

Code No: V3204 **R07** **Set No: 1**

III B.Tech. II Semester Supplementary Examinations, November/December - 2012

WATER RESOURCES ENGINEERING - II

(Civil Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions

All Questions carry equal marks

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1. (a) What are the main causes of failure of weirs on permeable foundation, and what remedies would you suggest to prevent them. [8M]
   (b) The cross section of a wear is shown in Fig 1. Calculate (i) uplift pressure at point A and E, (ii) Thickness of concrete apron at point B, (iii) Exit gradient. Use Khorla's curves. [8M]

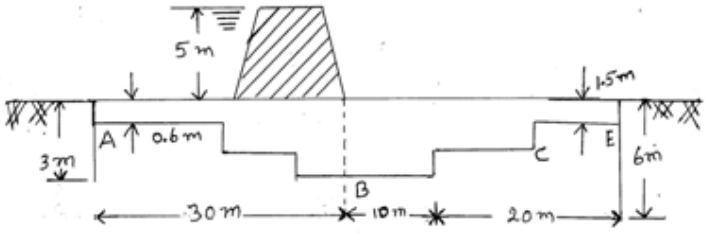

Fig :1

2. (a) Why are 'drops' constructed in an irrigation canal? [8M]
   (b) Draw a neat sketch of a siphon well drop and explain briefly its components. [8M]

3. (a) What do you mean by head regulator and cross regulator? [8M]
   (b) What is an outlet? Write down the requirements that an outlet should fulfill. [8M]

4. (a) Describe Mitra's method of hyperbolic transition. Derive the expression which represents this transition. [8M]
   (b) Discuss the various factors affecting the suitability of aqueduct and siphon aqueduct. [8M]

5. (a) Explain how the storage capacity of a reservoir is fixed? [8M]
   (b) Differentiate clearly between the following
   (i) A flood control reservoir and multipurpose reservoir.
   (ii) Firm yield and secondary yield of a reservoir. [8M]

6. (a) What are the main causes of failure of a gravity dam ? [8M]
   (b) How are dams are classified? Discuss in detail. [8M]

7. (a) What are the common causes of failure and corresponding safety measures adopted in an embankment dam? [8M]
   (b) Explain the method of plotting phreatic line for an earth dam with horizontal filter at downstream. [8M]

8. 8(a) What is a spillway ? What are its essential requirements? Describe the various components of a spillway [10M]
   (b) Describe with a neat sketch a volute siphon spillway. [6M]

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Code No: V3204 **R07** **Set No: 2**

III B.Tech. II Semester Supplementary Examinations, November/December - 2012

WATER RESOURCES ENGINEERING - II

(Civil Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions

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1. (a) Differentiate between weir and barrage. [6M]
   (b) Draw a neat layout of diversion head works and indicate the various components of the system. Briefly indicate the function of each component. [10M]

2. (a) Explain the procedure of designing of Trapezoidal notch fall. [10M]
   (b) Write a short note on Montague type fall? [6M]

3. (a) Define sensitivity of an outlet. Find the relation between sensitivity and flexibility of an outlet. [8M]
   (b) What is a rigid module? Describe with neat sketches the working of a Gibb's module. [8M]

4. (a) Differentiate between
   (i) siphon aqueduct and canal syphon, (ii) aqueduct and super passage. [10M]
   (b) What do you understand by level crossing? [6M]

5. (a) Discuss the various investigations required to be carried out to determine the most suitable site for a dam. [8M]
   (b) Write the factors governing selecting site for dam. [8M]

6. (a) What are the main causes of failure of a gravity dam ? [8M]
   (b) Discuss the zone method of design of a gravity dam. [8M]

7. For the earth dam of homogeneous section with a horizontal drain as shown in Fig.2, draw the top flow line and the flownet. Also estimate the discharge per metre length through the body of the dam ($K = 5 \times 10^{-4}$ cm/s). [16M]

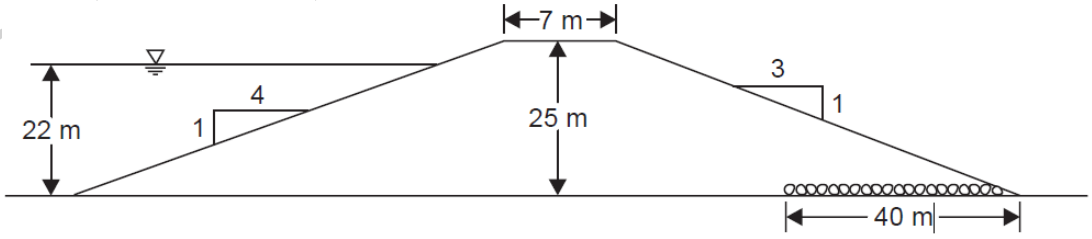

Fig 2

8. (a)Discuss the advantages as well as the limitations of a siphon spillway. [8M]
   (b) Explain with neat sketches different types of spillways gates. [8M]

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Code No: V3204 **R07** **Set No: 3**

III B.Tech. II Semester Supplementary Examinations, November/December - 2012

WATER RESOURCES ENGINEERING - II

(Civil Engineering)

Time: 3 Hours **Max Marks: 80**

Answer any FIVE Questions

All Questions carry equal marks

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1. (a) What is a canal headworks ? Describe briefly the functions of canal headworks. [8M]
   (b) Discuss briefly the causes of failure of weirs on permeable foundation and their remedies. [8M]
2. (a) Discuss the various considerations according to which the location of a fall is decided. [8M]
   (b) What is' Cistern element' in fall? [8M]
3. (a) What do you understand by flexibility of an outlet? Derive an expression for the same.[8M]
   (b) Define proportionality of an outlet. Distinguish between a proportional outlet, a hyper-proportional outlet and a sub-proportional outlet. [8M]
4. (a) Explain the method of determining uplift pressure on the roof of a siphon aqueduct. [8M]
   (b) Describe with the help of neat sketches the various types of cross drainage works. [8M]
5. (a) Explain the procedure to estimate capacity of a reservoir using mass curve. [8M]
   (b) Discuss in brief various investigations required for reservoir planning. [8M]
6. Discuss in detail with help of sketches various forces acting on a gravity dam. [16M]
7. (a) Explain how top seepage line is drawn in the case of an earth dam having different permeability's in horizontal and vertical directions. [10M]
   (b) What are the criteria for safe design of earth dams? [6M]
8. (a) How is the profile of ogee spillway evolved ? [8M]
   (b) Describe with a neat sketch a chute spillway. Also discuss the various design considerations of a chute spillway. [8M]

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Code No: V3204 **R07** **Set No: 4**

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WATER RESOURCES ENGINEERING - II

(Civil Engineering)

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1. Explain with help of a diagram, the various component parts, along with their functions of a diversion headwork. [16M]

2. (a) Explain the procedure of designing Sarda type fall. [10M]
   (b) Write a short note on notch fall. [6M]

3. What is meant by the terms "flexibility", 'proportionality', 'setting' and 'sensitivity' as applied to modules. Derive equation for them and discuss relation between these terms. [16M]

4. (a) What are the different types of cross drainage works that are necessary on a canal alignment? State briefly the conditions under which each one in used. [8M]
   (b) Explain the method of fixation of water way of drain in an aqueduct. [8M]

5. (a) Discuss the factors which are considered in the selection of the site for a proposed dam.
   (b) Explain the procedure to estimate capacity of a reservoir using mass curve. [8M+8M]

6. (a) Explain with sketch how you fill find the uplift pressure on a gravity dam provided with drainage gallery. [4M]
   (b) Following data were obtained from the stability analysis of a concrete gravity dam.
   (i) Total overturning moment about toe = $1X10^6$ kN-m
   (ii) Total resisting moment about toe = $2x10^6$ kN-m
   (iii) Total vertical force above base =50000 kN.
   (iv) Base width of the dam = 50 m
   (v) Slope of the d/s face = 0.8(H):1(V)
   Calculate the maximum and minimum vertical stress to which the foundation will be subjected to. What is the maximum principal stress at toe? Assume there is no tail water. [12M]

7. (a)Describe different methods of controlling seepage through an embankment dam and its foundation. [8M]
   (b)What are the different types of earth dams? Support your answer with neat sketches. [8M]

8. (a) Why is side channel spillway so called? Describe with a neat sketch a side channel spillway. [8M]
   (b) How spillways are classified? Describe briefly the different types of spillways. [8M]

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