K. E. Society's

Rajarambapu Institute of Technology, Rajaramnagar

(An autonomous Institute affiliated to Shivaji university, Kolhapur)

MM308

MID SEMESTER EXAMINATION 2013-14

F. Y. M. Tech Civil Structure Semester I

Course code and course: CES 503, Advanced Solid Mechanics

Day and date: Tuesday, 24/9/13 **Maximum Marks: 50**

Time: 3 pm to 5 pm.

Instructions: *1) All questions are compulsory*
2) Figures to the right indicate full marks
3) Use of non-programmable calculator is allowed
4) Assume suitable additional data if required and mention it clearly.

1.a) Derive the equation of equilibrium along tangential direction for an infinitesimal element in polar coordinate system. Draw a neat sketch showing an element indicating all these components. **08**

b) Derive the expressions for Lame's constants μ and λ from strain-stress relations and obtain set of stress-strain relations for isotropic elastic solids. **10**

2.a) At a point in a continuum, the stress components are $\sigma_x=3xy$, $\sigma_y=0$, $\sigma_z=0$, $\tau_{xy}=5y^2$, $T_{yz}=2z$, $\tau_{zx}=0$, $X=-13y$, $Y=0$, $Z=0$. State whether equilibrium conditions are satisfied for this state of stress and body forces. **06**

b) Prove that $\Phi= A(x^4-3x^2y^2)$ is Airy's stress function and investigate the stress distribution represented by it. **10**

OR

2.a) If the displacement field in a body is specified by $u_x=(x^2+3)10^{-3}$, $u_y=(3y^2z)10^{-3}$ and $u_z=(x+3z)10^{-3}$, determine the strain components at a point where co-ordinates are (1,2,3). **06**

b) Derive equations of compatibility from strain displacement relations **10**

3.a) Distinguish clearly between plane stress and plane strain condition. **04**

b) The state of stress at a point is given by $\sigma_x=100MPa$, $\sigma_y=200MPa$, $\sigma_z=-100MPa$, $\tau_{xy}=-200MPa$, $\tau_{yz}=100MPa$, $\tau_{zx}=-300MPa$. Determine the stress invariants, invariants of deviatoric stresses and principal stresses **12**

Enrollment No	

Q.P. Code	MM296

K.E.Society's

Rajarambapu Institute of Technology, Rajaramnagar.

(An Autonomous Institute)

Mid Semester Examination- September 2013

First Year M. Tech. Civil-Structure SEMESTER – I

Analysis of Structures (CES 501)

Day and Date: Monday, 23/09/2013

Time: 2 hrs 03:00pm To 05:00pm. Max Marks- 50

Instructions: 1) *All questions are compulsory*
2) *Figures to the right indicate full marks*
3) *Separate answer sheet is used for each section*
4) *Assume suitable data, if required and mention it clearly*

Q.1a. State significance of influence lines 5

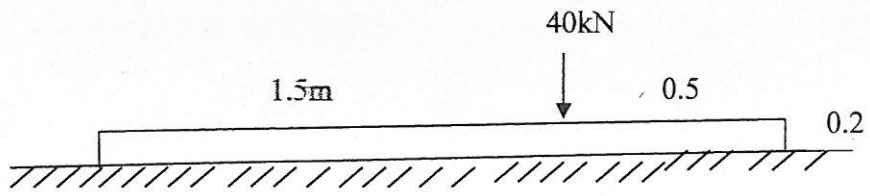
b. A two span continuous beam ABC is simply supported at A and C and continuous over support B, such that AB= 10m and BC=12m. Draw ILD for bending moment at 5 m from support C. Obtain ordinates of ILD at every quarter point of each span. 12

Q.2 A semicircular beam AB curved in plan of radius R is fixed at both ends and subjected to concentrated load W at mid point C of the span. The beam has circular cross section with radius r. Show that sagging moment at C, Mc = WR/π. 16

Q.3 Construct influence line diagram for horizontal thrust, radial shear and bending moment at a section 9 m from left hand support of the two hinged parabolic arch of span 30m and central rise 5m. 17

OR

Q.3 Determine the pressure distribution for the slab supported on soil, for which $K=1x10^3$ kN/m^2 and $E= 2x10^7$ kN/m^2. The load is per meter width of slab as shown in figure. Take the density of slab= 24 kN/m^3 17



Enrollment No	

Q.P. Code	MM297

K.E.Society's

Rajarambapu Institute of Technology, Rajaramnagar.

(An Autonomous Institute)

Mid Semester Examination- September 2013

First Year M. Tech. Civil Construction Management SEMESTER – I

Construction Project Management (CEC501)

Day and Date: Monday, 23/9/13

Time: 3pm to 5pm Max Marks- 50

Instructions:

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

Q.1 Attempt any two.

(a) What do you mean by project management and why it is necessary? (8)

(b) Describe scope of construction industry with respect to international and domestic market. (8)

(c) Describe role of construction project manager with suitable example. (8)

Q. 2 Attempt any two.

(a) Explain project management phases and process with suitable example. (8)

(b) What do you mean by W. B. S.? Classify project work break down levels. (8)

(c) Prepare W.B.S. for any one construction project. (8)

Q.3

(a) The following are the activities and their durations of a small project. Draw the network and mark critical path. Prepare activity table showing EST, EFT, LST, LFT and all floats. (9)

Activity	1-2	1-3	2-5	2-7	3-4	3-6	4-5	5-6	5-7	6-7	7-8
Duration in days	10	12	9	11	5	5	7	8	10	6	12

(b) Draw a precedence network diagram from the following activity information. Determine project duration and identify the critical path. (9)

Activity	Duration	Predecessor	Relationship
A	1	--	--
B	5	A	FS 2
C	4	A	SS 4
E	9	A	FF 10
D	5	B	FS 0
F	6	C	FS 4
G	1	D	FS 1
H	6	E, F ,G	FS 2, SS 4, FF 4

Enrollment No.		Q.P. Code	MM309

K.E.Society's

Rajarambapu Institute of Technology, Rajaramnagar.

(An Autonomous Institute)

Mid Semester Examination- September 2013

First Year M. Tech. Civil Construction Management SEMESTER – I

Construction Techniques and Equipments – (CEC503)

Day and Date: Tuesday, 24/9/13

Time: 2hr Max Marks- 50

Instructions: (If any)

i. Assume suitable data required
ii. Figures to right indicate marks
iii. Use of calculators is allowed
iv. All questions are compulsory
v. Refer tables and graphs provided

Q1 a "Machines make it possible" Justify your answer through examples and machines on various projects. 06

OR

"Dozers are construction Horses" Justify this statement with example. Explain various tasks performed with various adjustments of dozer.

b A track-type dozer equipped with a power shift (see Fig. 7.4) can push an average blade load of 6.15 lcy. The material being pushed is silty sand. The average push distance is 90 ft. What production, in loose cubic yards, can be expected? *Given* 08

Push time: 2 mph average speed (sandy material);
Return speed 4mph
allowance for acceleration time = 0.05 min

c Explain operations performed by the dozer. Enlist steps for production estimate of Dozer 08

OR

How long will it take a crawler D7G dozer w/ straight blade to move 6,700 bcy's 150 feet?

- Grade -2%
- Dry clay, 1,950 lb/lcy
- Operator of average skill
- 50-min hour

Assume: Refer figure 1
Ideal Production = 320lcy/hr
Soil density = 2300 lb/lcy
Average operators skill
Swell factor = 0.74

Q2 a What are various operations included in earth work operation? State work cycle of scraper. Explain advantages of using scrapers in earth work operation and types feasible in various conditions. 08

OR

Determine the maximum hauling production given the following conditions. As many scrapers as required can be used, but only one push tractor will be available. The material is a sandy clay (dry earth), 2,900 lb/bcy. The expected haul-road rolling resistance is 80 lb/ton. The average scraper load will be 28.2lcy. There are three segments to the haul route: 600 ft at a grade of +3%; 2,200 ft at 0% grade; and 400 ft at +4% grade (moving from the cut to the fill). To account for acceleration and deceleration use an average speed of 4 mph for 200 feet at each end of the haul and return. Use the scraper specifications in Table 1.1 and the "performance charts" in Fig. 2. Assume 50-min hour efficiency.

b What advantages a hydraulic excavators have due to its hydraulic controls? State and explain various attachments used and tasks performed by each. 08

OR

A 4-cy wheel loader will be used to load trucks from a quarry stockpile of processed aggregate having a maximum size of 11/4 in. The haul distance will be negligible. The aggregate has a loose unit weight of 3,100 lb/cy. Estimate the loader production in tons based on a 50-min hour efficiency factor. Use a conservative fill factor.

Given:
Fill Factor=85%
50% static tipping load
Cycle time 30 sec.

Q3 a Explain work cycle of shovel. State with formulae all six steps involved in estimating shovel production 06

OR

State work cycle of hauling trucks and explain factors considered for computing production of trucks.

b Explain operation of grader and justify grader as multipurpose equipment. 06

OR

Which are the various plants required on the projects? Explain in detail working of aggregate production and interaction of this plant with other plants.

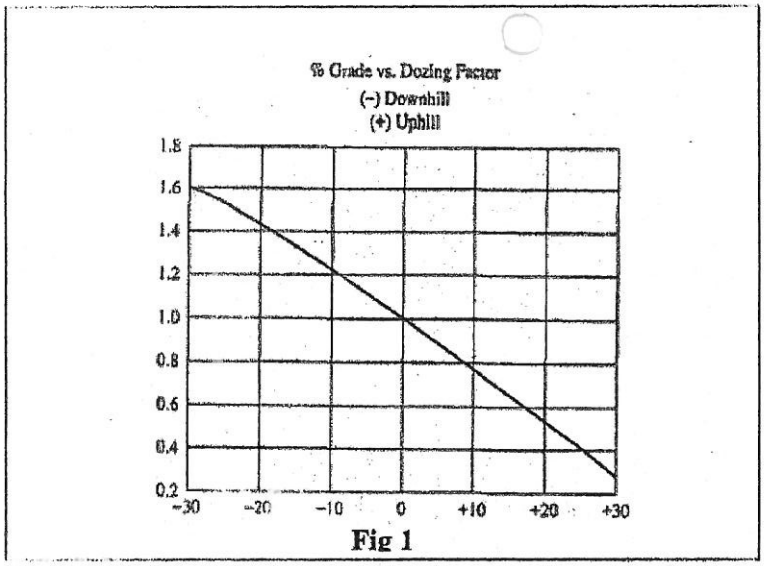
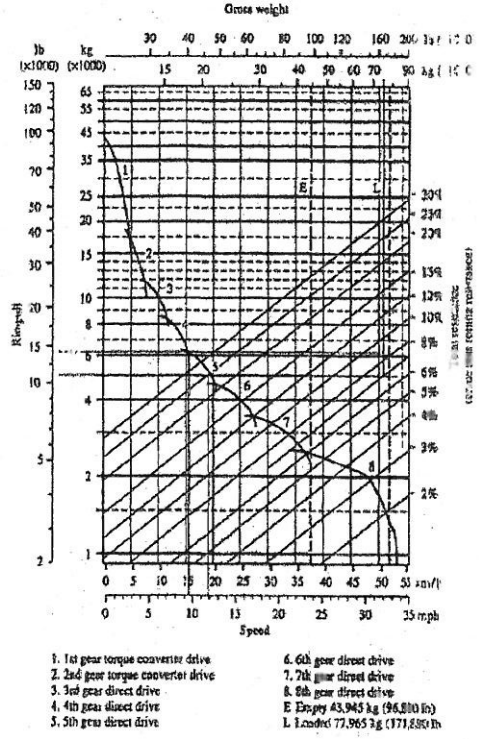


Fig 1

Engine: f.	heel power 450		
Transmission: semiautomatic power shift, eight speeds			
Capacity of scraper:	Struck		21 cy
	Heaped		31 cy
Weight distribution:	Empty	Drive axle	67%
		Rear axle	33%
	Loaded	Drive axle	53%
		Rear axle	47%
Operating weight:	Empty		96,880 lb
Rated load:			75,000 lb
Top speed:	Loaded		33 mph

Table 1



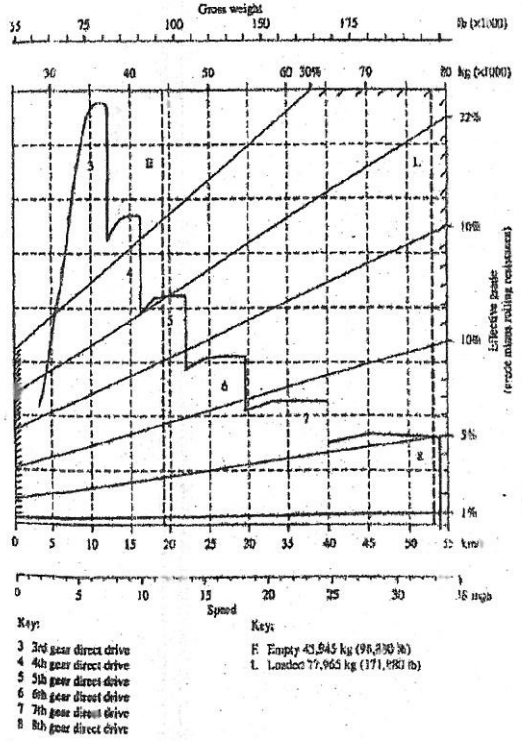


Figure 2

MID SEMESTER EXAMINATION 2013-14
M. Tech. (Civil-Structures) Part – I
Structural Dynamics

MM320

Day & Date : 25/09/2013, Wednesday
Time : 3 pm – 5 pm
Max. Marks : 50

Instructions :
1. Solve all three questions
2. Figures to the right indicates full marks
3. Use of non programmable calculator is allowed

1. A single degree of freedom system, having a mass of 2.4 kg and stiffness k, is set into motion with a *low* viscous damping, and allowed to oscillate freely. The frequency of the oscillation is found to be 15 Hz and measurement of the amplitude of oscillation shows two successive amplitudes to be 5.5 mm and 5.1 mm. Determine the viscous damping coefficient, c and the stiffness k of the system.

OR

A mass of 2 kg is supported by a damped spring, where the damping constant is 2.8 Ns/m. The mass is displaced 20mm from its equilibrium position and released from rest and the frequency is observed to be 2.5 Hz. Find the displacement after 4 complete cycle and the time taken for the displacement to be reduced to 5% of the initial displacement. 16

2. a) Explain how the response of a SDOF system subjected to a dynamic loading can be determined using Duhamel's Integral. OR 6

   a) Write short note on Duhamel's Integral. 6

   b) An over damped system has a spring constant K=140N/cm and a weight W of 86N and a damping factor C of 14.3 N sec/cm. It is at rest in its static equilibrium position when it receives an impulse force acting to the right that creates an initial velocity 25 m/sec. Determine an expression for the displacement x of the mass in terms of t. 12

3. Derive Equation of motion for SDOF system for external force $F(t) = F_0 \sin \omega t$. Plot graphs of Dynamic magnification and phase angle verses period of vibration. Comment on each. 16

Enrollment No	

Q.P. Code	MM321

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Rajarambapu Institute of Technology, Rajaramnagar.

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Mid Semester Examination- September 2013

First Year M. Tech. Construction Management SEMESTER – I

Construction Contracts and Materials Management (CEC 505)

Day and Date: Wednesday 25/9/13

Time: 3pm to 5pm Max Marks- **50**

Instructions:

1) All questions are compulsory
2) Figures to the right indicate marks

Q.1 a) State detailed classification of contracts. State examples of each. 06

b) Differentiate between Strike and Lock-out. 04

c) Explain with example what you understand by void contract. 06

Q.2 a) Explain advantages of arbitration over legal proceedings in a court. 06

OR

What is meant by Arbitration? What are its various powers? Also explain its necessity

b) What are the responsibilities of building owner? 04

Q.3 a) Explain injunction? State and explain its types? 06

Q.4 a) Define the following terms 03

A. Industry
B. Workmen
C. Contract

b) Write a note on: **(Any THREE)** 15

a) Industrial Dispute Act
b) Payment of Wages Act
c) Trade Union Act.
d) Workmens Compensation Act
e) Sales of Goods Act

□ *Best of Luck* □

Enrollment No		Q.P. Code	MM336

K.E.Society's

Rajarambapu Institute of Technology, Rajaramnagar.

(An Autonomous Institute)

Mid Semester Examination- September 2013

First Year M. Tech. Civil Construction Management SEMESTER – I

Human Resource Management in Construction – (CEC509) (PE I)

Day and Date: Thursday, 26/9/13

Time: 2hr Max Marks- 50

Instructions: (If any)

i. Assume suitable data required
ii. Figures to right indicate marks
iii. All questions are compulsory

Q 1 Solve any two questions from following. (6*2) 12

a Discuss about human resource planning. What are the factors considered?

b Briefly explain the employee selection process with real world example.

c If you were responsible for hiring someone for your job, which recruitment sources would you use? Why? Which sources you would avoid? Why?

d Explain theories of motivation.

Q 2 Solve any two questions from following. (6*2) 12

a What are the objectives and functions of HRM?

b What you mean by motivation? Explain motivation process.

c What you understand by span of control? How it affects the organizational structure?

d Bring out various methods used to determine number of recruits. Explain one you like. State why?

Q 3 Solve any five from following. (5*5) 25

a Explain purpose and importance of recruitment.

b Explain the factors affecting process of selection.

c What are the barriers to effective selection?

d Which are the ways to enhance training effectiveness?

e Write a detailed note on Job Analysis.

f What are the inputs into training and development? Explain.

g Explain the training process.

MM349

Rajarambapu Institute of Technology

Mid-Semester Examination (MSE), IEO503: Numerical Methods in Engineering

Date: 27.9.2013. Time: 2 Hrs, Max Marks 50

3 pm - 5 pm.

All questions are compulsory

Q.1 What is expected output of the following programs in MATLAB (18)

a) 09

```
x=3;
while (x<5)
  disp(x);
  x=x+1;
end
disp(x);
```

b)

```
x=2753;
while (x > 1)
  x=x/2;
end
disp(x)
```

c)

```
x=1.2;
for n=[1:5]
  x=x^2;
end
disp(x)
```

d) 03

```
syms x;
for n=[2:5]
 disp(['The derivative of ',char(x^n),' is ',char(diff(char(x^n),'x'))])
end
```

e) 06

```
total=0;
for n=[1:10]
  total=total+n;
end
disp(total);
```

f)

```
syms x a b c;
solve('a * x ^ 2 + b * x + c=0');
```

Q.2 a) Write algorithm with supporting figures for bisection method to find the roots of equation and hence comment on convergence 08

b) Derive Trapezoidal rule for integration from Newton-Cot's equations. 08

Q.3 a) Write algorithm with supporting figures for Newton Raphson method to find the roots of non-linear equations and hence comment on convergence 08

b) Compute the integration using Simpson's 3/8 rule and comment on error wrt exact. 08

$$I = \int_0^{\pi/2} \sqrt{\sin(x)}\,dx$$

OR

Q.3 a) Find the root of equation $f(x) = x^2 - 3x - 2$ using bisection and Newton Raphson method and compare their results with exact results. Take initial guess as $x = 0$. 08

b) Compute the integration using Gauss 3-point formula rule and comment on error wrt exact. 08

$$I = \int_{-2}^{2} e^{-\frac{x}{2}}\,dx$$

n	Points	Weight ages (w)	Location
3	1	0.55556	-0.77460
	2	0.88889	0.00000
	3	0.55556	-0.77460

*****

Enrollment No	

Q.P. Code	MM350

Rajarambapu Institute of Technology, Rajaramnagar.

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Mid Semester Examination- September 2013

First Year M. Tech. Civil Construction Management SEMESTER – I

Project Management – (IE505)

Day and Date: Friday, 27/9/2013.

Time: 2hr 3pm – 5pm Max Marks- 50

Instructions: (If any)

i. Assume suitable data required
ii. Figures to right indicate marks
iii. Use of calculators is allowed
iv. All questions are compulsory

Q 1 a The VP of marketing approaches you with a fabulous idea. "fabulous" because he is the boss and he has thought it up. He wants to set up kiosks in the grocery stores as mini offices. "These offices will offer customers the ability to sign up for new wireless phone services, make their wireless phone bill payments, and purchase equipments and accessories. He believes that exposure in grocery stores will increase awareness of the company's offerings. After all, everyone has to eat, right? He told you that the board of directors has already cleared the project, and he will dedicate as many resources to this as he can. He wants the new kiosks in place in 12 stores by the end of next year. The best news is he has assigned you to head up this project. 08

Read the case carefully and justify with statement; whether this is a project or process.

b Define life cycle of the project. Explain characteristics of the project life cycle. 07

OR

Bring out in detail skill set desired from Project Manager.

Q 2 a Explain in brief various organizational structures used in project management. Which parameters distinguish among organizational structures? 08

OR

What is a process? Explain project characteristics and what should be done to make project successful.

b Explain PDCA cycle. 07

OR

Explain the project management process interaction.

*Solve any Ten from the following (2*10=20)*

1	How much time does the typical project manager spend communicating both formally and informally? A. 40-60% B. 50-70% C. 60-80% D. 75-90%
2	The two closing procedures are called: A. Contract close out and scope verification B. Contract close out and Close Project C. Project closure and product verification D. Project closure and lessons learned
3	As applied to projects, temporary means that A. Projects are short in duration B. Every project has a definite beginning and end C. The undertaking will end at an undetermined in the future D. Projects can be cancelled at any time
4	A complex project will fit best in what type of organization? A. Functional B. Cross-functional C. Matrix D. Balanced
5	A project kick off meeting is usually conducted to: A. Setup project team and announce the PM assignment B. To draft project charter C. Build up team spirit D. Define project scope and develop WBS
6	**Which of the following is not normally an element of the Project Charter?** A. The formal authorization to apply organizational resources to project activities. B. Work package descriptions. C. The business need that the project was undertaken to address. D. The product description or a reference to this document
7	Which is not a good project example? A. Designing a new transportation vehicle B. Running a political campaign C. Building a facility D. Raising purchase order
8	The salient difference between operations and projects is _____: A. While one is ongoing and the other is temporary B. While one is repetitive and the other is unique C. While one may be well established, the other addresses the future D. 1, 2 and 3

9	Projects are frequently divided into _____ for easy manageable purpose: A. Subprojects B. Programs C. Function based grouping D. Sub products
10	In the beginning of a project, the probability of successfully completing the project is _____ , risk is _____ and uncertainty is _____: A. Lowest, lowest , lowest B. Highest, highest, highest C. Lowest, highest, highest D. Highest, lowest, lowest
11	The objective of fast tracking a project is to: A. Increase productivity. B. Reduce project duration. C. Increase schedule tracking controls. D. Reduce project risks
12	You have never managed a project before and are asked to plan a new project. It would be best in this situation to rely on _____ during planning to improve your chance of success? A. your management skills B. your previous training C. historical records D. responsibility charts
13	The project life cycle: A. Determines if the project should continue to the next phase. B. Defines the beginning and end of a project. C. Is a collection of project phases? D. B and C
14	George works for a medium-size IT consulting company and likes his job. He recently became involved with an upgrade of his company's IT system, and it will likely become an ongoing activity for him in addition to his other responsibilities. What describes the work that George is doing for this new assignment? A. It is an attractive project and he should take it. B. Because the project has several phases, it will use a lot of resources. C. His new work is an interesting program for the company. D. He should look for a new job.
15	The triple constraints of Project Management are frequently discussed in other contexts such as marketing classes and a variety of other subjects. The interaction between _____, _____, and _____ can be seen as a triangle, with the three sides impacting the others. A. quality, resources, time B. money, resources, quality C. scope, quality, planning D. time, scope, cost

Answer sheet for objective questions

QUESTION	ANSWER	QUESTION	ANSWER	QUESTION	ANSWER
1		6		11	
2		7		12	
3		8		13	
4		9		14	
5		10		15	