

CIVIL ENGINEERING PAPER - II

Time Allowed : 3 hours

Full Marks : 100

Marks for each question is indicated against it.

Attempt any 5 (five) questions taking not more than 3 (three) questions from each Part.

PART - A

1. (a) Explain any two methods for estimating building works. **(10)**
(b) What do you mean by Load bearing and Framed structures? **(10)**
2. (a) Define a Bench Mark. What are the different kinds of Bench Mark? **(5)**
(b) Determine the reduced level of a church spire at C from the observation taken from two stations A and B which are located 60 m apart. The angle BAC = 50° and angle ABC = 60° . Angle of elevation from station A to church spire is 30° and angle of elevation from B to the church spire is 29° . Both the station A and B are located in same Bench Mark of 100 m. The staff reading from station A to bench mark is 2.7 m and from station B is 0.6m. **(15)**
3. (a) Write a short notes on: **(2×5=10)**
 - (i) Reinforcement in cement concrete roads.
 - (ii) Processes in bitumen road construction.
(b) While aligning a highway in a built up area it was necessary to provide a horizontal curve of 325 m. The data available are: design speed of vehicle 65 km/hr; length of wheel base of truck 6.1 m; pavement width is 10.5 m. Calculate the extra widening of pavement to be provided. **(10)**
4. What do you mean by Critical Path Method? The three time estimate t_o , t_m , and t_p of each activities of a project are given below: **(5×4=20)**

Activity	t_o (days)	t_m (days)	t_p (days)
1-2	2	5	14
1-3	3	12	21
2-4	5	14	17
3-4	2	5	8
4-5	1	4	7
3-5	6	15	30

- (a) Draw the network diagram
- (b) Find the expected duration and variance of each activities.
- (c) Calculate the early and late occurrence times for each event
- (d) Determine the expected duration

PART - B

5. (a) Derive the Muskingum routing equation and the expression for routing coefficient C_0 , C_1 and C_2 . **(5×2=10)**
- (b) What is furrow? State the advantage of sprinkler irrigation method over surface irrigation method. **(3+7=10)**
6. (a) Discuss the various methods of landfill and its operation. Also discuss control of gas movement and leachate control in landfill site. **(2×5=10)**
- (b) Explain different local and global effect of air pollution with suitable examples. With the introduction of BS VI norms for vehicular exhaust do you expect cleaner environment, justify your answer. **(10)**
7. The ordinates of a 4-hour unit hydrograph for a particular basin are given below. Determine the ordinates of the S-curve hydrograph and the ordinates of 6- hr unit hydrograph. **(10×2=20)**

Time in hrs.	4-hr UHO in cumec
0	0
2	25
4	100
6	160
8	190
10	170
12	110
14	70
16	30
18	20
20	6
22	1.5
24	0

8. A rectangular sedimentation basin is to handle 10 million litres/ day of raw water. A detention basin of width to length ratio of 1/3 is proposed to trap all particles larger than 0.04 mm in size. Assuming a relative density of 2.65 for the particles and 20°C as the average temperature, compute the basin dimensions. If the depth of tank is 3.5 m. Calculate the detention time. **(20)**

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