**Exercise 1A. Catchment Rainfall and Runoff**

Part 1 Spatial rainfall variability (30 marks)

Student ID:

**Results:**

**You are given the measured data for each rainfall gauge in Table 1. Calculate the arithmetic mean:**

*Show working.*

ADR =

**Work out the ADR based on the other two methods:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 1. Rainfall data for Thiessen polygon method *(complete polygon diagram overleaf)*. | | | | |
| Station Number | Polygon area (km2) | % Area | Rainfall (mm) |  |
| 5028 |  |  | 39.6 |  |
| 5035 |  |  | 74.9 |  |
| 5049 |  |  | 87.4 |  |
| 5038 |  |  | 73.9 |  |
| 5033 |  |  | 105.4 |  |
| 5089 |  |  | 106.9 |  |
| 5055 |  |  | 68.6 |  |
| 5050 |  |  | 62.2 |  |
| 5096 |  |  | 98.6 |  |
| 5082 |  |  | 101.1 |  |
| 5075 |  |  | 63.8 |  |
| Catchment Area = | 106.3 | 100% |  | ADR = |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 2. Rainfall data for iso-hyet method *(refer to contour plot in instructions)*. | | | | |
| Rainfall interval | Isohyetal area (km2) | % Area | Pi  (mm) |  |
| P\_100-105 mm |  |  |  |  |
| P\_90-100 mm |  |  |  |  |
| P\_80-90 mm |  |  |  |  |
| P\_70-80 mm |  |  |  |  |
| P\_60-70 mm |  |  |  |  |
| P\_50-60 mm |  |  |  |  |
| P\_40-50 mm |  |  |  |  |
| Catchment Area = | 106.3 | 100% |  | ADR = |

**Sketch the Thiessen polygons:**



**Figure 1**. Gridded map for polygon construction and area estimates.

**Compute the catchment discharge for this rainfall event:**

*Show working and describe assumption.*

Q=?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 3. ADR and catchment discharge using three different rainfall averaging methods. | | | | |
| Averaging Method | ADR (m) | Runoff coefficient | Catchment discharge (m3/d) | Catchment discharge (m3/s) |
| Arithmetic average |  |  |  |  |
| Theissen polygons |  |  |  |  |
| Isohyets |  |  |  |  |

**Conclusions:**

**The aim(s) of this exercise was:**

**After doing this exercise I have been able to conclude:**

**Limitations, assumptions and sources of error:**

**Based on this study I would recommend:**