

K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar
(An Autonomous Institute, affiliated to SUK)

Enroll No

Q.P.Code
UT 1628

Unit Test-02
First Year M. Tech. Civil-Structural Engineering Sem.-II.
Finite Element Analysis Course Code: CES 2011

Day & Date: ~~Monday, 19/03/2018~~ Thu, 22/03/2018
Time: ~~10.30 am - 11.30 am.~~ 5.00 - 6.00 pm

Max Marks- 25

Instructions: 1) Attempt all questions. 2) Figures to the right indicates full marks
3) Assume suitable data, if required 4) Use of nonprogrammable calculator is allowed

Q.1a) What is shape function? Write the shape function for 1-D, 3 noded finite elements. CO₃ 3

OR

- a) Explain when 3D elements used in finite element method and why? CO₃ 3
- b) A two span continuous beam ABC, such that AB = L and BC = 2L is fixed at A and C and simply supported at B that allows rotation. The beam is subjected to udl of intensity w/m over the span AB. Compute the rotation at the simple support and reactions at all supports. Use FEM. CO₂ 10

Q.2a) Evaluate the stiffness matrix [K] for four noded rectangular isoparametric element of size 2a x 2b for plain stress and strain condition. CO₄ 8

OR

- a) Formulate stiffness matrix [K] using relationship between natural and cartesian coordinate system in isoparametric element with the help of suitable example. CO₄ 8
- b) What do you mean by isoparametric element? Explain its importance. CO₄ 4



BP code
UT 1644

K. E. Society's
Rajarambapu Institute of Technology, Rajaramnagar
(An Autonomous Institute)
Unit Test No 2 Mar 2018

M Tech Civil (Structural Engineering) SEM – II
Advanced Design of Concrete Structures CES-2021

Day and Date – Fri, 23/03/2018
Time- 5.00 – 6.00 pm

Maximum marks – 25

Instructions – All questions are compulsory
Figures to right indicates full marks

Q 1 a) Design interior panel of flat slab 5.5 x 7 m carries superimposed load of 12 kN/m.² excluding self-weight Slab is continuous in both directions. Drop is Provided. Steel of grade Fe 415 & concrete M 20 with clear cover of 30 mm. Verify shear stress. Draw sketch. 20

OR

Design exterior panel of flat slab 6 x 7.5 m carries superimposed load of 11 kN/m.² excluding self-weight Drop is provided. Steel of grade Fe 415 & concrete M 20 with clear cover of 25 mm. Verify shear stress Draw sketch. 20

Q 2 Compare briefly any two points about design of Steel & RCC building under fire resistance structure



Unit Test 2, 2018

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

Course: Theory of Elasticity and Plasticity, Course Code: CES2031

Date & Day: 20-03-2018, Tuesday

Maximum Marks: 25

Time: 10.30am to 11.30pm

- 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 data if necessary and mention it clearly.
 5. Draw neat sketches wherever required.

- 1 a If the value of E and G for an alloy are 2×10^5 MPa and 0.8×10^5 MPa. Find Lamé's constants. Hence 05
or otherwise if $\epsilon_x = 0.001$, $\epsilon_y = -0.003$, $\epsilon_z = 0.0$, $\gamma_{xy} = 0$, $\gamma_{yz} = 0.0005$, $\gamma_{zx} = -0.002$, compute the
components of stress.
- b Prove that $\phi = A(x^4 - 3x^2y^2)$ is Airy's stress function and examine the stress distribution represented 05
by it.
- 2 a Derive the expressions for shearing stresses for equilateral triangular section of side 's' subjected 08
to torque 'T'. Show the distribution of shearing stresses on cross section.
- b Explain soap film analogy or membrane analogy? Derive the expression for shearing stress for thin 05
rectangular section of width 'b' and small thickness 't' ($b \gg t$) subjected to torque 'T' by applying
membrane analogy.
- c A hollow aluminum thin walled rectangular tube is designed with outer dimensions 100mm x 02
50mm and wall thickness 5mm for a maximum shear stress of 35MPa. Find maximum permissible
twisting moment for this section and the angle of twist under this moment per meter length. $G =$
28GPa.



K. E. Society's Rajarambapu Institute of Technology, Sakharale
(An Autonomous Institute)
F. Y. M. Tech Civil Engineering Sem.- II
Unit Test 2 Mar/Apr.- 2018
Code No. & Name of Course : CES2081: PRE STRESSED CONCRETE STRUCTURES
(Program Elective III/IV)

Day & Date : Wed, 21/03/2018
Time : 10.30 - 11.30 am

Max. Marks : 25

Instructions : All questions are compulsory
Figures to the right indicate full marks
Assume suitable data if necessary

- Q.1. a) Prove that, $e = (2M_d + M_l) / 2P$ 10
Where, e - Eccentricity, M_d - Dead load moment,
P - Prestressing Force, M_l - Live load moment.

OR

A prestressed concrete beam of uniform rectangular cross section and span 18 meters supports a total distributed load of 302 kN excluding the weight of the beam. Determine the suitable dimensions of the beam and calculate the area of tendons and their positions. The permissible stresses are 15 N/mm² for concrete and 1100 N/mm² for the tendons.

- Q. 2 15
Design a pretensioned beam for the following data:
Effective span (Simply Supported) : 6m
Applied load : 5 kN/m
Concrete cube strength f_{cu} : 50 N/mm²
Concrete cube strength at transfer f_{ci} : 30 N/mm²
Tensile strength of concrete f_t : 1.7 N/mm²
Loss ratio η : 0.8
Permissible stresses :
At Transfer, Compressive stress f_{ci} = 15 N/mm² and Tensile stress f_{ti} = 1 N/mm²
At Working load, Compressive stress f_{cw} = 17 N/mm² and Tensile stress f_{tw} = 0 N/mm²
High tensile steel wires, 7mm diameter with an ultimate tensile strength f_{pu} = 1600 N/mm² are available for use. The safe stress in the steel wires is 1200 N/mm². The suggested sections with preliminary dimensions are given in following figure no. 1.
Weight of prestressed concrete = 24 kN/m³.

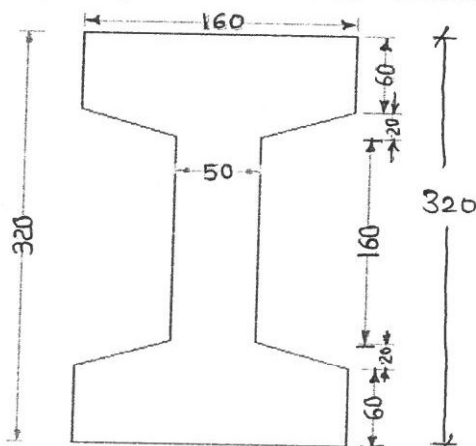


Figure - 1

Note : All Dimensions are in mm.



Enrollment No	
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Q.P. Code	UT 1629
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K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar.
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Unit Test 2- March - 2018
First Year M. Tech. Civil Construction Management SEMESTER - II
Project Economics and Financial Management (CCM2012)

Day and Date: Thu, 22/03/2018

Time: 5.00 - 6.00 pm

Max Marks- 25

Instructions:

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

Q.1 Attempt any two

- (a) Illustrate the factors influencing working capital requirements. (7) CO3
- (b) Describe the current asset financing policy and the matching principle. (8) CO3
- (c) Explain the receipts and payment method for cash budgeting. (8) CO3

Q. 2 Attempt the following.

- (a) A paper company is planning to set aside Rs. 150000 now for possibly replacing its large motors. If the replacement isn't needed for 8 years, how much will the company have in the account if it earns interest at a rate of 8% per year? (5) CO4
- (b) A company precedent wants to know the equivalent future worth of 1 million capital investment each year for 8 years, starting 1 year from now at an interest rate of 14% per year. (5) CO4

OR

- (c) A software company that installs systems for inventory control using RFID technology spent Rs 600000 per year for the past 3 years in developing its latest product. The company wants to recover its investment in 5 years beginning now. If the company signed a contract that will pay Rs. 250000 now and amount increasing by a uniform amount each year through year 5, how much must the increase be each year, if the company uses an interest rate of 15% per year? (10) CO4



K.E.Society's
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Unit Test-02
First Year M. Tech. Civil Construction Management
SEMESTER- II
Construction Contracts (CCM2022)

Enroll No

Q.P.Code
UT 1645

Day & Date : Fri, 23/03/2018
Time : 5.00 - 6.00 pm

Max Marks- 30

- Instructions:
- 1) All questions are compulsory
 - 2) Figures to the right indicate marks
 - 3) Assume suitable data whenever necessary.

- Q.1 a) Maharashtra State Electricity Board wants to construct guest house for Nagpur 12
division. The detailed BOQ for the same has been prepared by Engineer-in-charge.
The estimated cost of the project is Rs. 50,00,000 only. Type of contract is B2.
Prepare Notice Inviting Tender in the prescribed format stating all relevant project
information.
- Q.2 a) Discuss types of contracts and their suitability in various types of contracts. 08
b) Attempt any **TWO**
i) Discuss in detail responsibilities of sponsor. 05
ii) Discuss pretender activities with reference to case study. 05
iii) Discuss in detail responsibilities of contractor. 05



RP code

UT 1515

K.E.Society's
Rajarambapu Institute of Technology, Rajaramnagar
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First Year M. Tech. SEMESTER - II
Resource Management – (CCM2032)

Day and Date: Tue, 20/03/2018
Time: 1 Hr 10.30 - 11.30 am

Max Marks- 25

Instructions: (If any)

- Assume suitable data if required
- Figures to right indicate marks
- All questions are compulsory

Q 1 Solve any five:

CO

- | | | | |
|---|---|----------|----------|
| a | Describe with appropriate example need of addressing Material Management issue on construction projects. | 5 | 2 |
| b | List Secondary objectives and describe how they help in achieving overall objectives of material management. | 5 | 2 |
| c | Develop a code for steel pipes of diameter 40MM using alpha numeric method; also describe your approach for code development. | 5 | 1 |
| d | Explain various codification methods with examples from construction industry. | 5 | 1 |
| e | Explain the functions of store kipping. | 5 | 3 |
| f | “Codification and Standardization save cost” Justify. | 5 | 1 |
| g | Describe suitable organization for remote area placed construction project. | 5 | 3 |



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Unit Test-02
First Year M. Tech. Civil Construction Management
SEMESTER- II

Project Formulation & Appraisal (CCME12)

Q.P.Code
UT 1557

Day & Date : Tuesday, 20/03/2018

Time : 02.30 pm to 03.30 pm

Max Marks- 25

- Instructions:
- 1) All questions are compulsory
 - 2) Figures to the right indicate marks
 - 3) Assume suitable data whenever necessary.

- Q.1 a) A bank introduces two investment schemes whose details are as follows: 12
Analyze the alternative's from the investor's point of view and choose best out of.(Use Rate of Return Method)

	Axis Bank	IDBI Bank
Deposit Amount	Rs 1,00,000	Rs. 2,00,000
Maturity Period (Years)	5	3
Maturity amount	Rs. 3,00,000	Rs. 4,50,500

- Q.2 a) Solve the following problem. 07
By using Benefit-Cost Ratio method and identify whether the following project be accepted or not?
Initial investment:- Rs. 3,00,000
Rate of interest:- 10%
Benefit at the end of first year:- Rs. 50,000
Benefit at the end of second year:- Rs. 80,000
Benefit at the end of third year:- Rs. 1,00,000
Benefit at the end of fourth year:- Rs. 1,50,000
Justify your answer.
- b) Discuss Benefit cost ratio analysis and social cost benefit analysis for projects. 06

OR

- c) Discuss with example shadow price and market price. 06



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K.E. Society's
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Unit Test-02
First Year M. Tech. Civil Engineering SEMESTER- II
Subject: Highway Project Development Code: CCME24

Q.P. Code
UT 1589

Day & Date: Wednesday, 21/03/2018

Time : 10.30pm to 11.30pm

Max Marks- 25

Instructions: 1. Figures to right indicates full marks.
2. Mention your assumptions clearly, if any.

- Q.1 (a)** Explain different revenue models employed by NHAI. **8M**
- (b)** Prepare a note on rehabilitation and resettlement policy in India with reference to National Highways Act. **7M**
- OR
- (c)** Critique on the current SIA process in India. **7M**
- Q.2 (a)** Explain the steps involved in the EIA clearance process of highway projects as per NHAI gridlines. **10M**
- OR
- (b)** Evaluate PPP project procurement process in India. **10M**



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Rajarambapu Institute of Technology, Rajaramnagar
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UNIT TEST

First Year M. Tech. (Civil Construction and Management Engineering) SEM- II

Course: Advanced Engineering Mathematics

Course Code: SHP 524

Day & Date: Wednesday 21/03/2018

Max. Marks: 30

Time: 2:30 pm to 3:30 pm

Instructions: i) All questions are compulsory

ii) Use of non-programmable calculator is allowed

iii) Figure to the right indicate full mark

Q. 1. Attempt the following.

- (a) Fit a binomial distribution assuming the coin is unbiased for the following data: 6 CO_1
- | | | | | | |
|----|----|----|----|----|---|
| x: | 0 | 1 | 2 | 3 | 4 |
| f: | 30 | 62 | 46 | 10 | 2 |

OR

- (a) 20 % of the bolts produced by machine are defective , determine the probability that out of four bolts selected at random , the following would be defective: 6 CO_1
- (i) one bolt (ii) no bolt (iii) at most two bolts.
- (b) In a normal distribution, 31 % of the items are under 45 and 8 % are over 64. Determine the mean and standard deviation of the distribution. Given for the area 0.19 the value of $z = 0.496$ and for the area 0.42, the value of $z = 1.405$. 6 CO_1

Q. 2. Attempt the following.

- (a) Illustrate the Sampling Distribution of a statistic by taking particular statistic. 6 CO_2
- (b) Discuss briefly the basic principles of a sample survey. 6 CO_2
- (c) Distinguish between simple random sampling and purposive sampling 6 CO_2

OR

- (c) What are limitations of sampling? 6 CO_2

