

# National Institute of Technology, Hamirpur (H. P.)

Name of the Examination: B.Arch. 2<sup>nd</sup> year

Branch : Architecture

Semester : 4<sup>th</sup> Sem

Course Name : Building Services- I

Course Code : AR -223

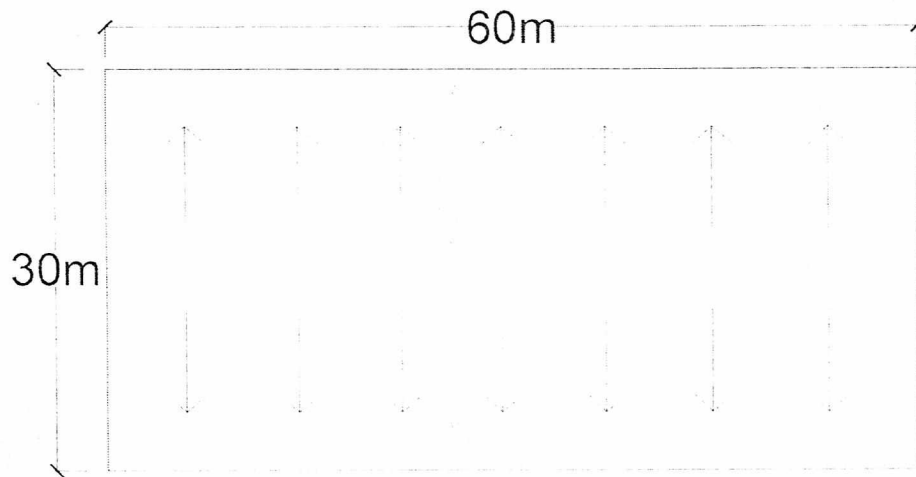
Time : 03 Hours

Maximum Marks : 60

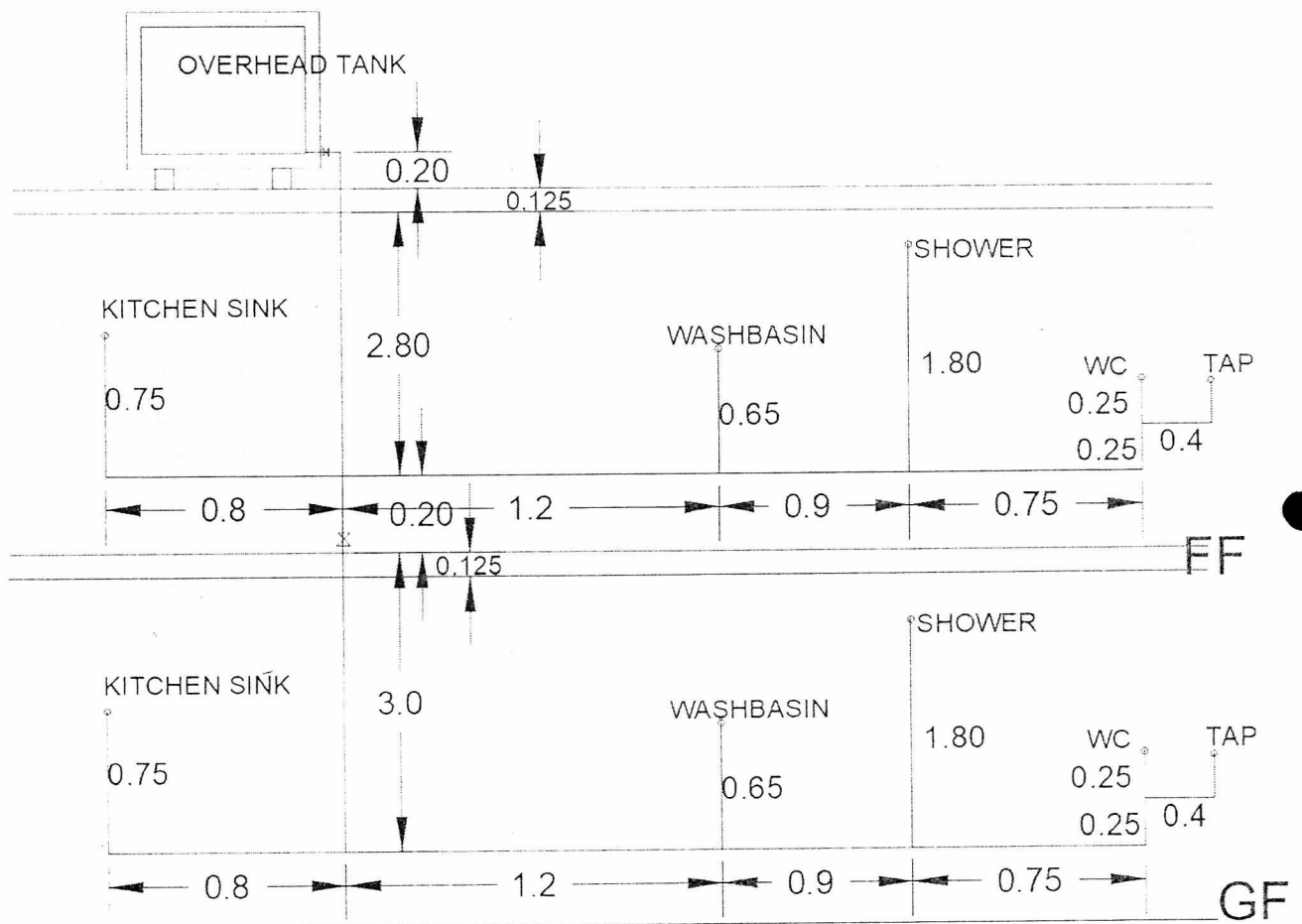
Note: Assume missing Data suitably. Students are allowed to bring Table for Friction and Velocity of small Pipes (02 pages) and Fixture Units: Discharge Table (01 page) and Table 6B to 6E (02 pages) in the examination hall.

1. Explain briefly any **THREE** water supply fixtures and any **THREE** sanitary fixtures  
6
2. Calculate the head loss of friction of a 500m long pipe and the slope required for a sewer having diameter of 250 mm to run half full, with a velocity of 0.75 m/sec? Assume missing data suitably.  
8
3. A septic tank is proposed to be constructed for the upcoming apartment at Hamirpur on a land having 4m deep water table. The apartment will have a population of 120 members living in 30 houses having 2 WCs, 2 washbasins and 2 showers in each house. Provide the size of proposed septic tank using Rate of Water Supply method & Fixture Discharge method for 10 years. Assume missing data suitably.  
12
4. Explain the role & general sizes of soak pits and manholes.  
4
5. Discuss, along with neat sketches, the design considerations and IS code provisions for designing a toilet.  
8
6. Design a storm water drainage system for a building with GI sloped roof of size 60m x 30m located at Hamirpur having rainfall intensity of 80 mm/hr (Roof plan at the back side for reference).  
10
7. Design a water supply distribution scheme by providing pipe size and available head for the diagram given at the back.  
12

39



Roof Plan for Q6.



Distribution scheme for Q7.