DEPARTMENT OF CIVIL ENGINEERING: IIT DELHI

CEL 776: FUNCTIONAL PLANNING, BUILDING SERVICES AND BUILDING MAINTENANCE

MAJOR TEST DURATION: **2 hours.** SECOND SEMESTER: 2009-2010

DATE:- 06-05-2010 TIME:- 10.30 A.M -12.30 PM Venue : IV 323 . Maximum marks. : **50.**

Draw neat sketches wherever necessary

Assume missing data suitably if required.

1. Consider a roof top water tank of capacity 1000 lit to be filled in daily, the water supply is available in the morning for an hour and available pressure head at the municipal main supply point is 25 m. The building is Ground + 5 floors; floor to floor height is 3.75 m. The horizontal distance between municipal main and the point at the ground for vertical rise is 15 m and tank is 2 m away at roof top from the point of rise of the pipe. Height of the tank is 1.5 m and is on columns of height 1 m. Determine a suitable size of the pipe for intake to the tank from municipal main. 6
2. Draw figures and explain a) hydro-pneumatic system for water supply in multistory building; b) hot water supply system. 6
3. Draw diagrams showing time versus waste water flow in a pipe connecting a fixture to stack; variation of pressure in a stack with height and explain the necessity of trap. A WC is connected to 100 mm soil stack that runs to a 200 mm deep in to soil service duct and the horizontal length is 15 m from the stack. Is the layout satisfactory? 9
4. Explain why is it necessary to install Capacitors in a multi storey building where a number of motors are working? What is balanced load, how the electrical load can be balanced in a 25 storey building having single occupancy? 6
5. Explain the role of inspection in planned maintenance, it has been observed that with no inspection number of emergency call/year for an electrical system is 15, with 2 inspections per year the emergency calls reduces to 5. If cost of emergency repair is 4 times than that of cost of single inspection, how many inspection/year would you recommend? 8
6. Explain concept of fire resistance and fire severity. 8
7. Draw diagrams to explain schematically the interaction of the building service system and the environments it is concerned with. Explain with the help of diagrams, the various types of control systems those can be adopted in building service system. 7

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