BE/INSEM/APR-501

B.E. (Civil Engineering)
401007 : DAMS AND HYDRAULIC STRUCTURES
(2015 Pattern) (Semester - II)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :
1) *Solve Q.1 OR Q.2, Q.3 OR Q.4 and Q.5 OR Q.6.*
2) *Neat sketches/diagrams must be drawn wherever necessary.*
3) *Figures to the right Indicate full marks for the sub-questions.*
4) *Assume suitable data if necessary and state them in your answer clearly.*
5) *Use of non-programmable pocket size electronic calculator is allowed.*

Q1) a) Explain four factors considered for selection of an ideal site for a dam.**[4]**

   b) Explain with sketches various types of piezometers (working & uses).**[6]**

OR

Q2) a) Explain with sketch/sketches the instrumentation required for monitoring (Measurement of) joints and cracks in a concrete dam. **[4]**

   b) i) Discuss the displacement and rehabilitation issues with reference to a big dam project.

   ii) State three differences between overflow and non-overflow types of dams with the help of neat sketches.

   [3 + 3]

Q3) a) Discuss briefly 4 site conditions those are most suitable for an arch dam. **[4]**

   b) For the dam section shown, *check the stability of dam in overturning*. Use the data given below. **[6]**
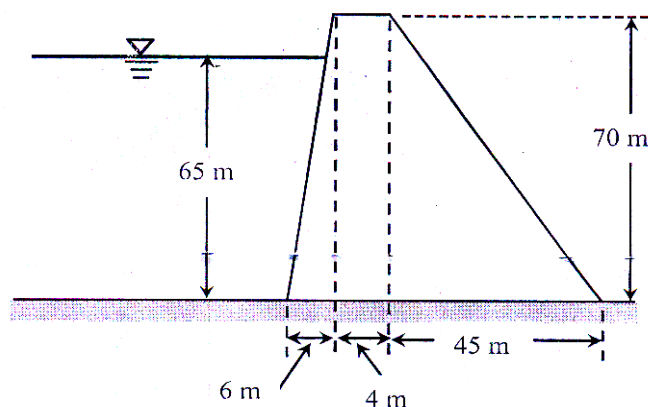
P.T.O.

- Specific weights of concrete and water are 24 kN/m^3 and 10 kN/m^3 respectively; F.S. = 1.50 for overturning.

- Consider only hydrostatic force, weight of water and uplift forces only (Neglect wind/ wave and seismic forces).

- There is no gallery and no tail-water.

OR

Q4) a) What is meant by 'elementary profile of gravity dam'? Draw an explanatory sketch. Using relevant formulas and assuming necessary values; show that maximum height of a small gravity dam is 88m. **[4]**

b) What is meant by an arch dam? Give classification of arch dams. Show these types in neat sketches. **[6]**

Q5) a) If Froude's Numbers (Fr) is 3.9; describe the specific type of Indian Standard stilling basin (IS 4997-1968) for energy dissipation below spillway along with sketch. **[4]**

b) Discuss the following clearly with respect to spillway crest gates :**[3+3]**

i) Inspection of gates.

ii) Maintenance of gates.

OR

Q6) a) Show sectional elevation and plan of a vertical lift (Sliding) gate provided for a spillway. Briefly explain its working. **[4]**

b) An ogee spillway is to be designed for a discharge of 20 m^3/s with upstream face vertical and downstream face having slope 1V : 0.8H. Obtain the downstream profile of spillway with 1 m interval for the 'x' coordinates in the profile equation $x^{1.85} = 2.y.H^{0.85}$

Assume C = 2.20 and L = 1 m. Neglect effects of end contractions and velocity of approach. **[6]**

❧❧❧