

**B. E. PRODUCTION ENGINEERING FOURTH YEAR SECOND SEMESTER EXAMINATION 2022**Subject: **PLANNING & EVALUATION OF PROJECTS (HONS.)**Time: **Four Hours**Full Marks: **70****Answer Question No. 1 & 4 and any Three from the rest.**

Q1. a) What do you understand by the term "Project"? Explain the objectives of a project with suitable examples. Discuss the characteristic features of project management. Explain the role of a project manager in planning & execution of projects. With a proper example explain the life cycle of a project. 15

Q2. What is Project Scheduling? Differentiate between Backward & Forward scheduling. Briefly explain the different methods of project scheduling. Discuss the advantages of Network techniques over other methods of scheduling. 13

Q.3a) Discuss how the duration of a project is estimated using PERT. Make a comparative analysis of I) PERT & CPM and II) Floats & Slacks.

Q.3b) The activities of a Project, their dependency and duration are given in the table below. Determine the expected time of completion of the Project. Find out the path with maximum variance and determine the duration of the project for a probability of completion in between 0.95 and 0.50. 13

Activity	Immediate Predecessor	Duration (Days)		
		T <sub>o</sub>	T <sub>m</sub>	T <sub>p</sub>
A	--	7	10	13
B	--	7	10	13
C	A	6	8	10
D	A,B	4	7	16
E	A	8	12	16
F	C	9	12	15
G	D	4	7	13
H	G,E	6	10	18
I	G,E	1	3	7
J	F,H	8	12	16

Q.4) From the given data of a small manufacturing project, evaluate: i) Earliest & Latest times of all the activities, ii) The normal duration & cost and the minimum duration & cost of the project, iii) Free & Independent float of the non-critical activities, and iv) the project duration with minimum cost. Draw the Cost Vs Duration graph. Indirect cost is Rs. 160 per day. 16

Activity	Immediate Predecessor	Duration (Days)		Direct Cost (Rs.)	
		Normal	Crash	Normal	Crash
A	--	6	4	450	630
B	--	3	2	150	220
C	A,B	12	10	850	1050
D	A,B	8	6	450	500
E	A	4	3	400	495
F	C	3	1	250	410
G	E,F	6	5	500	590
H	E,F	7	6	200	220
I	D,G,H	5	5	430	430
J	I	6	4	505	750

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Q.5) For the given project determine the fund requirement on weekly basis considering earliest and latest 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. 13

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

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

Activity	Immediate Predecessor	Duration (Days)	No. of Workers
A	--	6	8
B	--	3	4
C	A	7	6
D	B	5	4
E	A	3	4
F	C	11	3
G	D,E,C	4	4
H	G,F	8	5
I	C,E,D	7	3

Evaluate the day wise labour requirement for the Project and draw the histogram for manpower loading based on earliest and latest 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 bring down the peak manpower requirement. 13

Q.7a) What is Investment Analysis? Explain its role in project evaluation. From the cost data, of a manufacturing company (given below) find the best decision alternative using i) Savage principle iii) Laplace's criteria, and iii) Hurwicz principle.

Decision Alternatives	Chance Event				
	1	2	3	4	5
D1	567	555	546	580	530
D2	560	550	500	545	534
D3	550	536	517	550	539
D4	527	545	538	546	550
D5	595	500	515	550	500

Q.7b) Identify and explain the causes behind project risk. Explain how project risk consequences are quantified. Briefly explain the different project risk management strategies. 13

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		