

**M.E. PRODUCTION ENGINEERING
FIRST YEAR
SECOND SEMESTER EXAM 2025**

MANAGEMENT AND CONTROL OF PROJECTS (PM)

Time: 3 Hrs.

Full Marks:100

Use separate Ans. Script for each part.

PART –I (40 Mks.)

Ans. **any 2 Q-s.**

1. a) In the network shown in Fig. 1, the 3 time estimates for each of the activities are indicated. Calculate the variance of the expected time for each activity. Enter the values in a tabular form. If 1 is the start event & 10 the end event, determine the critical path based on (a) the most likely time estimate for each activity & (b) the expected time obtained from the above prob.

10

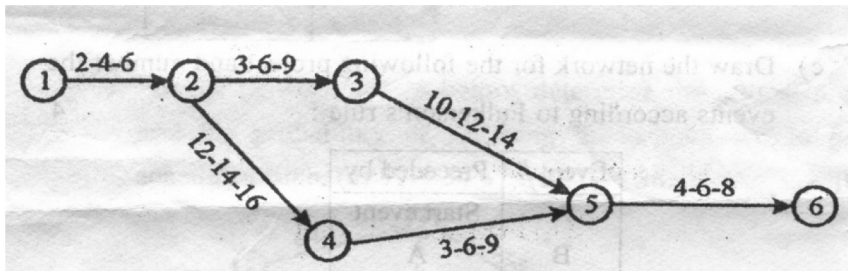


Fig.1

[Turn over

b) For the network shown in Fig. 2, determine the critical path & the probability of finishing the project within the scheduled time, (a) $T_s = 34.67$, (b) $T_s = 36$. 10

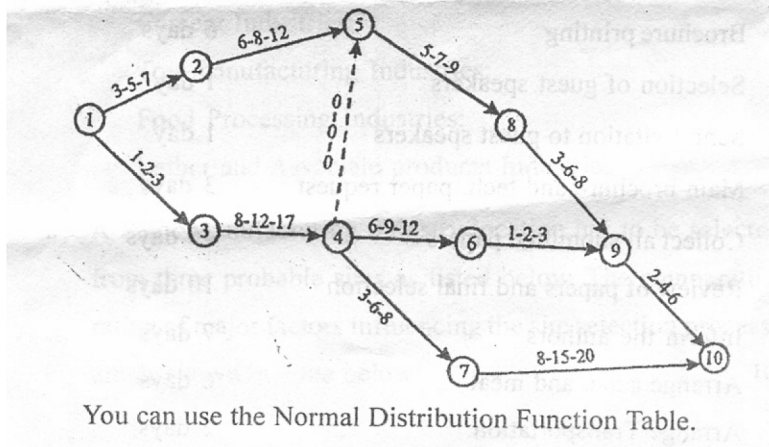


Fig.2

2. The Production Engg. Dept. JU is planning to organize a seminar. It is supposed to be a 2 days seminar with 2 invited lectures and about 16 technical paper reading sessions. Assume the following activities with their duration times:

Fix the dates of the seminar	2 days
Formulate the theme of the seminar	2 days
Collect the names & addresses of persons to be intimated	4 days
Brochure printing	6 days
Selection of guest speakers	1 day
Sent invitation to guest speakers	1 day
Main brochure & tech. paper request	3 days
Collect all submitted papers	45 days
Review of papers & final selection	10 days
Inform the authors	7 days
Arrange accommodation & meal	6 days
Arrange transportation	2 days
Arrange lecture halls	2 days
Prepare introductory speech	1 day
Assign duties	2 days

- Determine the minimum no. of days required for preparatory work before the actual seminar can begin.
- Determine the critical path for the network.
- Analyze in regard to slack times, earliest event times & latest event times.
- Calculate the total float, free float & independent float for each activity.

3. a)

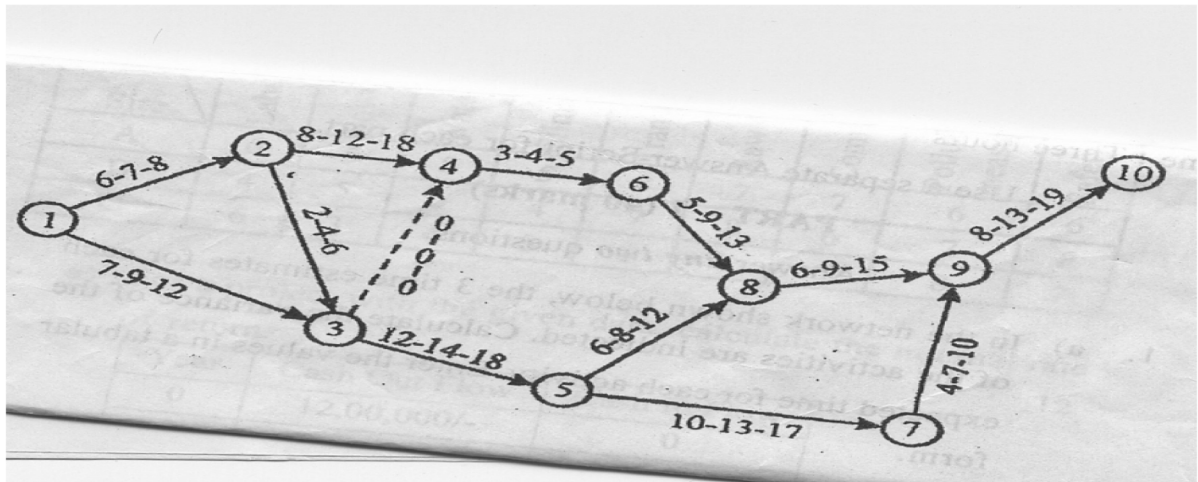


Fig. 3

The 3 time estimates are indicated along the activity arrows for the project shown above (Fig.3). Calculate (1) the expected or the avg. time t_e & the variance for each activity, (2) the earliest expected time & (3) the latest allowable occurrence time for each event. Make the entries in a tabular form. Also enter the last 2 values against the respective event circles.

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b) The following project is to be represented by a bar chart. The duration for each activity is in days. These are the actual work days. The proj. commences on Wed., Nov. 15, with 5 work days a week. Draw the bar chart with the horizontal scale denoting calendar dates. Activities 1 & 2 can occur concurrently. Activity 3 can take place after activity 2 is completed. Activities 4, 6 & 3 can occur concurrently. Activity 8 can start 4 days after the commencement of activity 6. Activity 7 should follow activity 5. Activity 5 can begin concurrently with activity 8.

Activity 1	8 days
Activity 2	4 days
Activity 3	7 days
Activity 4	9 days
Activity 5	3 days
Activity 6	3 days
Activity 7	14 days
Activity 8	17 days

5

c) Draw the network for the following project and number the events according to Fulkerson's rule:

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Event No.	Preceded by
A	Start event

B	A
C	B
D	B
E	D
F	B
G	E
H	G,E
J	D,F,H
K	C,J
L	K

The relevant portion of the
Normal Distribution Function

Normal deviate (+)	Probability (%)	Normal deviate (+)	Probability (%)
0	50.0	0	50.0
-0.1	46.0	+0.1	54.0
-0.2	42.1	+0.2	57.9
-0.3	38.2	+0.3	61.8
-0.4	34.5	+0.4	65.5
-0.5	30.8	+0.5	69.2
-0.6	27.4	+0.6	72.6
-0.7	24.2	+0.7	75.8
-0.8	21.2	+0.8	78.8
-0.9	18.4	+0.9	81.6
-1.0	15.9	+1.0	84.1
-1.1	13.6	+1.1	86.4
-1.2	11.5	+1.2	88.5
-1.3	9.7	+1.3	90.3
-1.4	8.1	+1.4	91.9
-1.5	6.7	+1.5	93.3
-1.6	5.5	+1.6	94.5
-1.7	4.5	+1.7	95.5
-1.8	3.6	+1.8	96.4
-1.9	2.9	+1.9	97.1
-2.0	2.3	+2.0	97.7
-2.1	1.8	+2.1	98.2
-2.2	1.4	+2.2	98.6
-2.3	1.1	+2.3	98.9
-2.4	0.8	+2.4	99.2
-2.5	0.6	+2.5	99.4
-2.6	0.5	+2.6	99.5
-2.7	0.3	+2.7	99.7
-2.8	0.3	+2.8	99.7
-2.9	0.2	+2.9	99.8

M. E. Production Engg. 1st Year, 2nd Semester EXAMINATION, 2025**SUBJECT: MANAGEMENT AND CONTROL OF PROJECTS****Time : Three hours****Full Marks 100****Use a Separate Answer Script For Each Part****PART II****(Answer any Three Question)**

4. Identify suitable location in India, stating various deciding factors to be considered for the evaluation of the plant site of the following type of industries. 10
- Cement Manufacturing Plant;
 - Food Processing Industries;
 - Plywood Industries;
 - Precision Engineering Industries;

- b) A Hydral Power plant location has to be selected from three probable sites as listed below. The comparative rating of major factors influencing the site selection process are as shown in table below. 10

Rating Site	Labour	Power	Water	Climatic Condition	Transport- ation	Zoning Regulation	Community Facility	Pollution Control measure
A	5	5	8	5	5	4	3	5
B	6	7	5	3	7	3	5	4
C	5	3	4	8	6	5	4	5

5. Compare projects 'A' and 'B' using NPV method of evaluation and IRR method utilising the given data. Is there any difference between the two results? If yes explain why? Assuming a discount rate of 11% per year. 17+3

Year	Project A (Cash Flow)	Project B (Cash Flow)
0	- 12,00,000/- (Cash Out Flow)	- 12,00,000/- (Cash Out Flow)
1	8,00,000/-	4,00,000/-
2	7,00,000/-	3,00,000/-
3	-----	3,00,000/-
4	-----	2,00,000/-
5	-----	2,00,000/-

6. a) Write a short notes on (*any three*): 3×5
- Annuities
 - Means of Finance for Project
 - Matrix Organisation
 - Hierarchy of Plans
- b) How the Performance Analysis helps to controls Projects 5
7. a) How to construct activity relationship chart? 5
- b) Describe the advantages and disadvantage of Process, Product and Group layout. 15