Ref. No.: Ex/Prod/T/423/2018

B. E. Production Engineering, 4th Year, Second Semester Examination 2018

Subject: Planning & Evaluation of Projects

Time : Three Hours Full Marks: 100

Answer Question No.1 & 8 and Any Two each from Group A & Group B

Q 1 a) Explain the life cycle of a project. Discuss the characteristics of a project organization. 08

Q 1.b) Briefly explain the project constraints. 05

Q 1.b) What are the different costs associated with project activities? How the total cost of a project be minimized? 07

GROUP A

(Anwer any two questions)

2 X 15

Q 2.a) State the Network rules. What is a 'Dummy activity'? 05

Q 2.b) From the given data of a small manufacturing project : i) evaluate: Earliest and Latest start & finish times of all the activities, the critical path(s) & critical activities, ii) The Duration & Cost of the project, iii) Total float of the non- critical Activities. Indirect cost is Rs. 800 per Day.

Activity	Immediate Predecessor	Duration (Days)	Direct Cost (Rs.)
A	--	7	1500
B	--	6	2500
C	A,B	15	9500
D	A	12	6000
E	A,B	8	5000
F	C	7	3500
G	D,F	10	6000
H	D,F	12	7000
I	E,G,H	4	5300
J	I	8	6050

10

Q 3.a) Make a comparative assessment of I) PERT & CPM and II) Float & Slack. 06

Q 3.b) The activities of a Project, their dependency and duration is given in the following table:

Activity	Duration (Days)		
	T_o	T_m	T_p
1-2	6	9	12
1-3	7	10	13
2-4	6	8	10
2-5	4	7	16
3-6	8	12	16
4-7	9	12	15
5-6	5	7	15
6-7	7	10	19
6-8	1	4	7
7-8	8	12	16

Identify the critical activities. Find out the path with maximum variance and determine the probability of completion of the project in between 48 and 52 days. 09

[Turn over

Ref. No.: Ex/Prod/T/423/2018

B. E. Production Engineering, 4th Year, Second Semester Examination 2018

Subject: Planning & Evaluation of Projects

Time : Three Hours Full Marks: 100

Answer Question No.1 & 8 and Any Two each from Group A & Group B

Q 4. From the given data of a small manufacturing project : Draw the Total Cost Vs Duration graph .Evaluate: i) the minimum Duration & the corresponding Cost of the project, and ii) The project duration with minimum cost.. What is the percentage change in Cost when the Project duration is reduced by three weeks from its normal value? Indirect cost is Rs. 1700 per Week.

Activity	Immediate Predecessor	Duration (Wee Normal	Duration (Wee Crash	Direct Cost (Rs. Normal	Direct Cost (Rs Crash
A	--	4	2	4500	6300
B	--	3	2	1500	2200
C	A	12	10	8500	10500
D	A,B	8	6	45000	50000
E	A,B	4	3	4000	4950
F	E	3	1	2500	4100
G	D,F	6	5	5000	5900
H	D,F	7	6	20000	22000
I	C,G,H	2	2	4300	4300
J	I	4	2	5050	7500

15

GROUP B

(Anwer any two questions)

2 X 15

Q 5.a) The Activities and the labour requirement of a Project is given in the following table:

Activity	Immediate Predecessor	Duration (Days)	No. of Workers
A	--	7	8
B	--	4	4
C	B	8	6
D	A	6	4
E	A	4	4
F	C	12	3
G	D,E	6	4
H	G,F	8	5
I	E,D	8	3

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

B. E. Production Engineering, 4th Year, Second Semester Examination 2018

Subject: Planning & Evaluation of Projects

Time : Three Hours Full Marks: 100

Answer Question No.1 & 8 and Any Two each from Group A & Group B

Q 6.a) What are the different factors that make a project to be of high Risk? Explain how Project risks can be evaluated and minimized. 07

Q 6. b) From the given data of a Project, evaluate the expected completion time and expected cost of the project considering the risks involved.

Activity	Immediate Predecessor	Baseline Time Estimate(Days)	Risk likelihood	Baseline Cost Estimate(Rs.)	Corrective Time (Days)	Corrective Cost (Rs.)
A	--	10	0.2	12000	2	2400
B	--	7	0.3	4000	1	700
C	A	11	0.1	3000	3	500
D	B	9	0.2	6000	1	1000
E	A	7	0.2	2500	1	1000
F	C	15	03	12000	3	4000
G	D,E	8	0.1	7000	1	2000
H	G,F	12	0.4	4000	4	15000
I	E,D	11	0.1	10000	3	3000

08

Q 7 a) For the given project determine the fund requirement on weekly basis considering earliest start of activities. Assume indirect cost to be Rs.15,000/ per week. Make a schedule to reduce the cumulative fund requirement in the first two months of the project.

Activity	Immediate Predecessor	Duration (Weeks)	Direct Cost (Rs.)
A	--	2	45000
B	--	3	50000
C	--	10	85000
D	A	6	45000
E	B	2	40000
F	C,D,E	8	75000
G	A	4	35000
H	C,D,E	5	50000
I	G,F,H	3	43000

15

Q 8.a) What is meant by 'Net Present Value of a project? How it is utilized in evaluating project proposals? Explain how breakeven sales is evaluated for a multiproduct manufacturing plant. 09

Q 8.b)Describe the steps involved in the process of decision making. What criteria are used in decision making under uncertainty and under risk? From the given payoff table, the element of which represent 'Profit', determine the best decision alternative using i) Savage principle & ii) Laplace's principle 11

Decision Alternatives	Chance Event				
	Event 1	Event 2	Event 3	Event 4	Event 5
D1	700	750	650	500	600
D2	600	550	500	450	400
D3	550	600	700	550	450
D4	500	450	450	600	550
D5	400	500	550	650	500

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

Ref. no. Ex/Prod/T/423/2018