Ref. No.: Ex/PROD/PC/H/T/423/2024

B. E. PRODUCTION ENGINEERING FOURTH YEAR SECOND SEMESTER EXAM – 2024

Subject: PLANNING & EVALUATION OF PROJECTS (HONS.)

Time: Three Hours **Full Marks: 100**

Answer Any Five Questions

Q1.a) A multi-national car manufacturing company is going to make a new plant in India for manufacturing EVs. Identify the key parameters to be considered for this purpose by the planning team. Briefly explain the steps that are required to be followed for the successful completion of the project and also categorize the probable constraints that may cause delay or failure of the project. 15

b) Discuss the characteristics of a project organization. 5

Q2. a) What is project scheduling? Discuss the advantages of network techniques over other methods of scheduling. Briefly explain the Network rules. 13

b) Discuss how the duration of a project is estimated when one is using PERT. 7

Q3 a) Explain the significance of 'Floats" and Slacks", Derive the expression for Independent Float with respect to total float and slacks. 5

b) What is the objective of Crashing? Briefly explain the procedure of time-cost trade-off. 7

c) Explain how Project risks are identified, estimated and reduced. 8

Q4. From the given data of a small manufacturing project: Determine: i) the project Duration, ii) total cost of the project, using Gantt chart method. Also make the modified Gantt chart and determine the latest start time of the activity G & I. Indirect cost may be taken as is Rs. 500 per day.

Activity	Immediate Predecessor	Duration (Days)	Direct Cost (Rs.)
A	--	4	2050
B	--	9	2704
C	--	7	7500
D	A,B,C	8	6000
E	A	4	3500
F	C	3	3500
G	E	6	6000
H	E	7	9000
I	D,F,H,	2	8300
J	E	4	2500
K	G, J	7	2500

[Turn over

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Q5. From the given data of a civil construction project: determine: i) The earliest & latest time of all the activities, ii) the project duration, iii) total cost of the project, and iv) total & independent Float of all the non critical activities. Indirect cost may be taken as Rs. 1100 per Week. 15

Activity	Immediate Predecessor	Duration (Weeks) Normal	Direct Cost (Rs.) Normal
A	--	5	4500
B	--	6	1500
C	A	4	8500
D	A,B	10	4500
E	A	7	4000
F	C	5	2500
G	D,F	8	5000
H	E	10	2000
I	G,H	6	4300
J	I	6	5050
K	J	8	3700

Q6. Activities and the labour requirement of a Project are given in the following table:

Activity	Immediate Predecessor	Duration (Days)	No. of Workers
A	--	9	14
B	--	10	12
C	A	8	8
D	A,B	7	7
E	A,B	12	12
F	E	12	13
G	D,F	7	7
H	D,F	10	10
I	G	3	6
J	H, I	12	14
K	C,J	8	11

Evaluate the day wise labor 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 and determine the total idle man days if the peak labour requirement is hired for the total duration of the project. 20

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Answer Any Five Questions

Q7.) From the given data of a manufacturing project evaluate: i) the minimum duration & the corresponding cost of the project & ii) project duration with minimum cost. Indirect cost is Rs.900 per day. 20

Activity	Immediate Predecessor	Duration (Days) Normal	Duration (Days) Crash	Direct Cost (Rs.) Normal	Direct Cost (Rs.) Crash
A	--	8	6	14500	16300
B	--	13	12	1700	2400
C	A	5	3	8500	10500
D	A,B	8	6	4500	5000
E	A,B	4	3	4000	4950
F	E	10	8	2500	4100
G	D,F	6	5	5000	5900
H	D,F	12	11	1200	1620
I	C,G,H	2	1	900	1200
J	I	9	7	1500	1800

Q8. a) Discuss, with suitable example, the application of the following in respect of evaluation of project proposals: i) Payback period & ii) IRR 6

b) Briefly explain how the different decision making criteria under uncertainty is used in project decision making. 7

c) From the given data evaluate the expected completion time of the project considering the risks involved: 7

Activity	Immediate Predecessor	Duration (Day Normal	Risk likelihood	Corrective Time (Days)
A	--	6	0.2	2
B	--	3	0.3	5
C	A	12	0.1	3
D	A,B	8	0.2	1
E	A,B	4	0.2	1
F	C	3	0.05	7
G	D,F	6	0.1	1
H	G,E	7	0.4	4