B. E. Production Engineering, Fourth Year, Second Semester Examination   2019
Subject: PLANNING & EVALUATION OF PROJECTS

Time : Three Hours   Full Marks: 100

Answer Question No.1 And any Three From the Rest

Q.1 Answer Any Five: 8 X 5

a) Explain the characteristics of a project organization. Briefly explain the different stages of project life cycle.

b) Clarify the significance of Dummy activity & Total Float. Discuss how the duration of a project can be reduced with minimum increase in the cost of the project.

c) Discuss the following methods in respect to evaluation of Project proposals: i) IRR & ii) NPV,

d) Briefly explain the following terms: i) project constraints, ii) project stakeholder, & iii) project environment.

e) Make comparative analysis of : I) Gantt Chart methods & Network Techniques and II) PERT & CPM .

f) Discuss how Project risks are identified and reduced. Elucidate how Risk time & Risk cost are evaluated.

g) Describe the steps involved in the process of decision making. Briefly explain the following : i) Expectation Principle & ii) Regret table.

Q2. The activities of a Project, their dependency and duration is given in the following table:

Activity	Immediate Predecessor	Duration (Days)		
		T_o	T_m	T_p
A	--	6	9	12
B	--	7	10	13
C	A	6	8	10
D	A	4	7	16
E	B	8	12	16
F	C	9	12	15
G	D	4	7	10
H	G,E	7	10	19
I	G,E	2	3	10
J	F,H	8	12	16

Determine the Expected time of completion of the Project. Find out the path with maximum variance and determine the duration of the project for probability of completion of i) 0.95, ii)0.65, & iii) 0.35. Draw the Expected duration Vs. Probability of completion graph.   20

Q3. The activities of a Project and their direct cost is given in the following table:

Activity	Immediate Predecessor	Duration (Days)	Activity Direct Cost in Thousand)
A	--	5	9
B	--	4	11
C	A	14	16
D	A	10	10
E	A,B	6	7
F	E	5	4
G	D	8	9
H	D,F	9	10
I	C,G,H	4	5

Determine the peak fund requirement and draw the cumulative Cost graph with respect to time for both earliest and latest start schedule. Assume indirect cost as Rs. 800/ per day.   20

Ref. No.: Ex/Prod/T/423/2019

B. E. Production Engineering, Fourth Year, Second Semester Examination   2019

Subject: PLANNING & EVALUATION OF PROJECTS

Time : Three Hours   Full Marks: 100

Q4. From the given data of a small manufacturing project : Draw the Cost Vs Project Duration graph. Evaluate: i) The Normal duration of the project and the corresponding total cost, ii) the minimum Duration & Cost of the project, and ii) The project duration corresponding to minimum total cost. Indirect cost may be taken as Rs. 1500 per Week.

Activity	Immediate Predecessor	Duration (Weeks) Normal	Duration (Weeks) Crash	Direct Cost (Rs.) Normal	Direct Cost (Rs.) Crash
A	--	6	4	4500	6300
B	--	5	4	1500	2200
C	A.	12	10	8500	10500
D	B	10	8	45000	50000
E	A	6	5	4000	4950
F	E	6	2	2500	4100
G	D,F	8	7	5000	5900
H	D,F	9	8	20000	22000
I	C,G,H	9	9	4300	4300
J	I	6	4	5050	7500

20

Q5. a) Determine the total cost & the independent Float of all the non-critical activities of the following Project.

Activity	Immediate Predecessor	Duration (Days)	Direct Cost (Rs.)
A	--	7	2500
B	--	6	2500
C	A,B	16	7500
D	A	24	6000
E	A	8	5000
F	C	10	3500
G	D,F	10	6000
H	D,F	11	7000
I	E,G,H	12	8300

If the time duration of activity 'F' is increased by 2 days and that of 'D' by 5 days, what will be its' effect on the project   duration? Indirect cost may be assumed as Rs. 500 per day.

20

B. E. Production Engineering, Fourth Year, Second Semester Examination   2019

Subject: PLANNING & EVALUATION OF PROJECTS

Time : Three Hours   Full Marks: 100

Q 6. The Activities and the labour requirement of a Project is given in the following table:

Activity	Immediate Predecessor	Duration (Days)	No. of Workers
A	--	10	10
B	--	7	6
C	A	11	8
D	A,B	9	6
E	A,B	7	6
F	C	15	5
G	D,E,C	8	6
H	G,F	12	7

Evaluate the day wise labour requirement for the Project and draw the Histogram for Manpower loading based on earliest start of the activities.Determine the total idle man days if the peak labour requirement is hired for the total duration of the project. Carryout smoothing exercise to minimize idle man days.   20

AREA UNDER THE STANDARD NORMAL CURVE
WITH RESPECT TO LEFT EXTREME LIMIT

Z	0	−0.1	−0.2	−0.3	−0.4	−0.5	−0.6	−0.7	−0.8	−0.9	−1.0
A	0.5	0.460	0.421	0.382	0.345	0.309	0.274	0.242	0.212	0.184	0.159
Z		−1.1	−1.2	−1.3	−1.4	−1.5	−1.6	−1.7	−1.8	−1.9	−2.0
A		0.136	0.115	0.097	0.081	0.067	0.055	0.045	0.036	0.029	0.023
Z		−2.1	−2.2	−2.3	−2.4	−2.5	−2.6	−2.7	−2.8	−2.9	−3.0
A		0.018	0.014	0.011	0.008	0.006	0.005	0.004	0.003	0.002	0.001
Z		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
A		0.540	0.579	0.618	0.655	0.692	0.726	0.758	0.788	0.816	0.841
Z		1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
A		0.864	0.885	0.903	0.919	0.933	0.945	0.955	0.964	0.971	0.977
Z		2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0
A		0.982	0.986	0.989	0.992	0.994	0.995	0.996	0.997	0.998	0.999