Seat No. | | | | | | |

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मजल - 063

Water Resources Engineering- II
(New) (1300)

P. Pages : 2

Time : Three Hours **Max. Marks : 100**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Attempt **any two** bits from each questions.
5. Figure to the right indicate full marks.
6. Assume suitable data if required.
7. Use of non programmable calculator is allowed.

1. a) i) What are U.S.B.R. recommendation for uplift pressure in gravity dam. **3**

ii) What should be the position of resultant for no tension to develope in any part of the gravity dam. **2**

iii) Write a short note on Arch dam. **5**

b) Design the practical profile of a gravity dam of stone masonry for the following data.

R. L. of base of dam = 1450 m

R. L. of H.F.L. = 1480.5 m

Specific gravity of masonry = 2.4

Safe compressive stress of masonry = 120 tonnes/m^2

Height of waves = 1 m. **10**

c) What are different modes of failuar of gravity dam. Explain in detail. **10**

2. a) What types of protection works will you provide for energy dissipation by plotting J.H.C. and T.W.C. Explain in detail. **10**

b) i) A dam has spillway whose cross-section is 1 m high and 4m wide. The tail water elevation at design flow is 6m below summit of siphon and the head water elevation is 1.5m above summit. Assuming a coefficient of discharge = 0.6. What is the capacity of siphon. What head would be required on an ogee spillway (C = 2.25) 4m long to discharge this flow. What length of ogee weir would be required to discharge the same flo as the Siphon with the head of 1.5 m on Weir Crest. **6**

ii) Discuss the possible locations of spillways. **4**

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c) Write short notes on :
   i) Cavitation in Ogee spillway. **5**
   ii) Gates used for spillway. **5**

3. a) What are different modes of failure of earthen dam. Explain in detail. **10**

b) i) For the earth dam of homogeneous section with a horizontal filter as shown in fig draw the top flow line. If the coefficient of permeability of soil material used is 5×10^{-4} cm/sec . Find the seepage flow per unit length of dam. **7**

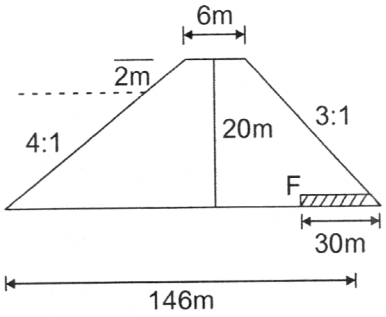

Fig. Q.No. 3(b)

ii) Explain Beige Creep theory. **3**

c) Write short note on :

i) Down stream drainage system of earthen dam. **5**

ii) Component parts of diversion head works. **5**

4. a) i) Give the design steps of kennedy's method of channel design. **7**

ii) Compare Kennedy's theory with Lacey's theory. **3**

b) i) Explain bed load and suspended load in a sediment transport. **5**

ii) How will you use Garrets diagram in channel design. **5**

c) State various types of lining of canal. Explain any four in detail. **10**

5. a) What are different types of cross drainage works that are necessary on a canal alignment state briefly the conditions under each one is used. **10**

b) What is Spur. What are its types. Explain their use design and construction. **10**

c) Write short note on :
   i) Assessment of power potential. **5**
   ii) Types of hydropower plant. **5**

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