Code No: 07A60104　　　　　　　R07　　　　　　　Set No. 2

III B.Tech II Semester Examinations,APRIL 2011
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) List any eight qualities of a good siphon.

   (b) Draw the neat sketch of USBR drum gate. Mention its salient features.
   　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　[8+8]

2. (a) Differentiate between

   　　　i. Aqueduct and syphon aqueduct
   　　　ii. Syphon aqueduct and canal syphon
   　　　iii. Aqueduct and superpassage
   　　　iv. Level crossing and inlet-outlet structure

   (b) What factors will you consider while selecting a suitable type of cross-rainage
   work.　　　　　　　　　　　　　　　　　　　　　　　　　　[8+8]

3. (a) Explain the working of a Crump's adjustable proportional module (Crump's A.P.M.). What are its advantages and disadvantages.

   (b) Design a semi-modular outlet for a discharge of 0.06 cumecs on a distributory with a full supply depth of 1 m and the working head of 0.55 m.　　　[8+8]

4. Following data refers to a canal fall site.

Item	Upstream	Downstream
Full supply discharge	50 cumecs	50 cumecs
Bed width	30 m	30 m
Full supply level	270.00	268.50 m
Bed level	268.00 m	266.50 m

Recommend the fall to be used. Design and sketch the following elements of the fall.

   (a) Length and RL of crest

   (b) Length and RL of cistern.　　　　　　　　　　　　　　　　　[16]

5. The following figure 5 gives profile of a gravity dam with reservoir level as shown. If the co-efficient of friction is 0.8 and weight density of concrete is $2.4t/m^3$, Check the safety of the dam against sliding and overturning. Assume any other data not given.　　　　　　　　　　　　　　　　　　　　　　　　　　　[16]
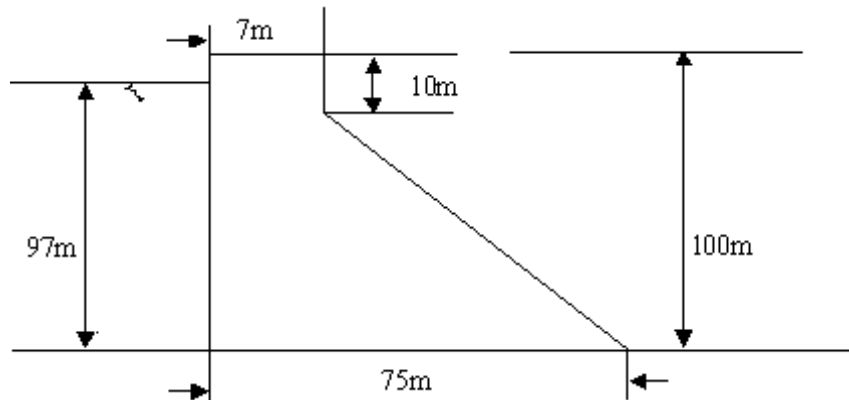
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Figure 5

6. (a) Explain the functions of various components of a diversion work.

   (b) Discuss Khosla's theory for design of weirs on permeable foundations, Enumerate the various corrections that are needed in its application. [8+8]

7. (a) What is phreatic line? Explain its significance in earthen dams.

   (b) Describe the procedure of determining phreatic line through homogeneous earthen dams provided

      i. with a horizontal filter
      ii. without a horizontal filter. [6+10]

8. Explain the mass curve method that can be used for determining:

   (a) Reservoir capacity for fulfilling given demand

   (b) Demand rate from a reservoir of a given capacity [16]

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R07

Set No. 4

III B.Tech II Semester Examinations,APRIL 2011
WATER RESOURCES ENGINEERING-II
Civil Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) What are different types of aqueducts based on the canal cross-section at the crossing. Where will you adopt each type.

   (b) What is transition. What is its purpose. Discuss various methods for the design of transitions.   [8+8]

2. Write short notes on the following:

   (a) Dropping shutters

   (b) Stop logs
      Also draw the relevant sketches   [16]

3. (a) What are the functions of a divide wall in a diversion headworks. Explain the general considerations for the design of a divide wall.

   (b) What are the causes of piping failures and the failures due to rupture of floor How would you prevent such failures.   [8+8]

4. Write detailed notes on:

   (a) Foundation and inspection galleries in gravity dams.

   (b) Elementary and practical profiles of gravity dams.   [16]

5. (a) Explain the methods of construction of earth dams. Also write the merits and demerits of earth dams.

   (b) Write briefly about overtopping, wave erosion and piping phenomenon in earthen dams.   [8+8]

6. Design 1 m Sarda type fall on a channel carrying 20 cumecs discharge whose bed width and water depth are 14 m and 1.5 m respectively.   [16]

7. (a) Explain the following terms:

       i. Catchment area
      ii. normal pool level,
     iii. maximum pool level,
      iv. minimum pool level.

   (b) Dams serve many purposes. List any eight of them.   [8+8]

8. (a) State briefly how you will fix up the location and capacity of canal outlet.

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(b) State requirements for an ideal outlet.Distinguish between a modular, a non-modular and a semi-modular outlet. Give on example of each type.   [8+8]

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FIRSTRANKER

Code No: 07A60104 | R07 | Set No. 1

III B.Tech II Semester Examinations,APRIL 2011
WATER RESOURCES ENGINEERING-II
Civil Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Define outlet. What are the essential requirements of a good outlet.

   (b) Draw neat sketches illustrating each of the following types of canal outlets.
      i. Non-modular outlet
      ii. semi-modular outlet and
      iii. rigid module.   [8+8]

2. (a) Discuss utility and limitations of Khosla's theory.

   (b) What is the difference between diversion headworks and a storage headworks
   (dam). What considerations will you have while selecting the site for a diver-
   sionheadworks.   [8+8]

3. (a) Describe the procedure for the design of a straight glacis fall when it is
      i. Unflumed and non-metered
      ii. Flumed and metered.

   (b) How would you select a suitable type of fall at a particular location.   [8+8]

4. Write short notes on:

   (a) Straight drop spillway

   (b) Side channel spillway

   (c) Ogee spillway

   (d) Priming devices for siphon spillways.   [16]

5. Write short notes on:

   (a) Hydraulic failures of earthen dams

   (b) Significance of pore pressure in relation to earthen dam construction

   (c) Slope protection in earthen dams

   (d) Filters in earthen dams.   [16]

6. (a) Explain the different types of storages in a reservoir with the help of a neat
   sketch.

   (b) Given the specific yield, describe the procedure for estimating the reservoir
   capacity using mass inflow and demand curves.   [16]

7. (a) What points will you consider while selecting the site of a cross-drainage work.

(b) Discuss the methods for the estimation of the design discharge and waterway for a drainage at an aqueduct. [8+8]

8. The following are the details of the section of a gravity dam. Calculate

i)Maximum vertical stress at the heel and toe of the dam.
ii)Major principal stress at the toe of the dam.
iii) Intensity of shear stress on a horizontal plane near the toe.

RL of top of dam = 584.00 m
Top width = 6 m;
u/s face is vertical;
RL of water level on u/s = 580.00 m.
The batter on the d/s face starts from RL of 575.00 m;
Slope of d/s batter = 2H:3V;
RL of Tail water level = 506.00 m
The horizontal distance between u/s face and center line of drain holes is 8 m.
Consider reservoir full condition and neglect earthquake, silt pressure and wave pressure effects.
Assume any other data not given. [16]

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Code No: 07A60104 **R07** **Set No. 3**

III B.Tech II Semester Examinations,APRIL 2011
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 the optimum size of an outlet. What are the objections to large and small size outlets.

   (b) Why is the installation of an adjustable proportional module preferred by irrigation department but unpopular amongst irrigators.Give discharge formula for three types of outlets.   [8+8]

2. (a) How do you decide the section of a zoned earth dam if the following materials are available:

      i. Only silty clay is available.
      ii. Only fine gravel or coarse sand is available.

   (b) Explain the necessity of slope protection in earthen dams. How do you protect upstream and downstream slopes of an earthen dam?   [8+8]

3. (a) Explain the necessity of a cross-drainage structure. How do you classify cross-drainage works.

   (b) State how will you determine

      i. Contraction of canal waterway
      ii. Waterway for the drain, and
      iii. Thickness of floor for the drain in the transition reach in case of a siphon aqueduct.   [8+8]

4. How is the capacity of a reservoir fixed based on a specified yield? Also explain how safe yield of a reservoir is obtained for a given capacity.   [16]

5. Describe with the help of suitable sketches Bligh's creep theory for the safe design of apron in an irrigation work.   [16]

6. A concrete gravity dam 20 m in height has top width 6 m and free board 2.5 m, upstream face is vertical, while downstream face has a slope of 0.6H:1V right from top to bottom. Check the stability of the dam. Take specific weight of concrete as $2.4t/m^3$. Consider full uplift. There is no tail water. Assume any other data not given.   [16]

7. (a) Why do we provide a fall on canal.Enumerate different types of falls.

   (b) Data refer to fall site, full supply discharge us/ds = 50 cumecs, bed width u/s/d/s = 28.0 m, full supply level u/s/d/s = 150.00/148.50, bed level u/s/d/s = 148.00/146.50 m. What type of fall would you recommend for this canal. Design cistern of fall.   [8+8]

8. Design a suitable section for the overflow portion of a concrete gravity dam having the d/s face sloping at 0.7H:1V. The design discharge for the spillway is 8000 cumecs. The height of the spillway crest is kept at RL 204.0m. The average river bed level at the site is 100.0m. The spillway length consists of 6 spans having a clear width of 10m, each. Thickness at each picr may be taken as 2.5m. [16]

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