B. Tech.  
(SEM. VII) (ODD SEM.) (REG.) EXAMINATION, 2012-13  
HYDRAULIC STRUCTURES

Time : 3 Hours]  
[Total Marks : 100

Note :  
(1) Attempt all questions.  
(2) All questions carry equal marks.  
(3) Assume any missing data suitably and mention it.

1. Attempt any two parts of the following : 10×2=20
   (a) What are main different types of hydraulic structures? Discuss in short.
   (b) What are the common causes of failure and corresponding safety measures adopted in an embankment dam?
   (c) Explain the method of plotting the flownet for seepage through anisotropic soil.

2. Attempt any two parts of the following : 10×2=20
   (a) What do you understand by gravity dam? Explain various forces that act on gravity dam.
   (b) Determine minimum safe base width of an elementary profile of a gravity dam holding 60 m depth of water, assume specific gravity of dam material 2.42, uplift factor as 0.4, coefficient of friction between concrete and foundation soil 0.7. Also find out principal shear stress at toe of the dam.

[Contd...]
(c) Distinguish clearly between a low gravity and high gravity dam. Derive the expression used for such a distinction.

3 Attempt any two parts of the following: \(10 \times 2 = 20\)

(a) What is the spillway? What are its functions? Enumerate various types of spillways.

(b) Why is the cavitation erosion of a spillway surface caused? What are the possible measures to prevent or reduce it?

(c) Explain the principle of energy dissipation works. What is need and locating of energy dissipation works?

4 Attempt any two parts of the following: \(10 \times 2 = 20\)

(a) Enumerate the different methods which may be used for designing the canal transition for a flumed canal and the conditions under which each can be used.

(b) Explain any one method of fluming in detail.

(c) Give a detailed classification of hydropower plants.

5 Attempt any two parts of the following: \(10 \times 2 = 20\)

(a) How do you assess the water potential of a hydroelectric scheme?

(b) What is surge tank? Discuss its functions and working.

(c) Write short notes on any two of the following:

(i) Draft tube
(ii) Scroll casing
(iii) Storage plant.