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IV B.TECH I SEM

SUPPLEMENTARY EXAMINATIONS

MARCH 2025

NAKASAKAOPETA
NEC ENGINEERING COLLEGE
(AUTONOMOUS)

IV B.Tech I Semester Supple. Examinations, March-2025

Sub Code: 19BCE7TH01 ESTIMATION SPECIFICATIONS AND COSTING

Time: 3 hours (CE) Max. Marks: 60

Note: Answer All **FIVE** Questions. All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	KL	CO	M
1		Unit-I			
	a	i)What do you mean by detailed estimate and abstract estimate?	K3	CO1	6M
		ii)Explain the importance of Estimation in Civil Engineering	K2	CO1	6M
		OR			
	b	Explain any four types of approximate estimates in detail.	K2	CO1	12M
2		Unit-II			
	a	Estimate the quantities of the following items using Centre line Method i) Earthwork in Excavation in foundation ii) Lime Concrete in foundation iii) Ist Class Brick work in cement mortar 1:6 in foundation & plinth. iv) 2.5 cm c.c damp proof course v) Ist class brickwork in lime mortar in super structure.	K6	CO2	12M
		OR			
	b	i) Explain about long wall and short wall method.	K2	CO2	6M
		ii) Estimate the quantities of the following items using long wall & short wall method i) Earthwork in Excavation in foundation ii) Lime Concrete in foundation iii) Ist Class Brick work in cement mortar 1:6 in foundation & plinth. iv) 2.5 cm c.c damp proof course v) I st class brickwork in lime mortar in super structure.	K6	CO2	6M
3		Unit-III			
	a	Calculate the quantity of each work for 200m length for a portion of a road in an uniform ground the heights of bank at the two ends being 1.00m and 1.60m. The formation width is 1.0 m and side slopes 2:1 (H:V). Assume that there is no transverse slope. Use the following methods and justify which method is good. a) Prismoidal formula and b) Mean - sectional area method	K3	CO3	12M
		OR			
	b	i)Describe how earthwork is estimated in hill roads	K2	CO3	6M
		ii) Describe how earthwork is estimated in irrigation channels	K2	CO3	6M
4		Unit-IV			
	a	i) Explain in detail the different types of standard specifications used in building construction.	K2	CO4	6M
		ii) A residential building was constructed 20 years back on a plot of area 223 m^2. The plinth area of building is 62m^2. The present cost of construction of the building is Rs: 8,00,000.00. The cost of land is 500 per m^2. The rate of depreciation of the building is 1%. Calculate the total value of the property.	K3	CO4	6M
		OR			
	b	i) What is meant by valuation? Explain the different types of valuation	K2	CO4	6M
		ii) Describe the detailed specification of various items of works for the following (i) RCC (ii) Color washing (iii) Brick I Class (iv) Plastering cement Mortar or lime mortar	K2	CO4	6M

5		Unit-V			
	a	i) What do you understand by rate analysis, what are the factors affecting analysis of rates of civil works? And explain the elements which constitute the rate analysis.	K2	CO5	6M
		ii) Brief the application about any five types of contracts in construction industry with their suitability.	K3	CO5	6M
		OR			
	b	Describe the procedure for the calculation of rate for the following a) C.C 1:5:10 in foundation with brick ballast 40 mm thick unit 1 cum b) R.C.C. brick work on slab etc 1:3 mortar unit 1cum	K2	CO5	12M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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NEC NARASARAOPET ENGINEERING COLLEGE
(AUTONOMOUS)

IV B.Tech I Semester Supple. Examinations, March-2025

Sub Code: 19BCE7TH02 ENVIRONMENTAL ENGINEERING

Time: 3 hours (CE) Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	KL	CO	M
1		Unit-I			
	a	i) Explain the importance of protected water supply systems.	K2	CO1	6M
		ii) Explain the factors affecting the design period	K2	CO1	6M
		OR			
	b	i) What are the basis for estimation of water demand and would you adopt suitable measure of fire fighting	K4	CO1	6M
		ii) Discuss the various factors which influence the water consumption in a community	K2	CO1	6M
2		Unit-II			
	a	What is a river intake? State the factors that govern the location of an intake structure on a meandering river	K3	CO2	12M
		OR			
	b	i) Discuss the types and advantages of infiltration galleries	K2	CO2	6M
		ii) Explain the construction and suitability of cast-iron pipes and concrete pipes	K2	CO2	6M
3		Unit-III			
	a	i) Differentiate BOD and COD	K2	CO3	6M
		ii) If the 3 day 25^{0}C BOD of sample of sewage is 225 mg/l, what will be its 5 day 30^{0}C BOD? k20=0.1 d^{-1}; Temperature coefficient = 1.047.	K3	CO3	6M
		OR			
	b	i) What are the WHO guidelines for drinking water	K3	CO3	6M
		ii) Explain the importance of chemical and bacteriological analysis of water used for domestic purposes.	K2	CO3	6M
4		Unit-IV			
	a	i) Differentiate slow sand filter and rapid sand filter.	K2	CO4	6M
		ii) Design a rectangular sedimentation tank to treat 2.4 million liters raw water per day. The detention period may be assumed to be 3 hours.	K5	CO4	6M
		OR			
	b	i) What is break point chlorination and under what conditions is it advocated?	K3	CO4	6M
		ii) Differentiate the coagulation and flocculation.	K2	CO4	6M
5		Unit-V			
	a	i) Write short notes on scour valves and check valves	K3	CO5	6M
		ii) What do you understand by an equivalent pipe? How do you determine its length when the pipes are (i) in series (ii) in parallel?	K3	CO5	6M
		OR			
	b	i) Explain the Hardy Cross method used for pipe net work analysis in water distribution system.	K2	CO5	6M
		ii) Discuss the various possible water distribution arrangements in multi-storaged buildings	K2	CO5	6M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

IV B.Tech I Semester Supple. Examinations, March-2025

Sub Code: 19BCE7PE07 **PRESTERESSED CONCRETE**

Time: 3 hours (CE) Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	i) Explain about the assumptions made in the design of Prestressed Concrete members	K1	CO1	6M
		ii) Explain with Neat sketches Freyssinet System of Post tensioning	K2	CO1	6M
		OR			
	b	i) Difference between fully prestressed member and partially prestressed members	K1	CO1	6M
		ii) Explain the Magnel Blaton system of prestressing	K2	CO1	6M
		Unit-II			
2	a	A prestressed concrete pile 250mm square contains 60 pre tensioned wires, each of 3mm diameter, uniformly distributed over the section. The wires are initially tensioned on the pre stressing bed with a total force of 500KN. Calculate the final stress in concrete and the percentage loss of stress in steel after all losses, given the following data: E_s= 200 KN/mm^2 & E_c=30KN/mm^2, Shortening Due to creep= 30X10^{-6}mm/mm per N/mm^2 of stress, total Shrinkage=200X10^{-6}per unit length, Relaxation of steel stress= 5 % of Initial stress, Pre stressing Force, P=400KN	K3	CO2	12M
		OR			
	b	A pre tensioned beam 250 mm wide and 360 mm deep is pre stressed by 10 wires of 8mm dia. Initial stress to 1000N/mm2. The centroid of the steel wires is located at 105mm from the soffit. Determine the max stress in concrete immediately after transfer allowing elastic shortening of concrete only at the level of centroid of the steel. If however, the concrete is subjected to additional shortening due to the creep and shrinkage and the steel is subjected to relaxation of stress of 5% of initial stress. Find the final percentage of loss of stress in steel wires. Take Es=210kN/mm2, Ec=36.85kN/mm2, ϕ=1.60, take residual shrinkage strain =3X10-4.	K3	CO2	12M
		Unit-III			
3	a	A box girder of pre-stressed concrete bridge of span 40m has overall dimensions of 1200mm by 1800mm. The uniform thickness of walls 200mm.The live load analysis indicates a maximum live load moment of 2000 kN at centre of span. The beam is pre-stressed by parabolic cables with an effective force of 7000 kN. The cables which are concentric at supports have an eccentricity of 800mm at centre of span section. Compute the resultant stresses at centre of span section using the internal resisting couple method.	K3	CO3	12M
		OR			
	b	i) Explain Different Types of Flexure Failures Modes in PSC beams	K2	CO3	6M
		ii) Explain Shrinkage of Concrete in PSC members	K2	CO3	6M
		Unit-IV			
4	a	i) A pre- tensioned concrete beam having a rectangular section,150 mm wide and 350mm deep, has an effective cover of 50 mm. If fck=40 N/mm2,Fp=1600N/mm2 and an area of pre stressed steel Ap=461 mm2.calculate the ultimate flexural strength of the section using IS:1343 code provisions	K3	CO4	7M
		ii) Briefly Explain the Importance of Creep of Concrete in long term Deflections of Pre stressed Members?	K2	CO4	5M

		OR			
	b	A Concrete beam having a rectangular Section 100X300MM is prestressed by a parabolic cable with an initial pre stressing force of 240KN. The cable has an eccentricity of 50mm at the centre and concentric at the supports. If the span of the beam is 12m and subjected to a load of 5KN/m. Calculate the short term deflection at mid Span. Assu,e E_c=38KN/mm^2, Creep Coefficient =2, Loss of pre stress=20% Estimate the Long term Deflection	K4	CO4	12M
5		Unit-V			
	a	i) What are the Different ways of improving the Shear resistance of Structural concrete members by prestressing Techniques?	K3	CO5	6M
		ii) Define End Block? Explain about Transmission length	K2	CO5	6M
		OR			
	b	i) Explain with sketches the effect of varying the ratio of depth anchorage to the depth of end block on the distribution of bursting tension.	K1	CO5	6M
		ii) How do you estimate the Ultimate Shear strength of PSC sections with Flexure Shear Cracks	K2	CO5	6M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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NARASARAOPETA
NEC ENGINEERING COLLEGE
(AUTONOMOUS)

IV B.Tech I Semester Supple. Examinations, March-2025

Sub Code: 19BCE7PE12 PHOTOGRAMMETRY AND REMOTE SENSING

Time: 3 hours (CE) Max. Marks: 60

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 12 = 60M)

<table>
<tr><th>Q.No</th><th></th><th>Questions</th><th>KL</th><th>CO</th><th>M</th></tr>
<tr><td rowspan="6">1</td><td colspan="5">Unit-I</td></tr>
<tr><td rowspan="2">a</td><td>i) Define Photogrammetry List the Applications of Photogrammetry</td><td>K1</td><td>CO1</td><td>6M</td></tr>
<tr><td>ii) Distinguish between maps and aerial photographs</td><td>K2</td><td>CO1</td><td>6M</td></tr>
<tr><td colspan="5">OR</td></tr>
<tr><td rowspan="2">b</td><td>i) Three points A,B and C were photographed and their coordinates with respect to the lines joining the collimation marks on the photograph are:
<table><tr><th>Point</th><th>X</th><th>Y</th></tr><tr><td>a</td><td>-34.52mm</td><td>21.43mm</td></tr><tr><td>b</td><td>9.32mm</td><td>-16.38mm</td></tr><tr><td>c</td><td>42.26mm</td><td>36.72mm</td></tr></table>The focal length of the lens is 130.80mm. Determine the azimuths of the lines OB and OC, if that of OA is 354°30′ and the vertical angles of a, b and c. The axis of the camera was level at the time of the exposure at the station O.</td><td>K3</td><td>CO1</td><td>8M</td></tr>
<tr><td>ii) Explain the process to determine the horizontal and vertical angles from terrestrial photograph with a neat sketch.</td><td>K2</td><td>CO1</td><td>4M</td></tr>
<tr><td rowspan="5">2</td><td colspan="5">Unit-II</td></tr>
<tr><td>a</td><td>An area of 110X110KM^2 is to be surveyed by aerial photographs. The following data is available: Focal length of camera= 200mm; Least count of Interval meter=0.5s;
Size of photograph=220X220mm; Average scale of photograph=1:14000;
Average elevation of terrain=400m; longitudinal overlap=58% side overlap=30% Velocity of aircraft=300kmph Determine i) Flying Height ii) Spacing of Flight lines iii) Ground Distance between exposure; iv) Exposure interval</td><td>K3</td><td>CO2</td><td>12 M</td></tr>
<tr><td colspan="5">OR</td></tr>
<tr><td rowspan="2">b</td><td>i) A vertical photograph of a flat area having an average elevation of 220m above M.S.L was taken with a camera having a focal length of 20cm. A section line AB, 240m long in the area, measures 8.50 cm on the photograph. A tower TB in the area also appears on the photograph. The distance between the images of top and bottom of the tower measures 0.46cm cm on the photograph. The distance of the image of the top of the tower is 6.46cm. Determine the height of tower.</td><td>K3</td><td>CO2</td><td>6M</td></tr>
<tr><td>ii) A section line AB appears to be 10.16cm on a photograph for which the focal length is 16cm. The corresponding line measures 2.54 cm on a map which is to a scale 1/50000. The terrain has an average elevation of 200m above mean sea level. Calculate the flying altitude of the aircraft above mean sea level, when the photograph was taken.</td><td>K2</td><td>CO2</td><td>6M</td></tr>
<tr><td rowspan="2">3</td><td colspan="5">Unit-III</td></tr>
<tr><td>a</td><td>A photographic Survey was carried out to a scale of 1:20000 Find the error in the height where given hat there is an error of 0.15mm in measuring the parallax of the point Given f=200 mm, Size of the photograph is 250X250mm and overlap is 60%</td><td>K4</td><td>CO3</td><td>12 M</td></tr>
</table>

		OR			
	b	i) Describe aero-triangulation and its principles	K2	CO3	6M
		ii) What is stereoscopy of images? How it is important in photogrammetry	K2	CO3	6M
4		Unit-IV			
	a	i) Atmospheric Windows are useful in remote sensing why?	K1	CO4	6M
		ii) What are the Different Types of resolutions used as parameters of sensors?	K1	CO4	6M
		OR			
	b	What do you understand by electromagnetic spectrum? State the wavelength regions, along with their uses for remote sensing applications.	K2	CO4	12 M
5		Unit-V			
	a	i) Differentiate between along track and Across talk scanning	K2	CO5	6M
		ii) Write a note on Landuse/land cover classification and analysis	K2	CO5	6M
		OR			
	b	i) Write a detailed note on the application of remote sensing in land use land cover analysis?	K3	CO5	6M
		ii) List out the different data products and explain their characteristics	K2	CO5	6M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

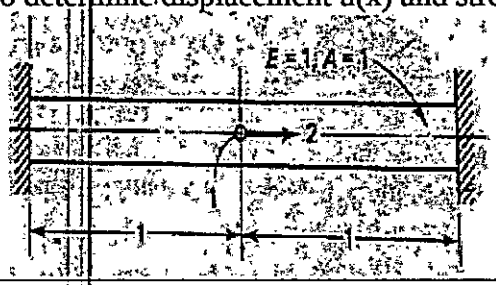
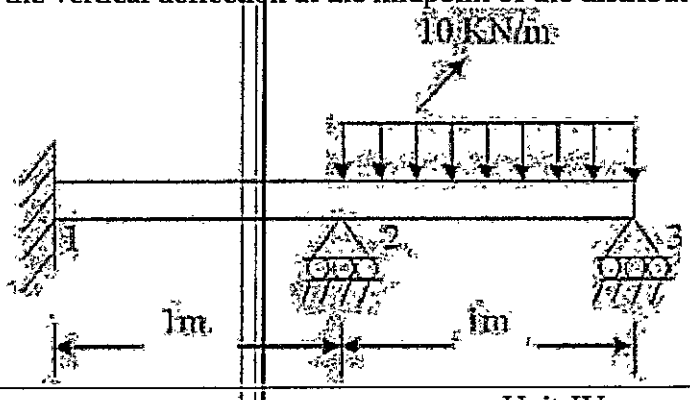
IV B.Tech I Semester Supple. Examinations, March-2025

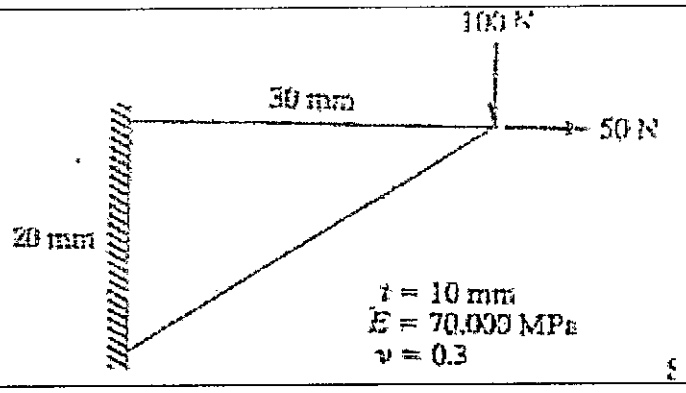
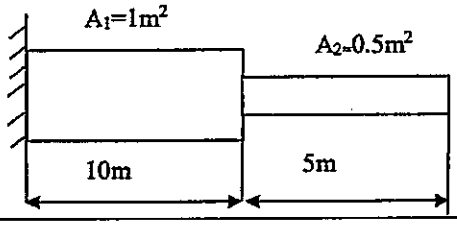
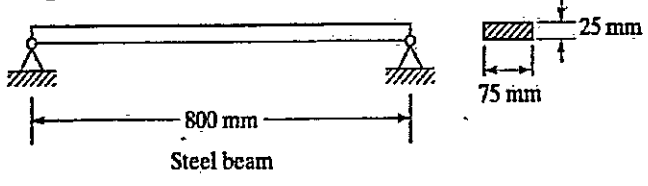
Sub Code: 19BME7TH02 **FINITE ELEMENT METHODS**

Time: 3 hours (ME) Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	KL	CO	M
1		Unit-I			
	a	Explain hook's law and deduce [D] matrix for an isotropic material	K3	CO1	12M
		OR			
	b	Discuss in detail about the concepts of FEM formulation .Explain the applications of FEM.	K2	CO1	12M
2		Unit-II			
	a	Derive the stiffness matrix of axial bar element with quadratic shape functions based on first principles	K2	CO2	12M
		OR			
	b	A rod fixed at its ends is subjected to a varying body force as shown in Figure. Use the Rayleigh-ritz method with an assumed displacement field $u=a0+a1x+a2x^2$ to determine displacement u(x) and stress σ(x). 	K3	CO2	12M
3		Unit-III			
	a	Derive the stiffness matrix of a truss element. Write its applications	K3	CO3	12M
		OR			
	b	For a beam and loading shown in figure. Determine the slopes at 2 and 3 and the vertical deflection at the midpoint of the distributed load. 	K3	CO3	12M
4		Unit-IV			
	a	For the configuration shown in Figure. determine the deflection at the point of load application using a one-element model. If a mesh of several triangular elements is used, comment on the stress values in the elements close to the tip.	K3	CO4	12M

					
		OR			
	b	Evaluate the following integral using Gaussian quadrature, so that the result is exact. $\int_{-1}^{1}\int_{-1}^{1}\left(2x^3y^2+5xy^3\right)dx\,dy$	K3	CO4	12M
5		Unit-V			
	a	Determine the Eigen values and Eigen vectors for the beam shown in figure. 	K3	CO5	12M
		OR			
	b	Determine all natural frequencies of the simply supported beam shown in figure. Using one element model, take E=200GPa, Density of steel= 7850kg/m³ 	K3	CO5	12M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

IV B.Tech I Semester Supple. Examinations, March-2025

Sub Code: 19BME7PE09 **POWER PLANT ENGINEERING**

Time: 3 hours (ME) Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	KL	CO	M
1		**Unit-I**			
	a	i) Describe the working of FBC boiler with a neat diagram.	K2	CO1	6M
		ii) Explain with neat sketches various draught systems.	K2	CO1	6M
		OR			
	b	i)) Summarize the arrangement and operation of a surface condenser.	K2	CO1	6M
		ii) Explain any one ash handling system with a neat sketch.	K2	CO1	6M
2		**Unit-II**			
	a	i) Give the advantages and disadvantages of a diesel power plant.	K2	CO2	6M
		ii) Illustrate the advantages of Integrated Gasifier based combined cycle power plants.	K2	CO2	6M
		OR			
	b	i) Explain the working of closed loop gas turbine with a neat sketch.	K3	CO2	6M
		ii) Express the advantages of combined cycle power plants.	K2	CO2	6M
3		**Unit-III**			
	a	i) Explain with a neat sketch CANDU reactor.	K3	CO3	6M
		ii)With the help of a sketch show all the important part of nuclear reactor. Describe briefly the functions of each part.	K3	CO3	6M
		OR			
	b	i) List out the advantages of fast breeder reactors.	K2	CO3	6M
		ii) Explain the functions of moderators.	K2	CO3	6M
4		**Unit-IV**			
	a	i) Explain with a neat diagram of wind electric generating power plant.	K3	CO4	6M
		ii) Discuss the different types of ocean thermal energy conversion system.	K2	CO4	6M
		OR			
	b	i) Describe the functions of a solar PV electric plant	K2	CO4	6M
		ii) Quote the advantages of fuel cell power sources with specific reference to environment.	K2	CO4	6M
5		**Unit-V**			
	a	i) Define tariff? Discuss and compare various tariff used in practice	K3	CO5	6M
		ii) Summarize the elements which contribute to the cost of the electricity? And how can the cost power generation be reduced?	K3	CO5	6M
		OR			
	b	i) Explain load curves and load duration curves? Discuss their utility in the economics of generation.	K3	CO5	6M
		ii) Explain the pollution control technologies including waste disposal options for nuclear power plant	K2	CO5	6M

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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