



UNIVERSITY OF TECHNOLOGY  
Building and Construction Eng. Dept.  
Final Exam. – First Attempt – 2010 / 2011

Subject : Airport Engineering  
Branch : Highways and Bridges Eng.  
Examiner : Dr. Karim Al Helo

Class: Fourth  
Time : 3 Hours  
Date : 07/06/ 2011



Note: Attempt FOUR of the following questions.

Q1:

- a: For what reasons are the estimation of transport demands is necessary. (6 marks)
- b: Draw relationship between the speed and distance of runway showing all probabilities of take off. (7 marks)
- c: State what is the site selection (phase 2 of the master plan) includes. (6 marks)
- d: What is the number of runways influenced by? (6 marks)

Q2:

- a: State and draw the five principal imaginary surfaces to protect airspace around airport? (5 marks)
- b: What are the factors affecting airport capacity? (5 marks)
- c: Determine the size, capacity, velocity of water, and slope of pipe for line segment of 25 acres drainage (10% paved); average runoff coefficient equals 0.35 if you know the following:

Area	Distance (ft)	Slope %
Over pavement	110	1
Over turf	1140	0.6

Use 5 years curve in Fig. 10.2, assume  $n$  Manning= 0.015,

$c$  for turf=0.3 and  $c$  for pavement = 0.9

(15 marks)

Q3:

- a: What are the weight component of aircraft, explain each one briefly? (9 marks)
- b: Use Fig. 10.10 and find the thickness of 1. Sub base, 2. Base, and 3. Pavement (Binder and surface) for primary traffic area and wheel load of 40 K if you know that the thickness factor equals 1.15 and:  
CBR for Sub grade = 6, for Sub base= 18, for Base = 30 and for Binder=50 (16 marks)

Q4:

- a: Define the VFR and IFR and where they are used? (9 marks)
- b: An airport pavement to be designed for the traffic mix below. Convert the traffic to equivalent DC-8-61 departure. Then convert the (dual tandem) to (Dual).

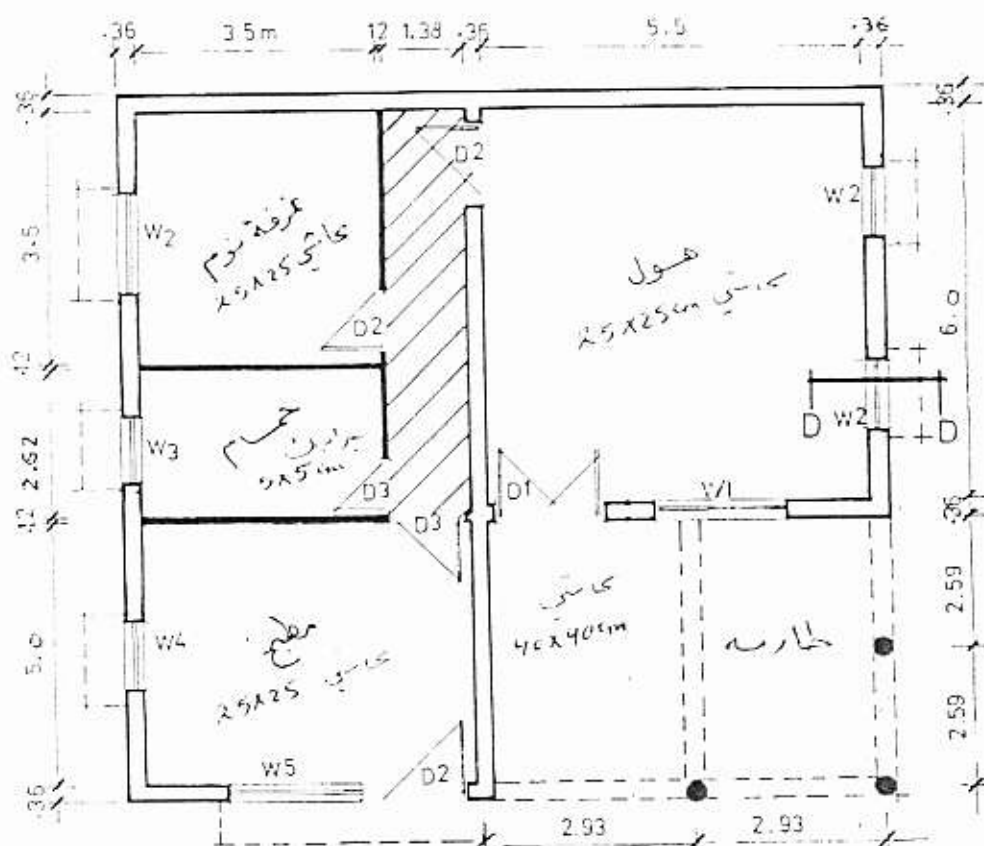
Aircraft wheel configuration	Departure R	Load per wheel lb
CV-880 (dual tandem)	3 000	22 000
DC-9-32 (Dual )	12 800	25 200
DC-8-61 (dual tandem)	3 600	39 400

Note: to convert from dual to dual tandem use factor equals 0.6

(16 marks)

Hand-drawn cross-section diagram of a gravity dam. The dam has a total height of 2.8m. The crest width is 0.45m. The upstream face is vertical with a 10:1 slope. The downstream face is sloped at 7:1. The dam body is made of R-C 1:1.5:3. The foundation is R-C 1:2:4. The base width is 0.7m. The dam is divided into three horizontal sections: 0.7m, 0.6m, and 0.08m. The water level is at the crest. The dam is labeled 'Slop 10:1' and 'Slop 7:1'. The material is labeled 'R-C 1:1.5:3' and 'R-C 1:2:4'. The dimensions are labeled: 0.45m, 2.8m, 0.7m, 0.6m, 0.08m, 0.15m, 0.45m, 0.10m, 0.7m, 0.7m. The water level is labeled 'N.G.L.'

- 1- ((ارتفاع مستوى السقف عن الكاشي (3.15 متر)).
- 2- المطبخ و الحمام كاشي فرفوري (15\*15 سم ) بارتفاع (2.1 متر).
- 3- ازالة الكاشي للارضيات بارتفاع ( 10 سم).
- 4- السقف الثانوي بارتفاع (2.3 متر) عن مستوى الكاشي.



قطر الاخر 30 cm

مستطیل شادابی  
نوع دایره

مسور الرضا، ماء ليعرض من 30  
وار رفاع 35

	W	H
W1	2.5	1.60
W2	1.5	1.20
W3	1	0.5
W4	1.5	0.90
W5	3.	0.90
D1	120 × 2.10 m	
D2	1 × 2.10 m	
D3	0.8 × 2.10 m	