

K.E.Society's

Rajarambapu Institute of Technology, Rajaramnagar

(An Autonomous Institute)

MID SEMESTER EXAMINATION, 2014

First Year M. Tech. Construction Management SEMISTER-II

Advanced Construction Techniques

Course Code: CCM 502

Enroll.
No.

MIM367

Day & Date: MON, 10/3/2014

Time : 2Hrs

Instructions :

3:30pm - 5:30pm

Max. Marks : 50

- i. All questions are compulsory
- ii. Figures to the right indicate full marks
- iii. Assume suitable data if necessary and mention it.

- Que.1 a Describe dredging operation. Indicate the factors to be considered for deciding method of dredging? 07
- b Categorize dredging equipments based on the type of material to be dredged? Tabulate the results. 08

OR

- b List various dewatering methods. Categorize each with application and remarks. 08
- Que.2 a A commercial port needs to be deepened in order to accommodate heavy vessels, required draft height is 20 meters, current water depth is 8m. The geological investigation shows the strata availability as shown below. 15

Sr. No	Strata	Depth Up to
1	Cohesions less soil strata	12 m
2	Cohesive soil	14 m
3	Soft rock	20 M
4	Rock	24M +

Choose from various dredging equipments and methods, the desirable for performing economic dredging operation. Justify the results.

- b Disposal of dredged material is an important activity. State various ways of material disposal. Explain one in detail? 05
- OR
- b What special operations are involved in construction of piers for construction of jetty? Tabulate process and equipments used for each operation. Give Reason? 05
- Que.3 a List various dewatering methods. Tabulate each with application and remarks. 07

OR

- a Explain cyclic and continuous dredging process? Distinguish dredger's based on process. 07
- b Cost of dewatering is controlled by which factors? Justify your answer? 08

Enrollment No

Q.P. Code MIM366

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Rajarambapu Institute of Technology, Rajaramnagar.
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Mid Semester Examination- March 2014
F. Y. M.Tech. (Civil-Structure) SEMESTER - II
Finite Element Analysis (CST502)

Day and Date: Mon, 10/3/2014
Time: 2 hrs 3-30pm - 5-30pm

Max Marks- 50

- Instructions: i) Solve all Questions
ii) Assume suitable data if necessary
iii) Figures to the right indicate full marks
iv) Use of non-programmable calculator is allowed

- Q.1a) Explain principal of minimum potential energy, with suitable example 6
b) Write procedure to formulate element stiffness matrix [K] for LST element starting from displacement function 10
Q.2 For the spring assemblage shown in figure 1. Compute i) Global stiffness matrix 17
ii) Nodal displacement of node 2 and 3 iii) Reaction at fixed nodes 1 and 4
(at node 3, $P = 3000$ N towards right, $k_1 = 1000$ N/m, $k_2 = 2000$ N/m, $k_3 = 3000$ N/m)

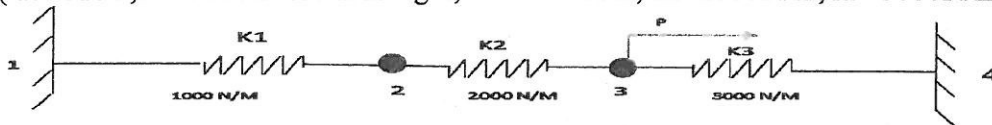


Fig.1

- Q.3 The truss is loaded and supported as shown fig.2, by using finite element method 17
i) Develop the overall stiffness matrix ii) Using elimination approach solve for nodal displacement. Take $A = 10$ cm² for all members and $E = 2 \times 10^5$ N/mm²

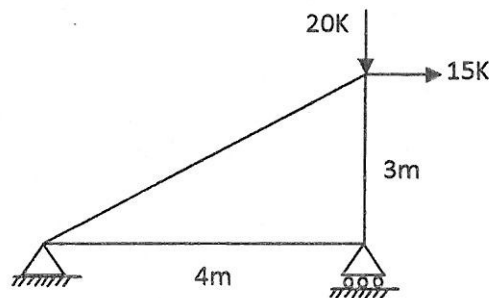


Fig.2

OR

- Q.3 A continuous beam ABC, is fixed at A and supported at B and C, such that $AB = BC = 5$ m. Beam is subjected to UDL of intensity 10 kN/m over span AB and concentrated load of 40 kN at midpoint of BC. Analyze the beam using finite element method and construct BMD. Assume $EI = \text{constant}$ 17

Enrollment No	
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Q.P. Code	MM 379
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K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar.
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Mid Semester Examination- March 2014
First Year M. Tech. Construction Management SEMESTER - II
Operations Research in Construction (CCM 504)

Day and Date: Tues, 11/03/2014

Time: 3.30 pm - 5.30 pm

Max Marks- 50

Instructions:

- 1) All questions are compulsory.
- 2) Figures to the right indicate marks
- 3) Use of non-programmable calculator is allowed.

Que.1 a) Suppose you are being interviewed by the manager of a construction company for a job in research department which deals with the applications of quantitative techniques and its usefulness to the company. Illustrate him some examples of the applications of quantitative techniques in construction industry. 04

b) Discuss the origin and development of OR. Identify the limitations of OR? 08

OR

b) Discuss the various phases in solving an OR problem. 08

Que.2 a) Formulate the payoff matrix (for profit) with three alternative products A_1 , A_2 , and A_3 . 10
The respective costs of these products are Rs. 2, Rs. 2.50 and Rs. 4 per unit and their sale prices are Rs. 3, Rs. 4 and Rs. 5 per unit respectively.

The normal production capacity of the plant for production of each of the products A_1, A_2 , and A_3 is 3000 (High Demand), 2000 (Moderate Demand) and 1000 (Low Demand) units respectively.

Also justify the decision taken under the following approach:

1) Regret and 2) Hurwicz criterion or Criterion of Realism (Consider coefficient of optimism = 0.5)

b) Pragati construction is considering the purchase of one of the four available tracts of land. The future profit that will be realized on the tracts depends upon the geographical area that will have the greatest population growth during the next two years. Potential profits in thousands of rupees are given in the table below. Management believes that each of the four areas is equally likely to be the area that experiences greatest growth.

What probability assessments should be assigned to states of nature?

Calculate the expected value of perfect information.

	Profit if greatest growth occurs in the (000's)			
Tract	North	East	South	West
A ₁	70	70	50	30
A ₂	50	90	50	30
A ₃	30	60	60	60
A ₄	50	20	80	80

OR

b) A newspaper boy has the following probabilities of selling a magazine:

08

No. of copies sold	Probability
10	0.10
11	0.15
12	0.20
13	0.25
14	0.30

Cost of a copy is 30 paise and sale price is 50 paise. He cannot return unsold copies. Choose the best alternative available to newspaper boy. (Use Expected opportunity Criterion)

Que.3 a) Explain the principle of dominance in game theory and solve the following game.

08

	Player B		
Player A	B ₁	B ₂	B ₃
A ₁	1	7	2
A ₂	6	2	7
A ₃	5	2	6

b) In a game of matching coins with two players, suppose A wins one unit of value when there are two heads, wins nothing when there are two tails and losses $\frac{1}{2}$ unit value when there is one head and one tail. Construct the payoff matrix and interpret the best strategies for each player and the value of the game to A.

04

c) Explain the following terms (Any one)

- i) Two person zero sum game
- ii) Pure strategy in game theory

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MM378

Enroll.
No.

MID SEMESTER EXAMINATION, 2014

First Year M. Tech. Civil Engineering SEMESTER-II

Design of Earthquake Resistant Structures

Course Code: CST 504

Day & Date:
Time : 2Hrs

Tues, 11/03/2014
3.30pm - 5.30pm

Max. Marks : 50

Instructions :

- i. All questions are compulsory
- ii. Figures to the right indicate full marks
- iii. Assume suitable data if necessary and mention it.

1. A) Explain different types of seismic waves with the help of neat sketches. Which of the waves are detrimental to structures and how? 08

B) Explain intensity of an earthquake? Explain modified Mercalli's scale of intensity. 08

OR

B) List the different methods used for measurement of magnitude of earthquake? Explain one method in detail. 08

2. A) Write in brief on "response of structure to earthquake motion" 08

B) Construct design response spectrum. (L5) (CO2) 09

3. A) Write short note on "Tripartite response spectrum" 08

B) Starting from first principles and with a suitable mathematical function explain the terms displacement spectrum, pseudo velocity spectrum and pseudo acceleration spectrum of an earthquake. 09

B) Distinguish between earthquake spectra and design spectra? 09

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Q.P. Code	MM391
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K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar.
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Mid Semester Examination- March 2014
First Year M. Tech. Civil Construction Management SEMESTER - II
Project Economics & Financial Management (CCM 506)

Day and Date: Wed, 12/3/14
Time: 3.30pm - 5.30pm

Max Marks- 50

Instructions:

- 1) All questions are compulsory.
- 2) Assume suitable data where ever necessary.

Q.1 Attempt any two.

- a) Why does money have time value? (7)
- b) Illustrate the concept of capitalized cost with suitable example. (8)
- c) Explain the concept of inflation with respect to history of inflation. (8)

Q. 2

a) Two types of construction equipment are available.

	MACHIN M	MACHIN N
INITIAL COST	12 Lakh	16 Lakh
SALVAGE VALUE	2 Lakh	3 Lakh
ANNUAL MAINTENANCE	1.5 Lakh	1.2 Lakh
ANNUAL RETURNS	4 Lakh	4.5 Lakh
LIFE	8 Yrs.	10Yrs.

Which equipment should be selected, if minimum requirement of return is 12%?

(15)

Q.3

- a) Suggest the best project alternative out of P, Q&R if rate of interest is 12%
The details of the alternatives are as follows:

Alternative	P	Q	R
Annul loan repayment (Lakhs)	25	13	33
Annul O&M cost (Lakhs)	03	05	03
Annul benefits (Lakhs)	50	20	70
Additional benefits (Lakhs)	10	05	15
Scrap value (Lakhs)	20	10	30
Project life (Years)	15	15	15

Additional benefits for all alternatives are at the end of 5th and 6th year.

Note. Use present worth method.

(15)

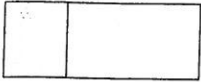
- b) A person has taken a loan of Rs. 400,000/- from the bank at rate of interest of 12% for 15 years. How much amount he have to repay every year?

(5)

OR

- b) How much money you have to deposit now; if you want Rs. 24000 per year for 15 years starting from next year? The rate of interest is 10%.

(5)



K.E. Society's
Rajarambapu Institute of Technology, Rajaramnagar
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MID SEMESTER EXAMINATION, 2014
First Year M Tech Civil-Structure, Semester-II
ADVANCED DESIGN OF STEEL STRUCTURES
Course Code: CST506

MM390

Day & Date: *wed, 12.3.14*
Time: 2 Hrs *3.30pm - 5.30pm*

Max Marks:
50

Instructions:

- i. All questions are compulsory*
- ii. Figures to the right indicate full marks*
- iii. Assume suitable data if necessary and mention it clearly*
- iv. Use of IS:800-2007 and IS-Hand Book or Steel Table is allowed.*

- 1 A through type trussed girder bridge consists of two Warren trusses. The effective span of truss is 25m. The bridge supports an equivalent uniformly distributed live of 170kN/m and dead load transmitted to each truss including self weight is 15kN/m. Select the no of panels and height of the truss. Construct ILD for forces and analyze the truss for design forces in the central top chord, bottom chord and diagonal members. 18
- 2 a) A rectangular frame of uniform section with column height 4m and beam span 4m is subjected to central point load of 50kN on beam and horizontal load towards right of 25kN at left side junction of beam and column. Analyze the frame and construct plastic BMD. 08
b) A propped cantilever ABCD is fixed at A and simply supported at C. $AB=BC=L/2$ and $CD=L/2$. It is subjected to point loads W at B and $W/2$ at D. Determine the collapse load. 08
- 3 Analyze and design a portal frame ABCD subjected to ultimate load of 30kN/m over beam BC and horizontal concentrated load of 40kN at B. 16
OR
- 3 Design a continuous beam ABCD fixed at A and D, $AB=6m$, $BC=7m$ and $CD=4m$, subjected to ultimate loads: central point load of 50kN on AB, uniformly distributed load of 30kN/m on BC and central point load of 50kN on CD. 16

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(An Autonomous Institute)
Mid Semester Examination

MMA06

First Year M Tech. Civil Engineering SEMESTER – II
Theory of Plates and Shells, Course Code (CST508)

Day & Date: Thurs, 12/8/14
Max Marks: 50

Time: 3.30pm-5.30pm

Instructions: 1) All questions are compulsory

- Q.1 (a) Appraise about reduction in three dimension (3D) problems to two dimension (2D) problems in continuum mechanics. (08)
- (b) Demonstrate constitutive relationship for orthotropic materials. (06)
- Q.2 (a) Construct displacement field for Kirchhoff's plate theory (Classical Thin Plate Theory) as per assumptions for symmetrical pure bending of plates. (12)
- (b) Illustrate with neat sketch, stress resultants acting on plate element and hence write equilibrium equations for a plate in terms of stress-resultants. (06)
- Q.3 (a) Demonstrate Moment-Curvature relationship from displacement field. (12)
- (b) Estimate q_{mn} for uniformly distributed load. (06)

OR

- Q.3 Analyze an isotropic plate made up of steel material with dimensions 1 m x 1 m and all edges simply supported. The plate is subjected to a central point load of $P = 10$ kN. Thickness of plate is 10 mm. Compare your results of transverse displacement (w) with normalized value of 0.1266 with factor $(E h^3/a^2 P)$. Summarize results with number of harmonics required for convergence. (18)

Enrollment No	
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Q.P. Code	MMA07
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K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar.
(An Autonomous Institute)
Mid Semester Examination- March 2014
First Year M.Tech. SEMESTER - II
Disaster Management CCM 512

Day and Date: Thurs, 13/3/14
Time: 3.30 pm - 5.30 pm

Max Marks- 50

Instructions.

1. All Questions are compulsory.
2. Figures to the right indicate full marks.

Q1. A. critically analyze the statement: "The learning's of disaster management remain localized at their place of occurrence" 8

B. How will you plan for the disaster management of a nuclear power plant . 8

Q2. Attempt any two of the following : 16

1. Explain any two types manmade disasters and interpret their causes and effects in India.

2. "Monitoring has an important role in all the three phases of disaster management." – Criticize

3. What are the requirements of fire escape in multistoried buildings? Design a suitable plan for the same.

Q3. Explain a Tsunami disaster with a suitable case study. 18

OR

Explain the occurrence of Earthquake. How will you measure the magnitude of an earthquake ?
Identify three major mitigation measures to reduce earthquake risk.

Enrollment No	
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Q.P. Code	MM 419
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K.E.Society's
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Mid Semester Examination- March 2014
First Year M. Tech. Institute Elective SEMESTER - II
Value Engineering (IET506)

Day and Date: Friday, 14/3/14

Time: 3:30 - 5:30 pm.

Max Marks- 50

Instructions:

- 1) All questions are compulsory.
- 2) Assume suitable data where ever necessary.

Q.1 Attempt any two.

- a) Justify role of value engineering in today's context. (7)
- b) Compare cost value, use value, esteem value and exchange value with each other by giving suitable examples. (8)
- c) Comment on mathematical model of value with suitable example from your discipline. (8)

Q. 2 Attempt any two.

- a) Identify reasons of poor value for any one product/ process/ service. (7)
- b) Prepare feature function matrix for any one product from your discipline. (8)
- c) Construct FAST diagram for screw driver/ prison reception and processing center / wooden door. (8)

Q.3

- a) Develop function cost matrix for oil pump/ Door/ Window/ Pre stressed beam or slab/ any other process or service. (12)
 - b) Why worth is important in value engineering? Explain with suitable example. (8)
- OR
- b) Prepare process flow diagram for determining worth of any one product. (8)
