Name : .....

Roll No. : .....

Invigilator's Signature : .....

2013

CONSTRUCTION, PLANNING & MANAGEMENT

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) A Turn-key contract means

a) to design and build

b) to build the structure only

c) to perform all the functions from inception to completion of the construction

d) the same as the unit price contract.

ii) If t_0, t_p, t_m are the optimistic, pessimistic and most likely time estimates of an activity respectively, the expected time t of the activity

a) $(t_0 + 4t_m + t_p)/4$ b) $(t_0 + 3t_m + t_p)/4$

c) $(t_0 + 4t_m + t_p)/6$ d) none of these.

iii) Front open space for residential building up to 15·5 m height as per municipal building rule, is

a) 1·5 m b) 1·2 m

c) 2·0 m d) 1·8 m.

iv) For any residential building if floor area ratio is 2, and plot size is up to 500 sq.mt. Maximum permissible ground coverage

a) 60% b) 50%

c) 65% d) 55%.

v) CPM network consists of which of the following type of activities ?

a) Predecessor

b) Both predecessor and successor

c) Successor

d) Predecessor or successor.

vi) When submitting a tender the contractor has to deposit a certain amount of money with the department as guarantee of the tender. This deposit is called

a) Security Deposit b) Earnest money

c) Retention money d) all of these.

vii) The most suitable equipment for compaction of cohesive soil is

a) smooth wheeled rollers

b) vibratory rollers

c) sheep foot rollers

d) tamper.

viii) A.P.E.R.T. network is

a) activity oriented

b) event oriented

c) both activity as well as event oriented

d) neither activity nor event oriented.

ix) Slack or slack time

a) is always zero for critical activities

b) can never be greater than zero

c) can never be less than zero

d) is minimum for critical activities.

x) An embankment constructed of granular soils has Relative Density (%) between 65 to 85. The soil is

a) very loose b) loose

c) medium d) dense.

xi) Minimum width of stair in your college should be

a) 1 m b) 1·2 m

c) 1·5 m d) 2 m.

xii) For a residential house minimum room height should be

a) 2·75 m b) 2·4 m

c) 3 m d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Determine any *two* of the following :
   a) Carpet area
   b) Floor area ratio
   c) Means of access
   d) Ground coverage.
3. Explain any *two* of the following :
   a) Unbalanced tender
   b) Secured advance
   c) Liquidated damages.
4. What should a tender document include ?
5. a) State Fulkerson's rule of numbering a network. 3
   b) State three differences between PERT and CPM networks. 2
6. Draw a bar chart time (weeks) *vs* Activity break down as follows :

Site selection and survey	0 - 4 weeks
Design	0 - 5 weeks
Drawing	4 - 7 weeks
Specifications and tender document	6 - 8 weeks
N.I.T.	8 - 12 weeks
Selection of contractor	12 - 13 weeks
Award of work order	13 - 14 weeks.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Develop a network with the following activities and determine the project completion time and isolate the critical path for a project with the following activities :

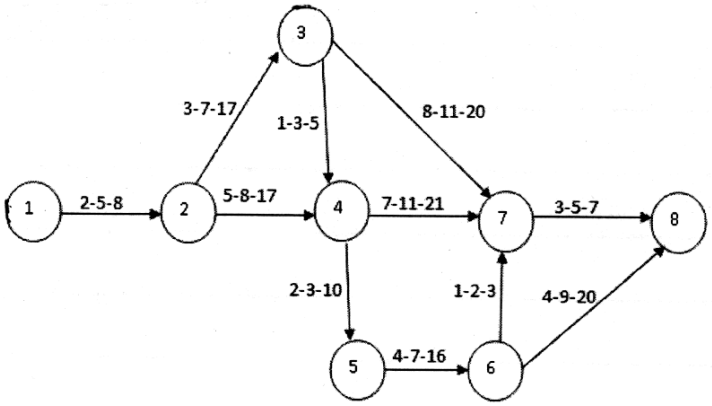
Activity	Duration (weeks)	Logic
1 - 2 1 - 3	5 10	1 - 2 and 1 - 3 are starting activities and can be taken up simultaneously.
2 - 4	0	Dummy activity
2 - 7	10	1 - 2 precedes 2 - 7
3 - 5	5	1 - 3 precedes both 3 - 5 and 3 - 6
3 - 6	4	3 - 5 and 3 - 6 are concurrent
4 - 7	5	1 - 2 precedes 4 - 7
5 - 7	8	5 - 7 follows 3 - 5
6 - 7	9	3 - 6 precedes 6 - 7

8. The three time estimates t_0, t_{in} and t_p of each activities of a project are given below :

Activity	t_0 (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 & variance of each activity.
c) Calculate the early and late occurrence times for each event.
d) Determine the expected duration.
e) Calculate the total float for each activity.
f) Find the variance and standard deviation of the entire project.

9. The time estimates in days for optimistic, most likely and pessimistic times of various activities are shown below in the network diagram. Draw the critical path and obtain the approximate value of standard deviation for the network.



10. a) What is contract ? 2

b) Briefly describe about Lump Sum Contract and cost plus bid fee contract. 5

c) Draw the organization chart for PWD. 5

d) What are the responsibilities of a Chief Engineer ? 3

11. Write short notes on any *three* of the following : 3 × 5

a) Grader

b) Conveyor

c) Output of scrapper

d) Co-efficient of traction.

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