D 50484 (Pages : 2) Name.....

Reg. No.....

SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION NOVEMBER 2013

CE 09 702—DESIGN OF HYDRAULIC STRUCTURES

Time : Three Hours Maximum : 70 Marks

Drawing sheets may be supplied for the examination.

Part A

Answer **all** *questions.*
Each question carries 2 *marks.*

1. What are the consideration in selecting the type of the dam ?
2. What are the measures adopted to avoid cracking in gravity dams ?
3. Explain non-modular outlets.
4. Define surface and subsurface weirs.
5. Differentiate between super passage and canal syphon.

(5 × 2 =10 marks)

Part B

Answer any **four** *questions.*
Each question carries 5 *marks.*

6. List out various types of spillways and explain any *two* in detail.
7. Explain thick cylinder theory for arch dam design.
8. Explain the necessity and requirements of surplus works in tank structures.
9. Explain the procedure from the design of subsurface weirs.
10. What is a canal fall ? Explain the necessity and location of canal falls.
11. Explain the method of determining uplift pressure under the floor of a siphon aqueduct.

(4 × 5 = 20 marks)

Part C

12. A regulator cum road bridge has to be constructed across a branch canal with the following particulars :—

Canal details :	U/S of regulator	D/S of regulator
FSQ	20 cumecs	16 cumecs
CBL	+ 30.00	+ 30.0
FSL	+ 32.0	+ 31.75
Bed width	15 m	15 m

Turn over

[redacted]

	U/S of regulator	D/S of regulator
Top width of the banks		
R.B.	5 m	5 m
L.B.	2 m	2 m
Top level of the banks	+ 33.0	+ 32.75
Side slopes	1 : 1	1 : 1
General GL at site		+ 32.00
Hard gravelly soil for foundation is met at		+ 29.00

A road bridge has to be designed for single lane IRC class A loading 1 m clear above the FSL of canal.

(20 marks)

Draw to the scale the following :—

(i) Longitudinal section of through regulator vent.

(ii) Half plan at top and half plan at foundation.

(20 marks)

Or

13. A siphon aqueduct is to be designed across a stream for the following data :—

Canal	*Drainage*
Full supply discharge = 56 cumecs	High flood discharge = 425.0 cumecs
RL of Bed = + 267.0 m	High flood level = + 268.20 m
Depth of water = 2.0 m	General Bed level of low water cross-section = + 265.50 m
Bed width = 32 m	General ground level = + 267.2

Make suitable assumptions where required :

(20 marks)

Also draw to scale the following :—

(a) Longitudinal section.

(b) Half plan at top and half plan at foundation.

(20 marks)

[1 × 40 = 40 marks]