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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

MAKEUP EXAMINATION – JAN 2023

Course Code: MEC 106

Course Name: Project Management

Program : B.Tech

Date: 30-JAN-2023

Time: 01:00PM – 04:00 PM

Max Marks: 100

Weightage: 50%

Instructions:

- (i) Read the question properly and answer accordingly.
 - (ii) Question paper consists of 3 parts.
 - (iii) Use of normal distribution table is allowed.
 - (iv) Use of graph sheets are permitted.
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Part A (Memory recall)

Answer ALL Questions. Each question carries SIX marks

(4Qx6M=24)

1. Define the characteristics of a project and explain them.
2. State the assumptions made in sequencing problem.
3. Draw the network diagram for the given activities.

Activity	Predecessor activity
A	-
B	A
C	A
D	B
E	C
F	D
G	E
H	G

4. What are the expected qualities of a project manager?

(CO NO 1, 2, 3, 4) [Knowledge Level]

Part B (Thought Provoking)

Answer ALL Questions. Each question carries TWELVE marks (3Qx12M=36)

5. A Responsibility Matrix (RM) describes the participation by various roles in completing tasks or deliverables for a project or business process. It is especially useful in clarifying roles and responsibilities in cross-functional/departmental projects and processes. Prepare a RACI matrix considering various tasks (project deliverables) and roles of each participant for a “home renovation construction project”. Also explain the steps to create RACI chart.

(CO NO 1) [Comprehension Level]

6. The sequencing problem is very much common in Job workshops and Batch production shops. There will be number of jobs which are to be processed on a series of machine in a specified order depending on the physical changes required on the job. We can also see the same situation when number of critical patients waiting for treatment in a clinic, where number of patients are in queue, to be treated. Like this we may find number of situations in real world. Consider the processing times (in minutes) of 5 jobs each of which must go through two machines M_1 and M_2 in the order M_1, M_2 .

Jobs	J ₁	J ₂	J ₃	J ₄	J ₅
M ₁	5	1	9	3	10
M ₂	2	6	7	8	4

Obtain the sequence for the jobs that minimizes the total elapsed time and also find the idle time of both the machines.

(CO NO 2) [Comprehension Level]

7. The main objective in the analysis through PERT is to find out the completion for a particular event within specified date. The PERT approach takes into account the uncertainties. The use of PERT chart gives project managers a tool to estimate the time and resources needed to complete their project tasks, which is crucial during the initiation and planning phases. A small project is composed of 7 activities whose time estimates are listed below.
- Draw the network diagram and find the expected project completion time.
 - Calculate the variance and standard deviation for the project.
 - What is the probability of completion of the project not more than 4 days later than expected?

Activities	Time in days		
	t_o	t_m	t_p
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

(CO NO 3) [Comprehension Level]

Part C (Problem Solving)

Answer ALL Questions. Each question carries TWENTY marks (2Qx20M=40)

8. The critical path method (CPM) is a technique where you identify tasks that are necessary for project completion and determine scheduling flexibilities. A critical path in project management is the longest sequence of activities that must be finished on time in order for the entire project to be complete. It is an algorithm for planning, managing and analyzing the timing of a project. The step-by-step CPM system helps to identify critical and non-critical tasks from projects' start to completion and prevents temporary risks. A small marketing project consists of jobs in the table given below. With each job is listed its normal time and a minimum or crash time (in days). The cost slope for each job is also given.

Job	Normal duration (days)	Crash duration (days)	Cost slope (Rs.)
1-2	9	6	20
1-3	8	5	25
1-4	15	10	30
2-4	5	3	10
3-4	10	6	15
4-5	2	1	40

- Determine normal project duration and its associated cost.
- Determine optimum project duration and its associated cost.

(CO NO 3) [Comprehension Level]

9. Graphical method is applicable to solve the problems involving 2 jobs to be processed on 'm' machines in the given order of machining for each job. We have to lay out the jobs in the order of machining showing the processing times. Using the graphical method, calculate the minimum time needed to process job 1 and job 2 on five machines A, B, C, D and E, that is, for each machine find the job which should be done first. Also calculate the total time needed to complete both jobs. The machining order for job 1 is ABCDE and the order of machining for job 2 is CADEB respectively for processing.

Job 1	Sequence	A	B	C	D	E
	Time in hrs.	2	3	4	6	2
Job 2	Sequence	C	A	D	E	B
	Time in hrs.	4	5	3	2	6

(CO NO 2) [Comprehension Level]

Normal Distribution Table for positive value of Z

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9924	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9958	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986