Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

II SEMESTER M.TECH. (CONSTRUCTION ENGG. & MANAGEMENT) END SEMESTER EXAMINATIONS, APRIL/MAY 2024

SUBJECT: CONSTRUCTION QUALITY & SAFETY MANAGEMENT [CIE 5212]

REVISED CREDIT SYSTEM

Date of Exam: / /2024 Time of Exam: Max. Marks: 50

Instructions to Candidates:

✤ Answer ALL the questions & missing data may be suitably assumed

No		Question										
	Calculate the perception prevention-appraisa could improve the result.											
		Cost elements		Cost (₹)]							
1		ncoming materials inspec	tion	6,000		3	1	4				
	3	Scrap cost		30,000								
	F	Process inspection		2,000								
	(Quality testing facility		10,000								
	(Quality audits		3,000								
	Ν	Maintenance and calibration	on	8,000								
	(Cost during the 'defect liab										
	E	Equipment downtime										
	A study records the	the rate at which										
	heat is transferred	d through concrete, infl	uencing the	building	s overall energy							
	performance), dry	types of concrete										
	samples. Using a s											
	following parameter											
	compressive streng	6		5								
2	most preferred.		2									
	Type of concrete	I hermal conductivity	Dry density		ressive strength							
		1.73 2489		40.30								
	TC3	1.05	2402	40.73								
	TC4	1.78	2468	45.33	45.33							
	TC5	1.2	1861	46.49								
	TC6	1.41	2251	55.06								
3	Compare any ONE	5	3	4								
	relevant examples of	Ŭ	0	-								
4	Explain, with the he	4	3	3								
-	and derive the ex											

	characteristics using Taguchi's principles.																	
	Data from a company records the following types leading to the causes of accidents.																	
	Rank the most significant causes of concern by adopting a suitable tool and conclude									lude								
	an action plan to mitigate the problem.																	
	-	Type of accidents in construction sites Frequency																
		Accide	nt ir	nvolv	ing v	ehic	les				35							
5		Collapse of structures 31																
		Combined causes (more than one) 16											5	3	4			
		Drown	ing								4							
		Electro	cuti	on							31							
		Fall fro	m a	heig	ght						12	5						
		Fall/hit	by (objed	cts						39							
		Fire		4														
		ng passenger lift							8									
		Others									27							
6	Compare the conceptual differences between the Goals-Freedom-Alertness theory										eory	5	4	3				
Ŭ	and the Adjus	stment S	tres	s The	eory	of th	e 'Ao	ccide	ent C	ausa	tion'	theo	ries.					
	On a particul	ar day, a	a co	onstru	uctio	n co	mpa	ny e	mplo	oys 1	00 v	vorke	ers a	t the site.	The			
	company rec	orded 12	20 lo	ost-ti	me i	njuri	es fo	or a t	total	of 4	00 m	nan-c	lays	lost that y	ear.			
-	The total cost of 120 accidents was estimated to be ₹2,00,000. The company									any	5	Δ	3					
1	followed a 10-hour shift per day for 6 days a week and 52 weeks per year. Compute									oute	5	-	5					
	the following reactive indicators: a) Frequency rate, b) Severity rate, c) Incidence										ence							
	rate, d) Disabling rate, and e) Average days charged.																	
	Categorize the safety costs with its components referring to a typical large									arge								
	construction project.																	
	During an unfortunate accident, Mr. X, a 25-year-old worker, got severely iniured.									red.								
8	resulting in death on arrival at the hospital. At the time of the accident. Mr. X was									was	5	5	4					
•	earning ₹ 30,000 salary per month. Estimate the compensation Mr. X is eligible to get									aet								
	as ner the Fr	nnlovees	'' Cr	mne	ancat	tion (Δme	andm	ent)	Δct	201	7 (Δ	 	ne a maxin	num			
	factor for the calculation).									ium								
	Perform a root-cause analysis by constructing a fishbone diagram to identify the										the							
0	'causes for accidents' at a construction site. List relevant primary and secondary										darv	5	5	3				
9	causes under each category and suggest remedies to mitigate them										Jary	-	-	-				
	The table below presents the 28-day compressive strength data for concrete											rete						
	produced in a ready-mix plant collected for a 10-day cycle. Prepare an X-bar and R-											d R-						
	chart and examine if the process is statistically in control. Calculate the process									cess								
	capability index (C _P).											_						
10	Day 1 2 3 4 5 6 7 8 9 10]	1	2	4					
	_		1	40	41	42	45	44	44	41	43	34	49	UIL=30				
	Sam	ple	2	36	46	39	44	43	47	36	40	50	43	. . .	1			
	measure	ements	3	48	50	41	44	50	52	38	47	47	49	LIL=0				