Q.P. Code :36461

[Time: Three Hours] **[Marks:60]**

Please check whether you have got the right question paper.

N.B: 1. Q 1 is compulsory and carries 20 marks.
2. Attempt any 4 questions from remaining 6 questions each carrying 10 marks.
3. Use of scientific calculator is permitted.
4. All necessary values are provided in the question paper.

Normal Table positive Z Value	0	0.82	1	1.04	1.28	1.5	1.65	1.96
Area from Z = 0 till positive Z	0	0.30	0.34	0.35	0.40	0.43	0.45	0.475
Discounting factor for 10% year	0	1	2	3	4	5		
	1	0.909	0.826	0.751	0.683	0.621		

Q.1 (a) A company is in assembly production and costs are wages of operators required. **10**

Activity	Preceding Activity	NT(days)	CT(days)	Blenders	Packers	Fillers
A	-	4	3	3	-	-
B	-	3	3	1	-	1
C	A,B	3	2	-	2	1
D	A	6	4	1	2	-
E	C,D	5	4	-	1	2
F	A,B	10	6	2	1	1
G	E,F	3	2	-	-	2

The operators work for 8 hrs/day. The Normal Wage rates for different skills are as below: Blender Rs.250/ hr , Packer Rs.50/hr & Filler Rs.200/hr.

The cost of manpower resource is assumed to be equally spread over entire duration for each activity. The duration of each activity can be reduced by using equal no of operators having better skills. Better skilled operators are paid at double the normal rate. The reduced duration of each activity is given as Crash Time. (CT). Determine normal project duration.

Determine what activities need to be crashed to reduce project duration by 2 days. Determine project cost.

(b) A company intends to produce a single product whose estimated demand in year 1 is 1700 units. It is expected to increase by 85 units each subsequent year. Estimated price for year 1 is Rs 600/unit which is expected to increase by Rs 15/unit each subsequent year. Operating expenses excluding depreciation and interest on term loan for year 1 are estimated to be Rs 178000/- which are expected to increase by Rs 20000 each subsequent year. At the beginning of project (at end of year 0) liabilities include equity capital of Rs 6 lakhs and Term loan of Rs 12 lakh. Assets include Land Rs 1 lakh and other Fixed assets Rs 17 lakh. Term loan is to be repaid in 5 years with equal annual installments and carries 12 % rate of interest charged on opening balance of that year. Other fixed assets are depreciated at 10 % per year by written down value method. Calculate DSCR (debt service coverage ratio) and ICR Interest coverage ratio) for years 1 and 2. **10**

Assume income tax rate is 35% . All units produced are sold in same year. All payments and expenses realized in same year.

Q.2 Answer any 2 from below: **10**

Consider the data given below of a small project. The actual performance is measured at end of 5 months in terms of % actual completion and actual cost incurred. Assume all activities will begin at the earliest.

(a) Calculate cost performance index and schedule performance index.
(b) Calculate revised project duration and cost.
(c) Explain application of S - curve in project monitoring.

Activity	Preceding activity	NT	NC	AC	% actual completion
A	-	4	6	6	100
B	-	12	15	6	40
C	-	4	3	3	95
D	A	10	15	2	7
E	C	6	10	0	0
F	A	14	11	8	7
G	B,D,E	8	10	0	0

Q.3 Answer any 2 from below: **10**

The past demand for 6 months is given of a product

Month	1	2	3	4	5	6
Demand	32	29	27	36	34	32

(a) Calculate Mean Squared Error and sales for month 7 using Moving Average method with period 3.

(b) Calculate Mean Absolute Deviation and estimated sales for month 7 using exponential smoothing method with smoothing constant 0.1. Assume forecast for rnonth2 as initial value of 32.

(c) Explain Mean Absolute Percentage Error as a measure of accuracy in forecasting.

Q.4 Answer any two of the below: **10**

(a) Calculate Internal Rate of Return if investment is 200 & cash inflows for 2 years are 120 & 144 .

(b) Calculate discounted payback period in months of project with initial investment 210 and inflows 25, 55, 155 & 200. Assume rate of discounting 10 % per year

(c) Calculate NPV if initial investment is 500 & cash inflow for subsequent years are 50, 75, 125, 225, & 300 . Assume rate of discounting is 10% per annum.

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Q.5 Answer any two of the below: **10**

The TaCo Iron and Steel Company is expanding its operations in Maharashtra to include a new drive-in weigh station. The weigh station will be a heated / air-conditioned building with a large floor and small office. The large room will have the scales, a 15-foot counter, and several display cases for its equipment. Before erection of the building, the project manager evaluated the project using PERT / CPM analysis. The activities with their corresponding times were recorded in the table below:

Activity	Description	Optimistic	Pessimistic	Most Likely	Preceding Tasks
A	Lay foundation	6	30	12	
B	Dig hole for scale	4	28	10	-
C	Insert scale bases	12	60	24	B
D	Erect frame	4	16	10	A, C
E	Complete building	10	34	22	D
F	Insert scales	66	66	66	E
G	Insert display cases	6	54	18	E
H	Put in office equipment	2	14	8	G
I	Finishing touches	8	56	38	E, H

(a) Determine critical path and project duration.
(b) Determine free float for all activities.
(c)Determine the project duration so that project completion probability will be 85 %.

Q.6 Answer any 2 from below: **10**
(a) Explain different examples of Project Management in launch of new products.
(b) Explain how uncertainties are handled in PERT approach to project planning.
(c) Define a project stating its characteristics.

Q.7 Answer ant two of below: **10**
Consider following data of a small project given below:

Activity	Preceding Activity	Duration(days)	No. of men per day
A	Nil	5	4
B	Nil	7	2
C	A	3	2
D	A	3	4
E	B	2	6
F	B	2	3
G	D,E	2	3
H	F,G	3	4

(a) Calculate critical path and project duration
(b) Plot resource graph and Gantt chart and determine requirement of maximum no. of mean and time interval in which it happens . Assume all activities begins at the earliest.
(c) Suggest means to reduce above maximum requirement of no. men.

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