

Menoufia University
 Faculty of Engineering, Shebin El-Kom
 Civil Engineering Department
 Second Semester Examination, 2014
 Date of Exam: 7 / 6 / 2014



Subject: Hydraulic Structure
 Code: 552
 Year : Diploma
 Time Allowed : 3 hours
 Total Marks : 100 marks

Answer the following questions

Question 1 (35 marks)

- (a) Discuss the effect of the shape of the wing wall on the losses in different the hydraulic structures. (5 marks)
- (b) What are the main differences between the Counterfort and Butressed retaining walls? (5 marks)
- (c) Why control structures are need sensitive methods of design rather than other hydraulic structures? (5 marks)
- (d) What are the main categories of investigations which required for constructing dams? (5 marks)
- (e) Design a computer program to design culvert take in consideration all types of loads. (15 marks)

Question 1 (65 marks)

A. it was required to pass a road with high level over metrobus tunnel with low level in perpendicular manner :- (50 marks)

- 60 ton truck.
- L.L 2.0 t/m²
- Square tunnel width 6m,
- Higher road width and level are 12 m and (13.00)
- Lower tunnel width and level are 8 m and lower level (4.00)
- $C = 0.33 \text{ kg / cm}^2$ $q_{all} = 1.60 \text{ kg / cm}^2$ $\phi = 30^\circ$ $\gamma = 1.65 \text{ t/m}^3$

It is required to:

1. A complete design of the Square tunnel.
2. Draw all drawing details.

B. Classify tunnel according to method of constructions. (10 marks)

C. Show with sketch the main points which should be followed to build a control structure in a canal (5marks)

With our best wishes Dr/ Esam Helal

This exam measures the following ILOs														
Question Number	Q1-a	Q1-b	Q1-c	Q1-d	Q1-e	Q1-c	Q2-c	Q2-a			Q1-d	Q2-b		
Skills	a-2-1	a5-2	a-2-4	a-2-4	a-3-1	b-2-2	b-1-1	b-2-2			c-1-1	c-1-1		
	Knowledge & Understanding Skills					Intellectual Skills				Professional Skills				