Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058

End semester Examination July 2023

21/7/23

Program: M. Tech. Construction Management — Duration: 3 hr

Course code: PC-MTCM-201 — Maximum Points: 100

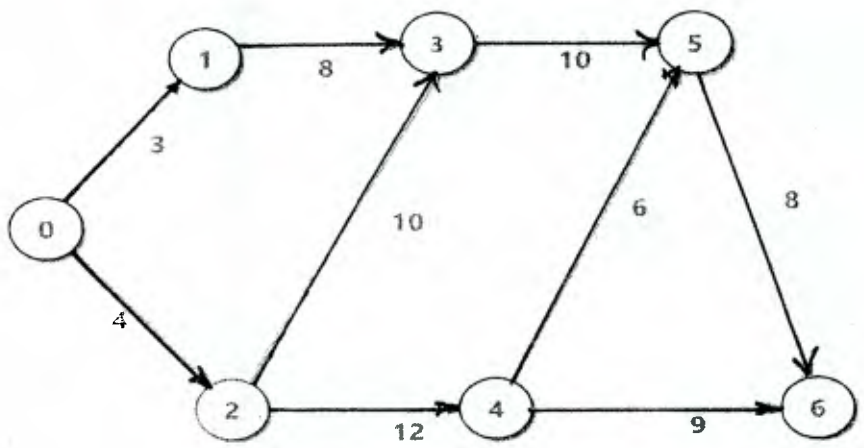
Name of the Course: Project Monitoring and Control — Semester: II

F.Y. M.Tech (Constn. mgt) Sem II

Instructions:

1. **Attempt any 5 questions.**
2. **Neat diagrams must be drawn wherever necessary.**
3. **Figures to the right side indicate full points.**
4. **Assume Suitable data if necessary and state it clearly**

Q. No.	Questions	Points	CO	BL	Module
1 (a)	Update the network and find the critical path.	10	CO1	BL3	1



A review of the project after 10 days reveals that
(a) Activities 0-1, 0-2 and 1-3 are completed.
(b) Activity 2-3 is in progress and will take 6 days more.
(c) Activity 2-4 is in progress and will take 7 days more.
(d) Also it is estimated that due to the arrival of a new machine, activity 3-5 will take only 6 days.

1 (b)	Explain in detail the causes of time and cost overruns in construction project and discuss the corrective measures for the same with more emphasis on schedule delays.	10	CO1	BL2	2
2(a)	Define method statement and explain different types of method statement along with its utility. Discuss how it is useful for project monitoring and control.	10	CO1	BL3	2,3
2(b)	Discuss the need of cost management in a mega construction project. Discuss about the roles and responsibilities of project manager for cost monitoring and control.	10	CO1	BL1	3

3(a)	Following table gives the data on normal time & cost and crash time & crash cost for a project	12	CO1	BL3	3

(a) Draw the network and identify the critical path.
(b) Determine the normal project duration & associated cost.
(c) Find out total float for each activity.
(d) It is proposed to speed up the project, crash the project, determine optimum project time & cost. Indirect cost ₹ 50 per week.

Activity	Normal		Crash	
	Time weeks	Cost (₹)	Time weeks	Cost (₹)
1-2	3	300	2	400
2-3	3	30	3	30
2-4	7	420	5	580
2-5	9	720	7	810
3-5	5	250	4	300
4-5	0	0	0	0
5-6	6	320	4	410
6-7	4	400	3	470
6-8	13	780	10	900
7-8	10	1000	9	1200

3(b)	Discuss the Safety & Health Checklist for the highway construction project.	8	CO3	BL3	5,6
4a	Define lean construction and discuss how it is useful during construction project execution?	6	CO2	BL2	2,3
4b	State the importance of PDCA cycle in construction project. What is check list? How it is useful to achieve quality in a construction project?	8	CO2	BL3	4
4c	Discuss the roles and responsibilities of various stakeholders during the change control process.	6	CO1	BL2	1
5a	Define BIM. Discuss the benefits of BIM collaboration during various stages of the product.	10	CO3	BL3	7
5b	Discuss about construction project process group their integration points and corresponding documents required at that process stage.	10	CO1	BL3	7
6a	Discuss the factors which governs productivity. Discuss the typical causes of low labour productivity.	10	CO2	BL3	2
6b	Discuss in depth quality related costs.	10	CO2	BL3	4
7a	Discuss the process of project risk monitoring and control.	10	CO1	BL3	2,3
7b	Discuss the construction communication categories	5	CO3	BL2	7
7c	What is Quality? Distinguish between Quality Control and Quality assurance.	5	CO2	BL2	4

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Munshi Nagar, Andheri (West), Mumbai – 400058.
Examinations, JULY 2023

24/7/23

Total points:100
Duration: *Total Time allotted will be 3Hr.*
Class: M TECH(CM). Semester: II Program: Civil
Name of the Course: **Project Appraisal, Planning and Scheduling** Course Code : PC-MTCM-202

F.Y. Mtech (Project appasial, Planning & Scheduling) Sem - II (Cons. mgt)

Instructions:

1. **Questions no 1 & 2 are compulsory**
2. Draw neat diagrams
3. Assume suitable data if necessary and state the clearly.

Question No		Points	CO	BL	PI
Q1(A)	<table><tr><th rowspan="2">Activity</th><th colspan="2">Normal</th><th colspan="2">Crash</th></tr><tr><th>Time in days</th><th>Cost in Rs</th><th>Time in days</th><th>Cost in Rs</th></tr><tr><td>1-2</td><td>3</td><td>300</td><td>2</td><td>400</td></tr><tr><td>2-3</td><td>6</td><td>480</td><td>4</td><td>520</td></tr><tr><td>2-4</td><td>7</td><td>2100</td><td>5</td><td>2500</td></tr><tr><td>2-5</td><td>8</td><td>400</td><td>6</td><td>600</td></tr><tr><td>3-4</td><td>4</td><td>320</td><td>3</td><td>360</td></tr><tr><td>4-5</td><td>5</td><td>500</td><td>4</td><td>520</td></tr></table> For a network shown below, normal time, crash time, normal cost, crash cost are given in table. Contract the network by crashing it to optimum value and calculate optimum project cost. Indirect cost = Rs 100/- per day. Draw Final Curves	10	2,3	4	2.2.3
Q1(B)	Explain briefly- a. Direct Cost b. Indirect cost c. Total cost d. Normal duration e. Crash Duration and Crash Slope	10	2,3	2	1.2.2
Q2(A)	<table><tr><th>Activity</th><th>Duration(weeks)</th><th>Predecessors</th><th>Resources (unit/week)</th></tr><tr><td>A</td><td>3</td><td>----</td><td>9</td></tr><tr><td>B</td><td>5</td><td>----</td><td>6</td></tr></table>	10	2,3	4	3.2.1

	C	1	----	4			
	D	1	A	10			
	E	7	B	16			
	F	6	B	9			
	G	4	C	5			
	H	3	C	8			
	I	6	D,E	2			
	J	4	F,G	3			
	K	3	H	7			
Q2(B)	The activities involved in the construction of a small project are given in Table. The resource usage for each activity is shown in Table. Smooth the resource so that a preferred resource usage is obtained. Activity / Duration in month / Manpower requirement 1-2 / 4 / 10 1-3 / 5 / 4 2-3 / 8 / 5 2-4 / 8 / 2 3-4 / 4 / 7 Reschedule the activities of the project with a maximum limit on the manpower requirement = 10 Draw Time scaled version of Network.				10	2,3	4	3.2.1
Q3(A)	Explain Line of Balance Method with example				5	2,3	2	3.2.1
Q3(B)	Explain Types of Risks and Threats or Negative Risks Mitigation Tools.				5	2,3	2	3.2.1
Q3(C)	Explain Job Plan in detail.				5	2,3	2	3.2.1
Q3(D)	Explain Applications and uses of value analysis				5	2,3	2	1.2.2
Q4(A)	Explain Cost capacity factor and parameter cost.				5	2,3	4	3.2.1
Q4(B)	What is Project Life Cycle? Explain all principle stages of life of project.				10	1,2	3	1.2.2
Q4(C)	X Ltd. is considering to start a new project for which it has gathered following data:				5			

	Cash flow *Probability* 30,000 0.1 60,000 0.4 1,20,000 0.4 1,50,000 0.1 Calculate the expected cash flow. Differentiate between CPM and PERT.				
Q5(A)	Deliberate the process of generating and screening the project ideas. Also explain what factors affect the project ideas along their consequences.	10	1,2	2	2.2.1
Q5(B)	Explain Different analysis carried out for Project Appraisal?	10	1,2	1	2.2.1
Q6(A)	Write a note on time cost trade-off in construction projects	10	1,2	2	1.2.2
Q6(B)	What is Work breakdown structure? Develop WBS for water treatment plant	10	1,2	2	1.2.2
Q7(A)	Why provisions for inflation and contingencies are important.	10	2,1	2	1.2.1
Q7(B)	X Ltd. is considering to start a new project for which it has gathered following data *NPV* *Probability* 80,000 0.3 1,10,000 0.3 1,42,500 0.2 Compute the risk associated with the project i.e. standard deviation.	10	2,1	3	2.1.1

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SARDAR PATEL COLLEGE OF ENGINEERING

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Munshi Nagar, Andheri (W) Mumbai – 400058

End Semester Exam

July - 2023

Program: Civil Engineering with specialization of Construction Management

Duration: 3 hrs.

Course Code: MTCMPEC- 202 **Maximum Points: 100**

Course Name: Risk & Value Management **Semester: II**

Notes:

1. **Q.1 is a compulsory and solve any four out of remaining six**
2. **Illustrate answer with neat sketches wherever required.**
3. **Make suitable assumptions where necessary and state them clearly.**

Q.No.	Questions	Points	BL	CO	Module
1	**Solve any four:** 1. Value Analysis Vs Value Engineering 2. Reasons for poor value in construction industry. 3. Risk Register 4. Components of life cycle cost analysis 5. Risk Response Plan	20	1, 2	1-3	1-7
2	A. Define: Risk & Risk Management. Explain in detail risk identification process and tools. B. Discuss the various types of risks with examples on the basis of , a) Chance of occurrence b) Flexibility c) Chance of measurability d) Coverage e) Chance of behavior f) Diversification	8+12	1	1	1,2
3	C. Discuss the residual risk with following points, a) Definition b) Inherent vs residual c) Sources d) Residual risk assessment & its importance e) Residual risk management D. For a project with the given data, calculate the real internal rate of return. Assume rate of inflation is 8.5%.	10+5+5	2	1,2	2,3

Year	Cash out flow	Cash inflow
0	11,00,000/-	-
1		5,00,000/-

		2		4,00,000/-				
		3		4,00,000/-				
		4		2,00,000/-				
		5		1,50,000/-				
		6		1,20,000/-				
	E. An enterprise is investing ` 110 lakhs in a project. The risk-free rate of return is 7.5%. Risk premium expected by the Management is 8%. The life of the project is 5 years. Following are the cash flows that are estimated over the life of the project.							
		Year	**Cash flows (` in lakhs)**					
		1	25					
		2	65					
		3	74					
		4	80					
		5	65					
	Calculate Net Present Value of the project based on Risk free rate and also on the basis of Risks adjusted discount rate.							
4	A. What is transit insurance? Explain the coverages, parties and type of insurances of transit insurance policy. B. List the factors need to be considered by manager while taking decision on capital budgeting. Compute coef. Of variance, std. deviation and expected value.							
		Cash flow	**Probability**					
		30,000	0.2					
		50,000	0.3					
		1,10,000	0.3					
		1,30,000	0.2					
	C. Compare individual's contractor liability policy with wrap up liability policy.							
					10+5+5	2	1,2	3,4
5	F. Define: Value & Value Engineering. Explain any five objectives of value engineering. G. Write a short note on: Principles of Value analysis H. Explain the various types of values and functions need to be considered in value engineering with examples.				7+5+8	1, 2	2,3	5-7
6	I. Define: Value Analysis. What are the benefits of Value analysis in construction sector? J. Explain the various reasons for unnecessary costs in construction engineering. K. You are managing a project which is into six months of its execution. You are now reviewing the project status and you have ascertained that project is behind schedule. The actual cost of Activity A is ₹ 3, 00,000 and that of Activity				6+6+4+ 4	1, 2	2,3	5-7

	B is ₹ 2,00,000. The planned value of these activities are ₹ 2,70,000 and ₹ 1,70,000 respectively. The Activity A is 100% complete. However, Activity B is only 70% complete. Calculate the schedule performance index and cost performance index of the project on the review date. L. For the following project calculate SV,CV, SPI and CPI at the end of second month. **Month** **1** **2** **3** **4** **Planned Value** ₹ 11,10,000 ₹ 6,00,000 ₹ 25,00,000 ₹ 8,00,000 **Earned Value** ₹ 10,00,000 ₹ 7,50,000 **Actual Cost** ₹ 12,50,000 ₹ 5,00,000				
7	M. Define: Value management & Value management cycle. Explain any five key factors affecting energy consumption in building. N. Write a short note on: Energy Cost Escalation O. Explain the various phases/steps of value Analysis with examples.	8+4+8	1, 2	2,3	5-7

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END SEM Examinations July 2023

Program: M.Tech. Construction Management **Duration: 3hr**

Course Code: PEC-MTCM212 **Maximum Points: 100**

Course Name: Program Elective – V, Total Quality Management in Construction

Semester: II

F.Y. M Tech (Total quality mgt. in Cons.)
Sem - II (Cons mgt.)

Instructions:

1. **Attempt any five questions.**
2. Use A-4 size graph paper to draw control chart
3. Neat diagrams must be drawn wherever necessary.
4. Assume Suitable data if necessary and state it clearly.

Q. No.		Questions	Points	CO	BL	PI
1	a	Define QMS as per ISO. Discuss fundamental principles of QMS as per ISO 9000.	8	CO1 CO3	BL3	1.4.1
	b	What is Quality Audit? What are the points to be taken into account while making Audit plan.	8	CO1	BL3	1.3.1
	c	What is a certification body? Enlist any four names of the Accreditation agency.	4	CO2	BL1	1.4.1
2	a	What do you mean by Non-conformity? What are the Common causes of non- conformity in construction project.	10	CO1	BL2	1.4.1
	b	Explain various requirements as per section 7 of ISO 9001.	10	CO2	BL5	2.3.1
3	a	What are the qualities of QC inspector?	4	CO2	BL2	1.4.1
	b	Discuss benefits of ISO to an organization.	4	CO1	BL2	1.3.1
	c	A RMC plants produces self-compacting concrete (SCC) 800 m^3 per day. Following are the observed flow table results of 6 samples to measure the workability of concrete at different time intervals. Develop mean & range chart and comment on the process.	12	CO2	BL4	2.3.1

Observations sheet for flow table results at RMC plant

Day	*Observed workability of concrete at different time intervals*					
	8.00-10.00	*10.00-12.00*	*12.00-14.00*	*14.00-16.00*	*16.00-18.00*	*18.00-20.00*
1	470	585	469	494	480	512
2	485	505	589	524	501	486
3	462	469	475	458	466	516
4	494	478	469	454	574	498
5	510	501	584	477	493	502
6	465	510	585	475	584	516
7	570	466	574	469	570	542
8	454	484	567	484	472	533
9	560	577	486	554	569	498
10	515	467	458	468	477	526

4	a	Discuss in details the process of audit execution.	08	CO2	BL2	2.1.1
	b	Swastik India Ltd. manufactures Soil Modified Bricks (SMB) to make low cost sustainable material for the construction. A team of QC engineer decided to pull a random sample of 100 to find the defective products. Table shows the data from the last 25 days of production. Develop the appropriate control chart. Is the process in statistical control? What variation is in the control chart?	12	CO1	BL2	2.1.2

Observations sheet for Swastik India Ltd.

Day number	Units inspected	Number defective	Day number	Units inspected	Number defective	Day number	Units inspected	Number defective
1	100	22	10	100	27	19	100	21
2	100	33	11	100	31	20	100	26
3	100	24	12	100	26	21	100	24
4	100	20	13	100	31	22	100	32
5	100	39	14	100	24	23	100	43
6	100	24	15	100	22	24	100	25
7	100	24	16	100	22	25	100	21
8	100	29	17	100	29			
9	100	41	18	100	31			

5	a	Design check list for any construction activity of your choice. How it work as powerful tool for controlling the quality of project?	10	CO4	BL2	1.3.1
	b	What is review meeting? What are the requirements to be fulfilled by management to conduct review meeting according to ISO 9001.	10	CO1	BL3	2.1.1
6	a	Distinguish between (i) Cost of Good and poor Quality. (ii) QA and QC	08	CO4	BL2	2.1.2
	b	A company manufactures stoneware pipes for sewer line construction with production capacity of 1000 units per day. Defects in each components are recorded during testing. Based on the given data, draw the appropriate control chart and comment on the state of control.	12	CO3	BL4	2.3.1

Observations sheet for stoneware pipes

Lot	Sample size	No. of defects in the sample	Lot	Sample size	No. of defects in the sample	Lot	Sample size	No. of defects in the sample
1	1000	25	11	1000	53	21	1000	48
2	1000	24	12	1000	49	22	1000	44
3	1000	26	13	1000	51	23	1000	46
4	1000	28	14	1000	40	24	1000	57
5	1000	32	15	1000	56	25	1000	54
6	1000	44	16	1000	64	26	1000	42
7	1000	33	17	1000	47	27	1000	48
8	1000	34	18	1000	58	28	1000	46
9	1000	42	19	1000	57	29	1000	54
10	1000	45	20	1000	59	30	1000	45

7	a	Discuss in detail the section 6 *"Resource management"* as per ISO 9001.	12	CO2	BL1	3.1.2
	b	What is cost of Quality? Draw various curve to demonstrate the relationship between cost and quality and explain in brief.	08	CO3	BL2	1.3.1

Reference table for Mean and Range Chart

Tabular values for X-bar and range charts

Subgroup Size	A_2	d_2	D_3	D_4
2	1.880	1.128	-----	3.268
3	1.023	1.693	-----	2.574
4	0.729	2.059	-----	2.282
5	0.577	2.326	-----	2.114
6	0.483	2.534	-----	2.004
7	0.419	2.704	0.076	1.924
8	0.373	2.847	0.136	1.864
9	0.337	2.970	0.184	1.816
10	0.308	3.078	0.223	1.777
11	0.285	3.173	0.256	1.744
12	0.266	3.258	0.283	1.717
13	0.249	3.336	0.307	1.693
14	0.235	3.407	0.328	1.672
15	0.223	3.472	0.347	1.653
16	0.212	3.532	0.363	1.637
17	0.203	3.588	0.378	1.622
18	0.194	3.640	0.391	1.608
19	0.187	3.689	0.403	1.597
20	0.180	3.735	0.415	1.585
21	0.173	3.778	0.425	1.575
22	0.167	3.819	0.434	1.566
23	0.162	3.858	0.443	1.557
24	0.157	3.895	0.451	1.548
25	0.153	3.931	0.459	1.541

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End –SEM Examinations, JULY 2023

21/7/23

Total points:100

Duration: *Total Time allotted will be 3Hr.*

Class: M. TECH(CM) & MTECH(STR) Semester: II Program: Civil

Name of the Course-Operational Research **Course** Code : OE-PG03 PC-MTCM-202

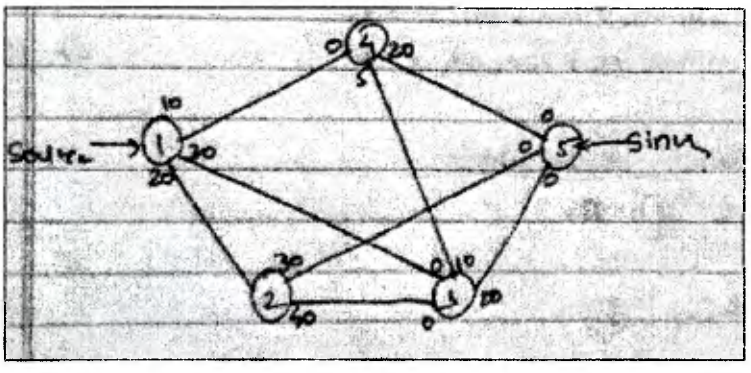
F.Y. MTech [Cons. mgt) (Struct.)] Sem-II

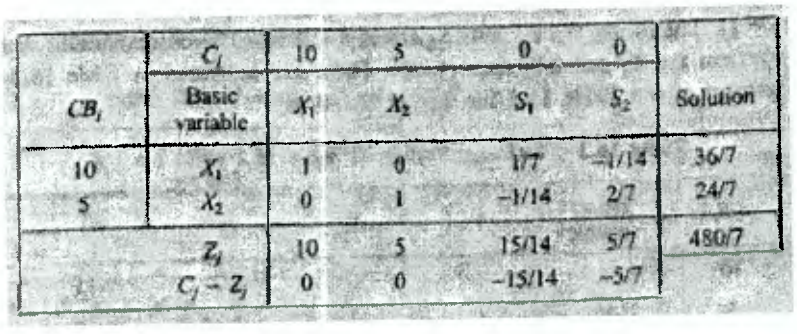
Instructions:

1. Draw neat diagrams
2. Assume suitable data if necessary and state the clearly.

		Points	CO	BL	PI
Q1(A)	Solve Following LPP by using Kuhn-Tuckers conditions Max Z = $-(X-2)^2 - 2(Y-1)^2$ Subject to, X+ 4Y <= 3 -X+ Y <= 0 X, Y >= 0	10	2,4	4	2.2.2
Q1(B)	There are 7 jobs, each of which must go through the machines A and B in the order AB. The processing times (in hours) are given as Determine a sequence of these jobs that will minimise the total elapsed time T. Also obtain: I) the minimum elapsed time; and ii) the idle time for each of the machines.	10	3,4	3	4.2.1
Q2	Solve following LPP by revised simplex method Max Z =2X1+X2	20	1,2	4	3.2.1

JOB	J1	J2	J3	J4	J5	J6	J7
MACHINE A	3	12	15	6	10	11	9
MACHINE B	8	10	10	6	12	1	3

	Subject to, 3X1+4X2 <= 6 6X1+X2 <= 3 X1, X2 >= 0				
Q3(A)	Explain all types of cost involved in Deterministic inventory model If for a project, annual demand is 10000/year, order cost=300/order, carrying cost = Rs 4/unit/year then 1. Estimate Economic order quantity and Total cost of project 2. Draw graphs for all types of costs in EOQ concept.	10	2,4	4	4.3.2
Q3(B)	 Find the maximum flow above in the Model.	10	2,4	3	2.3.2
Q4(A)	Customers arrive at the clinic at the rate of 8/hour (Poisson's Ratio), And doctor can serve at the rate of 9/hour (Exponential), 1. What is the probability that customer does not join the que and walks in doctor's room? 2. What is the probability that there is no que? 3. What is the probability that there are 10 customers in the que? 4. What is the expected number in the system? 5. What is the expected waiting time in the que?	10	3,4	4	2.3.2
Q4(B)	Consider following parametric linear programming problem- Max Z = (10 – 2t)X1 + (5 – 3t)X2 S.T. 8X1 + 2X2 <= 48 2X1 + 4X2 <= 24 X1 , X2, t >= 0 Perform parametric analysis with respect to objective function coefficient and find the range of t over which optimal solution will not change. Use following linear programming The optimum table –	10	2,4	3	4.3.3

					
Q5	Minimise f(x) = $7 * X_1 * X_2^{-1} + 3 * X_2 * X_3^{-2} + 5 * X_1^{-3} * X_2 * X_3 + X_1 * X_2 * X_3$ Where, X1, X2, X3 >= 0 Solve above model using geometric programming	20	1,3	5	3.2.1
Q6	A trader stocks a particular seasonal product at the beginning of the season and cannot re-order. The item costs him Rs. 25 each and he sells at Rs. 50 each. For any item that cannot be met on demand, the trader has estimated a goodwill cost of Rs. 15. Any item unsold will have a salvage value of Rs. 10. Holding cost during the period is estimated to be 10 per cent of the price. The probability distribution of demand is as follows: Unit Stocked: 2 | 3 | 4 | 5 | 6 Probability of demand: 0.35 | 0.25 | 0.20 | 0.15 | 0.05 Determine the optimal number of items to be stocked using **Pay-off Matrix method**.	10	3,1	5	3.2.2
Q6(B)	A factory manufactures two products A and B. To manufacture one unit of A, 1.5 machine hours and 2.5 labour hours are required. To manufacture product B, 2.5 machine hours and 1.5 labour hours are required. In a month, 300 machine hours and 240 labour hours are available. Profit per unit for A is Rs. 50 and for B is Rs. 40. Formulate as LPP.	10	1,4	5	3.2.1
Q7(A)	Activity | Duration 1-2 | 8 1-3 | 10 1-4 | 5 2-7 | 6 3-4 | 3 4-5 | 7	10	1,3	4	1.2.3

	4-7	0				
	5-6	4				
	5-7	3				
	5-8	6				
	6-8	5				
	7-8	5				

Determines all types of floats and critical Path using information given in above table.

Q7(B)	Activity	Duration(weeks)			10	1,3	4	1.2.3
		a	m	b				
	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				

I) Construct the project network

II) Find expected duration and variance of each activity

III) Find critical path and expected project duration time

IV) What is the probability of completing the project on or before 18 weeks?

V) What is the probability of completing the project 3 weeks earlier than expected time?

STANDARD NORMAL DISTRIBUTION: Table Values Represent AREA to the LEFT of the Z score.

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-3.9	.00005	.00005	.00004	.00004	.00004	.00004	.00004	.00004	.00003	.00003
-3.8	.00007	.00007	.00007	.00006	.00006	.00006	.00006	.00005	.00005	.00005
-3.7	.00011	.00010	.00010	.00010	.00009	.00009	.00008	.00008	.00008	.00008
-3.6	.00016	.00015	.00015	.00014	.00014	.00013	.00013	.00012	.00012	.00011
-3.5	.00023	.00022	.00022	.00021	.00020	.00019	.00019	.00018	.00017	.00017
-3.4	.00034	.00032	.00031	.00030	.00029	.00028	.00027	.00026	.00025	.00024
-3.3	.00048	.00047	.00045	.00043	.00042	.00040	.00039	.00038	.00036	.00035
-3.2	.00069	.00066	.00064	.00062	.00060	.00058	.00056	.00054	.00052	.00050
-3.1	.00097	.00094	.00090	.00087	.00084	.00082	.00079	.00076	.00074	.00071
-3.0	.00135	.00131	.00126	.00122	.00118	.00114	.00111	.00107	.00104	.00100
-2.9	.00187	.00181	.00175	.00169	.00164	.00159	.00154	.00149	.00144	.00139
-2.8	.00256	.00248	.00240	.00233	.00226	.00219	.00212	.00205	.00199	.00193
-2.7	.00347	.00336	.00326	.00317	.00307	.00298	.00289	.00280	.00272	.00264
-2.6	.00466	.00453	.00440	.00427	.00415	.00402	.00391	.00379	.00368	.00357
-2.5	.00621	.00604	.00587	.00570	.00554	.00539	.00523	.00508	.00494	.00480
-2.4	.00820	.00798	.00776	.00755	.00734	.00714	.00695	.00676	.00657	.00639
-2.3	.01072	.01044	.01017	.00990	.00964	.00939	.00914	.00889	.00866	.00842
-2.2	.01390	.01355	.01321	.01287	.01255	.01222	.01191	.01160	.01130	.01101
-2.1	.01786	.01743	.01700	.01659	.01618	.01578	.01539	.01500	.01463	.01426
-2.0	.02275	.02222	.02169	.02118	.02068	.02018	.01970	.01923	.01876	.01831
-1.9	.02872	.02807	.02743	.02680	.02619	.02559	.02500	.02442	.02385	.02330
-1.8	.03593	.03515	.03438	.03362	.03288	.03216	.03144	.03074	.03005	.02938
-1.7	.04457	.04363	.04272	.04182	.04093	.04006	.03920	.03836	.03754	.03673
-1.6	.05480	.05370	.05262	.05155	.05050	.04947	.04846	.04746	.04648	.04551
-1.5	.06681	.06552	.06426	.06301	.06178	.06057	.05938	.05821	.05705	.05592
-1.4	.08076	.07927	.07780	.07636	.07493	.07353	.07215	.07078	.06944	.06811
-1.3	.09680	.09510	.09342	.09176	.09012	.08851	.08691	.08534	.08379	.08226
-1.2	.11507	.11314	.11123	.10935	.10749	.10565	.10383	.10204	.10027	.09853
-1.1	.13567	.13350	.13136	.12924	.12714	.12507	.12302	.12100	.11900	.11702
-1.0	.15866	.15625	.15386	.15151	.14917	.14686	.14457	.14231	.14007	.13786
-0.9	.18406	.18141	.17879	.17619	.17361	.17106	.16853	.16602	.16354	.16109
-0.8	.21186	.20897	.20611	.20327	.20045	.19766	.19489	.19215	.18943	.18673
-0.7	.24196	.23885	.23576	.23270	.22965	.22663	.22363	.22065	.21770	.21476
-0.6	.27425	.27093	.26763	.26435	.26109	.25785	.25463	.25143	.24825	.24510
-0.5	.30854	.30503	.30153	.29806	.29460	.29116	.28774	.28434	.28096	.27760
-0.4	.34458	.34090	.33724	.33360	.32997	.32636	.32276	.31918	.31561	.31207
-0.3	.38209	.37828	.37448	.37070	.36693	.36317	.35942	.35569	.35197	.34827
-0.2	.42074	.41683	.41294	.40905	.40517	.40129	.39743	.39358	.38974	.38591
-0.1	.46017	.45620	.45224	.44828	.44433	.44038	.43644	.43251	.42858	.42465
-0.0	.50000	.49601	.49202	.48803	.48405	.48006	.47608	.47210	.46812	.46414

STANDARD NORMAL DISTRIBUTION: Table Values Represent AREA to the LEFT of the Z score.

Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.50000	.50399	.50798	.51197	.51595	.51994	.52392	.52790	.53188	.53586
0.1	.53983	.54380	.54776	.55172	.55567	.55962	.56356	.56749	.57142	.57535
0.2	.57926	.58317	.58706	.59095	.59483	.59871	.60257	.60642	.61026	.61409
0.3	.61791	.62172	.62552	.62930	.63307	.63683	.64058	.64431	.64803	.65173
0.4	.65542	.65910	.66276	.66640	.67003	.67364	.67724	.68082	.68439	.68793
0.5	.69146	.69497	.69847	.70194	.70540	.70884	.71226	.71566	.71904	.72240
0.6	.72575	.72907	.73237	.73565	.73891	.74215	.74537	.74857	.75175	.75490
0.7	.75804	.76115	.76424	.76730	.77035	.77337	.77637	.77935	.78230	.78524
0.8	.78814	.79103	.79389	.79673	.79955	.80234	.80511	.80785	.81057	.81327
0.9	.81594	.81859	.82121	.82381	.82639	.82894	.83147	.83398	.83646	.83891
1.0	.84134	.84375	.84614	.84849	.85083	.85314	.85543	.85769	.85993	.86214
1.1	.86433	.86650	.86864	.87076	.87286	.87493	.87698	.87900	.88100	.88298
1.2	.88493	.88686	.88877	.89065	.89251	.89435	.89617	.89796	.89973	.90147
1.3	.90320	.90490	.90658	.90824	.90988	.91149	.91309	.91466	.91621	.91774
1.4	.91924	.92073	.92220	.92364	.92507	.92647	.92785	.92922	.93056	.93189
1.5	.93319	.93448	.93574	.93699	.93822	.93943	.94062	.94179	.94295	.94408
1.6	.94520	.94630	.94738	.94845	.94950	.95053	.95154	.95254	.95352	.95449
1.7	.95543	.95637	.95728	.95818	.95907	.95994	.96080	.96164	.96246	.96327
1.8	.96407	.96485	.96562	.96638	.96712	.96784	.96856	.96926	.96995	.97062
1.9	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670
2.0	.97725	.97778	.97831	.97882	.97932	.97982	.98030	.98077	.98124	.98169
2.1	.98214	.98257	.98300	.98341	.98382	.98422	.98461	.98500	.98537	.98574
2.2	.98610	.98645	.98679	.98713	.98745	.98778	.98809	.98840	.98870	.98899
2.3	.98928	.98956	.98983	.99010	.99036	.99061	.99086	.99111	.99134	.99158
2.4	.99180	.99202	.99224	.99245	.99266	.99286	.99305	.99324	.99343	.99361
2.5	.99379	.99396	.99413	.99430	.99446	.99461	.99477	.99492	.99506	.99520
2.6	.99534	.99547	.99560	.99573	.99585	.99598	.99609	.99621	.99632	.99643
2.7	.99653	.99664	.99674	.99683	.99693	.99702	.99711	.99720	.99728	.99736
2.8	.99744	.99752	.99760	.99767	.99774	.99781	.99788	.99795	.99801	.99807
2.9	.99813	.99819	.99825	.99831	.99836	.99841	.99846	.99851	.99856	.99861
3.0	.99865	.99869	.99874	.99878	.99882	.99886	.99889	.99893	.99896	.99900
3.1	.99903	.99906	.99910	.99913	.99916	.99918	.99921	.99924	.99926	.99929
3.2	.99931	.99934	.99936	.99938	.99940	.99942	.99944	.99946	.99948	.99950
3.3	.99952	.99953	.99955	.99957	.99958	.99960	.99961	.99962	.99964	.99965
3.4	.99966	.99968	.99969	.99970	.99971	.99972	.99973	.99974	.99975	.99976
3.5	.99977	.99978	.99978	.99979	.99980	.99981	.99981	.99982	.99983	.99983
3.6	.99984	.99985	.99985	.99986	.99986	.99987	.99987	.99988	.99988	.99989
3.7	.99989	.99990	.99990	.99990	.99991	.99991	.99992	.99992	.99992	.99992
3.8	.99993	.99993	.99993	.99994	.99994	.99994	.99994	.99995	.99995	.99995
3.9	.99995	.99995	.99996	.99996	.99996	.99996	.99996	.99996	.99997	.99997

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

End Semester – July 2023 Examinations

21/8/23

Program: F Y M.Tech **Duration: 3 Hours**

Course Code:AU-PG-03 **Maximum Points:100**

Course Name: Disaster Management **Semester: II**

F.Y.M.Tech (Cons mgt) Sem-II

Notes: 1. Answer any five questions.
2 All questions carry 20 points.

Q.No.	Questions	Points	CO	BL	Module No.
1	1.1 What is Disaster Risk Reduction? Explain in detail.	10	1	2	5
	1.2 Explain 'exposure' with an example and its drivers. Explain 'vulnerability' and its drivers.	10	1	2	5
2	2.1 What are the seven Global targets of the Sendai Framework for Disaster Risk Reduction? What was the status of Target E by 2019?	10	4	2	5
	2.2 What are the four Global priorities for action of the Sendai Framework for Disaster Risk Reduction?	10	4	2	5
3	3.1 What is Disaster Mitigation? How does it differ from other disaster management disciplines/phases? What are goals of Disaster Mitigation?	10	4	2	6
	3.2 Explain structural and non-structural activities in Disaster Mitigation. What are mitigation strategies for floods?	10	3	2	6
4	4.1 What is the aim of Disaster/Emergency Response? List out the key activities and elements of Disaster Response.	10	3	3	4
	4.2 Explain the three Humanitarian Principles that Humanitarian agencies must observe while responding to Disasters.	10	3	3	4

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Q.No.	Questions	Points	CO	BL	Module No.
5	5.1 What are the three levels and responsibilities of Disaster Management Authorities specified in Disaster Management Act, 2005? What has the Act been criticized for?	10	4	2	4
	5.2 Riverine flooding is perhaps the most critical climate-related hazard in India. Explain.	10	4	2	3
6	6.1 With the help of a diagram explain the four phases of the Disaster Management Cycle. Mark the point in the cycle where the disaster occurs.	10	2	2	1
	6.2 Explain the causes and typical adverse effects of Floods.	10	3	2	2
7	7.1 Explain the four interrelated components involved in Community Risk assessment.	10	2	2	5
	7.2. List out ten focus areas pertaining to strategies for survival from disasters.	10	4	2	5
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