Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

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

Re-EXAMINATION
June 2016

Max. Marks: 100 Duration: 4 Hrs
Class: M. Tech Semester: II Program: (Civil) Construction Management

Course: Elective II: Value Engineering Course Code : MTCM157

Master file.

Instructions:
1) Attempt ***any five*** questions.
2) Neat diagrams must be drawn wherever necessary.
3) Figure to the right side indicate full marks.
4) Use of Scientific calculator is allowed.
5) Assume suitable data if necessary and state it clearly.

Q. No.			Marks	Course Outcome Number	Module No
1	(a)	Explain the term Value and basic concept of Value Engineering.	10	CO1	1
	(b)	Explain Relevance of Value Engineering in Indian construction Scenario.	10	CO1	1
2	(a)	Explain the importance of quality and serviceability of any construction project.	10	CO2	1
	(b)	Explain the factors governing success or failure of the value analysis.	10	CO2	2
				CO1	1
3	(a)	(a) Discuss application of value engineering in construction of: (i) Industrial building of small scale industry (ii) Tunnel construction	10	CO3	2
	(b)	Discuss the factors that contribute to unnecessary cost in the construction project	10	CO3	2

(PTO)

4	(a)	Describe: Value Engineering Job Plan along with its elements.	10	CO2	2
	(b)	Explain: Value management and Control.	10	CO3	2
5	(a)	A building costing Rs.4,50,000/- has recently been constructed in a urban city. The plot measuring 500 sq. m was purchased @ Rs. 150/- per square meter. Work out the rent of the property. Assume 8% as net return on the cost of the construction and 4.50% on the land value. All expected outgoing are Rs. 11,000/- per year.	10	CO2	2
	(b)	Determine cost of project by preliminary estimate method for the following data: i. G+15 story building with four flat on each story with carpet area of each flat = 60 square m. ii. Cost of construction = Rs. 1800/- per sq. feet. iii. Cost of land = Rs. 5,00,000/- per sq. meter. iv. ESI = 1.50	10	CO3	3
6	(a)	Explain: (i) Internal rate of return (IRR) (ii) Present worth method	10	CO3	3
	(b)	How operating and maintenance cost is determined over the project life cycle? Explain in detail.	10	CO2	2
				CO3	3
7	(a)	Highlight: Essential of assessing effectiveness of value analysis in construction project.	10	CO2	2
	(b)	Highlight: Essential prerequisite for team members in Value management in any construction project.	10	CO2	2

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Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Exam
May 2016

Max. Marks: 100 Duration: 4 hrs
Class: M. Tech Structural Engg. (Civil) Semester: II Program: PG
Name of the Course: THEORY OF PLATES Course Code :MTST 152

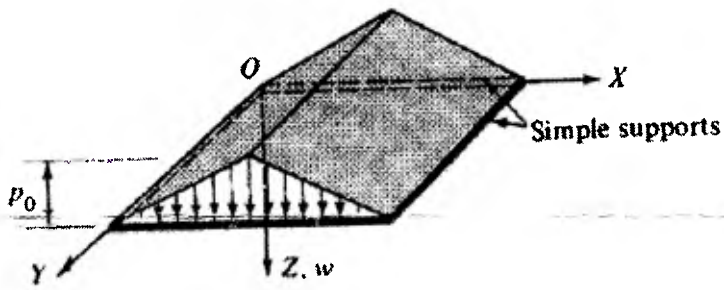
Master file.

Instructions:

1. Attempt any five questions.
2. Illustrate your answers with neat sketches wherever required, though not sought specifically.
3. Assume suitable data if necessary.

Question No		Maximum Marks	Course Outcome Number	Module No.
		(5)	(1)	(2)
Q1	Derive $D = \frac{Eh^3}{12(1-\upsilon^2)}$ Where D is the flexural rigidity of the plate			
b).	Derive the relation between twisting moment and twist of the surface of bent rectangular plate.	(10)	(1)	(2)
c)	Explain the following boundary conditions and equations used for (a) fixed edge (b) simply supported edge (c) free edge	(5)	(1)	(5)
Q2	Show that any point of the middle surface the sum of the curvatures in two perpendicular directions is independent of angle.	(10)	(1)	(2)
	State conditions for which Navier's and Levy's method are applicable.	(5)	(2)	(6)
	Write down the Kirchoff's assumptions for plate theory.	(5)		(3)
Q3	Explain why the corners of a simply supported laterally loaded square plate is subjected a reactive force R. Derive expression for R.	(10)	(1)	(5)

b.	Explain different types of plate theories. Briefly describe classical laminated plate theory (CLPT) and first order shear deformation theory (FSDT) in terms of transverse shear strains.	(10)		(1 & 3)
Q4	Derive the expression for the maximum bending moments of a uniformly loaded clamped circular plate. Also, find out the expression for deflection of a circular plate with a circular hole at the centre assuming the plate is supported along the outer edge,	(20)	(3)	(4)
Q5	A square plate with two opposite edges simply supported and other two edges clamped is subjected to a half sinusoidal load. Determine maximum deflection of plate and maximum positive moment using Levy's approach.	(20)	(2)	(5 & 6)
Q6	Find the deflections of a simply supported rectangular plate of size a x b subjected to sinusoidal load. Determine the maximum deflection of plate using Navier's approach.	(20)	(2)	(5 & 6)
Q7	Determine the maximum deflection of simply supported square plate subjected to a distributed load in the form of a triangular prism, as shown in Fig. Use finite difference method	(20)	(4)	(7)



(a) Lateral load

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Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Exam
May 2016

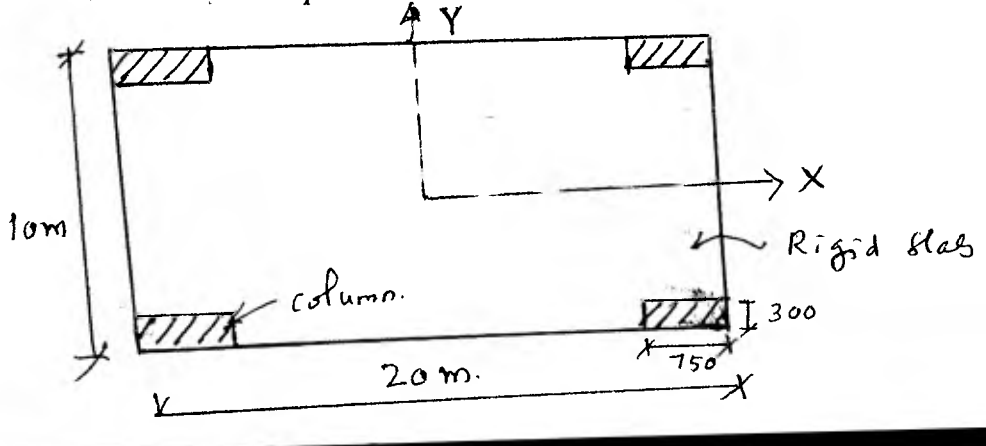
Max. Marks: 100 Duration: 4 Hours
Class: M.Tech. Semester: II Program: Civil Engineering with Structural Engineering
Name of the Course: Earthquake Engineering Course Code : MTST154

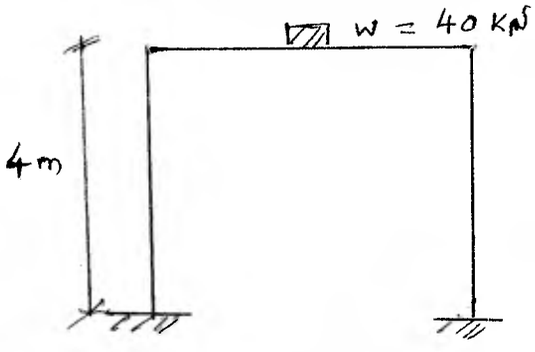
Master file.

Instructions:

- Attempt any FIVE questions out of SEVEN questions.
- Answers to all sub questions should be grouped together.
- Figures to the right indicate full marks.
- Assume suitable data if necessary and state the same clearly.

Question No		Max. Marks	Course Outcome No.	Module No.
Q1 (a)	Answer the followings: (i) What is Random dynamic Load? Briefly explain how the analysis of structure to random of dynamic Load is done.	3	1	1
	(ii) What is an earthquake? How the earthquakes are classified based on their causes?	3	3	2
	(iii) Briefly explain the Plate Tectonic Theory of an earthquake occurrence	4	3	2
Q1(b)	(i) A uniform rigid slab of total mass 30 t is supported by four columns of height 6.0 m. rigidly connected to the top of slab and fixed at bottom. Each column is rectangular section of 750 mm x 300 mm as shown if figure. If the system is subjected to harmonic ground motion of amplitude 0.2g at frequency of 10 rad/sec in X direction only, calculate the maximum lateral displacement of slab in X direction and maximum stress in each column $\zeta = 5\%$ and E = 20, 000 MPa.	4	2	1
	(ii) In the above problem, If the columns are hinged at bottom, then calculate the maximum lateral displacement of slab in X direction and maximum stress in each column. Comment on the effect of fixity of column on these parameters	3	2	1

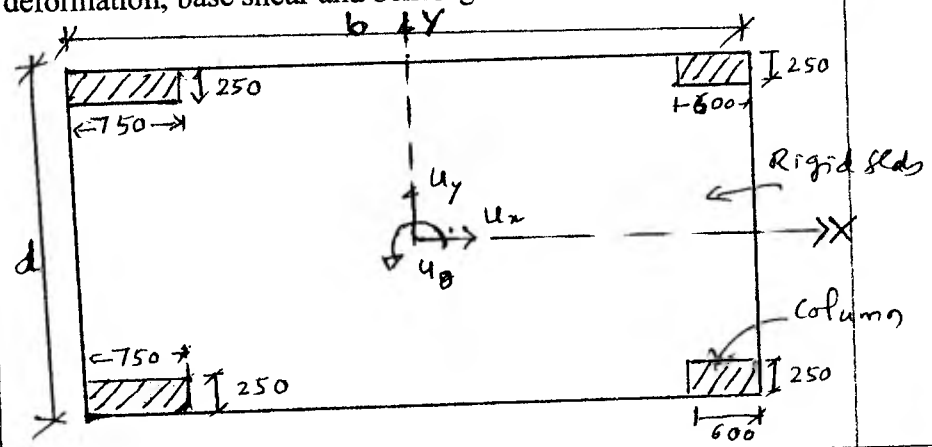


<table>
<tr><td>Q1 (c).</td><td>Explain the characteristics of ground motions</td><td>3</td><td>3</td><td>3</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Q2 (a)</td><td>The mass m, stiffness k, and natural frequency ω of an undamped system are unknown. These properties are to be determined by harmonic excitation tests. At an excitation frequency of 4 Hz, the repose tends to increase without bound (i.e, a resonant condition). Next, a weight Δw = 50 N is attached to the mass m and the resonance test is repeated. This time resonance occurs at f = 3 Hz. Determine the mass and the stiffness of the system.</td><td>4</td><td>2</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Q2 (b)</td><td>A one story RCC building is idealized as plane frame as shown in figure. The cross section of columns is 250 mm x 250 mm and E= 20,000 Mpa. If the building is to be designed for ground motion, the response spectrum of which is shown in figure1 but scaled to peak ground acceleration of 0.5g. Determine the design values of lateral deformation and bending moments in the columns for the following two conditions:
(i) The cross section of beam is much larger than that of columns, so the beam may be assumed as rigid.
(ii) The beam cross section is much smaller than that of columns, so the beam stiffness can be neglected. Comment on the influence of beam stiffness on deign quantities
  </td><td>4

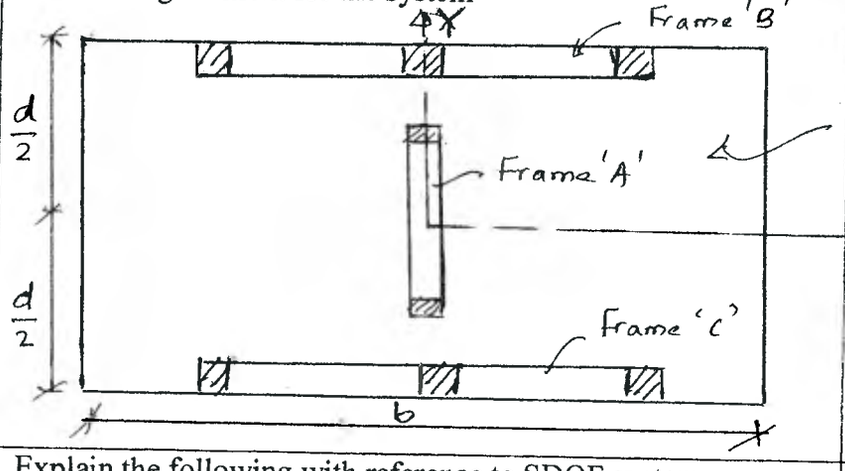
4</td><td>3

3</td><td>4

4</td></tr>
<tr><td>Q2 (c)</td><td>A two storey frame with free vibration characteristics as given below is subjected to a subjected to harmonic ground motion of amplitude 0.2g at frequency of 10 rad/sec Calculate maximum displacements of each storey. Take damping ratio =5%
<table><tr><td>Floor No.</td><td>Mass (t)</td><td>Mode No.</td><td>ω, rad/sec</td><td colspan="2">Mode Shapes</td></tr><tr><td></td><td></td><td></td><td></td><td>Φ_{i1}</td><td>Φ_{i2}</td></tr><tr><td>1</td><td>20</td><td>1</td><td>14.58</td><td>1.0</td><td>1.481</td></tr><tr><td>2</td><td>15</td><td>2</td><td>38.07</td><td>1.0</td><td>-0.822</td></tr></table></td><td>8</td><td>2</td><td>1</td></tr>
</table>

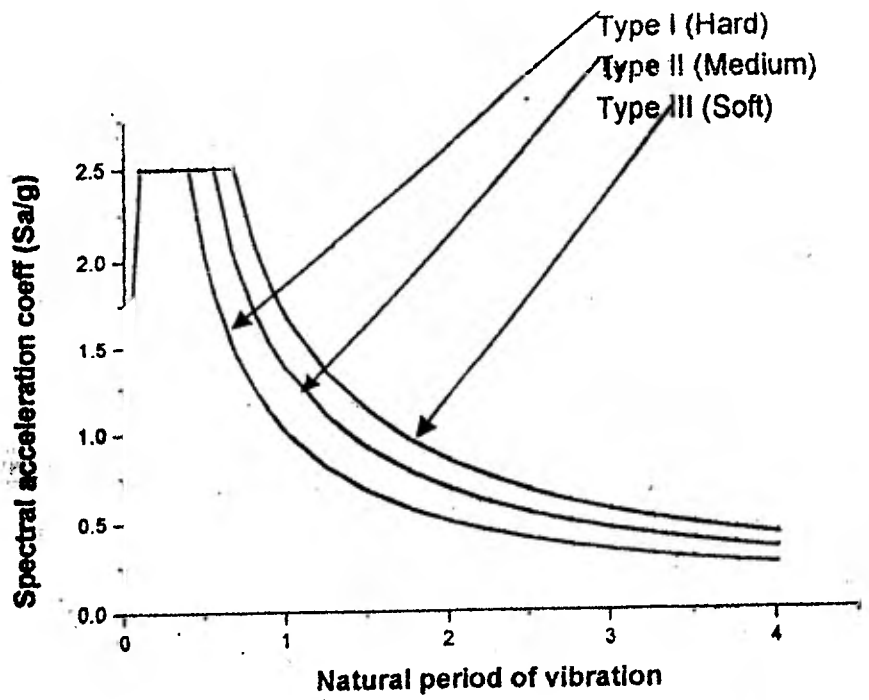
Q3	The plan of one story building is as shown in figure. The structure consists of a roof idealized as a rigid diaphragm, supported on four corner columns as shown in figure. The roof weight is uniformly distributed and has magnitude 200 kg/m^2. The plan dimensions are b= 30 m d=20m. E= 20,000 Mpa. (i) Derive the stiffness matrix and determine the natural frequencies and modes shapes of vibrations of the structure (ii) If the structure is subjected to ground motion $\ddot{u}_{gx}$ only in x direction. write down the equations of motion for the system (iii)As a special case, if all columns are of the same size, 250 mm x 600 mm, and if the system is subjected to the ground motion only in X direction, the response spectrum of which is shown in figure1. Determine the design value of lateral deformation, base shear and bending moment for the system. 	**20**	**3**	**4**
Q4 (a)	What is response spectrum? Explain briefly, the response spectrum characteristics.	**5**	**3**	**3**
Q4 (b)	Explain the procedure to construct elastic response spectrum for estimated peak ground motion parameters	**6**	**3**	**3**
Q4 (c)	A two story frame has the following free vibration characteristics. The frame is to be designed for the ground motion characterized by the design spectrum given in the figure 1 but scaled to peak ground acceleration of **0.4g**. Calculate the design values of lateral deformation of floors.	**9**	**3**	**4**

Floor No.	Mass (t)	Mode No.	ω, rad/sec	Mode shapes	
				Φ_{i1}	Φ_{i2}
1	20	1	14.58	1.0	1.481
2	15	2	38.07	1.0	-0.822

Q5(a)	The plan of one storey building is as shown in figure. The structure consists of a roof idealized as a rigid diaphragm, supported on three frames A, B, and C as shown. The roof weight is uniformly distributed and has magnitude 200 Kg/m^2. The lateral stiffness are K_y = 20000 KN/m for frame A and K_x =25000 KN/m for frames B and C. The plan dimensions are b= 30 m d=20m. The height of building is 10m. (i) Derive the stiffness matrix and determine the natural frequencies and modes of vibrations of the structure (ii)If the structure is subjected to ground motion $\ddot{u}_{gx}$ only in X direction. write down the equations of motion for the system (iii) If the system is subjected to the ground motion only in X direction, the response spectrum of which is shown in figure1. Determine the design value of lateral deformation, base shear and bending moment for the system  	8	3	4
Q5(b)	Explain the following with reference to SDOF systems: (i) Allowable Ductility (ii) Ductility Demand	4	4	4
Q5(c)	State the limitation of Seismic Coefficient Method. As per IS 1893-2002, under what conditions the seismic coefficient method is permitted to use to calculate the earthquake forces.	3	3	6
Q5(d)	Explain how the base isolation helps in reducing the earthquake induced response in building structure	5	4	5
Q6(a)	What is soft story? Explain the provisions of IS 1893-2002 for the design of RCC elements of soft story	4	3	6
Q6(b)	Explain the three requirements of displacement design of structure for earthquake load as per IS 1893-2002.	4	3	6
Q6(c)	As per IS 1893-2002, how many mode need to be considered in the earthquake force calculation by Response Spectrum Method	2	3	6

<table>
<tr>
<td>Q6(d)</td>
<td>Using response spectrum method, calculate the seismic force on each floor of the frame whose pre vibration properties are given below. Use the following additional data:
Z=0.24, I =1.5, R=3.0 and ξ = 5%. Assume foundation strata as soft and use response spectrum given in figure 2.

<table>
<tr><td>Story No.</td><td>Mass No.</td><td>Mass (t)</td><td>ω rad/sec</td><td colspan="3">Mode shapes</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Φ_{i1}</td><td>Φ_{i2}</td><td>Φ_{i3}</td></tr>
<tr><td>1</td><td>1</td><td>20</td><td>15.73</td><td>0.399</td><td>0.747</td><td>1.0</td></tr>
<tr><td>2</td><td>2</td><td>20</td><td>49.85</td><td>1.0</td><td>0.727</td><td>-0.471</td></tr>
<tr><td>3</td><td>3</td><td>20</td><td>77.82</td><td>-0.908</td><td>1.0</td><td>-0.192</td></tr>
</table>
</td>
<td>10</td><td>4</td><td>6</td>
</tr>
<tr><td>Q7(a)</td><td>What is shear Wall? Explain the advantages of shear walls.</td><td>3</td><td>4</td><td>6</td></tr>
<tr><td>Q7(b)</td><td>What is ductility of a structure? Explain the importance of ductility in seismic resistant structures.</td><td>3</td><td>3</td><td>7</td></tr>
<tr><td>Q7(c)</td><td>Explain the provisions of IS 13920 for
(i)Beams: General provisions, longitudinal reinforcement and web reinforcement
(ii) Shear Walls: General requirements and shear strength</td><td>12</td><td>3</td><td>7</td></tr>
<tr><td>Q7(d)</td><td>Briefly explain the earthquake design principle as per IS 1893-2002 (i.e. fail safe criteria)</td><td>2</td><td>3</td><td>6</td></tr>
</table>



Response Spectrum as per IS 1893-2002 for 5 % Damping

Figure-2 Q no. 6(d)

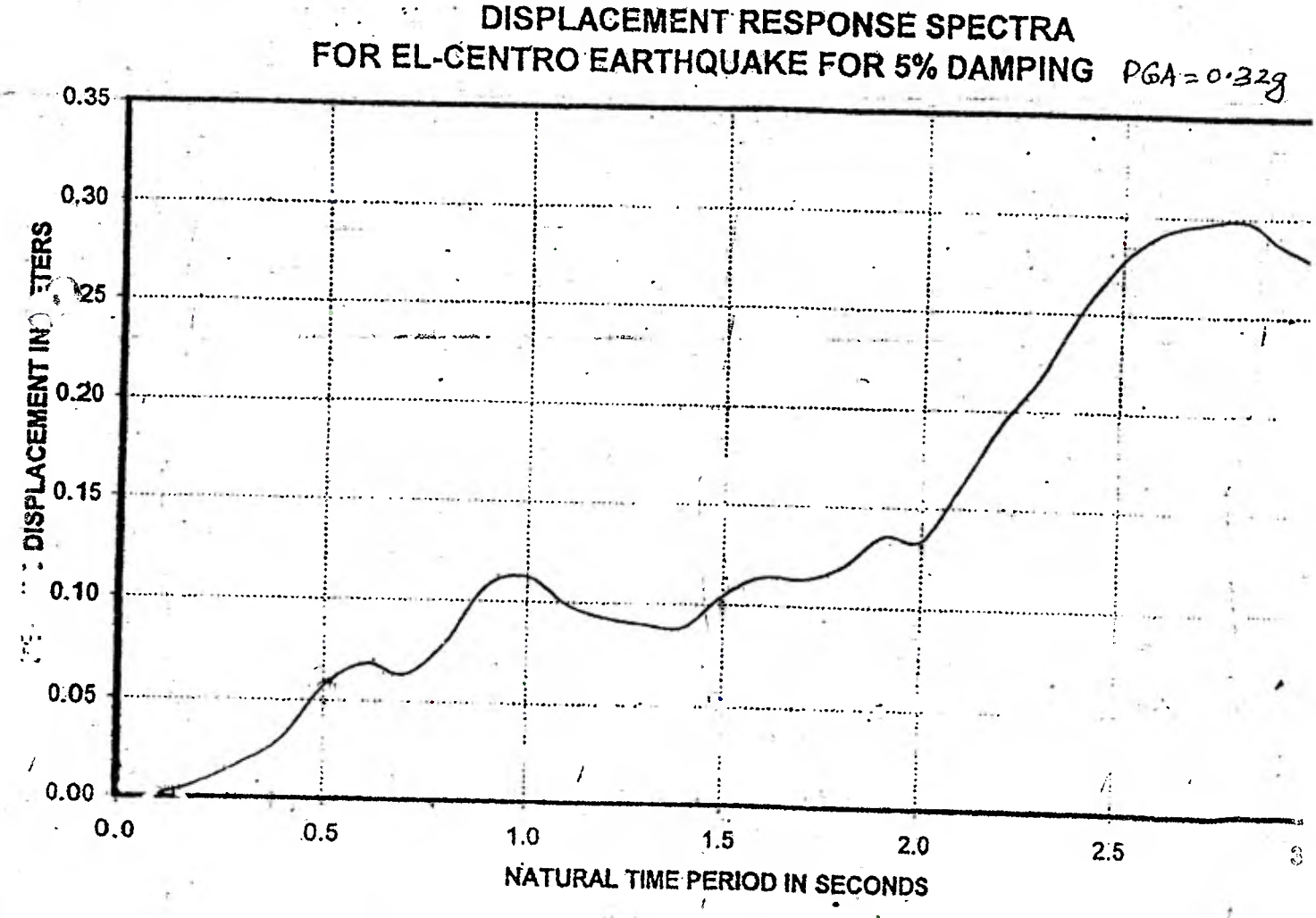


Figure 1 QNo 2(b), QNo 3(iii) QNo 4(c) QNo 5(a)

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Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Exam
May 2016

Max. Marks: 100 Duration: 4 Hours
Class: M.Tech Semester: II Program: M.Tech in Civil Engineering with Str. Engg. Subjects
Name of the Course: Elective-II Advanced Design of Concrete Structures
Course Code : MTST 156
Master file.

Instructions:

- Attempt any FIVE questions out of SEVEN questions.
- If there are sub questions, **answers to all sub questions should be grouped together.**
- Figures to the right indicate full marks.
- Assume suitable data if necessary and state the same clearly.
- Use of codes IS 456:2000, IS 4995:1974 (Part I & Part II) is allowed.

Question No		Max Marks	Course Outcome Number	Modul No.
Q.1 (a)	Using Whitney's stress block, find the ultimate moment of resistance of a reinforced concrete beam of rectangular section 250 mm x 500 mm reinforced with 3 numbers of 25 mm diameter bars. Use M20 concrete and Fe415 steel.	(08)	1,3	1
Q.1 (b)	If the rectangular section referred in Q1 (a) above is made monolithic with 120 mm thick R.C. C. slab of the same grade and top level flush with top of the beam, find the ultimate moment of resistance of the resulting T section assuming flange width as 1000 mm. Use Whitney's stress block	(08)	1,3	1
Q.1 (c)	Distinguish between Cambridge method and Baker's method of ultimate load analysis of structure.	(04)	1	2
Q.2 (a)	What is yield line? State the assumptions made in predicting yield line patterns.	(05)	1	2
Q.2 (b)	A reinforced concrete slab of effective plan dimensions of 4m X 6m size is fixed on all its edges. The working load due to finish is 1.5 kN/m^2 and superimposed live-load is 3 kN/m^2. The amount of reinforcement at the bottom provided along long span is 60% of that provided along short-span. Design the slab using yield line theory, considering overall load factor of 1.5. Use M 20 grade concrete and Fe415 steel.	(15)	1	2

Q.3 (a)	Explain the various limit states as per IS: 456	(05)	3	3
Q.3 (b)	Using limit state method, design a T beam with the following data. B_f = 1500 mm, D_f = 100 mm, b_w = 300 mm and M_u = 400 kNm. Use M 20 grade of concrete and Fe 415 steel.	(10)	3	3
Q.3 (c)	Explain how the rotation capacity of a reinforced concrete section can be increased.	(05)	1	2
Q.4 (a)	Explain the advantages and disadvantages of flat slab construction	(05)	1,3	4
Q.4 (b)	Design a simply supported slab 6.5 m x 5 m is simply supported on four sides. The slab is to be cast monolithically over the beams with corners held down. The width of the supporting beam is 250 mm. The slab carries a superimposed load of 3 kN/m^2. Use M20 grade concrete and Fe415 steel. Use limit state method.	(15)	1,3	4
Q.5 (a)	What are advantages and disadvantages of folded plates as compared to shells?	(04)	2	5
Q.5 (b)	Explain the steps involved in Whitney's method of analysis of folded plate.	(16)	2	5
Q.6	A circular wheat silo is has an internal diameter of 7m and a wall height of 25m. It has a conical hopper of height 2.5m. The inner diameter of the opening at the base of the hopper is 0.5m. Design the silo wall and hopper bottom. Density of wheat is 8 KN/m^3 Angle of internal friction is 20^o and co-efficient of friction between wheat and concrete wall is 0.42. Use M20 concrete and Fe 415 steel.	(20)	2	6
Q.7 (a)	Write a note on			
	(i) Deep beams	(06)	2,3	7
	(ii) Shear Walls	(10)	2,3	7
Q.7 (b)	Differentiate between a silo and a bunker.	(04)	2	6

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Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Exam
November 2015 / May 2016

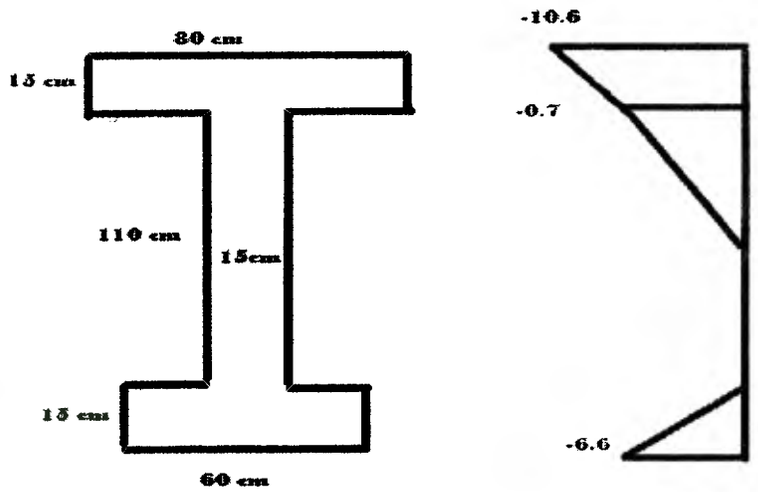
Q. P. Code: MTST153

Max. Marks: 100 Duration: 4hrs
Class: M Tech Structural Engg. Semester: II Program: M Tech Structural Engg
Name of the Course: Bridge Engineering Course Code : MTST153

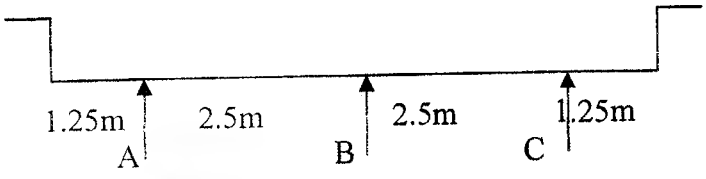
Master file.

Instructions:

- Solve any four questions.
- Assume suitable data wherever necessary.
- Use of IRC-6 2014 is allowed.

Question No		Maximum Marks	Course Outcome Number
Q1			
A.	Describe well foundation and its components with sketch.	10	2
B.	Derive equation for stress in concrete in steel for RCC section subjected to axial thrust & any axis bending.	10	4
Q2			
A.	Estimate the thermal stresses in a simply supported beam and slab concrete deck, for the given beam section and thermal gradient. i.e calculate stresses due to 01. varaiation in body mean temperature of 25 degree Celsius. 02. Eigen stresses Ec = 2.4 x 10 ^5 kg/cm^2, α = 1.17 x 10^-5 degree Celsius 	14	3

B.	Describe investigations to be carried out for major bridges.	6	3
Q 3.			
A.	Calculate the capacity of the pile for given data: Dia. of pile = 1m Qc (mudstone) = 29 MPa Qc (Sandstone) = 32 MPa Top of pile level = 480.00 Top of mudstone layer = 478.00 Top of sandstone layer = 458.00 Founding level = 454.00 Ksp = 0.8	14	4
B.	Calculate forces in each pile using rivet theory, 4 piles are arranged in 2 rows in a rectangular pile cap of 4m X 4m, with distance between two piles 2m and dist of pile from edge is 1m. P = 400 T M = 2500T-M	6	3
Q4			
A.	RCC section 80 cm X 150 cm, m = 14, Axial thrust P = 200 T , Moment about axis parallel breadth M = 80 T-m, clear cover= 5 cm, Asc = 40 cm^2, Ast = 60 cm^2, assume Neutral axis at 60 cm from extreme compression fibre. Find out the stress in concrete and steel.	10	4
B.	Design an isolated footing for pier of 2m X 1.5m. P = 60 T Mt = 80 T-m. SBC = 300Kn/m^2 Assume data wherever it is necessary.		4
Q. 5			
A	Describe behavior of skew slab culverts and recommended reinforcement arrangement with sketches.	6	2,3
B	Design slab bridge having following arrangements: M30, Fe 415 Span of bridge is 4m. IRC Class AA loading Road Width 7.5m 600mm footpath on each side. For shear check, tc = 0.28 MPa	14	1,4

Q. 6			
A	Elaborate difference between cable stayed bridge and suspension bridge.	5	3
B	Design Post tensioned longitudinal girder with necessary checks and sketches for the following arrangement of bridge: Length of a girder is 30m. Total deck width is 10.5m. 4 girders are placed at 2.5m c-c distance, with 1.5m cantilever on each side. Assume 300mm thick slab. Take crash barrier load of 10 kN/m on both edges, no Foothpath. Assume cross girders at each 5m having size 0.5m X 1.6m. Cross section of a main girder: Total depth 1.8m Top flange width 1.2m Top flange depth 0.25m Web thickness 0.2m Bottom flange width 0.6m Bottom flange thickness 0.3m Class AA load is placed at an eccentricity of 1.1m from centre of deck.	15	4
Q. 7			
A.	Obtain short pan and long span moments in case of interior panel of T beam Bridge having following details: Dimension of panel = 3m X 3.5m 1. Two wheels each of 57 kN adjusted symmetrically with respect centre of panel. Assume values of m1 and m2 suitably.	10	1,4
B	Determine the live load bending moment in the exterior girder, for two trains of Class A loading using Courbon's theory. First wheel load is placed at 0.4m from left edge and transverse distance between two vehicles is 1.7m. 	10	2,4

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Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to Mumbai University)

Total Marks: 100 Duration: 4 Hrs

Class: ME Structures Sem-II Sub: Finite Element Analysis

- Attempt any five questions out of seven questions
- Answers to all sub-questions should be grouped together
- Figures to the right indicate full marks
- Assume suitable data if necessary and state the same clearly.

Master file.

Q.1 a. Explain the convergence and compatibility requirements [06]

b. Write short notes on shape functions and their uses in finite element analysis [06]

c. Explain step by step procedure of solving a complicated problem using finite element method.

Q.2 Determine the member forces and reactions developed for the truss as shown in figure 1. Take modulus of elasticity as 210 GPa and area of cross-section of all members as 1000 mm^2. [08]

Q.3 Determine the member forces and reactions developed for the beam as shown in figure 2. Take modulus of elasticity as 210 GPa and Moment of Inertia of cross-section as 0.5×10^9 mm^4. [20]

Q.4 Determine the member forces and reactions developed for the frame as shown in figure 3. Take modulus of elasticity as 210 GPa and Moment of Inertia of cross-section as 0.8×10^9 mm^4 and area of cross section as 10000 mm^2. [20]

Q.5 a. Determine the stiffness matrix for the plane stress CST element having coordinates 1(0,0), 2(1,0) and 3(1,1). Take modulus of elasticity as 210 GPa and thickness of element as 0.010 m [20]

b. Determine the shape functions for 6 noded Lagrange element [12]

Q 6 Determine the first three frequencies of the propped cantilever beam using consistent mass matrix [08]

Q.7 a. Using functional approximation, determine the maximum deflection and bending moment developed at mid-span of the beam also determine the error associated if only first two terms of approximation is considered. [20]

b. Starting from the first principle, determine the shape function of four noded axial element. Also plot the variation of the shape functions. [12]

[08]

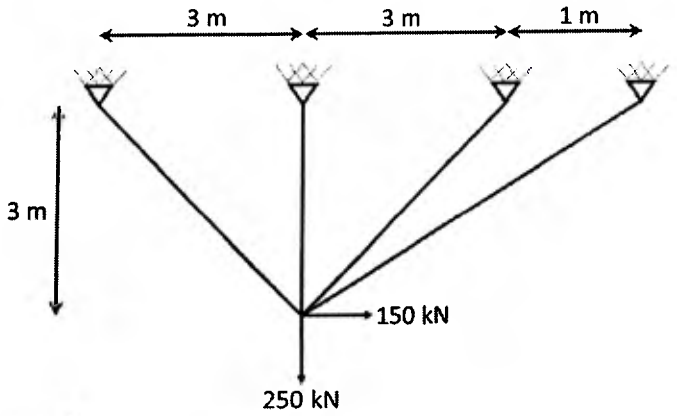

Figure 1

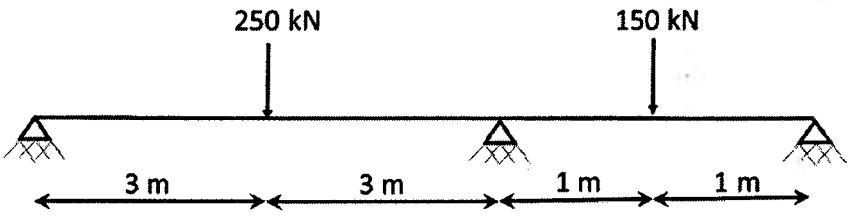

Figure 2

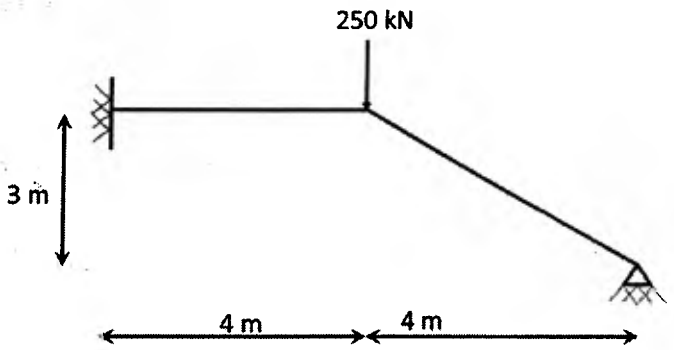

Figure 3

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Sardar Patel College of Engineering

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

End Semester Exam
May 2016

Max. Marks: 100 Marks Duration: 4 Hr
Class: M.Tech – Civil Engineering Semester: II Program: Construction Management
Name of the Course: Management of Construction Resources Course Code : MTCM152

Instructions:
Attempt any 5 Questions Each Question carries 20 Marks

Master file.

Question No		Maximum Marks	Course Outcome Number	Module No.
Q1	(a)Explain the scope of Materials Management.	10	3	3
.	(b)Briefly explain the functions of Materials Management.	10	3	3
Q2	(a)Highlight Materials Classification with suitable examples.	10	3	3
.	(b) Explain how you propose to organize Materials Management.	10	3	3
Q3	(a)Explain the factors considered for Materials purchasing.	10	3	3
.	(b)Give important strategies for efficient inventory control.	10	3	3
Q4	(a)Define EOQ .Explain the importance of EOQ for Inventory Management	10	3	3
.	(b)Calculate EOQ from the f0llowing details. The annual usage of material is 1200 units It costs Rs 10 to handle an order for this material the price is Rs 1 per unit..The carrying cost of inventory is 24 percent .per year.	10	3	3
Q5	(a)How do you classify Construction Equipment? Describe any two	10	2	2
.	(b)Explain the features of Aggregate and production Equipment.	10	2	2
Q6	(a)Explain the factors affecting the selection of Equipment.	10	2	2
.	(b)Determine the Owning and Operating cost from the following Machine Two Meter Cube Engine Crawler Mounted Power Shovel. Details .Engine 160 HP Crank case capacity 30 litres Useful Life 5 years.	10	2	2

	Time between oil changes 100 hours Shipping Weight 104 tonnes Factory price of equipment Rs.600000/ - Operating Factor 0.6 Freight Charges Rs.39 per tone Unloading and Assembly charges Rs. 600 Hours used per year. .5000 hours.			
Q7	(A) Explain the Methods used for Training Construction Managers.	10		
	(b) Explain the salient features of Performance Appraisal.	10		

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End Semester Exam
May 2016

Max. Marks: 100 Marks | Duration: 4 Hr
Class: M.Tech – Civil Engineering | Semester: II | Program: Construction Management
Name of the Course: Project Monitoring and Control | **Course Code : MTCM153**

Master file.

Instructions:
Attempt any 5 Questions Each Question carries 20 Marks

Question No		Maximum Marks	Course Outcome Number	Module No.
Q1	(a)Explain the features of Market Feasibility Study	10	1	1
.	(b)Describe the salient features of Financial Feasibility study	10	2	2
Q2	(a)Describe the phases and stages of Construction Projects	10	1	1
.	(b)Explain how You will prepare Supply and Demand Estimates	10	1	1
Q3	(a)Highlight the process of Updating and Updating with the help of Bar Chart	10	3	1
.	Explain Indirect cost Forming part of Project Execution	10	2	2
Q4	(a)Explain how you propose to manage Quality Control System	10	1	3
.	(b) You are the Manager of a Construction Project. Explain how you propose to organize Quality control and Inspection.	10	1	3
Q5	(a)Explain the key features of Cost control and Coding	10	2	1
.	(b) Briefly explain Cost control system classification.	10	2	1
Q6	(a)Highlight the Environmental issues in Construction.	10	3	3
.	(b)Give an account of Environmental issues in Transportation	10	3	3
Q7	(a)Explain the factors to be considered in planning for large Construction projects.	10	2	1
.	(b)Highlight the salient features of Earned Value Analysis	10	2	2

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Sardar Patel College of Engineering

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END SEMESTER EXAMINATION
May 2016

Max. Marks: 100
Class: M. Tech Semester: II Duration: 4 Hrs
Program: (Civil) Construction Management

Course: Elective II: Value Engineering Course Code : MTCM157

Instructions:

1) Attempt ***any five*** questions.
2) Neat diagrams must be drawn wherever necessary.
3) Figure to the right side indicate full marks.
4) Use of Scientific calculator is allowed.
5) Assume suitable data if necessary and state it clearly.

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Q. No.			Marks	Course Outcome Number	Module No
1	(a)	Define 'Value Engineering' and explain its importance in construction.	06	CO1	1
	(b)	Differentiate between: Value analysis, Value management, Value Control and Value assurance.	08	CO1	1
	(c)	Explain with example basic and secondary functions.	06	CO1	1
2	(a)	Do you think mere reduction in cost contributes to value in a construction project? Discuss in brief. Also suggest some suitable measures for reduction of unnecessary cost in construction projects	12	CO2	1
	(b)	Explain: how poor Communications affects Value engineering.	04	CO2	2
	(c)	Differentiate between Esteem and Exchange value.	04	CO1	1
3	(a)	Discuss application of value engineering in energy efficient construction of: (i) Multistoried residential building (ii) Water and wastewater treatment plant (iii) Highway and railway construction	15	CO3	2
	(b)	Discuss: aesthetic and ergonomic value.	05	CO1	1

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4	(a)	What is job plan? Explain in detail phases in job plan.	12	CO2	2
	(b)	Discuss potential of energy saving during construction of infrastructure projects.	Q4	CO3	2
	(c)	Explain the term: Present worth (NPV) and future value of money.	04	CO3	3
5	(a)	Discuss: Various steps involved in the application of Value Engineering in construction of bridge across perennial river.	12	CO2	2
	(b)	The cost of project is Rs. 50,000/- . Annual cash flow for the next four years is Rs. 25,000/- per year. What is payback period for the project at the discount rate of 8%.	04	CO3	3
	(c)	Cost of the project is Rs. 50,000/- has cash flow of Rs. 22,000/- for the period of five years. What is the NPV if the firm expects 14% per annum? Also state project is feasible or not?	04	CO3	3
6	(a)	Explain: internal rate of return (IRR).	06	CO3	3
	(b)	Explain: Effective utilization of equipments in the context of Value engineering.	06	CO2	2
	(c)	What is LCC in construction? Discuss in detail.	08	CO3	3
7	(a)	Explain the relation between benefits and cost for any hypothetical construction project. Why project evaluation is important? Explain.	10	CO3	3
	(b)	Explain the factors governing success or failure of the value analysis.	10	CO1	1

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Sardar Patel College of Engineering

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End Semester Exam
May 2016

Max. Marks: 100 Duration: 4 hrs
Class: Semester: II Program: M Tech Construction Management
Name of the Course: Legal Aspects in Construction Course Code :

Master file.

Instructions:
Paper setter is requested to give necessary instructions.
Q.1 is compulsory. Any 4 out of remaining questions to attempt.

Question No		Maximum Marks	Course Outcome Number	Module No.
Q1	a) What is ADR and explain arbitration process.	5	01	01
	b) Explain different types of contract.	5	01	02
	c) Explain the various types of insurance in construction industry.	5	02	05
	d) Explain the process of tender evaluation.	5	02	04
Q2	a) Elaborate on breach of contract.	10	04	02
	b) What are the main provisions in arbitration and conciliation act.	10	05	04
Q3	a) Elaborate on various types of quasi contracts.	10	04	01
	b) Elaborate on classification and rules relating to 'offers'	10	06	03
Q4	a) Elaborate on FIDIC and NEC types of contract	10	07	07
	b)Write about 10 situations where construction claims can be generated.	10	04	04
Q.5	a) Elaborate on 'latent defects' in construction	10	04	04
	b) Explain insolvency and related rules in detail	10	06	06
Q.6	a) Elaborate on Indian Contracts Act and its provisions.	10	03	03
	b) Elaborate on Employer's Liability Act.	10	05	05
Q.7	a) Discuss on the 8 ways the contract can be discharged.	10	04	04
	b)Write about the strategies used in preparation of tender documentation to help avoid claims.	10	02	02

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Sardar Patel College of Engineering

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END SEMESTER

May 2016

Max. Marks: 100 Duration: 4 Hrs

Class: M. Tech Semester: II Program: Construction Management

Course: Project Appraisal, Planning and Scheduling Course Code : MTCM154

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Instructions:

1) **Attempt any five questions.**
2) **Neat diagrams must be drawn wherever necessary.**
3) **Figure to the right side indicate full marks.**
4) **Use of Scientific calculator is allowed.**
5) **Assume suitable data if necessary and state it clearly.**

Q. No		Marks	Course Outcome Number	Module No
1 (a)	Discuss in detail projects appraisal.	10	CO1	1
(b)	Prepare work breakdown structure for Pumping station.	6	CO1	2
(c)	Discuss payback period method.	4	CO1	1
2 (a)	Discuss the process of planning for a Coastal Road project.	10	CO1	2
(b)	Discuss resources smoothening and leveling.	6	CO2	4
(c)	Explain vertical production method of scheduling.	4		4
3 (a)	Define risk and discuss in detail construction risks.	10	CO3	5
(b)	Discuss Value Engineering Job Plan.	10	CO3	6
4 (a)	Describe the various phases of project in construction.	6	CO1	2
(b)	Discuss cost slope and its utility in time cost trade off.	6	CO1	7
(c)	Explain clearly the following statement "CPM is deterministic and activity oriented network while PERT is a probabilistic and event oriented network".	8	CO5	3

Q. No		Marks	Course Outcome Number	Module No
5 (a)	Describe role of client and contractor during construction project planning	**4**	**CO1**	**2**
(b)	Discuss right method of responding to any risk in a construction project. Give example of (i) Risk Avoidance (ii) Risk reduction (iii) Risk transfer (iv) Risk sharing	**6**	**CO1**	**5**
(c)	For the data given find total float, free float, independent float and interfering float for each activity. Determine critical path and its duration.	**10**	**CO5**	**3**

Activity	Duration (days)	Activity	Duration (days)
1-2	8	4-7	0
1-3	10	5-6	4
1-4	5	5-7	3
2-7	6	5-8	6
3-4	3	6-8	5
4-5	7	7-8	5

6(a)	Define value engineering. In what stage of the project value engineering can provide maximum advantages. List the steps involved in the application of value engineering.	10	CO1	6
(b)	The optimistic, most likely and pessimistic times of the activities of a project are given below. Activity 40-50 must not start before 22 days, while activity 70-90 must end by 35 days. The scheduled completion time of the project is 46 days. Draw the network and determine the critical path. What is the probability of completing the project in schedule time?	10	CO2	3

Activity	t_o	t_m	t_p
10-20	4	8	12
20-30	1	4	7
20-40	8	12	16
30-50	3	5	7
40-50	0	0	0
40-60	3	6	9
50-70	3	6	9
50-80	4	6	8
60-100	4	6	8
70-90	4	8	12
80-90	2	5	8
90-100	4	10	16

Q. No		Marks	Course Outcome Number	Module No
7 (a)	<table><tr><th>Year</th><th>Benefits (Rs)</th></tr><tr><td>1</td><td>12,50,000</td></tr><tr><td>2</td><td>14,00,000</td></tr><tr><td>3</td><td>15,00,000</td></tr><tr><td>4</td><td>20,00,000</td></tr><tr><td>5</td><td>20,00,000</td></tr></table> Initial investment is Rs. 50,00,000. Cost of the capital is 12% Find out whether project is acceptable. Also calculate the pay-back period.	8	CO1	1
(b)	The following data gives the normal time and cost and crash time and cost for a project. Draw network and identify the critical path. Find normal project duration and associated cost Crash the relevant activities &determine optimum project time and cost. Indirect cost is Rs 50/-per week.	**12**	**CO2**	**7**

Activity	Normal		Crash	
	Time (weeks)	Cost Rs.	Time (weeks)	Cost Rs.
1-2	3	300	2	400
2-3	3	30	3	30
2-4	7	420	5	580
2-5	9	720	7	810
3-5	5	250	4	300
4-5	0	0	0	0
5-6	6	320	4	410
6-7	4	400	3	470
6-8	13	780	10	900
7-8	10	1000	9	1200