

Dr Saurabh Rawat

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- October, 2019

B.Tech. VII Semester

COURSE CODE: 10B13CE736

MAX. MARKS: 25

COURSE NAME: Underground Technology

COURSE CREDITS: 03

MAX. TIME: 1Hr 30 Min

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

- [1] A 2km long underground rail tunnel has to be constructed in Delhi at a depth of 25 m below the ground surface. The soil comprises of silty sand of medium density. The water table is 7 m below the ground surface. Dewatering is not feasible along the route due to the presence of structures at ground surface. What shield tunneling method will you adopt for construction of the rail tunnel? [6]
- [2] In circular excavation one rarely uses struts, rakers or tiebacks; whereas these are used extensively in rectangular or square shaped excavations. Why? [3]
- [3] Why are cut – and – cover road tunnels constructed in soil of square or rectangular shape whereas bored tunnels are circular in shape? [5]
- [4] Pipe jacking is used often for installation of horizontal sewage lines beneath buildings in urban areas. However, pipe jacking is not used in case of construction of vertical shafts of small diameter. What is your opinion is the reason for not adopting pipe jacking in the vertical direction. [5]
- [5] State the method that should be used for excavation for basement construction for the following cases with appropriate reasons: [6]

Case	No. of floors of basement	No. of floors of super structure	Excavation Depth (m)	Soil type	Depth to water table (m)	Distance to nearest building (m)
A	1	3	5	Clayey silt	10	50
B	1	3	5	Silty sand	10	10
C	2	10	9	Clean sand	5	50
D	2	10	9	Silty sand	8	10
E	2	10	9	Silty sand	15	Hospital at 10
F	4	15	16	Silty clay	18	20