B.E. (Civil Engineering) Seventh Semester (C.B.S.)

Advanced Concrete Structures

P. Pages : 4 **NRT/KS/19/3516**

Time : Four Hours * 0 2 2 4 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.
10. Use of non programmable calculator is permitted.
11. Use of IS 456 : 2000 and IS 3370 : 2009 may be consulted.
12. Detailing carry marks.

1. A circular water tank of capacity 4,50,000 litres resting on a firm ground and having rigid joint at the base. The depth of water is 4 m, including a free board of 250 mm. Design top dome and circular wall of tank. Use M20 grade of concrete and Fe 415 grade steel. **13**

OR

2. Design the wall of square water tank of size $5\text{m}\times5\text{m}\times2.5\text{m}(\text{L}\times\text{B}\times\text{D})$ for a capacity of 55m^3. The tank is fixed at base and free at top. Use M25 grade of concrete and Fe 415 grade of steel. Draw reinforcement details. **13**

3. Design an isolated footing for a column carrying an ultimate load of 600 kN and ultimate moment of 80 kN.m about an axis bisecting the depth of column. (major ax is). The size of column is $250\times450\text{mm}$. SBC of soil is to be taken as $200\text{kN}/\text{m}^2$. Use M20 grade of concrete and Fe 415 grade of steel. **13**

OR

4. Design the reinforcement for a column with lex = ley = 4.0m and size $400\text{mm}\times300\text{mm}$ subjected to a factored load of 1000 kN with biaxial moment of 120 kN.m and 80 kN-m with respect to the major and minor ax is respectively. Assume M 20 concrete and Fe 415 steel. Interaction curve may be consulted. **13**

5. Draw elastic moment diagram and bending moment diagram after 25% moment redistribution for a two span continuous beam of span 7 m each subjected to udl of 25 kN/m on entire span. **13**

OR

6. a) Sketch the bending moment envelope after 30% maximum redistribution for a fixed ended beam carrying two point loads of 20 kN each at one – third points and a uniformly distributed load of 4 kN/m over a span of 9 m. **9**

b) Explain redistribution of moments state its advantages. **4**

7. Design the stem of a cantilever retaining wall which is required to support a bank of earth 4 m above the GL. Assume a hard strata for foundation is available at 1.25 m below GL. The safe bearing capacity of soil is $170\,kN/m^2$, unit weight of soil is $16\,kN/m^3$ and the angle of shearing resistance is 30º. Use M20 grade concrete and Fe 415 grade steel. Curtail the main reinforcement and design distribution reinforcement also. **14**

OR

8. Design stem (vertical wall) of a counterfort retaining wall for following requirements : **14**

i) Height of wall above ground level = 5.5 m.

ii) S.B.C. of soil at site = $160\,kN/m^2$

iii) Density of soil = $18\,kN/m^3$

iv) Angle of internal friction = 30º.

v) Spacing of counter forts = $3\,m\,c/c$

Use M 20 grade of concrete and Fe 415 grade of steel. Perform all necessary stability checks. Show the details of reinforcements in the wall.

9. The roof of 8 m wide hall is supported on a portal frames spaced at 4 m intervals. The height of the portal frame is 4 m. The slab thickness is 100 mm. Live load on roof is $2.5\,kN/m^2$, SBC of soil $= 200\,kN/m^2$. The column is hinged at base. Design the column and hinge of the portal frame. Use M 20 grade concrete and Fe 415 grade steel. **13**

OR

10. Design dog legged stair case (waist type slab) for an office building of $2.5\,m \times 4.5\,m$ to suit the following data : Height between floor : 3.5 m, Risers = 150 mm, Thread = 250 mm, Length of landing = 2.7 m, width of flight = landing width = 1.2 m, provide 100 mm bearing at each end. One end of the flight is resting on plinth beam and other on the landing beam at the end of the flight. **13**

$L.L = 4\,kN/m^2$

11. Design a combined footing and its main reinforcement for two columns $400 \times 400\,(mm)$ and $500 \times 500\,(mm)$ supporting the service loads of 900 kN and 1600 kN respectively and the centre to centre distance between them is 4.5 m. The width of combined footing is restricted to 1.8 m. The allowable rate bearing capacity of soil is $200\,kN/m^2$. Use M 25 grade of concrete and Fe 415 type steel. Detail the design by a neat diagram. **14**

OR

12. Design a combined footing for two columns A & B carrying load of 800 kN and 1200 kN at 4.8 m apart. Column A is $350 \times 350\,mm$ and B is $450 \times 450\,mm$. The length of footing is restricted to 6 m. The SBC at soil is $140\,kN/m^2$. Use M 20 grade of concrete and Fe 500 steel. **14**

Chart 45 COMPRESSION WITH BENDING — Rectangular Section — Reinforcement Distributed Equally on Four Sides

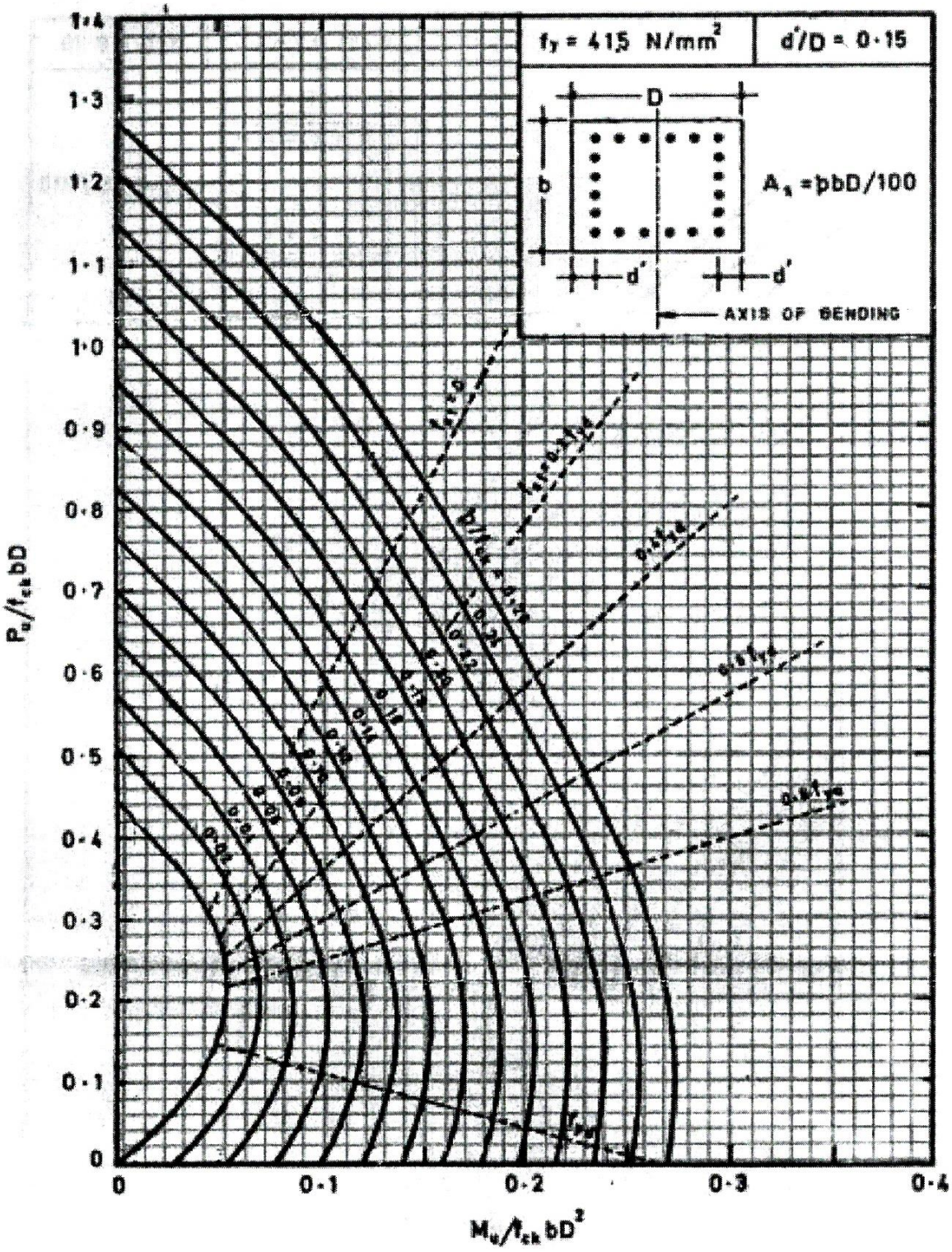
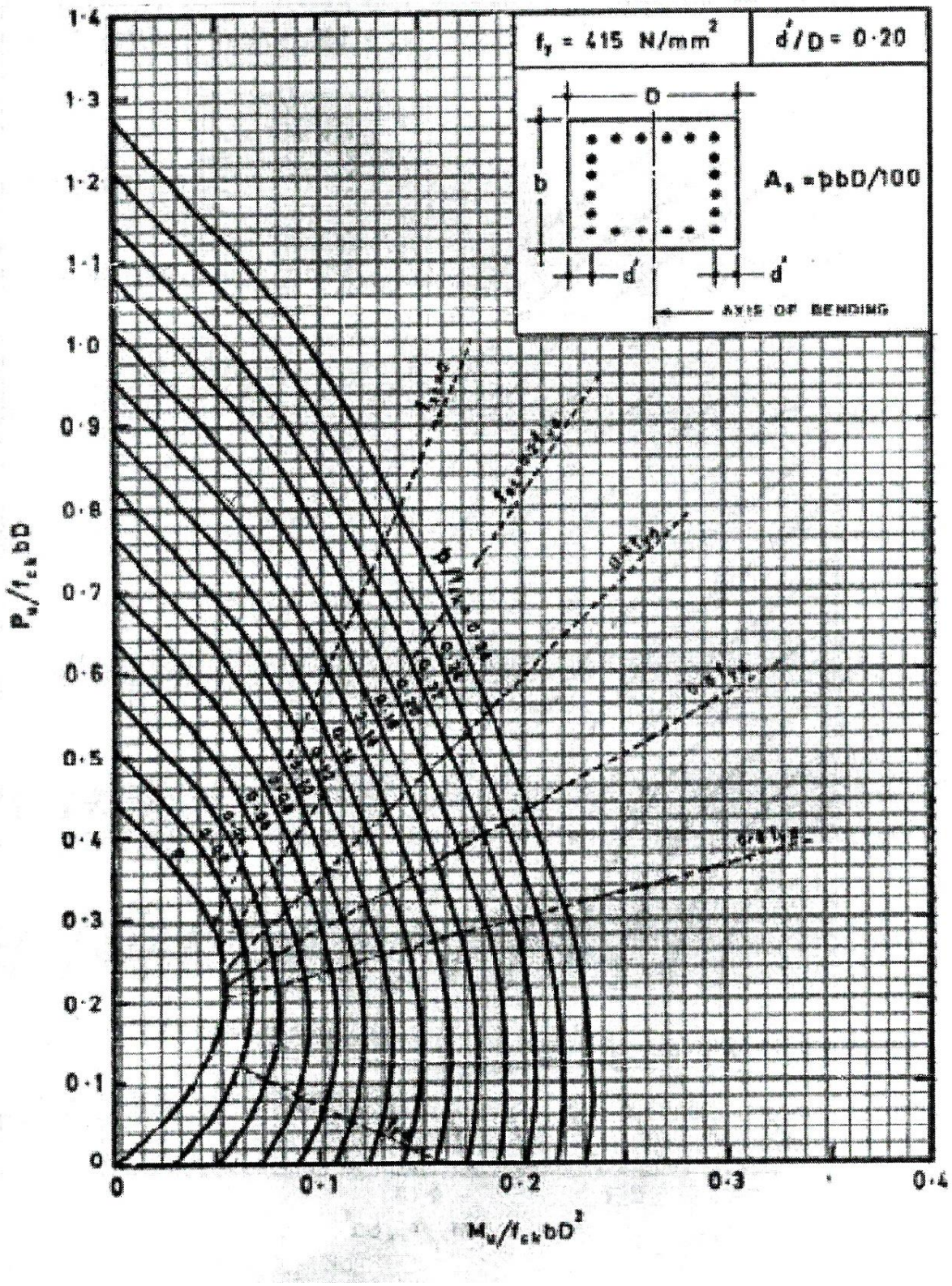


Chart 46 COMPRESSION WITH BENDING—Rectangular Section—Reinforcement Distributed Equally on Four Sides



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B.E. (Civil Engineering) Seventh Semester (C.B.S.)

Elective - I : Air Pollution & Solid Waste Management

P. Pages : 2 **NRT/KS/19/3520**

Time : Three Hours * 0 2 3 0 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.
10. Use of non programmable calculator is permitted.

1. a) Define air pollution. Explain it's sources. **7**

b) What is photo chemical smog ? Explain its effect on human health. **6**

OR

2. a) Explain the effects of air pollution on humans & plants. **7**

b) Write in detail about ozone deplection. **6**

3. a) Explain metrological factors affecting air pollution. **7**

b) Explain different types of plume behaviour with neat sketch. **6**

OR

4. a) A factory used 4.0 million liters of fuel oil per month. The exhaust gases from the factory contains the following quantities of pollutants per million liter per year. **7**

i) Particulate matter = 7 tons ii) SO_2 = 26 t

iii) No_x = 10 t iv) HC = 1.2 t &

v) CO = 0.6 t

Determine the safe height of the chimney for the safe dispersion of the pollutants.

b) Define wind rose. Explain its importants. **6**

5. a) List out the controlling equipment used in industries to control particulate matter & explain bag filter. **7**

b) What are the effects of sound pollution on health and how to control. **6**

OR

6. a) Write a short note on noise pollution and it's ill effect and how to control it. **7**

b) Write a short note on pollution due to petrol and diesel engines. **6**

7. a) Explain the various sources of generation of solid waste. **7**

b) Explain the physical & chemical characteristics of solid waste. **7**

OR

8. a) Write down the functional elements of solid waste management. **7**

b) Write a short notes on **any two.** **7**

i) Sampling of solid waste.

ii) Quality & quantity of solid waste.

iii) Composing of solid waste in India.

9. a) Explain various methods of solid waste collection with sketch. **7**

b) What is transfer station ? State its types. **6**

OR

10. a) Discuss methods of route optimization of solid waste collection vehicles. Explain any one in detail. **7**

b) Write short note on method for separation of municipal solid waste (any two) **6**

11. a) How to control leachate from sanitary landfill. Explain it. **7**

b) What are factors on which composting depends explain any four. **7**

OR

12. Write short note on **any three.** **14**

i) Site selection on sanitary landfill.

ii) Types of incinerator.

iii) Three component diagram.

iv) Control of gaseous from sanitary landfill.

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B.E. (Civil Engineering) Seventh Semester (C.B.S.)

Construction Management and Law

P. Pages : 2 **NRT/KS/19/3525**

Time : Three Hours * 0 2 2 6 * Max. Marks : 80

Notes : 1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What are the various types of costs? Explain. **6**

b) Explain the concept of PPP. **7**

OR

2. a) Explain project feasibility report. **6**

b) What is mean by Detailed project report? Discuss the essentials of a DPR. **7**

3. a) Give the difference between PERT & CPM networks. Explain the circumstances under which one is preferred over other. **7**

b) Define : **7**
i) Optimistic time.
ii) Most likely time.
iii) Pessimistic time.

OR

4. Draw the CPM network for the following logic & determine critical path. Total float & show the critical path with double lines on the network. If duration of network is as follows: **14**

Activity	A	B	C	D	E	F	G	H	I	J	K
Duration	7	6	4	7	8	8	10	6	5	10	7

The network logic is as follows :
At the start of the project activity A & B are the initial activities & ore done concurrently, D follows A, C & F follows B, E follows C & A, G & H follows E, J, follows both D & G, I follows F, K, follows both H & I, J & K are parallel activities & the project ends.

5. a) Explain any one type of organizational chart. **6**

b) Write a short note on Buldozers, power shovels. **7**

OR

6. a) Explain in details ABC analysis. **6**

b) A piece of equipment costs Rs. 2,50,000/- & has a useful life of 5 years & a salvage value of Rs. 45,000/- Determine the depreciation & book value at the end of each year using straight line & sum of year method. **7**

7. a) What is the concept of continuous improvement as per TQM? **7**

b) Least the items of work prone to several accident on construction site. **6**

OR

8. a) Explain management information system. **6**

b) Enlist the safety provisions as per National Building Code of India. **7**

9. Explain in details the legal aspects in construction projects. **13**

OR

10. Write a note on : **13**
a) MRTP Act,
b) Highway Act,
c) Housing Development Act.

11. a) What do you mean by Environmental Protection Act? Explain. **7**

b) Explain sale, purchase & lease for transfer of property act. **7**

OR

12. a) Explain in brief registration act & stamp duty law. **7**

b) Define **any three.** **7**

i) Contract. ii) Agreement.

iii) Consent. iv) Consideration.

v) Proposal.

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B.E. (Civil Engineering) Seventh Semester (C.B.S.)

Transportation Engineering - II

P. Pages : 2 **NRT/KS/19/3526**

Time : Three Hours * 0 2 2 7 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.
10. Use of non programmable calculator is permitted.

1. a) Define Gauge o railway track. What are the factors which affect the selection of gauge ? **7**

b) Discuss the necessity & effect of coning of wheel. **6**

OR

2. a) What do you understand by "Permanent way" ? Discuss the requirement of ideal permanent way. **7**

b) What are the possible causes of creep ? Discuss in brief. **6**

3. a) What are the types of rails ? What are the requirements of an ideal rail section ? **6**

b) Write a note on sleepers & list out the function of sleeper ? **7**

OR

4. a) Derive the relationship of super elevation with gauge, speed & radius of a curve. **7**

b) Write a short notes on **any two.** **6**

i) Rail failures

ii) Cant deficiency

iii) Length of transition curve

iv) Heel clearance & flange way depth.

5. a) Draw a neat diagram of 'Left Hand Turnout' & show its various component. **7**

b) Why signals are sued on railway track ? Describe different types of signals in brief ? **7**

OR

6. Write a short note on **any three.** **14**

a) Throw of switch

b) Warner signals

c) Tongue rail

d) Inter locking

e) Marshaling yard

7. a) Explain three controls of an overaft. **6**

b) Explain the procedure of Runway Orientation. **7**

OR

8. a) Write a short note "Wind Rose" ? **6**

b) Calculate the actual length of runway from the following data : **7**
- Airport Elevation : R.L. 100
- Airport reference temp. : 28ºC
- Basic Length of runway : 600 m
- Height pt along the length : R.L. 98.2
- Lowest pt along the length : R.L. 95.2

9. a) Draw the typical layout of a small domestic terminal building ? What are the facilities are provided in this area ? **7**

b) Write a short note on : **6**

i) Approach lighting.

ii) Runway marking

OR

10. a) Explain in brief with neat sketch the "I.L.S. System" ? **7**

b) What are the characteristics of ideal layout of Airport. **6**

11. a) Explain in brief how you would transfer the centre line and grade of a proposed tunnel from the ground surface to the interior of tunnel with neat sketch. **7**

b) Write a detail Tunnel Surveying. **7**

OR

12. Write a short note on **any three.** **14**

a) Tunnel ventilation.

b) Tunnel lining

c) Drainage in Tunnel

d) Lighting in Tunnel

e) Economics of Tunneling.

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