

Enrollment No	
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Q.P. Code	MM458
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K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar.
 (An Autonomous Institute)
Mid Semester Examination- October 2014
 First Year M. Tech. Civil Construction Management SEMESTER – I
Construction Project Management (CCM501)

Day and Date: Mon, 13/10/14
 Time: 10:30 - 12:30 pm

Max Marks- 50

Instructions:

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

Q.1 Attempt any two.

- (a) Explain concept of project and describe types of projects with suitable examples. (8)
- (b) Describe scope of construction industry with respect to 12th development plan of Government of India, CPWD projects, National Highway Authority of India projects and International projects. (8)
- (c) Classify project work breakdown levels with suitable example. (8)

Q. 2 Attempt any two.

- (a) Compare management of construction projects and the management of other ongoing projects with suitable example. (8)
- (b) Discuss how the understanding of float on construction activities can improve project management practices. (8)
- (c) Which resources are most critical in the current local construction market? Support your answer with data and describe how you would incorporate this information into the schedule. (8)

Q.3

- (a) Activity durations and precedence relationships between the activities of a project are given below. Draw the PDM network and indicate activity timings. Also calculate TF and FF (12)

Activity	A	B	C	D	E	F	G	H	I	J
Duration	10	5	6	8	4	5	7	4	5	5

Precedence relationships

$$F_A S_C = 4 \quad S_A S_B = 0 \quad S_B S_D = 2 \quad F_G S_J = 0$$

$$F_D S_E = 3 \quad S_E S_F = 0 \quad F_C S_G = 2 \quad F_I S_J = 1$$

$$F_C S_I = 0 \quad F_F F_H = 4 \quad S_H S_G = 0$$

- (b) Create a linear schedule for a high rise building project or highway project. Include the description with your linear schedule. (8)

Enroll. No.

K.E.Society's
Rajarambapu Institute of Technology,
Rajaramnagar
(An Autonomous Institute)
Mid Semester Examination Oct.2014
First Year M. Tech.(Civil -Structure) SEM.-I
Analysis of Structures (CST 501)

QP No. -
MM457

Day & Date: Mon, 13/10/14 Time : 10:30 - 12:30 pm Max. Marks : 50

Instructions :

- 01 All questions are compulsory
- 02 Figures to the right indicate full marks
- 03 Assume suitable data, if required and mention it clearly
- 04 Nonprogrammable Calculator is permitted

- Q. 1. A semicircular beam AB curved in plan of radius R. A cross section of beam is circular of radius r. Beam is fixed at both the ends A and B, and it carries a concentrated load W at mid length at C of a beam. Show that sagging moment at C, $M_c = WR/\pi$. Also construct BMD and TMD. Take $EI/GJ = \alpha$ 17
- Q. 2. A three span continuous beam ABCD, simply supported at A and D and continuous over the support B and C, such that AB= 20m, BC= 10m and CD= 30m. Construct ILD for the reaction at support C. Compute ordinates of influence line at mid spans of AB and BC and at intervals of 10 m in span CD. Assume EI is constant throughout the beam. 17
- Q. 3. Derive equations for deflection, pressure, slope, bending moment and shear force for long beam on elastic foundation subjected to concentrated load P_0 at one end which is hinged. Also draw their corresponding diagrams. 16
- OR**
- Q. 3. A long steel pipe 200 mm external diameter is suspended from a series spring hangers each having spring constant of 16.8 N/mm. The springs are spaced 3 m centers along the pipe. A concentrated load of 15 kN is suspended from center length of pipe. The modulus of elasticity of steel is 210 kN/mm². Calculate the maximum deflection, and flexural stress in the pipe. Take $I = 117 \times 10^5 \text{ mm}^4$. 16

Enrollment No	
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Q.P. Code	MM468
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K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar.
(An Autonomous Institute)

Mid Semester Examination- October 2014
First Year M. Tech. Civil Construction Management SEMESTER - I
Construction Techniques and Equipments – (CCM503)

Day and Date: Tues. 14/10/14

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

Q 1 a Reason why earthwork planning is necessary? State and explain operations involved. 07

OR

What is cycle time? Why it is important to reduce cycle time? What are the factors that affect cycle time of equipments in general?

b What are the three states in which soil is measured? Explain correlation and application. 07

Q 2 a A 200 Hp dozer is used to push material up to 90 ft, calculate the ideal production of the dozer using thumb rule formula used by manufactures. 08

b Explain how to determine rippability of rock. What geological conditions favor in ripping of rock. 08

OR

Excavator has many secondary attachments to perform various tasks; why as a civil engineer you will seek help from such secondary application when the same tasks can be performed as primary task by other equipments? Justify?

Q 3 a Based on the computation, you site engineer demands for fleet of 3 (three) excavators with bucket capacity of 1.2 M³ and 5 hauling units with volume of 6M³. Available equipments in your possession are 3 (three) excavators with 1.5M³ bucket size and hauling units, 8 numbers of 6m³ capacities. What decision you will take as a manager to fulfill the demand in optimized manner if the production cost of 1.2m³ and 1.5M³ excavators is Rs.40 & 41.5 respectively. Knowing that cycle time of hauling unit is 60 minutes, and that of 1.2m³ and 1.5M³ capacity excavators is 2 minutes, operators efficiency is 50M/Hr. 10

OR

In a slot dozing task; required production of a dozer is minimum 30 M³/Hr, what capacity bucket and distance of dozing will be compatible to achieve the said task, if efficiency is 45 Min/Hr, cycle time for 100M, 200M and 300M is 3,6 & 10 minutes respectively, available bucket sizes vary between 1.2 to 2.1 m³.

Seat No	
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K.E. Society's

Q. P. Code No	MM467
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Rajarambapu Institute of Technology, Rajaramnagar
(An Autonomous Institute)

Mid Semester Examination, 2014
F.Y. M. Tech Civil Structure – Semester I
Course: Advanced Solid Mechanics,
Course Code: CST503

Date & Day: Tues. 14/10/14

Maximum Marks: 50

Time: 10:30 – 12:30 pm.

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Use of non-programmable calculator is allowed.
4. Draw neat sketches wherever necessary.
5. Assume suitable data if required and mention it clearly.

1 Solve any two

a The general displacement field in a body, in Cartesian coordinates, is given as, 08
 $u = 10^{-5}(x^2 + 6y + 7xy)$, $v = 10^{-5}(yz)$, $w = 10^{-5}(xy + yz^2)$. Find the state of strain at $(x, y, z) = (1, 2, 3)$.

b The state of stress at a point in a body is given by $\sigma_x = 6x^2yz$, $\sigma_y = 5xyz^3$, $\sigma_z = 2(x^3 + y^3 - 2yz)$, $\tau_{xy} = 3xy^2z$, $\tau_{yz} = \frac{1}{4} [(6y^2 - 5xz^2)z^2 + 8(x^2 + y^2)]$ and $\tau_{zx} = 3xyz^2$. Does this satisfy the equations of equilibrium in the absence of body forces? 08

c The stress components at a point are $\sigma_x = 100\text{N/mm}^2$, $\sigma_y = -60\text{N/mm}^2$, $\sigma_z = 40\text{N/mm}^2$, $\tau_{xy} = 50\text{N/mm}^2$, $\tau_{yz} = 30\text{N/mm}^2$, $\tau_{zx} = -40\text{N/mm}^2$. Calculate the stress invariants and magnitudes of principal stresses. 08

2 a Explain plane stress and plane strain problems. 06

OR

a Explain hydrostatic stress, deviatoric stress and invariants of deviatoric stress. 06

b The strain components at a point in a body are given as follows: 06

$$\{\epsilon\} = \begin{bmatrix} 0.55 & -2.50 & 0 \\ -2.50 & 0.30 & 0.25 \\ 0 & 0.25 & -0.95 \end{bmatrix} \times 10^{-4}$$

If the modulus of elasticity for the material is $25 \times 10^6 \text{ kN/m}^2$ and Poisson's ratio is 0.25, determine the stress components at that point.

c Investigate what problem is solved by $\phi = -\frac{F}{d^3} xy^2(3d - 2y)$ applied to the region included in $y = \pm d$, $x = 0$ in the positive side of x . 10

- 3 A curved bar of rectangular section 40mm wide and 60mm deep and of mean radius of curvature 100mm is subjected to a bending moment of 1.5×10^6 Nmm, tending to straight the bar. Find the position of neutral axis and the magnitudes of bending stresses. Sketch the variation of bending stress across the cross section 12

MID SEMESTER EXAMINATION 2014-15
M. Tech. (Civil-Structures) Part - I
CST 505 Structural Dynamics

MM477

Day & Date : 16/10/2014, Thursday
Time : 10:30 - 12:30 pm.
Max. Marks : 50

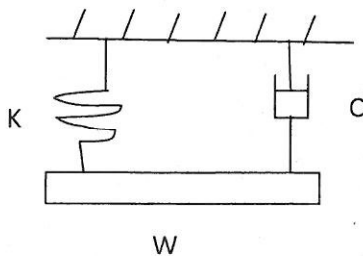
- Instructions :**
1. Solve all three questions
 2. Figures to the right indicates full marks
 3. Use of non programmable calculator is allowed

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 machine of mass 1000kg is supported on a vertical flexible mounting modeled as a single degree of freedom system. The mounting has a total stiffness 50 kN/m but negligible damping. Any horizontal motion of the system should be ignored. In normal operation the machine is subjected to a vertical force $F = F_0 \sin \omega t$, where the amplitude F_0 is 2500N. Calculate the response amplitude and force transmitted to the foundations when the driving frequency is 20 Hz. 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 $K=140\text{N/cm}$ 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. The mass shown in figure is initially at rest when a velocity of 10cm/sec is given to it. Find the subsequent displacement and velocity of the mass. Take $C= 0.15 \text{ N-sec/cm}$, $K= 100 \text{ N/cm}$ and $W = 200 \text{ N}$. 16



Enrollment No	
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Q.P. Code	MM487
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K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar.
(An Autonomous Institute)
Mid Semester Examination- October 2014
First Year M. Tech. Civil Construction Management SEMESTER - I
Human Resource Management in Construction (CCM509)

Day and Date: Fri, 17/10/2014
Time: 10:30 - 12:30 pm

Max Marks- 50

Instructions:

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

Q.1 Attempt any two. (20)

- (a) Justify the need and importance of HRP with suitable examples.
- (b) Describe the process of conducting job analysis for construction projects.
- (c) Identify the factors affecting job design.

Q. 2 Attempt any two. (20)

- (a) Suggest and justify the type of organization structure for multinational construction company.
- (b) Discuss the different methods of training for officers and workers in an organization.
- (c) How hierarchy of needs theory is applicable for employees in construction industry.

Q.3 (10)

- (a) Explain the concept job enrichment.
 - (b) Discuss about quality of work life.
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K.E.Society's

Enroll.
No.

Rajarambapu Institute of Technology, Rajaramnagar
(An Autonomous Institute)

MM486

MID SEMESTER EXAMINATION, 2014

F.Y.M.Tech. Civil Structure (Semester-I)

MAINTENANCE AND REHABILITATION OF STRUCTURES

(Course Code: CST 507)

Day & Date: 17/10/2014

Time : 2 Hrs

Max. Marks : 50

Instructions :

i. All questions are compulsory

Q.1. a Specify the reasons for commonly encountered leakage problems in building and suggest the possible remedies. 09

OR

a Outline various sources and causes of dampness in a building. Illustrate the ill effects of dampness on various components and materials in a building. 09

b Explain how will you classify the grade of concrete in Ultrasonic Pulse Velocity testing? Differentiate between pull-out and pull-off tests. 09

Q.2. a State the causes for deterioration and distress in concrete structures. Illustrate what type of distress is witnessed due to each cause. 08

b Classify various types of cracks and explain various causes of their occurrence. Write the time of appearance of various types of cracks from the time of placing the concrete. 08

OR

b Explain the various defects in welding. Which NDT method would you suggest to detect a surface flaw of an aluminium weld? 08

Q.3. a Discuss the principal mechanisms causing non-structural cracks in the building. 08

b Distinguish between quality assurance and quality control. Discuss the various components of quality management system. 08

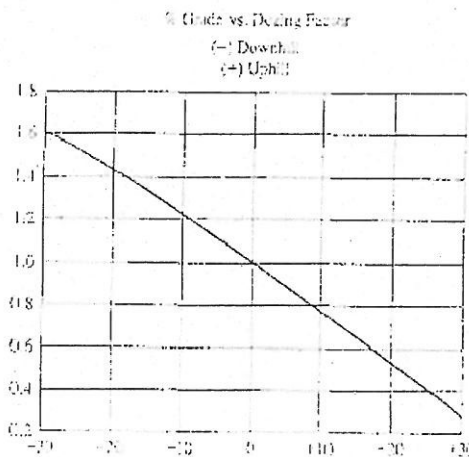
OR

b Summarize the various non-destructive and semi-destructive testing techniques to assess the quality of structures and elements. 08

- b A track type CAT 824S dozer with a power shift transmission and straight blade is to be used to push a material that weighs 150pcf in the bank state using normal dozing method during a clear sunny day. It is estimated that material will swell 20% from bank to loose state. This dry, Non-cohesive soil is to be moved an average distance of 250 ft up a 12% grade. The operator is new with poor skills; job efficiency estimated is 45 min/hr. assuming 0.36 coefficient of traction. Calculate direct cost of the proposed earthmoving operation per bcy. The O&O cost of dozer is \$47.30 per hour and operator's wage is \$8.76 per hour plus 34% for fringes.

TABLE 7.2 Caterpillar job condition correction factors for estimating dozer production.

	Track-type tractor	Wheel-type tractor
Operator		
Excellent	1.00	1.00
Average	0.75	0.60
Poor	0.60	0.50
Material		
Loose stockpile	1.20	1.20
Hard to cut; frozen		
with till cylinder	0.60	0.75
without till cylinder	0.70	—
cable controlled blade	0.60	—
Hard to drift; "head" (dry, noncohesive material) or very sticky material	0.80	0.80
Rock, ripped or blasted	0.60-0.80	—
Side dozing	1.20	1.20
Side-by-side dozing	1.15-1.25	1.15-1.25
Visibility		
Dust, rain, snow, fog, or darkness	0.80	0.70
Job efficiency		
50 min/hr	0.93	0.89
40 min/hr	0.67	0.67
Direct drive transmission (5.1-min fixed time)	0.80	—
Bulldozer		
Adjust based on SAE capacity relative to the base blade used in the estimated dozing production graphs		
Grades—see the graph		



*Note: Angling blades and crawler blades are not considered production-boosting tools. Even when on jobs such as the A-blade and C-blade will average 50-75% of straight-blade production.
 Required sources of Caterpillar Inc.

Enrollment No	
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Q. Code	MM497
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K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar.
(An Autonomous Institute)

Mid Semester Examination- September 2014
First Year M. Tech. Civil Construction Management SEMESTER - I
IE-I, Project Management (IEO505)

Day and Date: Sat, 18/10/2014

Time: 2hr 10:30 - 12:30 pm

Max Marks- 50

Instructions: (If any)

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

- Q.1**
- a Softwares get updated and new versions come into market. The new software version has some advanced or new features embedded in it. Illustrate with example the project and process part of this software business. 6
 - b Many a time it has been observed that operations are managed as the projects. Why people are confused about operations and Projects. What are the shared characteristics between project and operation, explain stating example. 6
 - c Explain in brief Project, Program and portfolio management. State importance of each? 6

OR

Illustrate with a flow diagram primary skill set required to be a project manager.

- Q.2**
- a Differentiate between Scope creep and progressive elaboration. Explain influence of each with example. 6

OR

Define is project management and Explain in details what it includes?

- b Study the given case below and answer the questions.** 8
- 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.

- a) Is this a project or a process? Give definition of the selection.
 - b) Justify your answer with example.
- c** State the phase characteristics. Explain why they are important? 6

OR

Who can be the project stakeholders? Why are they important in project? Explain stating their influence on the project.

Q.3 Solve any three (3)

- a 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? **Why?** 4
- a) your management skills
 - b) your previous training
 - c) historical records
 - d) responsibility charts
- b Who can be the project stakeholders? Why are they important in project? Explain stating their influence on the project. 4
- c Bring out the characteristics of Project life cycle. Explain the influence of the characteristics on project. 4
- d For being a project manager, Is it necessary for you to be the expert in the technical area of the project? Why? 4

Seat No

K.E. Society's

Q. P. Code No MM496

Rajarambapu Institute of Technology, Rajaramnagar.

(An Autonomous Institute)

Mid Semester Examination, 2014

F.Y. M. Tech Civil-Structure –Semester I

Course: Mechanics of Composite Materials,

Course Code: IEO517

Date & Day: Sat, 18/10/2014

Maximum Marks: 50

Time: 10:30-12:30pm

- Instructions:
1. All questions are compulsory.
 2. Figures to the right indicate full marks.
 3. Use of non-programmable calculator is allowed.
 4. Draw neat sketches wherever necessary.
 5. Assume suitable data if required and mention it clearly.

1 a Explain the concept of smart material and classify them. Illustrate the concept of smart concrete. 08

OR

a Classify the smart materials and describe their applications. 08

b How are composite materials classified? Give examples of composite materials. 08

2 a The general displacement field in a body, in Cartesian coordinates, is given as, 06

$u = 0.015x^2y + 0.03$, $v = 0.005y^2 + 0.03xz$, $w = 0.003z^2 + 0.001yz = 0.005$. Find the state of strain at $(x, y, z) = (1, 0, 2)$.

b A square composite plate containing unidirectional continuous carbon fiber reinforced epoxy 08
subjected to a uniaxial tensile load of 1000N. The plate thickness is 1mm. The length 'L' and width 'W' of the plate are 100mm each. Refer Table No. 1 for Typical properties of Carbon-Epoxy Composites.

Consider two loading cases, where

i) Load is applied parallel to the fiber direction

ii) Load is applied normal to the fiber direction

Calculate the changes in length and width of the plate in each case.

c A lamina consists of a 70% fiber volume fraction. The properties of fiber and matrix are given in 10
Table No. 2 and Table No. 3 respectively. Find the longitudinal elastic modulus, transverse elastic modulus, major Poisson's ratio, minor Poisson's ratio and in plane shear modulus of the lamina.

OR

c For a unidirectional lamina, find the following: Compliance matrix, Minor Poisson's ratio, reduced 10
stiffness matrix and strains in 1-2 coordinate system if the applied stresses are $\sigma_1 = 2\text{N/mm}^2$, $\sigma_2 = -3\text{N/mm}^2$, $\tau_{12} = 4\text{N/mm}^2$. Properties of the lamina are given in Table No. 1

3 a Expand the following laminate codes.

04

- i. $[45/-45]_s$
- ii. $[45/-45]_2$
- iii. $[45/0]_{3s}$
- iv. $[45/\pm 30]_2$

b Derive the strain- displacement equation for laminates.

06

Table No. 1	Table No. 2	Table No. 3
Typical properties of Carbon-Epoxy Composites	Typical properties of fibres	Typical properties of Matrix
Axial modulus= 127.5GPa	Axial modulus= 85GPa	Axial modulus= 3.5GPa
Transverse modulus= 9.0GPa	Transverse modulus= 85GPa	Transverse modulus= 3.5GPa
Axial Poisson's ratio= 0.25	Axial Poisson's ratio= 0.20	Axial Poisson's ratio= 0.35
Axial shear modulus= 5.7GPa	Transverse Poisson's ratio= 0.20	Transverse Poisson's ratio= 0.35
	Axial shear modulus= 35.42GPa	Axial shear modulus= 1.3GPa