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RM-7041

B. E. (Sem. VI) (Civil) Examination

May / June – 2010

Irrigation Engg. - I

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. (Sem. 6) (Civil)**

Name of the Subject :

☛ **Irrigation Engg. - 1**

☛ Subject Code No. : **7 0 4 1** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Figures to the right indicate full marks.

(3) Assume suitable data where necessary.

(4) Use of programmable calculator is not allowed.

(5) Draw neat and labelled sketch where needed.

SECTION - I

1 (a) Define the following : (any five) **5**

(i) Kor Wahring

(ii) Kharif crop

(iii) Overlap allowance

(iv) Readily available moisture

(v) Water application efficiency

(vi) Duty.

(b) Explain why Sprinkler irrigation method is preferred to other methods of irrigation. **7**

(c) What are the factors affecting duty? Explain how duty of water increases as we move downstream from the head of main canal towards the head of water courses. **7**

2 Attempt any **two** : **8×2=16**

(i) Explain the causes and ill effect of water logging? Derive the spacing of tile drains with a neat sketch.

(ii) What do you understand by economical depth of cutting? Draw the section of a canal in full filling with the following data :

(a) R.L of GL = 150.00 m

(b) The canal bed level = G.1

(c) Bed width of canal = 12.0 m

(d) Fully supply depth = 3 m

(e) Free Board = 0.5 m

(f) Top width of bank = 3 m

(g) Side slope of bank = 1:1 (canal side) 2:1 (coastry side)

Also find the height of the bank.

(iii) Design a lined canal having the following data :

(a) Full supply discharge = 250 m^3/sec

(b) Side slope = $1\frac{1}{2}$: 1

(c) Bed slope = 1 in 5000

(d) Rugosity coefficient = 0.018

(e) Permissible velocity = 1.8 m/sec.

3 Write short notes on (any **three**) **15**

(i) Classification of soil water

(ii) Lauy's Silt theory

(iii) Irrigation efficiencies

(iv) Benefits of irrigation

(v) Bandhara irrigation system.

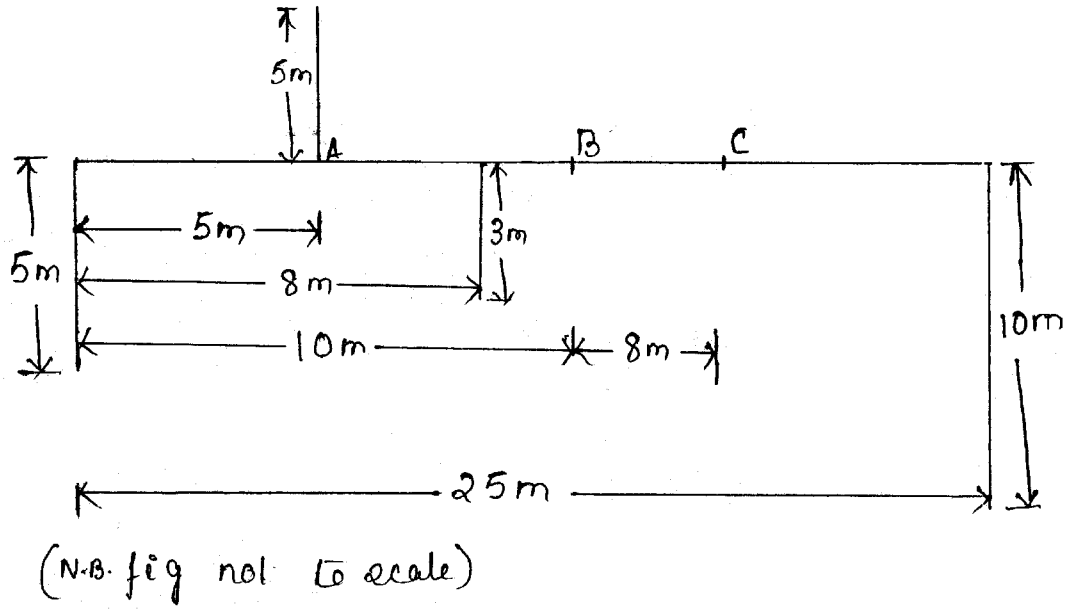
SECTION - II

4 (a) Explain the terms flexibility, setting and sensitivity related with outlets. Explain the relationship between flexibility and sensitivity. **7**

(b) Explain the necessity and location of canal fall. **5**

(c) Draw a neat sketch of Gibb's module. **3**

5 (a) The figure shows the section of a hydraulic structure on a permeable foundation. Calculate the average hydraulic gradient according to Bligh's creep theory. Also find the uplift pressures at points A, B and C shown in figure and the floor thickness required at these points. 8



(N.B. fig not to scale)

(b) Design a vertical drop weir, on the basis of Bligh's theory for the following data: 12

(i) Maximum flood discharge = 2500 cumec.

(ii) HFL before construction of weir = 250.0 m

(iii) River bed level = 245.0 m

(iv) FSL of canal = 249.0 m

(v) Allowable afflux = 1 m

(vi) Coefficient of creep = 11

Assume any other data not given. Show hydraulic calculations only.

OR

(b) (i) Write in detail about classification of aqueducts and the selection of a suitable type. 6

(ii) For the following data of a syphon aquaduct. 6

(a) Discharge of the canal = 30 cumec

(b) Bed width of the canal = 20 m

(c) Depth of water in the canal = 1.6 m

(d) Bed level of the canal = 260 m

(e) High flood discharge of the drain = 450 cumec

(f) High flood level of the drain = 261 m

(g) Bed level of the drain = 258.0 m

(h) General ground level = 260,0 m

(i) Silt factor = 0.9

Suggest the type of syphon aqueduct. Give the design of

(i) Drainage water way

(ii) Canal water way.

6 Write short notes on the following : (any **three**) **15**

(i) Functions of cross regulator

(ii) Causes of failure of weir and their remedies

(iii) Silt control devices and principle of silt control

(iv) Kennedy's Gauge outlet

(v) Classification of falls.
