



M.Tech. const.mgmt. Sem I
Advanced Construction Techniques.
Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

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

End Semester Exam
November 2015



Library

24/11/2015

Max. Marks: 100 Marks

Duration: 4 hrs

Class: Construction Management Semester: I

Program: M Tech

Name of the Course: Advanced Construction Techniques

Course Code :

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. Assume suitable data if necessary

MASTER FILE.

Question No		Maximum Marks
Q1	Attempt any four: (5 Marks Each)	(20 Marks)
(a)	Explain the various types of pile foundations.	5 Marks
(b)	Elaborate on Drilled Pier Foundation.	5 Marks
(c)	Explain the methods of rock tunneling.	5 Marks
(d)	Elaborate on various aspects of site investigation report.	5 Marks
(e)	Elaborate on thermal soil stabilization.	5 Marks
Q2(a)	Elaborate on underpinning procedures.	10 Marks
(b)	Elaborate on various types of patented formworks with their advantages and disadvantages	10 Marks
Q3(a)	Elaborate on the functions and uses of geosynthetics.	10 Marks
(b)	Explain in detail various methods of dewatering of trenches	10 Marks
Q4(a)	Explain Compressed Air Tunneling Method with figure.	10 Marks
(b)	What are the advantages and disadvantages of caisson foundation.	10 Marks
Q5(a)	Elaborate on the various types of construction chemicals and their applications	10 Marks
(b)	What are the various problems and precautionary measures associated with installation of Caissons?	10 Marks

Q6(a)	Explain with diagram the working principle of shield tunneling	10 Marks
(b)	Explain the chemical methods of soil stabilization	10 Marks
Q7(a)	Elaborate on the advantages and limitations of precast and prestressed components of buildings	10 Marks
(b)	Explain the methods of ventilation and dust control during tunneling process.	10 Marks

Note: Use Font as Times New Roman, Font size 12 with single spacing.

Lib
26-11-15

M.Tech. (Const. Mgmt.) sem I
Accounting & Finance Mgmt Instruction
Bharatiya Vidya Bhavan's



Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

November 2015

Max. Marks:100

Duration: 4 Hours

Class: Semester: I Program: M.tech(Construction Management)

Name of the Course: Accounting and Finance Management Instruction

Course Code :

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. Assume suitable data if necessary

Master File

Q 1 From the Trial Balance Prepare Trading. Profit and Loss Account and Balance Sheet for the year ended 31march,1997 (20)

Capital	38000	Bills Receivable	800
Drawing	2500	Travelling Expense	600
Purchases	16000	Bad Debt	400
Sales Return	400	Sundry Debtors	10800
Purchase Return	900	Insurance Paid	300
Furniture	6000	Postage Paid	150
cash Sales	12000	Motor Car Expenses	1200
Credit Sales	16000	Cash In Hand	880
Building	12000	Sundry Creditors	4380
Opening Stock	6000	Motor Car	5800
Sundry Expenses	500	Closing Stock	12250
Bills Payable	900		
Commission Received	250		
Rent Paid	250		
Wages & Salaries	7250		
Carriage Inword	250		
Carriage Outword	350		

- Q2 (a). Define book keeping. Explain the important features of Book keeping (8)
- (b) Explain the features of Journal and Ledger (6)
- (c) prepare a Format Of Trading and profit& Loss Account. (6)

1

=/r

- Q 3(a) Explain the important objectives of Financial Statements. (8)
- (b) Highlight the importance of financial statements. (6)
- (c) Explain essential requirements of Financial Statements. (6)

Q 4(a) Prepare Income statement from the following details (20)

Opening Stock	700000	Sales in Cash	520000
Purchases	900000	Sales in Credits	1500000
Wages	150000	Sales return	20000
Factory Expenses	350000	Closing Stock	600000
Opening Salaries	25000	Dividend Received	10000
Office Rent	39000	Profit on sale of Furniture	20000
Postage	5000		
Directors Fees	6000		
Salesmens Salaries	12000		
Advertising	18000		
Delivery Expenses	20000		
Debenture Interest	20000		
Depreciation on Office Furniture	10000		
Depreciation on Plant	30000		
Depreciation on Delivery Van	20000		
Loss on Sale of Van	5000		
Income Tax	175000		
Net Profit	145000		

- Q5 (a) Explain the factors affecting the requirements of Working capital (08)
- (b) Explain the significance of Working Capital (6)
- (c) Make a format of Working Capital Statement (6)

(2)

Q6 (a) Journalise the following and post them into Ledger January, 2015 (10)

1 Anup commenced business with cash Rs. 500000

2 purchased goods from Dilip on Credit Rs,75000

3 Paid salaries Rs 50000

4 Goods sold to Ravi for cash Rs 30000

5 Goods lost by fire Rs 11000

(b) Explain the significance of Cash Flow Statement (10)

Q 7 Write short notes on any four (4X5)

(a) Trial Balance

(b) Rules for Debit and Credit

(C) Journal Format

(d) Significance of Working Capital

(e) Balance Sheet in the vertical form..

(f) Steps in the preparation of Income Statement.

3



M.Tech (Const.mgmt) sem I
Safety Management
Bharatiya Vidya Bhavan's

Library
28/11/2015



Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

November 2015

Max. Marks:100

Duration: 4 Hours

Class:

Semester: I

Program: M.tech(Construction Management)

Name of the Course: Safety Management

Course Code :

Master file.

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. Assume suitable data if necessary

- Q1 (a) Explain various types of Electrical Burns. (8)
(b) Protective Measures for workers against electrical shock (6)
(c) Suggest safety measures in electrical works. (6)
- Q 2 (a) Explain the Safety Issues in Excavation. (10)
(b) Briefly Explain the diseases associated with Construction activities (10)
- Q3 (a) Explain the common causes for Fire (10)
(b) What are the strategies for Managing fire at construction site (10)
- Q4 (a) List out the objectives of safety audit (10)
(b) Briefly explain various types of safety Audit (10)
- Q 5 (a) Explain the common causes for Mental Stress (10)
(b) Give your suggestions for Managing Mental Stress (10)
- Q6 (a) explain major considerations in health management in handling
Cement, Glass Petrol. (10)
(b) How do you propose to manage Oil, Oxygen and Carbide at site (10)
- Q7 (a) Explain the salient features of OSHA (10)
(b) What are the considerations in the installation of electrical Systems. (10)

M. Tech. civil. sem I

Library
21/11/15

Applied statistics & Quantitative Techniques
Bharatiya Vidya Bhavan's



Sardar Patel College of Engineering



(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

November 2015

Max. Marks: 100

Class: M. Tech

Program: Civil Engineering (Construction Management)

Course: Applied Statistics and Quantitative Techniques

Duration: 4 hrs

Semester: I

Course Code : MTCM102

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. Assume suitable data if necessary

Master file

- Q1 a Jaquar Company went for mass production of plumbing items. 5 items of each colour were packed in each boxes which were to be sold as a unit item to the customers. Due to shortage of quality was compromised and it was estimated that 20% of items were defective. If customer purchases such a box of items, what is probability that the box will have
- (i) No defective item
 - (ii) 2 Defective item
 - (iii) Atleast one defective item
 - (iv) at most one defective item
 - (v) all defective item
- b Assuming that it is true that 2 in 10 industrial accidents are due to fatigue, find the probability that
- i) Exactly 2 of 8 industrial accidents will be due to fatigue.
 - ii) At least 2 of 8 industrial accidents will be due to fatigue.
- c Calculate the correlation coefficient of the following data

U	100	150	180	50	10	10
Y	34	50.1	67.2	34	12	4.9

- Q2 a Precast items are produced with desired strength. Mr Ramdev took a sample of 50 and out of 50, 3 items are found defective
- i) What the probability of observation?
 - ii) what is the probability that more than 3 items will defective in a sample of 50.
 - iii) How many are expected to break in a test of 100 items
- b Ram and Sham are the engineers with a safety agency. They have determined the number of serious accidents each month at construction sites to be Poisson distributed

Accidents/Months	0	1	2	3	4	5
Frequency	27	12	8	2	1	0

(1)

M.Tech. Civil - sem I Dt. 21/11/15
 Applied Statistics & Quantitative Techniques.

- i) Based on the data below, they predict a good chance of one serious accident each month. Are they correct?
 ii) What are the 1σ limits above and below the mean of this data.
- c Followings are the rating of the two brands of marbles A and B in 10 sets of rating 8

Set	1	2	3	4	5	6	7	8	9	10
A	44	80	76	48	52	72	68	56	60	64
B	48	75	54	60	63	69	72	51	57	56

If good performance by brand is given by rating, who should get the high rating?

- Q3 a Grohe Company has three options for launching a brand of plumbing 10
 Option A- Extra Premium
 Option B- Superior
 Option C- Commercial. The company anticipates three levels of demand viz High, medium and Low. The payoff for each level of demand and for option are given below

Demand	Alternative in Rs Lakhs		
	Option A	Option B	Option C
High	60	30	45
Medium	30	15	20
Low	-20	5	10

Discuss decision making approach under each criterion.

- b An Environmental engineer determined the % of Sulfur in the environment. For 100 days the number of days which violated the 4% per time limit are 7

Violations per day	0	1	2	3	4	5	6
Number of days	33	44	10	5	5	2	1

Test the hypothesis that whether data honors Poisson distribution or not. Use χ^2 goodness of fit test for level of significance $\alpha=0.05$

For $\lambda=1.15$ Cumulative Poisson's probabilities are given as below

x	0	1	2	3	4	5	6
F(x; λ)	0.317	0.681	0.890	0.970	0.993	0.999	1.000

- c Explain application of exponential distribution in construction engineering. 3
- Q4 a DR FIXIT Company is considering research into construction chemicals. The chances of success are estimated to be 75%. If successful, the Company would improve profit by Rs. 5 million. If unsuccessful, the result will be a loss of Rs. 6 million. Should the company go for research and stay with their traditional product line, their profit would depend on how competitors advertise. If competitive advertising is down, the profit would be Rs 6 million, if the same, they would be Rs 2 million and if up Rs 2 million with respective probabilities 0.2, 0.4 and 0.4. 8
- i) draw the decision tree for the situation (2)

- ii) Compute expected monetary value and identify the best action based on EMV.
 b Calculate Karl Pearson's correlation coefficient between the productivity of two construction labours X and Y 8

X	10	25	13	25	22	11	12	25	21	20
Y	12	22	16	15	18	18	17	23	24	17

- c Discuss various sampling distributions. 4

- Q5 a On the opening day of hardware stores, 200 customers visited the store. The following data gives the distribution of the number of items bought by customers: 8

Number of items Bought (x)	Number of customers (f)
0	122
1	60
2	15
3	2
4	1

Fit the Poisson distribution.

- b Hindustan plumbing and heating maintains stock of 30 lit hot water heaters it sells to and install for homeowners. Hindustan plumbing likes the idea of having a large supply at hands to meet customers demand, but they also recognizes that it is expensive to do so. They examines hot water heaters sales over past 50 weeks and data is give below 10

Hot water heater sales per week	Number of week this was sold
4	6
5	5
6	9
7	12
8	8
9	7
10	3
Total	50

- i) If Hindustan plumbing maintains a constant supply of 8 hot waters in any given week, how many times will it be out of stock during a 20 week simulation? Use random numbers-10, 24, 03, 32, 23, 59, 95, 34, 34, 51,08,48, 66, 97, 03,96,46,74,77,44.
 ii) What is average number of sales per week (Including stockouts) over the 20 week period?
 iii) Using an analytic non-simulation technique, what is expected number of sales of heatrs per week.

- c Discuss various measures of dispersion

3

Q6 a Find the two lines of regression from following data given between two brands of paints in form of warranty 12

Paint A	25	22	28	26	35	20	22	40	20	18
Paint B	18	15	20	17	22	14	16	21	15	14

Hence estimate

- (i) The warranty of paint A when warranty of paint B is 19
- (ii) The warranty of paint B when warranty of paint A is 30

- b What is simulation? Explain different situations its use in civil Engineering 5
- c Discuss normal distribution along with its properties. 3

Q7 a Reddy Mikks produces both interior and exterior paint from two Raw materials M_1 and M_2 . Following table provide the basic data for the problem. A market survey indicates that the daily demand for interior paint is not exceed that of exterior paint by more than one ton. Also, maximum demand of exterior paint is 2 ton. Reddy Mikks want to determine optimum product mix of interior and exterior paint that maximise the total daily profit. Formulate the LPP and solve by simplex method. (10)

	Tones of raw material per tones of		Maximum daily available in Tonnes
	Exterior Paint	Interior Paint	
Raw material M_1	6	4	24
Raw material M_2	1	2	6
Profit per ton	5	4	--

- b Discuss degeneracy in LPP. 5
- c Formulation of Duality Theorem and its Characteristics. 5

Library
29/11/2015

M-Tech. (Civil with const. Mgmt.) sem I.
Const. Mgmt. & organization.
BHARATIYA VIDYA BHAVAN'S



SARDAR PATEL COLLEGE OF ENGINEERING
GOVERNMENT AIDED AUTONOMOUS INSTITUTE
ANDHERI (WEST), MUMBAI - 400 058.

End Semester Exam
Nov. – Dec. 2015

Max. Marks: 100

Duration: 4 hours

Class: M. Tech. (Civil with Construction Management)

Semester: I

Name of the Course: Construction Management and Organization. Program: Civil Engineering (PG)

Course Code: MTCM101

Instructions:

1. Question No. 1 (One) is compulsory.
2. Out of remaining questions, attempt any 04 (four) questions.
3. In all 5 (Five) questions to be attempted.
4. Draw neat diagrams
5. Assume suitable data if necessary

Master file.

Question No.		Max. Marks
Q1 (a)	What is the purpose of management in construction organization? Explain.	(10)
(b)	How behavioral science helps management in effective decision making? Explain dimensions of behavior.	(10)
Q2 (a)	What are the various business opportunities in the Indian construction industry? Highlight importance of infrastructure and construction.	(10)
(b)	What do you mean by planning in construction? Explain various types of plans.	(10)
Q3 (a)	What is decision making? Highlight difference between decisions made under conditions of certainty, uncertainty and risk.	(10)
(b)	What is organizing means? Differentiate between formal and informal organizations.	(10)
Q4 (a)	Explain in brief: Effective organization and Organization Culture.	(10)
(b)	What is staffing? Explain system Approach to staff selection in an organization.	(10)
Q5 (a)	Define the term Leading and Explain: McGregor's Theory 'X' and Theory 'Y' about the nature of people.	(10)
(b)	Explain the role of leadership in the following Group Processes; (i) Forming, (ii) Storming, (iii) Norming, (iv) Performing	(10)
Q6 (a)	Highlight qualities of effective construction project manager.	(10)
(b)	What is mean by controlling in an organization? Explain basic control process.	(10)

(1)

M.Tech. (Civil with const. Mgmt.) sem I.

Const. mgmt & organization. Dt. 19/11/15

- Q7 (a) What is group decision making? Explain pros and cons of group decision making. (10)
- (b) Give contributions of Fredrick Taylor and Henry Fayol in management thought development. (10)

(2)

M.Tech. (Civil) sem I.
Applied statistics & Quantitative Techniques.



Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering



(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai - 400058.

Re-Examination

January 2016

Max. Marks: 100

Class: M. Tech

Program: Civil Engineering (Construction Management)

Course: Applied Statistics and Quantitative Techniques

Duration: 4 hrs

Semester: I

Course Code : MTCM102

Master file.

Instructions:

1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Draw neat diagrams
4. Assume suitable data if necessary

Q1 a In a construction company the number of employees, average wages per employee and variance of the wage per employee for two company are given below 10

	Company A	Company B
Number of Employees	100	200
Average wage per Employee (Rs)	5000	8000
Variance of Wages per Employee	6000	10000

Which company has more uniform wages?

- b Quality control department are doing spot checks of quality of construction work. Historically 8 out of 10 such checks produce good quality result. If QC department is going to perform 6 quality checks, find the chances of getting exactly 3 favorable results from this group of check. 4
- c An attempt to bid a construction project succeeds twice as often as it fails. What is the probability that in next five trials there will be 6
 - (i) 3 successes
 - (ii) at least 3 successes

- Q2 a For an exponential distribution $\lambda=1.2$ find 6
- (i) $P(x \geq 0.5)$
 - (ii) $P(1 \leq x \leq 2)$
 - (iii) Also find its mean and variance
- b The buses on a certain route run to carry construction labour after every 25 minutes. If a person arrives at the bus stop at random, what is the probability that 6
- (i) He has to wait between 10 to 15 minutes?
 - (ii) He gets a bus within 5 minutes?
 - (iii) He has to wait atleast 15 minutes?
- c The number of construction equipment coming at workshop for repair in a minute (X) and their probabilities are given by as below. Find mean and standard deviation 8

M.Tech. (Civil) Sem I - Dt - 05/10/16.
 Applied statistics & Quantitative Techniques.

X	0	1	2	3	4	5	6
P(X)	0.02	0.15	0.22	0.26	0.17	0.14	0.04

Q3 a 200 concrete blocks were chosen at random from a set of given blocks. The frequency of the blocks are given as below 8

Blocks	0	1	2	3	4	5	6	7	8	9
Frequency	18	19	23	21	16	25	22	20	21	15

Use the χ^2 - test to assess the correctness of the hypothesis that the blocks were distributed in equal numbers in the sample from which these numbers were taken. Value of χ^2 for 9 degree of freedom at 5% level is 16. 919

b Maximize $Z=3X_1 + 2X_2$
 $X_1 + X_2 \leq 4$
 $X_1 - X_2 \leq 2$ $X_1, X_2 \geq 0$

c Discuss Montecarlo simulation 4

Q4 a Discuss the decision making under uncertainty 5
 b The relationship between X and Y is given below find the coefficient of correlation and coefficient of variation 10

X	48	49	50	51	52	53	54	55	56	57
Y	100	105	104	107	111	115	125	130	132	135

c Discuss in brief probability and non probability sampling 5

Q5 a Raje Construction had to decide whether or not to drill a well on their site. In the surrounding area, only 40% of the wells drilled were successful at 200 feet of depth. Some of the builders, who did not get water at 200 feet, drilled further upto 250 feet but only 20% struck water at 250 feet. Cost of drilling is Rs 50/- per foot. Raje construction estimated that they would pay Rs. 18000/- during a 5 year period in the present value terms, if he continues to buy water from neighbor rather than go for the well which would have a life of 5 years. Raje constructions has three decisions to make (Draw decision tree). 10

- (a) Should they drill upto 200feet?
- (b) If no water is found at 200feet, should he drill upto 250 feet?
- (c) Should he continue to buy water from his neighbor?

b The following data shows chance of getting a tender for the contractor out of 100 7

Contractor 1	X	80	45	55	56	58	60	65	68	70	75	85
Contractor 2	Y	82	56	50	48	60	62	64	65	70	74	90

Find the equation of line of regression of X on Y

c Explain various tests for goodness of fit. 3

M.Tech (Civil) sem I . DT . 05/01/16 .
 Applied statistics & Quantitative Techniques .

- Q6 a For a brand of ceramic tiles daily demand based on the past experience is given below 12

Daily Demand	0	15	25	35	45	45
Probability	0.01	0.15	0.20	0.50	0.12	0.02

RND Nos- 48, 78, 09, 51, 56, 77, 15, 14, 68 and 09.

Using the sequence, simulate the demand for the next 10 days.
 Find the stock situation if the owner of the company decides to make 35 tiles/day.
 Also estimate the daily average demand for the tiles on the basis of the simulated data.

- b Calculate Spearman's rank correlation coefficient between the X and Y 6

X	8	36	98	25	75	82	92	62	65	35
Y	84	51	91	60	68	62	86	58	35	49

- c Discuss advantages of linear programming. 2

- Q7 a A company has three plants A, B and C which supply to warehouses D, E, F, G and H. Monthly plant capacity are 1000, 800, and 700 units respectively. Monthly warehouse requirement are 400, 400, 500, 400 and 800 units respectively. The unit transportation costs are given in table. Obtain the initial feasible solution to minimise the cost by 10

- (a) N-W corner method
 (b) Least cost Method.

Plants / warehouses	D	E	F	G	H
A	5	8	6	6	3
B	4	7	7	6	5
C	8	4	6	6	4

- b Discuss Transportation Model for Optimization 5

- c Vogals Approximation method 5

(3)

