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Menoufiya University
Faculty of Engineering
Shebin El-Kom
Second Semester Examination
Academic Year: 2014-2015

Department: Civil Eng.
Year: 3rd Civil Date 6/6/2015
Subject/Code: design of irrigation structures (1)/CVE321
Time Allowed: 3 hours

Remarks: No. of pages: 2 No. of questions: 4
Allowed Tables and Charts: ***(SHAKER EL BEHAIRY Design Handbook& Concrete Tables)***

Answer all the following Questions [70 Marks]

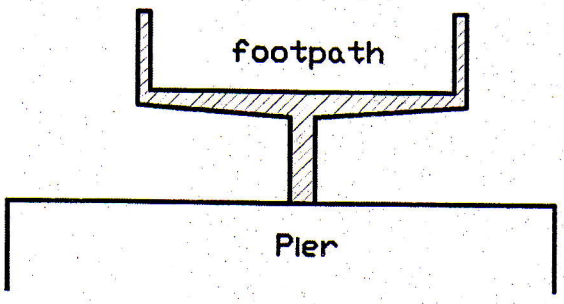
Question (1) **[20 Marks]**

- **Discuss** the uses of Culvert for Runoff Management. [2 Marks]
- **What** are the main functions of culvert? [2 Marks]
- **What** is the required information for designing culvert? [2 Marks]
- **Discuss** The main basis of selecting of material type of hydraulic structures [2 Marks]
- **How** the shape of hydraulic structures could be chosen? [2 Marks]
- **Draw** with discussion the entrance arrangements of syphon structure. [2 Marks]
- **Differentiate** between skew and right crossing. [2Marks]
- **What** are the main factors used for selecting of waterway crossing up works type? [2Marks]
- **Discuss** "El-Salam Syphon project under Suez Canal is one of the major projects in Egypt" [2Marks]
- **Explain** briefly, what are the super structures and the substructures of the bridge. [2Marks]

Question (2) **[15 Marks]**

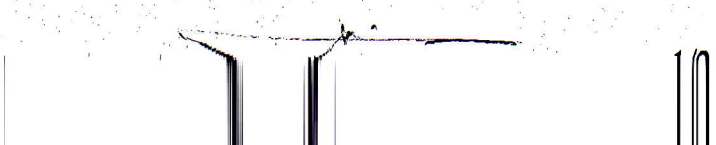
Discuss without calculations the following shapes:

1- A footpath bridge is constructed on a canal **[4Marks]**



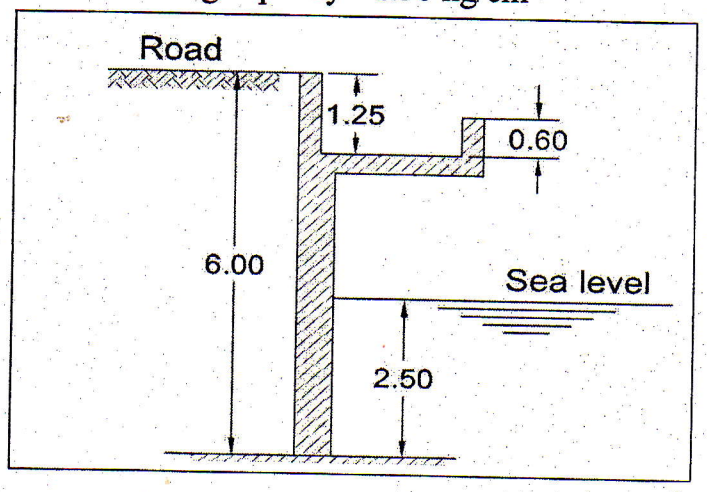
2- The modes of failure of retaining wall **[4Marks]**

3- It is required to calculate volume of reinforced concrete of the concrete holding down bolt of a steel hope of circular aqueduct in case of using two steel hope each one have two holding down bolts with 25mm diameter. The aqueduct diameter is 3.5 m and 16 m length between the two supports. The centerline of the aqueduct lays down the canal water level by 30 cm. **[7Marks]**



Question (3) **[15 Marks]**

In a coastal area, it is required to construct a tourist sidewalk near the sea. The proposed sidewalk is as shown in the figure. It is required to design all elements of the structure. Sidewalk's width =1.50m Live load on side walk=1.0 t/m^2, and the equivalent live load on the road= 3.33 t/m^2 γ_{soil} =1.80 t/m^3, Ø=30° Soil bearing capacity =1.50 kg/cm^2



Question (4) **[20 Marks]**

A roadway crosses a canal at right angle; the canal is proposed to pass through a culvert under the embankment of the road. the culvert is feeding a claimed area of 20.000 fed. With maximum water duty 68 m^3/ f/day.

Canal data:

Bed level =(2.75), Bed width =8.0 m, Side slopes 3:2 and 2:1 Bank width =8.0m Berm level = (5.50), Bank level =(6.70), H.W.L = 5.00

Road data :

Road width =12.0m , Side Slope =2:1 , Land level = (5.50) If the heading up not exceeds 20 cm , and the moving load is 60 ton lorry . γ_{Soil} = 1.65 tlm^3, $\Phi=25^0$

Lt 's required to:

1. Complete hydraulic design of culvert.
2.
3. Quick structural design of culvert.
4. Draw plan (H.E.R), Elevation, and side view.

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ملحوظة:هذا الجدول خاص بالجودة ولا يعني الطالب

Question no.	1	2-1	2-2	2-3	3-a	4-1	4-2
ILO's	A.4,A.11,B3 A.6, A.13, A.15, B9 and B14	A.6, A.13and A.15.	A.6, A.13, A.15, B9 and B14	A.15 and B14	A.15 and B14	A.15, B.3, C.10 and B14	A.14 and B14, C15
Question no.	4-3						
ILO's	A.11 and B14						