8

(Set-1)

B.Tech - 8th(Civil)
Construction Management

Full Marks : 70

Time : 3 hours

Answer six questions including **Q. No. 1**
which is compulsory

The figures in the right-hand margin indicate marks

Statistical Table to be provided

1. Answer any *ten* questions :   2 × 10

   (*i*) What is the use of multi activity chart ?

   (*ii*) Briefly explain 'Sinking fund deposit factor'.

   (*iii*) State the demerits of Bar-Chart.

   (*iv*) What is the meaning of artificial variable in optimization problem ?

   (*v*) What is cost slope and outage loss ?

(*Turn Over*)

(vi) How slack is different from float in a network diagram ?

(vii) What is ABC analysis of inventory control ?

(viii) State the factors affecting the output of power shovel.

(ix) Define independent float in a network diagram.

(x) State the need of work motion study.

(xi) When an activity is found to be supercritical in a project, what decision a construction manager should take ?

(xii) State few quality control measures at construction site.

2. (a) Draw the network diagram for the various jobs of a housing project.   5

Job Name	Description	Immediate predecessors
a	Excavation, pouring footers	--
b	Pouring concrete foundations	a

B.Tech - 8th(Civil)/Construction Management(Set-1)   (Continued)

Job Name	Description	Immediate predecessors
c	Erecting frame and roof	b
d	Laying of brick work	c
e	Installing drains	b
f	Pouring basement floor	c
g	Installing rough plumbing	c
h	Installing rough wiring	c
i	Installing air conditioning	c, f
j	Fastening plaster and paster board	g, h, i
k	Laying finished floor	j
l	Installing kitchen equipment	k
m	Installing finished plumbing	k
n	Finish carpentry	k
o	Finish roofing and flashing	d
p	Fastening gutters and downspouts	o
q	Laying storm drains	b

B.Tech - 8th(Civil)/Construction Management(Set-1)   (Turn Over)

Job Name	Description	Immediate presecessors
r	Sand and varnish floor/marble flooring	n, s
s	Painting	l, m
t	Finishing electrical work	s
u	Finishing grading	p, q
v	Pouring walks and landscape	u

(b) Explain different type of floats in an activity with neatly drawn diagrams. 5

3. (a) Explain the concept of resources smoothening. 6

(b) Explain the necessity and how the updating of the project is carried out. 4

4. (a) Derive EOQ formula for infinite delivery rate with no backordering. 5

(b) State and explain the various safety measures at construction site. 5

B.Tech - 8th(Civil)/Construction Management(Set-1) (Continued)

5. (a) What are the factors affecting in selection of construction equipment's ? 5

(b) Define the principle of optimality in dynamic problem and explain the Recursive equation in dynamic problem. 5

6. The duration in week and costs of various activities of the network is give in the following table. Find the optimum duration and the cost associated with it, if the overhead project costs are Rs.2,000 per week. 10

Activity	Normal Duration	Normal Cost (Rs.)	Crash Duration	Crash Cost (Rs.)
A-B	4	5,000	2	10,000
B-C	6	4,000	3	8,000
B-D	7	2,600	5	6000
C-D	4	7,000	2	11,000

7. (a) State the factors effecting the output of power shovel and determine the expected production of a power shovel given the following data :

B.Tech - 8th(Civil)/Construction Management(Set-1) (Turn Over)

Size of the bucket $= 1.14$ m³, actual depth of cut $= 3.15$ m and optimum depth of cut $= 2.1$ m, actual angle of swing $= 75°$, job and management factor $= 0.81$, class of material ; sand and gravel for which the ideal output for the given bucket size $= 206$ m³ (bank)/hr, conversion factor for DOC and AOS for this power shovel $= 0.935$. 6

(b) Explain various method of computing depreciation of construction equipment. 4

8. Draw the network diagram for the following activities of a project and estimate the

Estimate of Time	ACTIVITIES									
	1-2	1-3	1-4	2-5	3-4	3-6	4-5	4-7	5-7	6-7
Optimistic	2.0	1.5	5.0	6.0	2.0	5.0	1.0	4.0	5.0	2.0
Most Probable	2.5	6	10	7.0	5.0	10	4	8	10	5
Pessimistic	6.0	12	15	12	8.0	14	6	11	13	11

Following : (a) probability of completing the project in time. (b) probability of completing the event 4 on or before the schedule completion time. 10

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