

Babu Banarasi Das -National Institute of Technology & Management, Lucknow
B. Tech Second Year (Third Semester) 2018-19
Department of Civil Engineering

TUNNEL ENGG. (NCE-044)
Assignment: I (Unit 1)

NOTE-ATTEMPT ALL PARTS

1. Define the tunnel & give historical development of tunnel?
2. What are the geotechnical considerations in tunneling?
3. What is tunnel ? Discuss the advantage and disadvantage of tunnel as a mean of communication.
4. How tunnels are classified? Explain briefly how you would transfer the center line and grade of proposed tunnel from the ground surface to the interior of the tunnel with their neat sketches.
5. Show with sketch various types of tunnels and give the conditions when the following tunnels are used (i) segmental (ii) rectangular (iii) horse shoe (iv) elliptical.
6. What informations are collected in Geological investigations for tunnels ?
7. What are the various stages when geologic and geotechnical data are collected ? What type of information is taken in second stage of investigation ?
8. What are different types of supports in tunnels ? List the temporary and permanent types of supports.
9. Classify the tunnels according to their alignment and purposes. Also describe the tunnel construction in independent India.
10. How will you preliminary explore the location of a tunnel ? Also discuss why the preliminary exploration for a tunnel is very necessary

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Assignment: II (Unit 2)

NOTE-ATTEMPT ALL PARTS

1. What are the different tunneling methods explain in brief?
2. Give the different cross sectional shapes of tunnel?
3. What are the factors influencing size of tunnel?
4. Compare environmental merits & demerits of tunneling methods?
5. Explain NATM in detail?
6. What is the need of providing lining in tunnels ? How concrete lining is done ?
7. Discuss the following methods of tunneling in firm grounds :
 - a. Full face method
 - b. Top heading and benching method.
8. Differentiate between running ground, soft ground and firm ground. What do you understand by shield tunneling and where this is used ?
9. With the help of their neat sketches write about the cross sections of tunnel. Also write their comparative advantages and
10. Define portals and discuss the points to be observed while designing a portal. Also discuss the factors which decide the size of a tunnel.

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Assignment: III (Unit 3)

NOTE-ATTEMPT ALL PARTS

1. Give the different hard rock tunneling methods explain any two?
2. Write a short note on-
 - a. Fore poling method (2) Liner plate method
3. Give the different types of air locks explain?
4. Write notes on :
 - a. German method
 - b. Austrian method
 - c. Rock bolting
 - d. Bearing plates supports
5. Describe various types of explosives used in tunneling.
6. List the different types of drilling equipments for the construction of tunnels. Explain any two types with the help of their neat sketches.
7. Define the following terms: *blasting; explosive; safety fuse; blasting cap; primer and detonators*. Write a detailed note on detonators with neat sketch wherever possible.
8. Enumerate different types of explosives used for blasting of rocks. Also discuss how a borehole loaded with explosives and what precautions you will take during the blasting.
9. The method of tunnelling in soft grounds depends upon which factors ? Enumerate the methods of tunnelling in soft grounds. Discuss in detail the liner plate method of tunnelling in soft grounds with neat sketches.
10. Write short notes on-
Man Lock, Air lock and shields.

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Assignment: IV (Unit 4)

NOTE-ATTEMPT ALL PART

1. Define microtunneling & also give microtunneling in INDIA?
2. Give the application of pipejacking technology & also give its various benefits?
3. Write a short note on –
 - 1) Guidance system (2) slurry shield (3) jacking system
4. What is pre-jacking ? Give history of pre-jacking
5. Give advantages and limitations of pipe jacking and micro tunneling.
6. Explain auger bore micro tunneling in detail.
7. Enumerate the methods which can be adopted while tunnelling in hard strata. Explain full face method with neat sketch.
8. At the time of tunnel driving, it is very necessary to support the ground adjacent to tunnel, why ? Also discuss the various methods to support the ground at the time of tunnel driving.
9. What is the role of shafts in rocks ? With the help of their neat sketches discuss the shaft sinking in the soft soils.
10. Give the advantages of pipe jacking and micro tunneling.

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TUNNEL ENGG. (NCE-044)

Assignment: V (Unit 5)

NOTE-ATTEMPT ALL PARTS

1. What do you mean by drill mountings explain its types?
2. What do you mean by tunnel ventilation give the methods of permanent ventilation?
3. Explain priming & steaming & also give define delay detonators?
4. What measures are taken for the prevention of fire in tunnels ?
5. What are the locations, where lighting arrangements are to be made in tunnels ? Also describe the various types of lightings.
6. How the amount of dust can be controlled in tunnels ? Discuss equipments used for dust control.
7. What is the objective of providing proper ventilation to the tunnel interior during the construction ? Give the requirement of air also. Name the factors which affect the length of tunnel upto which natural ventilation would suffice.
8. Name the two operations which are involved in the drainage of a tunnel. Describe the well point drainage system with the help of its neat sketch.
9. Enumerate the safety measures to be adopted under the following situations :
 - a. During loading and hauling muck
 - b. While working in a cramped working space
 - c. During shaft operations
 - d. While handling explosives.
10. How will proceed to handle an unexpected source of water during tunneling operations?

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