



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2014/2015**

COURSE NAME : HYDROLOGY
COURSE CODE : DAC20902
PROGRAMME : 2 DAA
EXAMINATION DATE : DECEMBER 2014 / JANUARY 2015
DURATION : 2 HOURS
INSTRUCTION : ANSWER **FOUR (4)** QUESTIONS ONLY

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

- Q1 (a) Sketch and label the components of hydrologic cycle.
(8 marks)
- (b) Explain the contribution of civil engineer in the field of hydrology.
(5 marks)
- (c) Data collection of a reservoir in a week showed the level of water dropped by 30 cm, inflow was $2 \times 10^5 \text{ m}^3/\text{day}$, average seepage loss was 1.2 cm, total precipitation was 0.11 m, total evaporation was 6.6 mm. Calculate the outflow from the reservoir with area 1100 hectare.
(12 marks)
- Q2 (a) List **five (5)** parameters of importance in measurement of precipitation.
(5 marks)
- (b) Explain and list 5 classification/form of precipitation
(5 marks)
- (c) Stations A, B, C, D, E, F, G, H, I and J are the gauge stations in **Table Q2(c)**. Using data given below, calculate the average precipitation using Thiessen method.
(15 marks)
- Q3 (a) Sketch and explain briefly what do you understand by watershed.
(3 marks)
- (b) Explain briefly the various factors affecting runoff.
(5 marks)
- (c) Precipitation data of different duration is shown in **Table Q3(c)**, plot a graph of intensity vs. duration curves for 20-year and 10-year frequencies
(17 marks)

- Q4 (a) Sketch and explain two concept of modeling of catchment area
(5 marks)
- (b) With a simple sketch explain briefly the terminology used in hydrograph analysis.
(10 marks)
- (c) Determine the stream discharge for 29 gm/l solution of a flourescent tracer that was discharged into a stream at a constant rate of $1 \times 10^4 \text{ mm}^3/\text{s}$. The background concentration of the dye was found to be zero and the at downstream, concentration of dye was found to be 6 parts per billion.
(10 marks)
- Q5 (a) Sketch and label hydrograph components.
(5 marks)
- (b) Explain the procedures used to determine unit hydrograph
(5 marks)
- (c) Determine the discharge of a river as shown in **Table 5(c)** by using mean section method.
(15 marks)
- Q6 (a) Define hydrologic routing.
(5 marks)
- (b) Explain the concept of pulse method in reservoir routing.
(5 marks)
- (c) For a catchment area of 5.5 km^2 given in **Table Q6(c)**, determine the unit hydrograph of the catchment
(15 marks)

- END OF QUESTION -

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Table Q2(c) Outflow Data

Station	Area (km ²)	Precipitation (mm)
A	72	90
B	34	110
C	76	105
D	40	150
E	76	160
F	92	140
G	46	130
H	40	135
I	86	95
J	6	70

Table Q3(c) Precipitation Data

Rank m	Precipitation (in)of Duration of					
	5 minute	10 minute	15 minute	20 minute	30 minute	60 minute
1	0.40	0.66	0.89	1.07	1.48	2.15
2	0.38	0.63	0.83	0.97	1.29	1.92
3	0.37	0.62	0.79	0.91	1.26	1.48
4	0.36	0.60	0.76	0.86	1.06	0.91
5	0.35	0.60	0.73	0.86	0.83	
6	0.33	0.58	0.72	0.77	0.82	
7	0.33	0.50	0.72	0.77	0.78	
8	0.31	0.50	0.63	0.70	0.78	
9	0.30	0.49	0.57	0.67	0.67	
10	0.28	0.44	0.56	0.66	0.66	
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22	0.13	0.23	0.32	0.40	0.40	0.43

FINAL EXAMINATIONSEMESTER/SESSION: SEM I 2014/2015
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Vertical Section	Section Width (m)	Depth (m)	Mean Velocity (m/s)
0	0	0	0
1	4.1	3.9	2.1
2	2.9	5	2.4
3	4.5	7.4	2.9
4	5.2	4.8	2.3
5	4.0	3.6	1.9
6	4.8	0	0

Table Q6(c)

Time (hour)	Total Flow (m ³ /s)
1	2.78
2	2.88
3	6.33
4	14.60
5	16.70
6	13.10
7	9.45
8	6.05
9	4.35
10	3.05
11	3.00
12	2.90
13	2.80
14	2.78