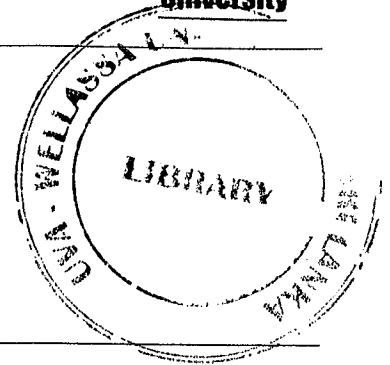


**Uva Wellassa University of Sri Lanka**  
**Faculty of Science and Technology**  
**Department of Science and Technology**  
**300 Level 2<sup>nd</sup> Semester Examination – Jan/Feb 2016**  
**MRT 351-1 Hydrology**



**Instructions to candidates**

Duration: One (01) hour

Number of questions: Two (02) Essay

Answer all questions

Mark allocation: 100 Mark

1. Mean Annual Rainfall values in mm for Badulla from year 1991 to 2015 are 1850, 2155, 2020, 1920, 1825, 1735, 1620, 1825, 1710, 2310, 2155, 2020, 1650, 1825, 1910, 1880, 2020, 2250, 2155, 1960, 1600, 2390, 1690, 2095 and 2155 respectively.
- a. Determine the 75% probability rainfall value in mm. (10 mark)
  - b. What is the rainfall value in mm that occurs once in 5 years? (05 mark)
  - c. What is the probability to have a rainfall of 1800 mm or above? (05 mark)
  - d. What is the recurrence interval of 2000 mm rainfall? (05 mark)
- 2.
- a. What are the two main components of stream flow? (02 mark)
  - b. What are the components of direct runoff? (03 mark)
  - c. What is unit hydrograph? (05 mark)
  - d. The observed outflows in a stream from a watershed of 0.27 km<sup>2</sup> due to a storm of 3-hour duration are given in the table.

Time	2 a.m.	3 a.m.	4 a.m.	5 a.m.	6 a.m.	7 a.m.	8 a.m.
Flow (m <sup>3</sup> /hour)	10	25	45	70	55	35	10

- i. Determine the equivalent depth of direct runoff. (05 mark)
- ii. Derive the 3-hour unit hydrograph. (05 mark)
- iii. What will be the outflow hydrograph for 2-hour storms of 12 mm and 8 mm started at 2 a.m. and 5 a.m. respectively? (45 mark)
- iv. Derive the 4-hour unit hydrograph using lagging storm method. (10 mark)

(State assumptions you made in solving this problem)