DEPARTMENT OF CIVIL ENGINEERING: IIT DELHI

CEL 776: FUNCTIONAL PLANNING, BUILDING SERVICES AND BUILDING MAINTENANCE

MAJOR TEST. DURATION: **2 hours.** FIRST SEMESTER: 2006-2007. Maximum marks. : **50.**

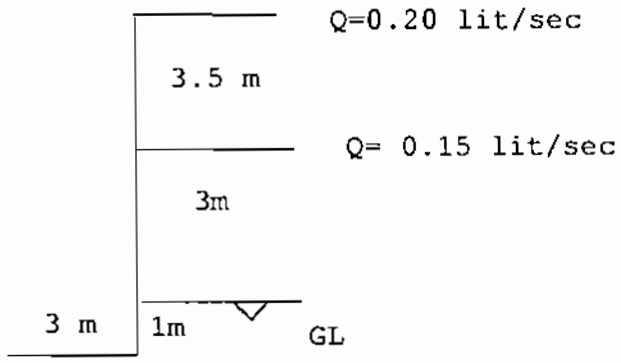
DATE:- 27-11-2006 TIME:- 10.30 A.M -12.30 P.M. Venue: V 315 (CE committee Room)

Draw neat sketches wherever necessary

Assume missing data suitably if required.

1. A Computer laboratory has a capacity for 25 students in 25 desktop machines with no other equipments in the laboratory. The volume of the room is 10×5×3.5 m^3. Required fresh air supply rate is 0.01m^3/sec per person at room condition. Required inside air temperature and relative humidity are 22 °C and 60 % RH. Out side design air condition is 35 °C and 70% RH. Each computer may be assumed to be eonsuming 250 Watts and lighting loads 10W/m^2 of the floor area. A design fabric heat gain of 10 kW may be assumed. Infiltration of 0.5 air changes/hour may be taken. It is preferred that a supply to room air differential of 10 °C is maintained. Heat gain from the oceupant would be 100 W sensible and 30 W latent. Caleulate the supply air flow rate required, moisture content of the supply air and the cooling load? 13

2. Caleulate the pipe sizes for the main as well as branch pipes shown with heights as shown and available head at the inlet is 20m. k= 100. 12



3. Draw a diagram showing contingency and schedule components of planned maintenanee system for an estatc. Explain the role of inspeetion in above. 9

4. Draw sketches and explain the concepts used for steel column protection against fire. 8

5. Draw sketchcs and explain the role of vertical and horizontal zoning in lift system design 8

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