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B. M. S. College of Engineering, Bengaluru - 560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: VII**
Branch: Aerospace Engineering **Duration: 3 hrs.**
Course Code: 21AE7HSPMN **Max Marks: 100**
Course: Project Management **Date: 15.09.2023**

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.
3. Using Probability Table is permitted

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

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UNIT - I

1. a) Discuss the phases of project life cycle with illustration. **10**

   b) Highlight the roles and responsibilities of Project Manager. **10**

UNIT - II

2. a) Describe the different methods for collecting requirements. **10**

   b) The table below gives a list of jobs, their duration in days. **10**

Job	1-2	1-3	1-4	2-5	3-4	3-7	4-5	4-6	5-6	4-7	6-7
Duration	20	24	8	20	16	24	0	18	0	4	12

i. Draw network
ii. Determine critical path

Compute ES, EF, LS, and LF for each activity.

OR

3. a) The following table gives a list of jobs along with their time estimates **10**

Jobs	**Duration in days**		
	Optimistic	**Most likely**	**Pessimistic**
1 - 2	1	1	7
1 – 3	1	4	7
2 – 4	2	2	8
3 – 4	1	1	1
2 – 5	2	5	14
4 – 5	2	5	8
4 – 6	3	6	15
6 – 8	6	15	30

6 – 7	5	14	17
4 – 7	3	12	21
5 – 8	4	6	8
7 - 8	2	4	6

i. Draw the project network.
ii. Find the expected duration and variance of each activity.
iii. Calculate early and late occurrence times for each event. What is the expected project length?

What is the probability that the project will be completed at least 3 days earlier than expected? 3 days later than expected?

b) The basic cost-time data for jobs in a project are as given below: **10**

Job	**Normal time**		**Crash time**		**Cost of crashing per day**
	Days	**Cost (Rs.)**	**Days**	**Cost (Rs.)**	
A	3	140	2	210	70
B	6	215	5	275	60
C	2	160	1	240	80
D	4	130	3	180	50
E	2	170	1	250	80
F	7	165	4	285	40
G	4	210	3	290	80
H	3	110	2	160	50

The activity (job) dependencies are as below:

i. A, B, C are starting activities
ii. Activities D, E & F can start when once A is completed.
iii. Activity G can start after B & D are completed.
iv. Activity H can start after C & E are completed.
v. Activities G, F & H are final activities.
   a) Draw the network and indicate the critical path
   b) What is the total time required to complete the project? (based on normal times)
   c) If the project is to be completed in 8 days, what is the minimum cost to be incurred? And indicate the cheapest cost schedule.

UNIT - III

4. a) A machine operator has to perform three operations, turning, threading and knurling, on a number of different jobs. The time required to perform thee operations (in minutes) on each job is known. Determine the order in which the jobs should be processed in order to minimize the total time required to turn out all the jobs. Also find the minimum elapsed time and idle time of each machine. **10**

Job	1	2	3	4	5	6
Turning	3	12	5	2	9	11
Threading	8	6	4	6	3	1
Knurling	13	14	9	12	8	13

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b) 5 sheet metal jobs are waiting to be assigned at work centre. Their processing times (in days) and due dates are given below. Determine the sequence of processing according to EDD and FCFS. **10**

Jobs	Processing times	Due dates
A	6	8
B	2	6
C	8	18
D	3	15
E	9	23

For each rule, calculate the total completion time, average flow time, average job lateness, and average jobs per day in the system.

UNIT - IV

5. a) Define budgeting. Highlight the advantages and disadvantages of budgeting. **10**

b) Draw a flexible budget for the overhead expenses on the basis of the following data and determine the overhead rate at 70%, 90% and 80% plant capacity. **10**

Particulars	Plant capacities (80%)
Variable overhead: Indirect Labour Stores including spares	 12, 000 4, 000
Semi variable overhead: Power (30% fixed) Repairs & Maintenance (60% fixed)	 20, 000 2000
Fixed overhead: Depreciation Insurance Salaries	 11, 000 3000 10, 000
Total Amount	62, 000

Estimated Labour hrs: 1, 24, 000.

OR

6. a) From the following information and assumptions the balance on hand 1st Jan 1996 is 72,500. **10**

Month	Sales	Material	Wages	SDOH	POH	AOH
Jan.	72, 000	25, 000	10, 000	4000	6000	1500
Feb.	97, 000	31, 000	12, 100	5000	6300	1700
Mar.	86, 000	25, 500	10, 600	5500	6000	2000
April.	88, 600	30, 600	25, 000	6700	6500	2200
May.	1,02, 500	37, 000	22, 000	8500	8000	2500
June.	1,08, 500	38, 800	23, 000	9000	8200	2500

The following information are:

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- Assume 50% cash sales
- Assets have to be acquired in Feb. & March and provision should be made for payment of 8000 & 25, 000.
- An application has been made for the grant of a loan of 30, 000 and hoped that it will be received in May.
- It is anticipated that a dividend of 35, 000 will be paid in June.
- Debtors allowed one month credit.
- Sales commission at 3% of total sales has to be paid.

Creditors (Material & Overhead) grant one month credit.

b) Define Budgetary control. Point out the characteristic features of budgetary control. **10**

UNIT - V

7. a) Discuss the more frequently used quantitative techniques for risk analysis. **10**

b) Name the three processes that make up project procurement management. Elaborate. **10**

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