Total No. of Questions : 8] SEAT No. :

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M.E. (Civil Engineering) Examination, May - 2015

WATER RESOURCE AND ENVIRONMENTAL ENGINEERING

Dam Engineering

(2013 Pattern)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates :

1) ***Solve any five questions.***
2) ***Figures to the right indicate full marks.***
3) ***Use of calculators allowed.***
4) ***Draw sketches wherever necessary.***
5) ***Assume suitable data, if required.***

Q1) a) State various treatments necessary for foundation of garavity dam and explain with neat sketch any two. **[6]**

b) Give the load combinations as per Indian standard (IS. 6512) for the design of dam. **[4]**

Q2) a) A homogeneous dam is 43 m high. The free board provided is 3 m. a 30 m long horizontal filter is also provided on the downstream end. A flow net was drawn for the dam section. The flow net comprised of 5 flow channels and 15 potential drops. If the permeability of the material in the dam is $3*10^{-5}$ m/sec. Calculate the seepage flow per meter length of earth dam. If the dam is 500 m long calculate the total discharge through the body of dam. **[4]**

b) Draw typical section of earth dam and explain the functions performed by component briefly. **[6]**

Q3) a) Explain the thick cylinder theory for design of arch dam. **[6]**

b) Explain various forces acting on arch dam. **[4]**

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Q4) a) What is buttress dam? State the classfication of buttress dam and explain any one. **[4]**

b) Explain various types of rock fill dams and draw the sketches of each of them. **[6]**

Q5) a) State various types of spillways and explain Ogee and siphon spillways. **[6]**

b) At an energy dissipater structure below a low spillway, the discharge is 19 m^3/s and the energy loss 1 m at hydraulic jump forming therein. Determine the depths of flow at both ends of the jumps. **[4]**

Q6) a) State the objectives of DSO. What is the purpose of this organization? **[6]**

b) State various instruments installed to monitor safety of dam. Explain any one in detail. **[4]**

Q7) a) Write short note on CWC. **[5]**

b) How Global Water Partnership play important role in management of water resources. **[5]**

Q8) a) For construction of a dam (multipurpose project) how will account for displacement and rehabilitation. Justify in brief. **[5]**

b) Explain social impact assessment and environmental impact. **[5]**