Seat
No.

T.E. (Civil) (Semester - V) Examination, April - 2016
WATER RESOURCES ENGINEERING - I (Revised)
Sub. Code : 66235

Day and Date : Friday, 29 - 04 - 2016　　　　　　　　　　**Total Marks : 100**
Time : 10.30 a.m. to 01.30 p.m.

Instructions:　　1)　Que. 1 and 5 are Compulsory. Attempt any two questions from re-
　　　　　　　　　　　　maining questions from both sections each.
　　　　　　　　　2)　Assume any suitable data if necessary, wherever needed.
　　　　　　　　　3)　Figures to the right indicate full marks.

SECTION - I

Q1) a)　Describe the importance of hydrologic cycle with its neat sketch.　**[6]**

　　　b)　Explain how phi index is determined from rainfall hyetograph. Explain its
　　　　　use in determination of runoff from the catchment.　**[6]**

　　　c)　Describe the procedure of using current meter for measuring velocity of
　　　　　flow in stream.　**[6]**

Q2) a)　Define rainfall excess. Explain how it is determined from a storm
　　　　　hydrograph?　**[8]**

　　　b)　What is S curve hydrograph? Explain how it is constructed. What are its
　　　　　uses?　**[8]**

Q3) a)　Explain the infiltration process. Explain in detail with neat sketches the
　　　　　methods of measurement of infiltration.　**[8]**

　　　b)　Given below are the ordinates of 6 hour unit hydrograph. Derive and
　　　　　plot 18 hour unit hydrograph. Describe the procedure in detail.　**[8]**

Time(hours)	0	6	12	18	24	30	36	42	48	54	60
Observed flow(m³)	0	24	72	120	150	120	80	45	27	15	0

P.T.O.

Q4) Write detailed notes on: [4 × 4 = 16]

   a) Components of Hydrograph

   b) Methods of stream gauging

   c) Factors affecting runoff

   d) Rational method of computation of peak runoff

SECTION - II

Q5) a) Describe recuperation test for an open well. [6]

   b) Table gives the necessary data about crop, duty of water and the area under each crop commanded by a canal taking off from reservoir. Taking a time factor for canal to be (12/10), calculate the discharge required at the head of the canal. If the capacity factor is 0.8 determine design discharge. [6]

Crop	Base period (Days)	Area (Hectors)	Duty of water at the head of the canal (Hectors/ cumec)
Sugar cane	320	900	580
Overlap for sugar cane in hot weather	90	150	580
Wheat (Rabi)	120	750	1600
Bajara(Kharif)	120	600	2000
Vegetables (Hot weather)	120	320	600

   c) Explain Bandhara irrigation scheme in detail. [6]

Q6) a) Derive an expression for discharge from a well in confined aquifer the well fully penetrates it. [8]

   b) Define the terms: [8]

     i) Aquifer

     ii) Aquiclude

     iii) Aquifuge

     iv) Aquitard

Q7) a) Define irrigation with necessity and ill effects of irrigation. Explain sprinkler irrigation in detail. **[5]**

b) Explain the terms 'duty' and 'delta'. Derive a relationship between the two for a given base period. What are the factors affecting duty and delta. Explain methods of improving duty. **[6]**

c) Explain the terms: **[5]**
   i) Net irrigation requirement
   ii) Field irrigation requirement
   iii) Gross irrigation requirement
   iv) Gross commanded area
   v) Culturable commanded area

Q8) Write short notes on: **[16]**
   a) Ground water recharge method
   b) Water shed management
   c) K.T Weir
   d) Urban rain water harvesting

⊖⊖⊖