8E4032

B. Tech. (Sem. VIII) (Main/Back) Examination, April/May - 2011
Civil Engineering
8CE2 Water Resources Engineering - II

Time : **3** Hours]

[Total Marks : **80**
[Min. Passing Marks : **24**

*Attempt any **five** questions, selecting **one** question from **each** unit. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary.) Any data you feel missing suitably be assumed and stated clearly, Units of quantities used/calculated must be stated clearly.*

Use of following supporting material is permitted during examination. *(Mentioned in form No. 205)*

1._____**Nil**_____   2._____**Nil**_____

UNIT – I

1   Design a Sarda type fall for the following data :

(i)   Full supply discharge $\dfrac{U/S}{D/S} = 35$ cumecs.

(ii) Full supply level $\dfrac{U/S}{D/S} = \dfrac{218.30\,m}{216.80\,m}$.

(iii) Full supply depth $\dfrac{U/S}{D/S} = \dfrac{1.8\,m}{1.8\,m}$.

(iv) Bed width $\dfrac{U/S}{D/S} = \dfrac{26\,m}{26\,m}$.

(v)   Bed level $\dfrac{U/S}{D/S} = \dfrac{216.50\,m}{215.00\,m}$.

(vi) Drop = 1.5 m

Design the floor by Bligh's theory taking coefficient of creep=8. Check the design by Khosla's theory. Safe exit gradient is $\frac{1}{5}$. Draw a neat sketch of the cross section.

16

OR

1 (a) Differentiate between aqueduct and syphon aqueduct. What are the considerations made in selection of suitable type of cross drainage work ?

8

   (b) Briefly discuss the features of design of cross drainage works.

8

UNIT – II

2 (a) Describe the Khosla's theory and derive the expression

$$P=\frac{H}{\pi}\cos^{-1}\frac{2x}{b}.$$

8

   (b) Compare the Bligh's and Khosla's theories for the design of impervious floor.

8

OR

2 Design a vertical drop weir on Bligh's theory for the following site conditions :
   (a) Maximum flood discharge = 3000 cames.
   (b) HFL before construction = 285.0 m
   (c) D/S bed level = 278.0 m
   (d) F.S.L. of canal = 284.0 m
   (e) Allowable afflux = 1 m
   (f) Coefficient of creep = 12

   (g) Permissible exit gradient = $\frac{1}{6}$.

   Check the design by Khosla's theory.

16

UNIT – III

3 (a) Describe the various forces acting on a gravity dam with neat sketches.

8

(b) Describe the swedish circle method of slope stability analysis for the upstream side of an earth dam under sudden drawdown condition.

8

OR

3 (a) Describe the points of consideration for the selection of site for a dam.

8

(b) Describe the phreatic line and its importance in an earth dam. Explain the graphical method of drawing flow net in an earth dam.

8

UNIT – IV

4 (a) Describe an ogee spilway along with the design criteria of its crest profiles.

8

(b) Describe the main components of a hydroelectric scheme.

8

OR

4 (a) Describe various types of spilways with neat sketches.

8

(b) Describe the method of assessement of water power potential.

8

UNIT – V

5 Describe the environmental impact assessement of a large water resource project.

16

OR

5 Write short notes on the following :
   (i) Reservior sedimentation
   (ii) Watershad management
   (iii) G.I.S.
   (iv) Computer aided irrigation design.

4×4=16