b) State dupuits assumptions for obtaining general equations governing ground water flow. Derive an expression for the confined aquifer. How can the expression be used to evaluate the aquifer permeability?　　7

Or

10. a) Explain followings:　　7

i) Types of canal alignment

ii) Canal escapes

iii) Canal head regulator

b) Compare "Kennedy" and "Lacey's" silt theories and explain which theory is better.　　7

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CE-602

Roll No ....

CE - 602

B.E. VI Semester

Examination, June 2014

Water Resources and Irrigation Engineering

Time : Three Hours

Maximum Marks : 70

Note: Attempt one full question from each unit. All full questions carry equal marks. Assume suitable data wherever necessary.

Unit - I

1. a) Write down general expression for intensity duration relationship of rainfall? Explain the necessity for frequency analysis.　　7

b) What is a S-curve hydrograph? How it is constructed and where it is used?　　7

Or

2. a) In a typical 4 hours storm producing 50mm of excess rain from a basin, the following flows in the stream are recorded:

Time in hours	Flow in cumec
0	0.0
2	1.22
4	4.05
6	6.75
8	5.70
12	3.40
16	1.35
20	0.0

Plot the unit hydrograph of runoff for this storm.　　7

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b) Explain followings: 7

   i) Infiltration indices

   ii) Raingauge net works.

Unit-II

3. a) Why ground water recharge is necessary? Explain in short, different methods of improving ground water storage. 7

  b) Explain the phenomenon of water logging. What are their causes and how it is prevented? 7

Or

4. a) Define "flood frequency" and "return period". Explain in detail, any one method of flood frequency analysis. 7

  b) Explain followings: 7

   i) Hydraulics of wells under steady flow condition.

   ii) Salt-efflorescence.

Unit-III

5. a) In connection with water resource project planning- 7

   i) What steps would you take for economical study?

   ii) How would you control cost-benefit ratio, annual costs and capital recovery factor?

  b) Explain followings: 7

   i) Rain-water harvesting.

   ii) Impact assessment of water resources projects.

Or

6. a) How linear programming approach is made applicable for water resources projects planning? 7

  b) Describe in brief various investigations required for reservoir planning. 7

Unit-IV

7. a) Define "Duty of water". What are the factors affecting duty of water and how duty of water is improved? 7

  b) Explain in brief the followings: 7

   i) Wilting coefficient

   ii) Field capacity

   iii) Crop ratio

Or

8. a) A field channel has culturable command area of 3000 hectares. The intensity of irrigation for gram is 30% and for wheat is 50%. Gram has a kor period of 18 days and kor depth of 12 cm, while wheat has a kor period of 15 days and a Kor depth of 15 cm. Calculate the discharge of the field channel. 7

  b) What is meant by consumptive use of water? How it is determined? 7

Unit-V

9. a) Design an irrigation canal to carry a discharge of 20 cumecs. Assume, $N = 0.0225$, $m = 1$, and $B/D = 5.0$ 7