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IV B.TECH I SEM

SUPPLEMENTARY EXAMINATIONS

MARCH / APRIL 2024

IV B.Tech I Semester Supple. Examinations, March-2024

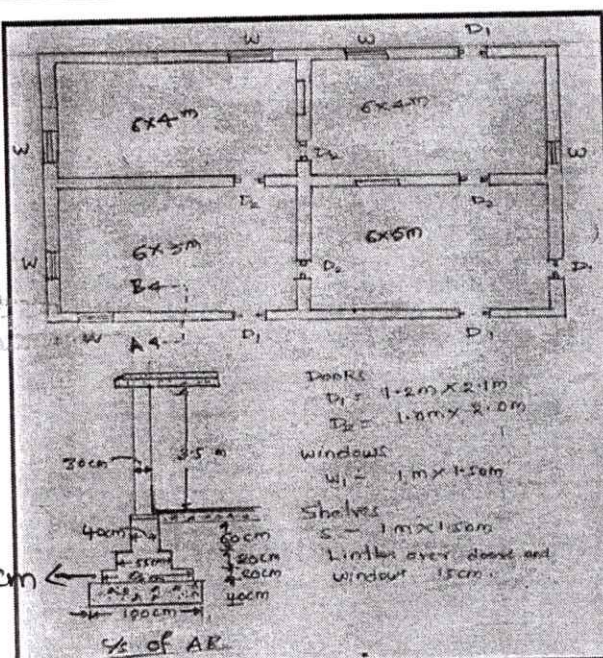Sub Code: 19BCE7TH01   ESTIMATION SPECIFICATIONS AND COSTING

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
		Unit-I			
1	a	i) Identify the Recommendations for Degree of Accuracy on measurements	K2	CO1	6
		ii) Explain Center line Method in detail	K2	CO1	6
		OR			
	b	i) Write clear note on the following general items of work in the building. a) Earthwork b) soiling c) concrete in foundation d) Masonry	K2	CO1	6
		ii) Explain the role and responsibility of a Estimator	K2	CO1	6
		Unit-II			
2	a	Estimate the quantities of the following items of a residential building from the given drawing a. Earth work in excavation in foundation. b. Lime concrete in Foundation c. First class brick work in 1:6 cement sand mortar in foundation and plinth. d. 2.5 cm damp proof course e. First class brick work in lime mortar in super structure	K3	CO2	12
		OR			
	b	i) List the Factors that effect the Estimation of the Final cost of the Building	K2	CO2	6
		ii) Explain the main items of work in Estimating a building	K2	CO2	6
		Unit-III			
3	a	i) Estimate the quantity of earth work for a portion of a proposed road from the following data. Proposed formation width of road in 10m, side slope 1 ½:1 in cutting and 2:1 in banking. Assume there is no transverse slope of the ground. Draw longitudinal section of the road and a typical cross section.	K4	CO3	8

Distance(m)	0	30	60	90	120	150	180	210	240
R.L of ground	83.12	82.44	81.86	82.08	81.30	80.80	80.54	80.82	81.50
R.L of Formation	82.42	Down ward gradient 0.9%				Upward gradient 0.7%			

			KL	CO	
	ii) The formation width of road embankment is 9.0m. The side slopes are 2.5:1. The depths along the center line of road at 50.0m intervals are 1.2,1.1,1.4,1.2,0.9,1.5 and 1.0m.It is required to calculate the quantity of earthwork by (i) Prismoidal rule. (ii) Trapezoidal rule		K3	CO3	

												K2	CO3	

i) Discuss the methods used for Estimating earthwork in road construction from longitudinal sections? — K2 — CO3

b) ii)The bed width of the channel is 7 m and the top widths of banks are 3.5 m for the left and 2.50m for the right bank. Side slopes of excavation is 2:1 and of bank 1.5:1. Height of bank from bed is 3.25 m throughout. The longitudinal slope of the bed of the channel is 1 in 2000.R. L of Bed at 6th chainage is 92.42. Calculate Quantity of earthwork in an irrigation channel and find out economical depth of digging. Draw longitudinal section of the road and a typical cross section — K4 — CO3 — 8

Distance	200	240	280	320	360	400	440	480	520
Chainage	6	7	8	9	10	11	12	13	14
R.L of ground	95.12	95.44	94.86	94.08	94.30	93.80	93.54	93.82	93.50

Unit-IV

			KL	CO	M
4	a	i) Distinguish between detailed specifications and general specifications with example?	K2	CO4	6I
		ii) Explain the different methods used for the valuation. Explain any three.	K2	CO4	6I

OR

	b	i) Discuss briefly about the methods of depreciation and methods of valuation of Building?	K2	CO4	6I
		ii) A pumping set with a motor has been installed in a building at a cost of Rs 10800/-. Assuming the life of the pump as 15 years, workout the amount of annual instalment of sinking fund required to be deposited to accumulate the whole amount of 5% compound interest.	K3	CO4	6I

Unit-V

5	a	i) Calculate analysis of rates for Brick masonry of standard brick 20*10*10cm for 1 Cu m. Take 10 Cu m.	K3	CO5	6I
		ii) Discuss in Detail about rate analysis for canal Work	K2	CO5	6I

OR

	b	i) Perform the rate analysis for cement concrete work in foundation with the proportion of the cement concrete as 1:2:4 for 1 Cu.m	K3	CO5	6I
		ii) Discuss the Important particulars in tender Documents and describe them	K2	CO5	6I

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

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

IV B.Tech I Semester Supple. Examinations, March-2024

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) Define per capita water demand? List any four major factors affecting the rate of demand of water and explain the concept of fluctuations in water demand?	K1	Co1	6M
			ii) The population statistics pertaining to a town are given below. Estimate the population expected in the year 2020 by Geometrical and incremental increase method?	K3	Co1	6M
			year: 1960, 1970, 1980, 1990, 2000 / population: 70,000; 1,00,000; 1,50,000; 2,10,000; 2,50,000			
			OR			
	b		i) Discuss the factors that affect the rate of water demand.	K1	Co1	6M
			ii) Discuss the physical characteristics of water and their influence on water quality.	K1	Co1	6M
2			**Unit-II**			
	a		What are the basic requirements of a pipe joint? Explain the various pipe joints with neat sketches.	K1	Co2	12M
			OR			
	b		i) Expalain different types of water intake structures	K2	Co2	6M
			ii) How to select pumps and pipe materials for water supply system explain in detail.	K1	Co2	6M
3			**Unit-III**			
	a		Explain the significance and analysis of any four important physical characteristics and any six chemical characteristics of drinking water.	K2	Co3	12M
			OR			
	b		i) What are the requirements of a good water distribution system?	K1	Co3	12M
4			**Unit-IV**			
	a		i) Explain the theory of sedimentation.	K2	Co4	6M
			ii) Explain the procedure for determination of Optimum Coagulant Dosage by JarTest with a neat sketch.	K2	Co4	6M
			OR			

Population table:

year	1960	1970	1980	1990	2000
population	70,000	1,00,000	1,50,000	2,10,000	2,50,000

	b	i) Illustrate with a sketch, the different functional zones of a rectangular sedimentation tank.	K3	Co4	6M
		ii) With a neat sketch, explain the working of a slow sand filter.	K3	Co4	6M
5		Unit-V			
	a	i) Write short note on the different layout of distribution networks.	K2	Co5	6M
		ii) explain methods of distribution system.	K2	Co5	6M
		OR			
	b	i) Explain the equivalent pipe method with neat sketch.	K2	Co5	6M
		ii) Explain Hardy-Cross method of analysis of complex pipe networks?	K2	Co5	6M

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

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IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BCE7PE07   **PRESTRESSED 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) Why is the high strength of concrete and high grade of steel required for prestressed concrete?	K1	CO1	6M
		ii) Explain any two methods of prestressing system.	K2	CO1	6M
		OR			
	b	i) What is Pre-stressing and explain different types of Prestressing	K1	CO1	6M
		ii) A beam is of simply supported span 8m. The size of the beam is 350mm x 700mm. A prestressing force of 100kN was applied. The cable is parabolic with an eccentricity of 100mm at centre and zero at the supports. It is subjected to an udl of 20kN/m. Compute the extreme stresses at the mid span.	K3	CO1	6M
		Unit-II			
2	a	What is pre tensioning and post tensioning.	K1	CO2	6M
	b	Explain with sketches Freyssinett system of post tensioning?	K2	CO2	6M
		OR			
	b	i) Explain with sketches Magnell's system of post tensioning?	K2	CO2	6M
		ii) What are the different types of high tensile steel used in pre stressed concrete members?	K2	CO2	6M
		Unit-III			
3	a	i) What do you mean by loss of prestress?	K1	CO3	6M
		ii) A prestressed concrete beam 200×300 mm deep is prestressed with wires (area = 320 mm^2) located at 50 mm from the bottom carrying an initial stress of 1000 N/mm^2. The span of the beam is 10 m. Calculate the percentage loss of prestress in wires when the beam is post-tensioned. Assume Es = 210 kN/mm^2, Ec = 35 kN/mm^2. Relaxation of steel stress = 5% initial stress, shrinkage of concrete = 200×10^{-6}, creep coefficient = 1.6, slip at anchorage = 1 mm, friction coefficient = 0.0015 per metre.	K3	CO3	6M
		OR			
	b	i) A prestressed concrete pile 250 mm square, contains 60 pre-tensioned wires, each of 3mm diameter, uniformly distributed over the section. The wires are initially tensioned on the prestresssing bed with a total force fo 500 kN. Calculate the final stress in concrete and the percentage loss of stress in steel after all losses, given the following data : Es = 210 kN/mm^2 & Ec = 32 kN/mm^2 Shortening due to creep = 30×10^{-6} mm/mm per N/mm^2 of stress Total shrinkage = 200×10^{-6} per unit length Relaxation of steel stress = 5 per cent of initial stress Prestressing force, P = 400 kN	K3	CO3	12M
4		**Unit-IV**			
	a	i) A post tensioned beam of 15m of rectangular cross section, 250 mm wide and 475 mm deep, is 10 m long and carries an applied load of	K4	CO4	6M

		10kN/m.UDL on the beam. The effective prestressing force in the cable is 650 kN. The cable is Parabolic with zero eccentricity at the supports and a maximum eccentricity of 150 mm at the center of span. Calculate the principal stresses at the supports			
		ii) Explain the Different types of flexure failures modes in PSC beams	K2	CO4	6M
		OR			
	b	i) A pre tensioned T- section has a flange which is 300mm wide 200mm thick .the rib is 150 mm wide by350 mm deep. the effective depth of the cross section is 500mm.given Fp=1600 N/mm2,Estimate the ultimate moment capacity of the T-section using the Indian standard code provisions	K4	CO4	6M
5		**Unit-V**			
	a	i) Write a note on end zone reinforcement in end block..	K2	CO5	6M
		ii) Explain Guyon's method for end block design	K1	CO5	6M
		OR			
	b	The end block of a prestressed concrete beam, rectangular in section, is 120 mm wide and 300mm deep. The prestressing force of 250kN is transmitted to concrete by distribution plate, 120mm wide and 75mm deep, concentrically located at the ends. Calculate the position and magnitude of the maximum tensile stress on the horizontal section through the centre of the end block using the Guyon method. Yield stress in steel = 250 N/mm^2 and design the end block also sketch the reinforcement in the designed block.	K4	CO5	12M

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IV B.Tech I Semester Supple. Examinations, March-2024

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)

Q.No		Questions	KL	CO	M
		Unit-I			
1	a	Photographs of a certain area were taken from P and Q, two camera stations, 100m apart. The focal length of the camera is 150mm. The axis of the camera makes an angle of 70° and 50° with the base line at stations P and Q respectively. The image of a point A appears 21.2mm to the right and 15.6mm above the hair lines on the photograph taken at P and 40.8mm to the left on the photograph taken at Q. Calculate the distance PA and QA and elevation of point A, if the elevation of the instrument axis at P is 128.645m.	K3	CO1	12M
		OR			
	b	i) Define Photogrammetry List the Applications of Photogrammetry	K1	CO1	6M
		ii) Distinguish between maps and aerial photographs	K2	CO1	6M
		Unit-II			
2	a	An area of 100X100KM^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=200X200mm; Average scale of photograph=1:15000; Average elevation of terrain=400m; longitudinal overlap=60% side overlap=30% Velocity of aircraft=300kmph Determine i) Flying Height ii) Spacing of Flight lines iii) Ground Distance between exposure; iv) Exposure interval	K3	CO2	12M
		OR			
	b	i) Discuss the Procedure to evaluate Ground length from tilted photographs?	K2	CO2	6M
		ii) Explain in detail about the flight planning in aerial photography	K2	CO2	6M
		Unit-III			
3	a	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%	K4	CO3	12M
		OR			
	b	i) Describe ortho-rectification and its significance in ortho-mosaic	K2	CO3	6M
		ii) Write about parallax and its equations with a neat sketch	K2	CO3	6M
4		Unit-IV			
	a	i) Atmospheric Windows are useful in remote sensing why?	K1	CO4	6M
		ii) Explain about EMR's interaction with earth's surface	K1	CO4	6M

		OR			
	b	i) What do you understand by Remote Sensing? Differentiate between Active and Passive Remote Sensing?	K1	CO4	12M
5		Unit-V			
	a	i) Differentiate between along track and Across talk scanning	K2	CO5	6M
		ii) Write a brief note on Different types of Platforms?	K1	CO5	6M
		OR			
	b	i) Write a detailed note on the application of remote sensing in land use land cover analysis?	K1	CO5	6M
		ii) Write a note on Landuse/land cover classification and analysis	K2	CO5	6M

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

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IV B.Tech I Semester Supple. Examinations, March-2024
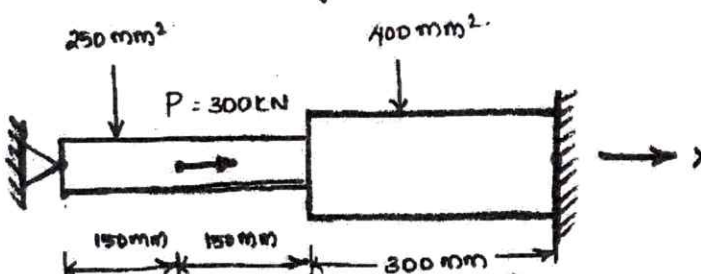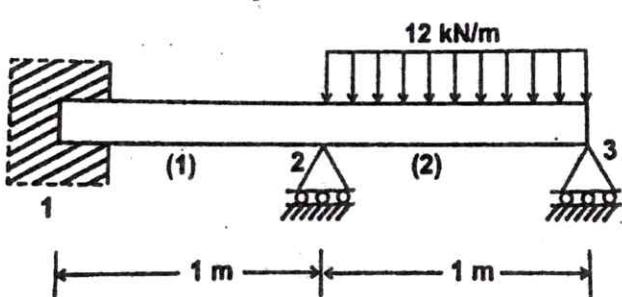
Sub Code: 19BME7TH02 **FINITE ELEMENT METHODS**

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
			Unit-I			
1	a	i)	If a displacement field is described by $u = (-x^2 + 2y^2 + 6xyz + 2z^2 + 4yz)$ E-4 $v = (3x + 6y - y^2 + 6yz + 3z)$ E-4 $w = (x^2 + 2y^2 + z^2 - 2z + 2xyz)$ E-4 Determine the strain field at the point x = 1 and y = 0.	K3	CO1	8M
		ii)	Discuss the general procedure for Finite Element Methods.	K2	CO1	4M
			OR			
	b	i)	Write the applications, advantages and disadvantages of Finite Element Methods.	K1	CO1	6M
		ii)	Explain the Different approaches of getting the finite element equations.	K2	CO1	6M
			Unit-II			
2	a		Consider the bar in figure loaded as shown in figure. Determine the nodal displacement, stresses, and support reactions. $E = 200 \times 10^9$ N/m^2	K3	CO2	12M
			OR			
	b		Derive the element stiffness matrix for the one dimensional bar element.	K4	CO2	12M
			Unit-III			
3	a		Derive the element stiffness matrix for the plane truss element.	K4	CO3	12M
			OR			
	b		For the beam shown in Figure below, determine the following: i) Slopes at node 2 and 3. ii) Vertical deflection at the mid-point of the distributed load. E = 200 GPa ; I = 4 x 10^{-6} m^4	K3	CO3	12M

		Unit-IV			
4	a	i) Evaluate the shape functions N1, N2, N3 at the interior point P for the triangular element as shown in figure. 	K3	CO4	6M
		ii) Determine the Cartesian coordinates of the point P which has local coordinates =0.8 and η=0.6 as shown in figure. 	K3	CO4	6M
		OR			
	b	Using a 2 X 2 rule, evaluate the integral $$\int\int_A (x^2 + xy^2)\, dx\, dy$$ by Gaussian Quadrature, where A denotes the region shown in figure. For 2 X 2 gauss rule sampling Points are ± 0.5774 and the weights are the two points are equally to unity. 	K3	CO4	12M
5		**Unit-V**			
	a	i) Discuss the Eigen value and Eigen Vector Analysis.	K2	CO5	6M
		ii) Explain the Lumped parameter model with Example.	K2	CO5	6M
		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
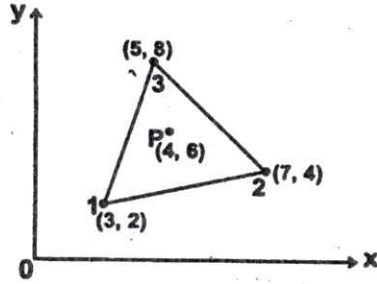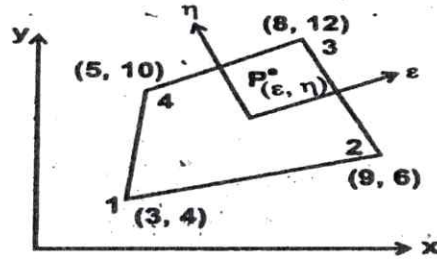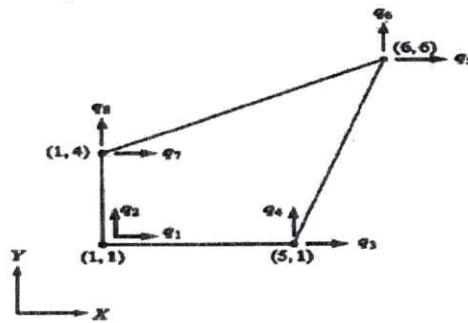
KL: Blooms Taxonomy Knowledge Level   CO: Course Outcome   M:Marks

IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BME7TH03   INDUSTRIAL ENGINEERING AND MANAGEMENT

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

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

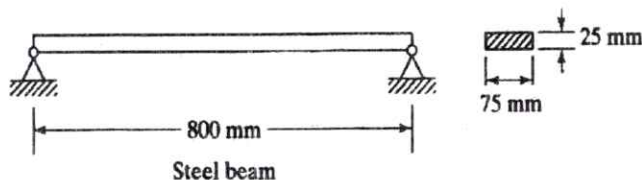| Q.No			Questions	KL	CO	M
			Unit-I			
1	a		i) Write the differences between production management and industrial engineering.	K1	CO1	6M
			ii) Differentiate between theory X and theory Y.	K4	CO1	6M
			OR			
	b		i) State Taylor's principles and explain them in detail.	K1	CO1	12M
			Unit-II			
2	a		i) What is the Process layout? Explain with the help of a neat sketch. Also summarize its advantages and disadvantages.	K1	CO2	12M
			OR			
	b		i) Explain about preventive and Breakdown maintenance.	K2	CO2	6M
			ii) state the quantitative techniques for optimal design of layouts.	K1	CO2	6M
			Unit-III			
3	a		i) Differentiate between method study and work measurement. How is productivity increased by these methods?	K4	CO3	6M
			ii) Explain about String diagram.	K2	CO3	6M
			OR			
	b		i) State the principles of Ergonomics and explain them.	K1	CO3	6M
			ii) Explain about therbligs in detail. Also draw the symbols used to indicate them.	K2	CO3	6M
			Unit-IV			
4	a		i) What is meant by a control chart? Differentiate between X and S charts.	K4	CO4	6M
			ii) Write the applications of R chart.	K1	CO4	6M
			OR			
	b		i) Explain the significance of statistics in quality control.	K2	CO4	6M
			ii) Differentiate between single and double sampling inspection methods.	K4	CO4	6M
			Unit-V			
5	a		i) Define job evaluation and narrate the various steps involved for evaluating the jobs.	K1	CO5	6M
			ii) State and explain the functions of personnel management.	K2	CO5	6M
			OR			
	b		i) Explain any three wage incentive plans with the help of suitable examples.	K2	CO5	12M

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

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IV B.Tech I Semester Supple. Examinations, March-2024

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
			Unit-I			
1	a		i) Describe about working principle of Super Critical Boilers.	2	1	6M
			ii) Explain about the feed water treatment methods.	2	1	6M
			OR			
	b		i) Explain about the working principle of Steam turbine.	2	1	6M
			ii) Explain about Fuel and ash handling systems in thermal power plants.	2	1	6M
			Unit-II			
2	a		Illustrate the working principle and components of Brayton Cycle based power plants.	2	2	12M
			OR			
	b		i) Describe about the combined Cycle Power Plant.	2	2	6M
			ii) What are the Advantages and Disadvantages of Diesel engine power plants?	2	2	6M
			Unit-III			
3	a		i) Explain the working of Pressurized Water Reactor (PWR).	2	3	6M
			ii) Illustrate the safety measures for Nuclear Power plants.	2	3	6M
			OR			
	b		i) Explain about the Canadian Deuterium- Uranium reactor (CANDU).	2	3	6M
			ii) Describe subsystems of Nuclear Power Plants.	2	3	6M
			Unit-IV			
4	a		i) Explain about classification and components of Hydro Electric Power Plants.	2	4	6M
			ii) Explain about the working of Tidal power plants.	2	4	6M
			OR			
	b		i) Explain about the Geo Thermal, Biogas power plants.	2	4	6M
			ii) What are the applications, merits and demerits of fuel cell power system?	2	4	6M
			Unit-V			
5	a		i) Explain about Load distribution parameters.	2	5	6M
			ii) Explain about pollution control techniques.	2	5	6M
			OR			
	b		i) Describe about site selection criteria of a power plant.	2	5	6M
			ii) What are the relative merits & demerits of different power plants?	2	5	6M

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

IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BCC7OE08   **AUTOMOTIVE ELECTRONICS**

Time: 3 hours   (ECE)   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 the basic operation of the engine and list uses of electronics in automotive.	K3	CO1	6M
		ii) Depict and explain the significance of The Four Strokes of a Typical Modern Gasoline-Fueled, Spark-Ignition Engine	K4	CO1	6M
		OR			
	b	i) list all components of the engine and explain four major crucial elements of it.	K2	CO1	6M
		ii) Draw the Schematic of the Ignition Circuit and differentiate it with hybrid vehicle configuration.	K4	CO1	6M
		Unit-II			
2	a	Implement a general A 4-Bit Digital Adder and represent the circuit for A = 0110 and B = 1100 addition operation.	K3	CO2	12M
		OR			
	b	i) Explain the use of feedback in operational amplifiers and derive the non-inverting amplifier gain using circuit.	K3	CO2	6M
		ii) Build the schematic of multiplexer (IC 74151) and 3 to 8 decoders (IC 74138).	K4	CO2	6M
		Unit-III			
3	a	i) Depict the Typical Microprocessor Internal Architecture and express some views in registers.	K3	CO3	10M
		ii) Write two Comparisons of analog and digital computers.	K4	CO3	2M
		OR			
	b	i) Explain the operation of Digital-to-Analog Converter Circuit Block and write the significance of an operational amplifiers.	K3	CO3	8M
		ii) Describe the significance of A to D converters in electronic automotive designs.	K4	CO3	4M
		Unit-IV			
4	a	i) Explain the working principle of best using AUTOMOTIVE ENGINE CONTROL ACTUATORS.	K3	CO4	6M
		ii) Describe these: Crankshaft Position Sensor and Detonation sensors.	K4	CO4	6M
		OR			
	b	i) Classify and give an example of sensors used automotive in real time.	K2	CO4	6M
		ii) Describe the basic vehicle speed sensors with its internal making diagram.	K3	CO4	6M
		Unit-V			
5	a	Depict block level representation for navigation types and their major working principle.	K3	CO5	12M
		OR			
	b	i) How the fiber optics interfaced in a car and explain the basic mode of operation.	K2	CO5	6M
		ii) Draw and brief the Control Signal Multiplexing Block Diagram.	K4	CO5	6M

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

IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BEC7TH01   **MICROWAVE ENGINEERING**   Max. Marks: 60

Time: 3 hours   (ECE)

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) Analyze the field components in rectangular waveguide while propagating TE wave.	K4	1	6M
			ii) Why TEM wave cannot exist in Rectangular Wave Guide? Explain.	K2	1	6M
			OR			
	b		i) Calculate the cut-off frequency of the following modes in a square waveguide 4 cm × 4 cm TE_{10}, TM_{11}, and TE_{22}.	K3	1	6M
			ii) Enumerate the basic advantages of microwaves. iii) Examine the applications of microwaves.	K3	1	6M
			Unit-II			
2	a		Derive the S-matrix for completely matched four-port directional coupler. Explain the coupling factor and directivity of the four ports directional coupler.	K4	2	12M
			OR			
	b		i) Describe the structure of Tuning Screws and Posts with diagrams	K4	2	6M
			ii) Analyze the operation of Rotary vane type attenuator.		2	6M
			Unit-III			
3	a		i) A two-cavity klystron operates at 10 GHz with I_o = 3.5 mA, V_o = 10 kV. The drift space length is 3cm, and the output cavity total shunt conductance is G_{sh}=20μmho with beam coupling coefficient b_0 =0.92. Find the maximum voltage gain.	K4	3	6M
			ii) Conclude the limitations and losses of conventional tubes at microwave frequencies.	K4	3	6M
			OR			
	b		i) Interpret the applegate diagram and working principle of reflex klystron with neat sketch.	K3	3	6M
			ii) Describe the uses of Re-entrant cavities. Mention the applications of Reflex Klystron	K2	3	6M
			Unit-IV			
4	a		i) Survey about the types and characteristics of slow wave structures	K3	4	6M
			ii) How oscillations are prevented in a Travelling Wave Tube.	K3	4	6M
			OR			
	b		i) Survey about the differences between the of magnetron and reflex klystron tubes	K3	4	6M
			ii) Determine the Hull cut-off voltage equation.	K4	4	6M
			Unit-V			
5	a		i) Utilize different microwave components to explain microwave bench.	K3	5	6M
			ii) Describe the two methods of measuring microwave Power	K3	5	6M
			OR			
	b		i) Describe the avalanche transit time devices? Explain the operation, construction and application of the IMPATT diode	K3	5	6M
			ii) What is transferred electron effect? Explain with neat diagram	K2	5	6M

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

IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BEC7TH02
Time: 3 hours

VLSI DESIGN
(ECE)

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) Illustrate the MOS transistor operation with the help of neat sketches in the Enhancement mode.	IV	1	6M
		ii) Derive relation between Ids vs Vds for Non-Saturation and Saturation Region.	III	1	6M
		OR			
	b	i) What are the steps involved in N-MOS IC fabrication	II	1	6M
		ii) Determine the ratio of pull up to pull down transistors for an NMOS inverter driven by another NMOS inverter through pass transistor.	III	1	6M
2		**Unit-II**			
	a	i) What is inverter delay? How delay is calculated to for multiple stages?	IV	2	6M
		ii) What are the issues involved in driving large capacitor loads in VLSI circuit regions? Explain.	IV	2	6M
		OR			
	b	i) Calculate on resistance of an inverter from VDD to GND. If n- channel sheet resistance Rsn=104Ω per square and P-channel sheet resistance Rsp = 3.5 × 104Ω per square. (Zpu=4:4 and Zpd=2:2).	IV	2	6M
		ii) Describe three sources of wiring capacitances. Explain the effect of wiring capacitance on the performance of a VLSI circuit.	II	2	6M
3		**Unit-III**			
	a	i) What is a stick diagram? Draw the stick diagram and layout for a CMOS inverter.	III	3	6M
		ii) Classify different types of MOS scaling. Derive their effects on various parameters of MOSFET.	IV	3	6M
		OR			
	b	i) Write a short note on 2µm Double Metal, Double Poly, CMOS/BiCMOS rules.	II	3	6M
		ii) Explain the operation of single stage amplifier with resistive load	IV	3	6M
4		**Unit-IV**			
	a	i) Give importance of Dynamic Logic design over static logic Design? Explain principle of Dynamic Logic.	II	4	6M
		ii) Explain the techniques used to reduce number of transistors in Complementary CMOS Logic design.	IV	4	6M
		OR			
	b	i) Explain the issues in Dynamic Design	IV	4	6M
		ii) Briefly discuss about Multiplexer based latches with a neat diagram.	II	4	6M
5		**Unit-V**			
	a	i) Illustrate with a neat architecture diagram about various functional blocks of FPGAs.	IV	5	6M
		ii) Compare FinFET and TFET Technologies	IV	5	6M
		OR			
	b	i) Describe short channel effect in MOS devices and explain their effect on characteristics of MOSFET	IV	5	6M
		ii) Draw the FPGA design flow and explain.	II	5	6M

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

IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BCI7TH01   **DATA SCIENCE**

Time: 3 hours   (CSE, IT)   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) Demonstrate Creating ndarrays and list the array creation functions.	K3	CO1	6M
			ii) Explain about Boolean Indexing, Fancy Indexing with example code?	K2	CO1	6M
			OR			
	b		i) What is Data Science? Write about the role of data scientist.	K1	CO1	6M
			ii) Demonstrate Expressing Conditional Logic as Array Operations.	K3	CO1	6M
			Unit-II			
2	a		i) Define DataFrame? Demonstrate various ways of creating DataFrames?	K3	CO2	6M
			ii) Write about the features and applications of pandas?	K1	CO2	6M
			OR			
	b		i) List and describe various Descriptive and Summary Statistics. Also demonstrate any three of them with example code?	K2	CO2	6M
			ii) Explain how to handle Missing Data with example.	K2	CO2	6M
			Unit-III			
3	a		i) Demonstrate the conversion of json string to python form and again back to json string, with the help of an example code?	K2	CO3	6M
			ii) Demonstrate reading excel files?	K2	CO3	6M
			OR			
	b		i) Write about HDF5 Format?	K1	CO3	6M
			ii) Explain about writing Data Out to Text Format with example.	K2	CO3	6M
			Unit-IV			
4	a		i) What is matplotlib and how it can be used in python code?	K1	CO4	6M
			ii) Demonstrate how to change the line style and colors in a plot?	K2	CO4	6M
			OR			
	b		i) Write about combining data with overlap?	K1	CO4	6M
			ii) Demonstrate removing duplicates in a data frame?	K2	CO4	6M
			Unit-V			
5	a		i) Explain about iterating over groups with example.	K2	CO5	6M
			ii) What is data aggregation? Explain Returning Aggregated Data Without Row Indexes.	K2	CO5	6M
			OR			
	b		i) Demonstrate Grouping with Functions with example code.	K2	CO5	6M
			ii) Demonstrate Filling Missing Values with Group-specific Values.	K2	CO5	6M

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

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IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BCI7TH02
Time: 3 hours

Dev Ops
(IT, CSE)

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	State and explain various phases of software development life cycle.	K2	1	12M
		OR			
	b	i) Describe values of Agile software development.	K2	1	6M
		ii) Write advantages of Agile software development.	K2	1	6M
		Unit-II			
2	a	Describe various components that constitute the Devops architecture with a neat diagram.	K2	2	12M
		OR			
	b	i) Explain orchestraisation of Devops in detail?	K2	2	6M
		ii) Write short notes on deployment in DevOps.	K2	2	6M
		Unit-III			
3	a	Elaborate on the toolset implementation and utilization in DevOps.	K3	3	12M
		OR			
	b	i) Describe the Agile capabilities of DevOps.	K3	3	6M
		ii) Discuss the technological aspects involved in utilizing DevOps for projects.	K3	3	6M
		Unit-IV			
4	a	i) List out benefits of CI/CD.	K4	4	6M
		ii) What is continuous integration? Explain a few benefits the software industry gets by incorporating continuous integration.	K4	4	6M
		OR			
	b	Describe the metrics used for monitoring CI & CD practices.	K4	4	12M
		Unit-V			
5	a	i) Describe the process of assessing DevOps maturity.	K5	5	6M
		ii) Give a Detailed explanation of the essential components of the DevOps maturity model.	K5	5	6M
		OR			
	b	Draw the diagram illustrating different stages of the DevOps maturity model and provide an explanation for each stage.	K5	5	12M

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

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NARASARAOPETA ENGINEERING COLLEGE
NEC (AUTONOMOUS)

IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BCI7TH03   **HUMAN COMPUTER INTERACTION**

Time: 3 hours   (CSE, IT)   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 the principle of uniformity in user interface design.	K2	CO1	6M
			ii) List and explain the benefits of good design.	K2	CO1	6M
			OR			
	b		i) Explain how advancements in technology influenced the evolution of screen design over time?	K2	CO1	6M
			ii) What are the difficulties in designing web interface design? Explain.	K2	CO1	6M
			Unit-II			
2	a		i) Outline are the goals of user interface designer?	K2	CO2	6M
			ii) Explain how the evolution of web technology influenced the popularity and characteristics of user interfaces on the internet?	K2	CO2	6M
			OR			
	b		i) Summarize are the differences between GUI and web user interface?	K2	CO2	6M
			ii) Explain the concept of direct and indirect manipulation.	K2	CO2	6M
			Unit-III			
3	a		i) Explain why it is important for designers to understand human behaviour and cognition in the context of human-computer interaction?	K2	CO3	6M
			ii) Summarize the important human characteristics that have an influence on design?	K2	CO3	6M
			OR			
	b		i) Illustrate how do cultural differences influence the design of interfaces for global audiences?	K2	CO3	6M
			ii) Develop strategies that designers can employ to accommodate users with varying levels of technological literacy?	K3	CO3	6M
			Unit-IV			
4	a		i) Demonstrate the primary design goals in creating screens for user interfaces, and how do they influence the overall user experience?	K2	CO4	6M
			ii) Can you explain the importance of the ordering of screen data and content in facilitating user comprehension and task completion?	K2	CO4	6M
			OR			
	b		i) What is the role of screen navigation in screen design? Explain.	K2	CO4	6M
			ii) Summarize the approaches to be taken to present information simply and meaningfully, particularly in complex or data-rich interfaces?	K2	CO4	6M
			Unit-V			
5	a		i) Explain the factors that influence the icon's usage?	K2	CO5	6M
			ii) What are the essential components of window interfaces? Identify how do text and messages contribute to user understanding and engagement?	K3	CO5	6M
			OR			
	b		i) What are the challenges associated with color selection? Identify how do colors contribute to the usability and aesthetics of window interfaces.	K3	CO5	6M
			ii) Illustrate various GUI controls in brief.	K2	CO5	6M

IV B.Tech I Semester Supple. Examinations, March-2024

Sub Code: 19BCS7TH04 **MACHINE LEARNING**

Time: 3 hours (CSE) 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 concept of Bayesian classification with an example.	K2	CO1	6M
			ii) Give a brief note on Model Selection and Generalization.	K2	CO1	6M
			OR			
	b		i) Explain the concept of learning a class from example with neat sketch.	K2	CO1	6M
			ii) Explain clearly about Probably Approximately Correct (PAC) Learning.	K2	CO1	6M
2			Unit-II			
	a		Explain the concept of Maximum Likelihood Estimation by using Bernoulli density method.	K5	CO2	12M
			OR			
	b		i) What is Regression? Why Linear Regression is not suitable for Classification?	K4	CO2	6M
			ii) Explain the concept of Parametric Classification.	K2	CO2	6M
3			Unit-III			
	a		i) Explain how dimensionality reduction takes place using PCA.	K4	CO3	6M
			ii) Explain Apriori Algorithm with an example.	K2	CO3	6M
			OR			
	b		i) Explain the concept of linear discriminant analysis.	K2	CO3	6M
			ii) Take sample dataset and discover the frequent item sets by using FP growth algorithm.	K4	CO3	6M
4			Unit-IV			
	a		i) Give a brief note on Self-Organizing Maps (SOM).	K2	CO4	6M
			ii) With an example explain Hierarchical clustering?	K2	CO4	6M
			OR			
	b		i) Explain the importance of Adaptive Resonance Theory.	K4	CO4	6M
			ii) Explain in detail about K-means algorithm with an example.	K5	CO4	6M
5			Unit-V			
	a		i) Give the differences between decision tree and random forest.	K4	CO5	6M
			ii) Explain the procedure to select the pruning mechanism.	K2	CO5	6M
			OR			
	b		i) Explain in detail about learning rules from data in decision tree.	K2	CO5	6M
			Explain random forest algorithm with an example.	K4	CO5	6M

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

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