

Roll No.

Total Pages : 2

002604

May 2024

B.Tech. (Civil) VI Semester

Metro and Tunnel Engineering

(PEC-CED-301-4)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. Write short notes on the following :

- | | |
|-------------------------|-------|
| (a) Timbering. | (1.5) |
| (b) Jambos. | (1.5) |
| (c) Depots. | (1.5) |
| (d) Tunnel Lining. | (1.5) |
| (e) Muck. | (1.5) |
| (f) Carbon Credits. | (1.5) |
| (g) Pilot tunnel. | (1.5) |
| (h) Routing Studies. | (1.5) |
| (i) Multimodal Systems. | (1.5) |
| (j) OHE. | (1.5) |

PART-B

2. (a) Discuss different surveys and investigations carried out in metro projects. (10)
- (b) With the help of Delhi Metro and Delhi Meerut RRTS, discuss the benefit of Regional Rapid Transit Systems. (5)
3. (a) Explain the Ventilation systems for road and rail tunnels. (5)
- (b) Enlist different factors responsible for accidents during tunneling. Further discuss safety precautions to be maintained during tunneling. (10)
4. Discuss various methods of construction of viaduct span and bridges for metro projects. (15)
5. (a) Write short note on Tunnel Boring Machine. (5)
- (b) With the help of neat and clean diagram identify and discuss various components of permanent way for a metro track. (10)
6. (a) Discuss the importance of blasting in tunneling. Further list down commonly used explosives as per different type of strata for blasting. (10)
- (b) Discuss the automation mechanism of metros using PLC and SCADA. (5)
7. With the help of suitable diagrams explain different methods of tunnelling for soft, hard and rocky strata. (15)