

## B. Tech Degree VI Semester Examination, April 2010

### CE 603 A/B WATER RESOURCES AND IRRIGATION ENGINEERING (2002 Scheme)

Time : 3 Hours

Maximum Marks : 100

- I. a. Explain with the help of a diagram hydrologic cycle. (8)  
b. What is run-off? What are the factors that effect run-off from a catchment area? (12)

**OR**

- II. a. Find out the ordinates of a storm hydrograph resulting from a three hour storm with rainfall of 3, 4.5 and 1.5 cm during subsequent three hour interval. The ordinates of unit hydrograph are given below:

Hours	0	3	6	9	12	15	18	21	24	3	6	9	12
Ordinates of unit hydrograph (cumecs)	0	90	200	350	450	350	260	190	130	80	45	20	0

Assume an initial loss of 5mm, Infiltration index of 5mm/hr and base flow of 20 cumecs. (10)

- b. Draw neat sketch and explain float type of automatic rain gauge. (10)
- III. a. Derive an expression for discharge from a well fully penetrating a confined aquifer. (10)  
b. With help of neat sketches explain the types of tube wells commonly in use. (10)

**OR**

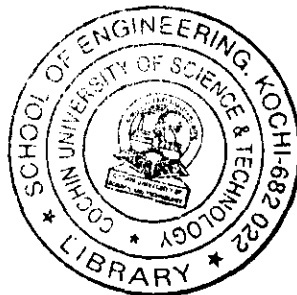
- IV. a. Write notes on the following:  
(i) Specific capacity of well (ii) Interference among wells (10)
- b. A tube well is fully found in unconfined aquifer. With the data given below, calculate the discharge from tube well.

Radius of well	=	15 cm.	
Draw down	=	2 m	
Effective length of strainer under the above draw down	=	11m	
coeff of permeability of Aquifer	=	0.055	
Radius of zero draw down	=	330 m.	(10)

- V. a. What are the main factors to be considered in selection of site for a storage reservoir? Explain. (10)  
b. Draw neat sketch and explain the components of a weir. (10)

**OR**

- VI. Write brief notes on the following:  
(i) Bligh's creep theory  
(ii) Silt excluder  
(iii) Mass curve  
(iv) Uplift and Piping (20)



(Turn over)

- VII. a. Explain various forces that act on a gravity dam. (10)  
b. Write notes on different types of earthen dams. (10)

**OR**

- VIII. a. Explain main forces acting on arch dam and main considerations of design of arch dam. (10)  
b. Design the practical profile of a gravity dam of stone masonry, given following data:

RL of base of dam	=	1450 m	
RL of H.F.L.	=	1480.5 m	
Specific gravity of masonry	=	2.4	
Safe compressive stress for Masonry	=	120 tones/m <sup>2</sup>	
Height of waves	=	1m	(10)

- IX. a. Design an irrigation channel to carry a discharge of 40 cumecs. (10)  
Assume  $N = 0.0225$ ,  $m=1$  and channel slope of  $0.15\text{m/Km}$ . (10)  
b. Differentiate between Ogee spillway and Syphon spillway. (10)

**OR**

- X. a. Compare Kennedy's theories and Lacey's theories. What are the limitations of both theories? (10)  
b. A channel section has to be designed for following data:

Discharge Q	=	30 cumecs
Silt factor f	=	1
Side slope	=	$\frac{1}{2}:1$

Find also longitudinal slope. (10)