 1 in 30.**

Question 12

- **M1** 200 - 80 = 120 m seen, oe
- **A1** average slope = 120 m / 1.6 km = 75 m per km cao
- **Answer: Change = 120 m; average slope = 75 m per km.**

Question 13

- **B1** concave slope has contours that are widely spaced near the top and closer together near the bottom, showing slope steepens downslope, oe
- **B1** convex slope has contours closer near the top and more widely spaced near the bottom, showing slope eases downslope, oe
- **Answer: A concave slope shows contours that are more widely spaced near the top and closer together lower down, so the slope gets steeper downslope. A convex slope shows closer contours near the top and wider spacing lower down, so the slope eases downslope.**

Question 14

- **B1** contours do not show surface cover or vegetation which can affect actual slope stability and usability, oe
- **B1** map contours are a simplification at set intervals so small local features or cliffs between contours may not be shown, oe
- **Answer: Contours do not show surface cover or vegetation, which affect slope stability and use. Also contours are at set intervals so small features or cliffs between contours may be omitted.**

Question 15

- **B1** e.g. arable farming, because gentle slopes make ploughing and drainage easier and reduce soil erosion, oe
- **Answer: Arable farming, because gentle slopes make ploughing and drainage easier and reduce soil erosion.**