D 23155 (Pages : 2) Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION DECEMBER 2011

CE 04 702—DESIGN OF HYDRAULIC STRUCTURES

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*
Assume any required data suitably.

Part A

I. (a) Explain the practical profile of a dam with the help of a neat sketch.

(b) Explain analysis of arch dam using cylinder theory.

(c) Distinguish between surplus escape and flush escape.

(d) Explain non-modular, semimodular and rigid modular outlets.

(e) Compare different types of canal falls.

(f) Distinguish clearly between a weir and a barrage.

(g) What is a cross drainage work ? State their types.

(h) Explain the different parameters to be considered in the design of a cross drainage work.

(8 × 5 = 40 marks)

Part B

II. (a) Design a surplus weir for a minor tank forming group of tanks, with the following data.

Combined catchment area	=	30 km^2
Catchment area intercepted by upper tanks	=	20 km^2
Ryve's Coefficient	=	9
Earth bund details :		
Top width	=	2.40 m
Side slopes	=	2 : 1 on both sides
Top level of bunds	=	+ 100.50 m
Full tank level	=	+ 98.00 m
Maximum water level	=	+ 98.75 m
General ground level at site	=	+ 97.00 m

Ground level slopes off to a level of +96.00 m in a distance of 8 m. Provision is to be made to store water up to MWL in times of necessity.

Turn over

Design :

(i) Length and cross-section of weir. (10 marks)

(ii) Wing walls, abutments and returns (10 marks)

(iii) u/s and d/s aprons. (10 marks)

Draw to a suitable scale :

(i) Half longitudinal elevation and half longitudinal section. (20 marks)

(ii) Section across weir. (10 marks)

Or

(b) Design an aqueduct for an irrigation canal crossing a stream for the following data :

Particulars	*Canal*	*Stream*
Discharge	15 cumecs	115 cumecs
Bedwidth	8.0 m	32.0 m
Bed level	+ 102.30 m	+ 100.0 m
FSL/HFL	+ 104.0 m	+ 102.0 m
Side slopes	1 :1	1 : 1
Permissible velocity	1.5 m/s	2.0 m/s
Top level of bank	+ 104.5 m	
Top width : right bank	3.0 m	
left bank	1.0 m	
Average ground level	+ 101.5 m	

Design :

Drainage way, Canal water way, trough foot slab and bottom slab. (30 marks)

Draw to a suitable scale :

(i) Half plan at top and half at foundation. (20 marks)

(ii) Cross-section along canal. (10 marks)