B.E. (Civil Engineering) Seventh Semester (CBS)

Advanced Concrete Structures

P. Pages : 3 **AHK/KW/19/2280**

Time : Four Hours Max. Marks : 80

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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. Use of non programmable calculator is permitted.
10. Use of IS456-2000 and IS 3370 may be consulted.

1. Design the cylindrical Wall of a Circular Water Tank for a capacity of 400,000 liters. The tank is fixed at base and free at top. The depth of water is to be 4 m and take free board as 0.4m. Use M 25 Grade Concrete and Fe 415 types Steel. Design for Hoop Tension, Bending Moment, and provide requisite distribution steel. Design by using IS code or by approximate method. Detail the design by neat Diagram. **14**

OR

2. Design the rectangular water tank 6m x 5m with depth of storage 3.5m, resting on firm ground whose walls are fixed at base and free at the top. Design the walls of water tank by using IS code method or by approximate method. Adopt M20 concrete and Fe 415 grade steel. **14**

3. Design an RC Concrete Corner column 400 x 400 mm is subjected to a factored axial load of 1500kN along with bending moments of 180kNm and 120kNm about its mutually perpendicular axes. The unsupported length of column with both ends are hinged is 3.5m. Use M25 grade concrete and Fe415 type steel. **13**

OR

4. Design a footing for column carrying an ultimate load of 1000kN and ultimate moment of 100kN.m about an axis bisecting the depth of Column at its base The size of column is 300 x 600 mm and S.B.C of Soil 180 kN/m2 Use M20 concrete and Fe 415, Draw reinforcement details. **13**

5. Draw elastic moment diagram and bending moment diagram after 30% moment redistribution for a two span continuous beam of span 8m each subjected to udl of 30kN/m on entire span. **13**

OR

6. a) Explain redistribution of moments. State its advantages. **5**

b) Draw bending moment dia. for fixed beam of span 6m carrying 12kN load at on third point, after 20% redistribution of moment. **8**

7. A cantilever retaining wall is to retain earth for a height of 4.0m above ground level. The back fill is horizontal. Density of soil is $18\text{kN}/\text{m}^3$ and SBC of soil is $200\text{kN}/\text{m}^2$. Take coefficient of friction between soil and concrete as 0.65 and angle of repose is 30º. Use M20 concrete and Fe 415 steel. Carry out stability analysis and design only the stem of Retaining wall and show reinforcement details. **14**

OR

8. Design a stem of Counter-fort retaining wall which is required to support a backfill of 7.5m above the GL. Assume a hard rock for foundation is available at 1.5m below. GL The counter forts are 500mm thick and the clear distance between the counter forts is 3.2m. The safe bearing capacity of soil is $170\,\text{kN}/\text{m}^2$, unit weigh of soil is $16\,\text{kN}/\text{m}^3$ and the angle of shearing resistance is 30º. Use M20 grade concrete and Fe 415 type steel. **14**

9. Design a doglegged stair case for a building in which vertical distance between floors is 3.2 m The stair case hall measures 2.5m x 5m. Take live load $2.5\,\text{kN}/\text{m}^2$. Use M20 grade of concrete and Fe 415 steel. Draw reinforcement details. **13**

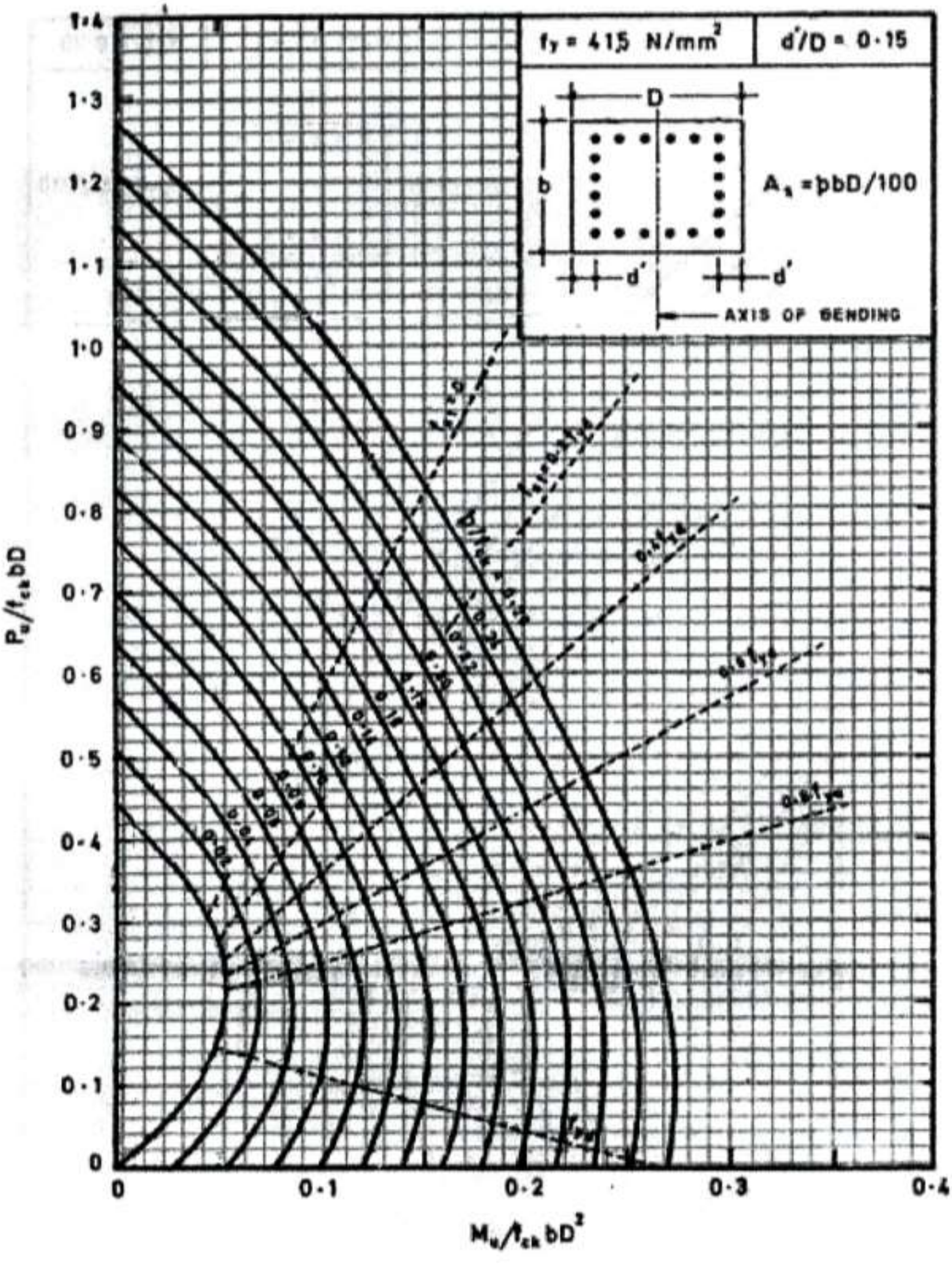
OR

10. An assembly hall 20m long and 12m wide between the centre of columns is supported by a Hinge base portal frame spaced at 4m c/c, the height of column up to centre of beam is 5.5m. Take live load as $1.5\,\text{kN}/\text{m}^2$, floor finish as $0.75\,\text{kN}/\text{m}^2$. Use M20 grade of concrete and Fe 415 steel. Design the column and hinge of the portal frame only. **13**

11. Design a combined footing and its main reinforcement for two columns 400 x 400 and 500 x 500 supporting the service loads of 900kN and 1600kN respectively and the center to Centre distance between them is 4.5m. The width of combined footing is restricted to 1.8m. The allowable safe bearing capacity of soil is $200\,\text{kN}/\text{m}^2$. Use M25 grade of concrete and Fe 415 type steel. **13**

OR

12. Design a combine footing for two column 4m C/C apart carrying load 800kN and 1200kN at service. The size of column 400 x 400 mm and 450 x 450 mm respectively. The length of footing is restricted to 5.5m. Take SBC of soil as $180\,\text{kN}/\text{m}^2$. Use M25 grade of concrete and Fe 415 steel. **13**



f_y = 415 N/mm²
d'/D = 0·15
D
b
d'
A_s = pbD/100
AXIS OF BENDING
$P_u/f_{ck}bD$
$M_u/f_{ck}bD^2$
0
0·1
0·2
0·3
0·4
0·5
0·6
0·7
0·8
0·9
1·0
1·1
1·2
1·3
1·4

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B.E. (Civil Engineering) Seventh Semester (CBS)

Estimating and Costing

P. Pages : 4 **AHK/KW/19/2281**

Time : Four Hours 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.
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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. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

1. a) Discuss the various method for approximate estimate of a residential structure. **6**

b) The following table is an extract from the longitudinal section of road earth work survey. Calculate the quantity of earthwork from the following data. **7**

i) Formation width : 14m.

ii) Side slopes.

a) Banking – 2 :1. b) Cutting – 1.5 :1.

Chainage	0	30	60	90	120	150	180
RL of ground	99.70	99.80	100.30	100.50	100.80	100.90	100.60
RL of formation	100.50	←(+) (1 in 300)→		← ------------ (-) (1 in 150) ---------- →			

OR

2. a) Explain the objective of preliminary estimate & enlist method of preliminary estimate. **6**

b) Estimate the quality of a double storeyed building having an carpet area of $2000\,m^2$. It may be assumed that 30% of the built up area will be considered for corridors and verandahs and 10% of the area to be occupied by walls. **7**

1) Plinth area rate – Rs 1700 per m^2.

2) Water supply & Sanitary work – 5% of building cost.

3) Electrical Installation – 12.5% of building cost.

4) Contingencies – 10%.

3. a) Estimate the quantity for the following items of work for the given building plan & typical wall section of figure (I). **8**

i) Earth work in excavation in foundation trenches.

ii) Second class brickwork in CM 1:6 in foundation and plinth.

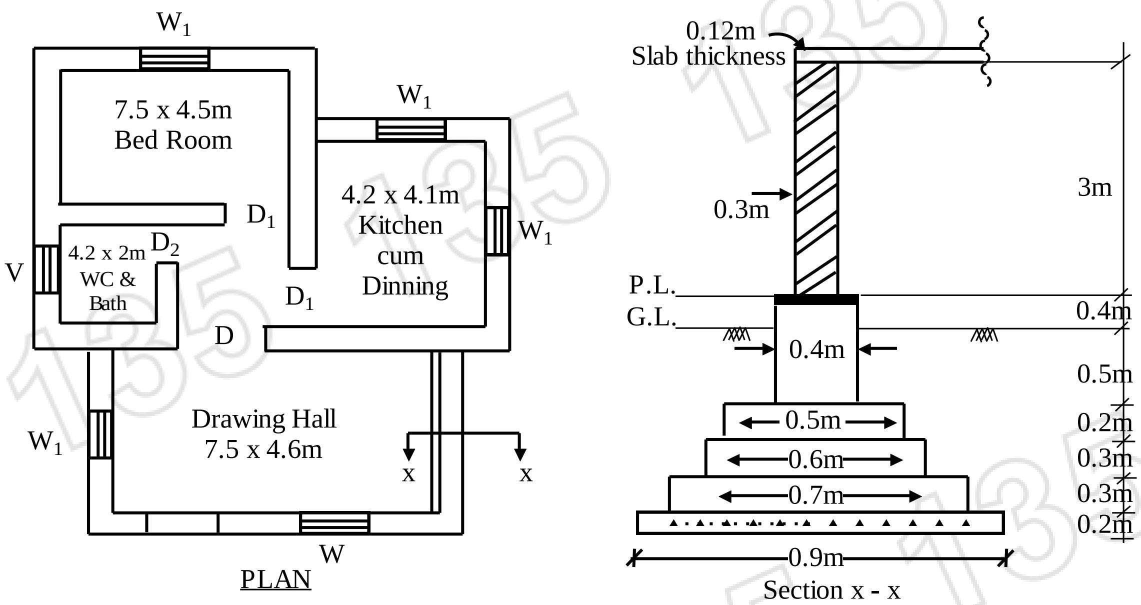

Figure (I)

D = 1.5 x 2.1m
D_1 = 1.2 x 2.1m
D_2 = 1.0 x 2.1m
v = 0.25 x 0.25m

W = 1.2 x 1.5m
W_1 = 1.0 x 1.5m

b) Workout the quantity of steel reinforcement in bar bending schedule for RCC beam of size 230mm $\times$ 350mm $\times$ 4800mm. It has 2 Nos. of 16mmϕ straight & 2 Nos. of 12mmϕ bent up at bottom and 2 Nos. 10mmϕ at top. M.S. reinforcement with 6mmϕ stirrups @ 200mm%. Assume cover as 25mm throughout (top, bottom & side). **6**

OR

4. a) Figure (I) shown building plan & typical wall section prepare Centre line plan and estimate the quantities of the following item of work. **8**

i) Brickwork in super structure.

ii) Internal plaster of wall surface.

b) A RCC simply supported slab of clear size 3.3m $\times$ 6.6m is Reinforced with 10mmϕ@120mm% alternately bent up. Distribution bars are 6mmϕ@140mm%. Thickness of slab is 120mm. Bearing of slab is 150mm. Calculate the total quantity of reinforcement. Also prepare schedule of bar. **6**

5. a) Explain the terms "Administrative Approval" & Technical sanction. **6**

b) Explain the term of contract, enlist the various types of contract, explain anyone of them. **7**

OR

6.	a)	Write short notes on **any two.**	**6**
		i) Earnest money Deposits.	
		ii) Security Deposits.	
		iii) Arbitration.	
		iv) Defect Liability period.	
	b)	Enlist an information to be included while drafting tender notice.	**7**
7.	a)	What do you understand by specification. What are the objectives of specification.	**6**
	b)	Explain 'Direct & Indirect charges'.	**7**

OR

8.	a)	Enlist the different types of specification. What are the objectives of specification.	**6**
	b)	Draft detailed specification for the following items **any two**.	**7**
		i) Brick Masonry in CMI : 6 in superstructure.	
		ii) 12mm thick internal cement plaster to wall surface.	
		iii) 10cm thick cement concrete flowing (1: 3:6).	
9.	a)	Define Rate analysis. Explain factor affecting it.	**6**
	b)	Work out rate analysis for the following items **any two.**	**8**
		i) RCC work (1:2:4) in slab with 1.2% steel reinforcement.	
		ii) Brick masonry (Brick size 200mm × 10mm × 10mm) in CM 1:4.	
		iii) 12mm thick plaster in CM 1:2.	

OR

10.	a)	Write short notes on:	**6**
		i) Overhead costs.	
		ii) Task work of labour.	
	b)	Calculate the rate per unit item of the following **any two.**	**8**
		i) RCC work (1:2:4) in column with 6% steel reinforcement including shuttering in column.	

ii) 12cm thick cement concrete flooring.

iii) Stone masonry in super structure CM 1:3.

11. a) What is valuation? Explain in brief, the purpose of valuation. **7**

b) Differentiate clearly with suitable example between cost, value & price. **6**

OR

12. Write short notes on **any three.** **13**

i) Market value & Book value.

ii) Cost value & price.

iii) Direct & Indirect charge.

iv) M.A.S. Account.

v) Depreciation and obsolescence.

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B.E. (Civil Engineering) Seventh Semester (CBS)

Elective-I : Air Pollution & Solid Waste Management

P. Pages : 2 **AHK/KW/19/2284**

Time : Three Hours Max. Marks : 80

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1. All questions carry marks as indicated.
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6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Due credit will be given to neatness and adequate dimensions.
9. Assume suitable data whenever necessary.
10. Diagrams and chemical equations should be given whenever necessary.
11. Illustrate your answers whenever necessary with the help of neat sketches.
12. Use of non programmable calculator is permitted.

1. a) Define air pollution give the various sources of air pollution. **7**

b) What are the major air pollutants & what are the effects of air pollutants on human being? **6**

OR

2. a) What are different air pollutant episodes? Explain any one in brief. **7**

b) Explain 'Green House effect'. **6**

3. a) What is lapse rate? State & explain various types of lapse rate. **7**

b) Explain with neat sketch High Volume Sampler. **6**

OR

4. a) A factory uses 0.4 million litres of fuel oil per month (Sp. Gravity 0.96). If has been estimated that one million litres of oil used per year, the following are the pollutants quantities observed- **7**

i) PM = 3.5 tonnes/year

ii) $SO_2 = 50.4$ tonnes/year

iii) $NOx = 8.0$ tonnes/year

iv) CO = 0.5 tonnes/year

Assuming Factory works 300 days for 24 hours. Determine the safe height of Chimney for the safe dispersion of pollutants.

b) Explain wind rose & its importance in details. **6**

5.	a)	What are the different types of Noise pollution? Suggest its control measures.	**7**
	b)	Write a short note on Automobile exhaust emission.	**7**

OR

6.	a)	List out various controlling equipment used in industry to control particulate matter & explain any one in detail with neat sketch.	**7**
	b)	Effects of sound pollution on human health.	**7**
7.	a)	Define 'waste'. Explain various type of sources of solid waste.	**6**
	b)	Write short note on Quantity & Quality of Solid waste.	**7**

OR

8.	a)	Discuss the functional elements of solid waste management system.	**7**
	b)	State the various physical & chemical characteristic of solid waste.	**6**
9.	a)	Explain Door to Door collection system.	**7**
	b)	Explain various types of transportation system used in solid waste management.	**6**

OR

10.	a)	Write a methods of segregation of solid waste.	**6**
	b)	Write a short note on transportation optimization system in SWM.	**7**
11.	a)	Write a short note on Bangalore method of composting.	**7**
	b)	What are the different factors affect composting. Explain in details.	**7**

OR

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

i) Sanitary land filling
ii) Incineration
iii) Three component diagram
iv) Gaseous control measurement in land fill

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B.E. (Civil Engineering) Seventh Semester (CBS)

Construction Management and Law

P. Pages : 2 **AHK/KW/19/2289**

Time : Three Hours Max. Marks : 80

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Notes :
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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) What is you mean by Detailed Project Report (D P R) and what are it's requirements. **7**

b) Explain the concept of P.P.P. **6**

OR

2. a) Draw a typical layout plan of Project Construction Site . **7**

b) Explain about Project Feasibility. **6**

3. a) What do you mean by slack of an event? Explain head Slack and tail slack. **7**

b) Define: **6**
i) Optimistic time.
ii) Most likely time and
iii) Pessimistic time.

OR

4. Draw a CPM network for the following logic and determine Critical path, total float and show the critical path with double lines of network. Duration of the network is as follows. **13**

Activity	A	B	C	D	E	F	G	H	I	J	K
Duration	6	5	3	6	7	7	9	5	4	9	6

The network logic is follows:
At the start of the project activity A & B are the initial activities and
Are 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 of the project ends.

5. a) Write the function of Personnel Manager. **7**

b) Explain in detail about A B C analysis. **7**

OR

6. What are the different methods of calculating Depreciation? Calculate total depreciation and book value for given data By sinking fund method. **14**

Cost of equipment	Rs. 3,50,000/-
Salvage value	Rs. 25, 000/-
Life of equipment	7 Years

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7. a) Explain the Total Quality management. **6**

   b) Explain Management Information System (MIS). **7**

OR

8. a) What are the various types of accidents on construction Site and its causes. **7**

   b) What are the safety equipments used in construction site. **6**

9. a) Explain town planning requirement, aim, and its objects. **7**

   b) Write a short note on Housing Development Act. **7**

OR

10. Write short notes on. **14**
    a) Gunthewari Act (Local Rules).
    b) Transfer of Property Act.
    c) Irrigation Act.

11. a) Write a short note on Water Pollution Act. **7**

    b) Discuss Air pollution Act. **6**

OR

12. a) Define **any three** of the following. **6**
    i) Contract.
    ii) Agreement.
    iii) Proposal.
    iv) Consideration.
    v) Consent.

    b) Explain in brief about Land Acquisition Act and Rehabilitation Act. **7**

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B.E. (Civil Engineering) Seventh Semester (CBS)

Transportation Engineering-II

P. Pages : 2 **AHK/KW/19/2290**

Time : Three Hours Max. Marks : 80

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10. Illustrate your answers whenever necessary with the help of neat sketches.
11. Use of non programmable calculator is permitted.

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

b) Using sleeper density of N+7, find out the number of sleepers required for constructing a Railway Track 1.2 km long (B.G.). **6**

OR

2. a) What are the possible causes of creep? Discuss in brief comment of prevention of creep. **6**

b) What is mean by coning of wheel? Explain in detail? **7**

3. a) A 4^o curve branches in B.G. layout of Railway yard. If the speed on Branch lines is restricted to 30 kmph, calculate the maximum speed that can be permitted on the main line. Assume cant Deficiency = 75 mm. **6**

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

OR

4. a) On a B.G. 3 degree curve, "The equilibrium cant" is pounded for a speed of 70 kmph. **7**
a) Calculate the value of the equilibrium cant.
b) Allowing a maximum cant deficiency, what would be the maximum permissible speed on the track.

b) Write short notes on **any two.** **6**
i) LWR.
ii) Rail failures.
iii) Sleeper density.
iv) Fishplate & fishbolt.

5. Write notes on **any three.** **14**
i) Heel divergence.
ii) Throw of switch.
iii) Tongue rail.
iv) Objects of signaling.
v) Interlocking.

OR

6. a) Explain in detail the various signal used in railway. **6**

b) Write note on. **8**

i) Types of station. ii) Marshalling yard.

7. a) Calculate the actual runway length required if the new airport is to be developed at a site having following details. **8**

i) Elevation = 1400 m
ii) ART = 37ºC
iii) Baric Runway length = 2500 m
iv) Effective gradient = 0.38 %
check the correction as per the ICAO aircraft.

b) Define the terms ; **6**

i) Cross wind component.
ii) Wind coverage.
iii) Calm period.

OR

8. a) Explain the procedure of orienting the runway. **8**

b) Discuss the characteristics of an aircraft that influences the planning & design of airport facilities. **6**

9. a) What do you understand by Terminal area? What facilities are provided in this area? **7**

b) Write short notes on : **6**

i) Approach lighting.
ii) Need of Air Traffic control.

OR

10. a) Discuss with neat sketch, 'Runway Lighting'. **7**

b) Explain in detail about the various Runway marking. **6**

11. Write notes on **any three** : **13**

i) Tunnel lining. ii) Drainage in Tunnels.
iii) Lightning in Tunnels. iv) Economics of Tunneling.

OR

12. a) What are the object of Tunnel ventilation? Discuss the requirements of a ventilating system. **7**

b) Write in detail tunnel surveying. **6**

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