AR20

CODE: 20CAE312 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, October-2023

DATA VISUALIZATION

CSE (AIML)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Define the Aesthetics and Types of Data?	6M	CO1	i
	b)	Explain the color for representation of data values ?	4M	CO 1	vi
		(OR)			
2.	a)	Define and explain the Directory of Visualizations?	6M	CO1	i
	b)	Write a brief note on Geospatial Data, Dot Plots and Heatmaps?	4M	CO1	i
		UNIT-II			
3.	a)	Explain the Visualizing Distributions and it's types?	5M	CO2	iii
	b)	Define the Q-Q Plots-Empirical Cumulative Distribution Functions ?	5M	CO2	i
		(OR)			
4.	a)	Write a brief note on Visualizing Many Distributions at Once?	5M	CO2	ii
	b)	Write a brief note on Visualizing Distributions Along the Horizontal Axis?	5M	CO2	i
		UNIT-III			
5.	a)	Explain the Visualizing Associations & Time Series -1 with its types?	6M	CO3	ii
	b)	Write a brief note on Dimension Reduction?	4M	CO3	i
		(OR)			
6.	a)	Explain about Stacked Bars and Stacked Densities ?	4M	CO3	ii
	b)	Write a brief note on Visualizing Proportions Separately as Parts of the Total?	6M	CO3	i
		UNIT-IV			
7.	a)	Explain the Visualizing Associations & Time Series -2?	4M	CO4	ii
	b)	Write a brief note on Multiple Time Series and Dose– Response Curves?	6M	CO4	i
		(OR)			
8.		Define the Visualizing Time Series and Other Functions of an Independent Variable in associations ?	10M	CO4	ii
		UNIT-V			
9.	a)	Explain Visualization of Trends using Smoothing?	6M	CO5	iv
	b)	Explain about Visualizing the Uncertainty of Point Estimates	4M	CO5	iv
		(OR)			
10.	a)	Write a brief note on Visualizing Uncertainty- Framing Probabilities as Frequencies ?	6M	CO5	iii
	b)	Explain the Hypothetical Outcome Plots ?	4M	CO5	iii
		UNIT-VI			
11.	a)	Explain the Visualizations a long Linear Axes and Logarithmic Axes ?	6M	CO6	v
	b)	Define the Partial Transparency and Jittering for handling Overlapping Points?	4M	CO6	iv
		(OR)			
12.	a)	Briefly explain about the handling overlapping points a) 2D histogram b) Contour lines	7M	CO6	ii
	b)	Explain about the non – monotonic color scale using encode data values ?	3M	CO6	ii

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CODE: 20CEE311 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

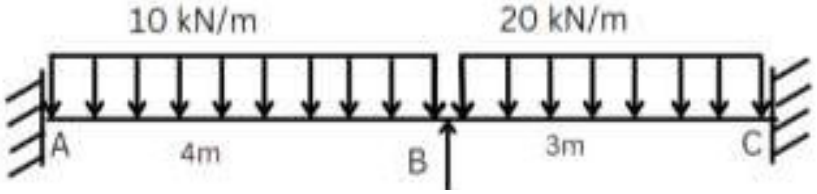
ADVANCED STRUCTURAL ANALYSIS

(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

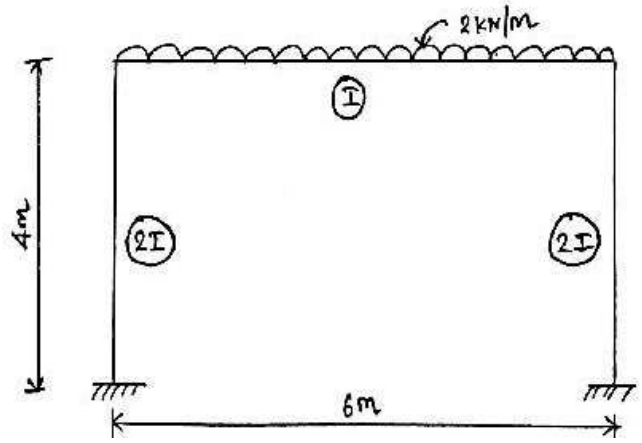
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

		Marks	CO	Blooms Level
	UNIT-I			
1.	Analyse the given continuous beam by slope deflection method and draw bending moment diagram.	10M	CO1	3



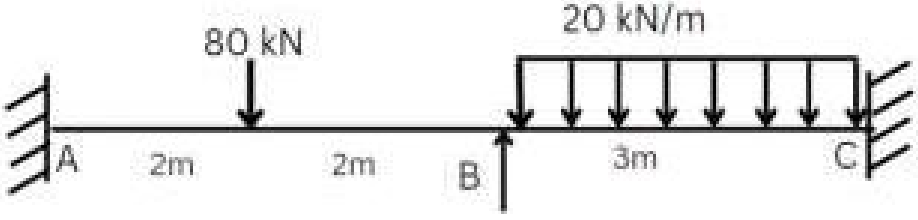
(OR)

2.	Determine the end moments in a symmetrical frame as shown by slope deflection method. Draw the bending moment diagram of the frame.	10M	CO1	3



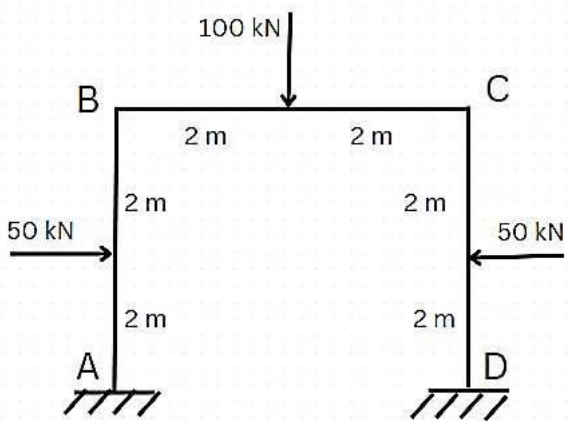
UNIT-II

3.	Analyse the continuous beam shown in fig. by the moment distribution method. Draw bending moment diagram and shear force diagram.	10M	CO-2	3



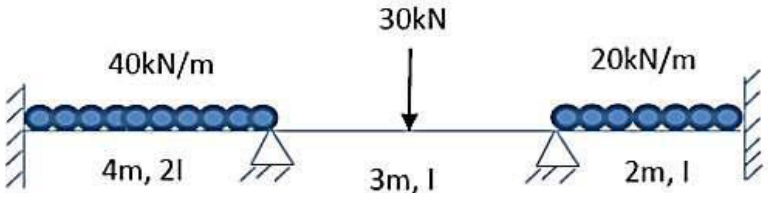
(OR)

4. Analyse the given portal frame by moment distribution method and draw the BMD. 10M CO2 3



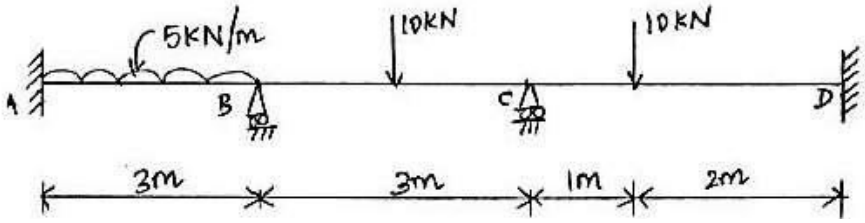
UNIT-III

5. Determine the end moments and draw the BMD of the continuous beam by kani's method for the given figure. 10M CO3 3



(OR)

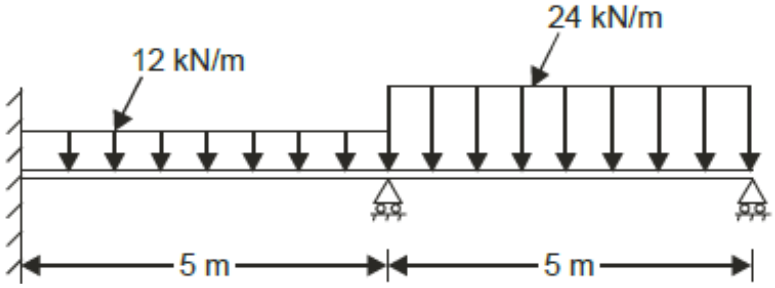
6. Determine the end moments and draw the BMD of the continuous beam by kani's method for the given figure. 10M CO3 3



UNIT-IV

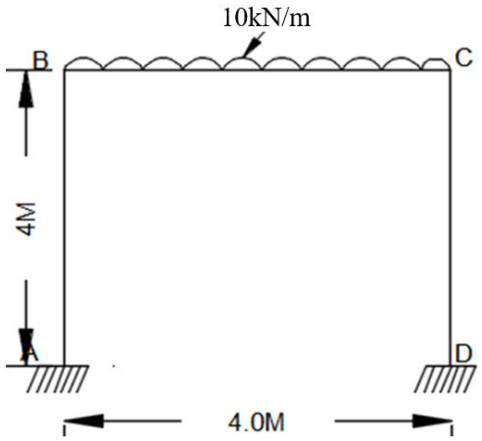
7. 10M CO4 3

Determine the end moments and draw the BMD of the continuous beam by stiffness method for the given figure.



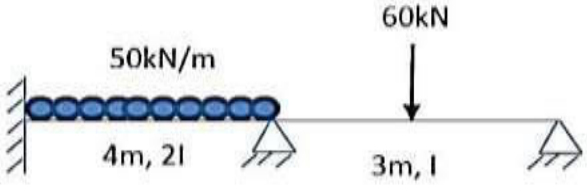
(OR)

8.	Analyse the given portal frame by stiffness method and draw the BMD.	10M	CO4	3



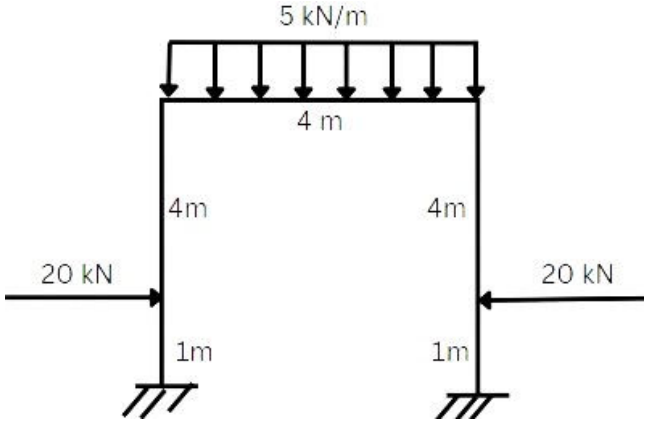
UNIT-V

9.	Determine the end moments and draw the BMD of the continuous beam by flexibility method for the given figure.	10M	CO5	3



(OR)

10.	Analyse the given portal frame by flexibility method and draw the BMD.	10M	CO5	3



UNIT-VI

11.	a) What is plastic hinge explain its mechanism with an example.	5M	CO6	1
	b) Write about limitations of plastic analysis	5M	CO6	1

(OR)

12.	A simply supported beam of rectangular section and of span 5m is subjected to udl of intensity 20kN/m throughout the span. Design the section, with depth equal to twice the width with a load factor of 2. Take yield stress for the material as $26x10^4 kn/m^2$.	10M	CO6	3

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CODE: 20CSE311 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

UNIX Internals

(COMPUTER SCIENCE AND ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain the architecture of UNIX Operating system	6M	1	2
	b)	Compare and contrast the mv and cp commands	4M	1	4
		(OR)			
2.	a)	Demonstrate the cat command with its options	6M	2	2
	b)	Explain the following commands with examples i)echo ii)wc	4M	2	2
		UNIT-II			
3.	a)	Examine the "ls" command's options with suitable examples	6M	2	4
	b)	Construct the grep commands for the following pattern searches i)to search username@domain.subdomain ii) to search the words that start with "a" and ends with "l".	4M	2	3
		(OR)			
4.	a)	Identify the usage of standard streams and demonstrate with suitable examples	5M	2	3
	b)	Explain the working flow of grep command	5M	2	2
		UNIT-III			
5.	a)	Explain any three control structures with suitable examples.	6M	3	2
	b)	Distinguish exit and exit status of UNIX shell script	4M	3	4
		(OR)			
6.		Construct an interactive file handling shell program that offers the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.	10M	3	3
		UNIT-IV			
7.	a)	Demonstrate the Race conditions with suitable code snippet	5M	4	2
	b)	Compare and contrast the wait , wait 4 and wait3 functions	5M	4	4
		(OR)			
8.	a)	Illustrate the ways of process termination with suitable code snippet	5M	4	2
	b)	Write a short note on exec functions	5M	4	1
		UNIT-V			
9.	a)	write about SIGCHLD with suitable code snippet	5M	5	1
	b)	Summarize the alarm and pause functions with examples	5M	5	2
		(OR)			
10.	a)	Demonstrate the basic coding rules to prevent unwanted interaction from happening, with respect to daemon processes.	6M	5	2
	b)	Describe about signal masking	4M	5	2
		UNIT-VI			
11.	a)	Compare and contrast the IPC mechanisms with relevant situations	4M	6	4
	b)	Differentiate the pipes and named pipes with suitable examples	6M	6	4
		(OR)			
12.	a)	Write a short notes semaphores	4M	6	1
	b)	Summarize the popen and pclose functions	6M	6	2

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CODE: 20ECE311 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

CONTROL SYSTEMS

(ELECTRONICS AND COMMUNICATION ENGINEERING)

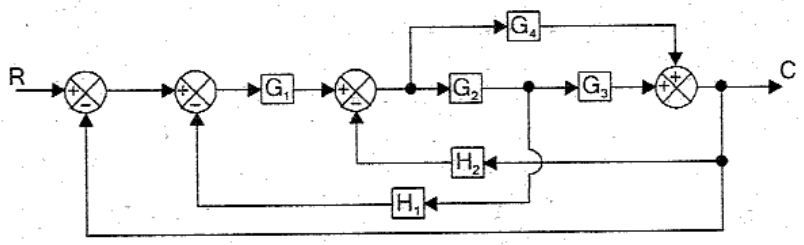
Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

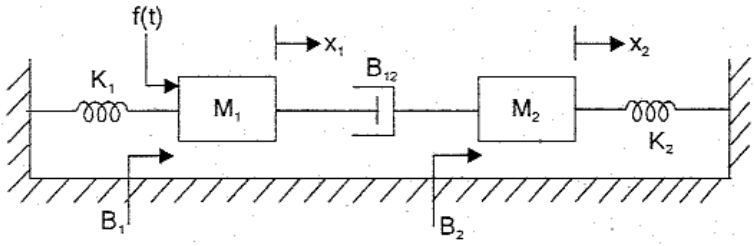
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Compare open loop system with close loop system?	3	CO1	L1
	b)	Using block diagram reduction technique find closed loop transfer function of the system whose block diagram is shown in fig.	7	CO1	L3

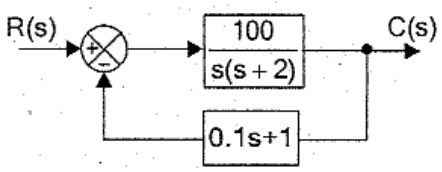


(OR)

2.	a)	Write the properties of signal flow graph?	3	CO1	L1
	b)	Determine the transfer function X1(s)/F(s) and X2(s)/F(s) for the system shown in fig?	7	CO1	L3



		UNIT-II			
3.	a)	Find the transfer function of armature controlled DC motor?	5	CO2	L2
	b)	A positional control system with velocity feedback is shown in fig. what is the response of the system for unit step input.	5	CO2	L3



(OR)

4.	a)	A unity feedback system is characterized by the open loop transfer function G(s) = $\frac{10K}{S(s^2+4S+200)}$ determine the steady state error for (i) unit step input (ii) unit ramp input (iii) unit acceleration input.	5	CO2	L3
	b)	A unity feedback system is characterized by open loop transfer function G(s) = $\frac{K}{S(S+10)}$ Determine gain K so that system will have a damping ration of 0.5. For this value of K determine settling time, peak overshoot and time to peak overshoot for a unit step input.	5	CO2	L3

UNIT-III

5.	a)	Construct Routh array and determine the stability of the system whose characteristic equation is $S^6 + 2S^5 + 8S^4 + 12S^3 + 20S^2 + 16S + 16 = 0$. Also determine the number of roots lying on right half od S-Plane, left half of S-Plane and on imaginary axis.	5	CO3	L3
	b)	Define stability? What do you mean by absolute stability and limitedly stability? Explain Routh-Hurwitz stability criterion with suitable example.	5	CO3	L2

(OR)

6.		The open loop transfer function of a unity feedback system is given by $G(s) = \frac{k(S+9)}{S(S^2+4S+11)}$ sketch the root locus of the system and comment on stability.	10	CO3	L3

UNIT-IV

7.		For the following transfer function draw bode plot and obtain the margins. $G(s) = \frac{20}{S(1+3S)(1+4S)}$	10	CO4	L3

(OR)

8.	a)	Explain the general procedure for constructing Bode plots?	5	CO4	L2
	b)	What is frequency response? What are advantages of frequency response analysis?	5	CO4	L2

UNIT-V

9.		Consider a unity feedback system having an open loop transfer function $G(s) = \frac{K}{S(1+0.2S)(1+0.05S)}$ Sketch the polar plot and determine the value of K so that (i) gain margin is 18dB (ii) phase margin is 60^0.	10	CO5	L3

(OR)

10.		Draw the Nyquist plot for the system whose open loop transfer function is $G(S)H(S) = \frac{K}{S(S+2)(S+10)}$ Determine the range of K for which closed loop system is stable.	10	CO5	L3

UNIT-VI

11.	a)	Discuss about the properties of state transition matrix?	5	CO6	L2
	b)	Determine the state controllability and observability of the system described by $\dot{X} = \begin{bmatrix} -3 & 1 & 1 \\ -1 & 0 & 1 \\ 0 & 0 & 1 \end{bmatrix} X + \begin{bmatrix} 0 & 1 \\ 0 & 0 \\ 2 & 1 \end{bmatrix} U;\quad y = \begin{bmatrix} 0 & 0 & 1 \\ 1 & 1 & 0 \end{bmatrix} X$	5	CO6	L3

(OR)

12.		The open loop transfer function of a unity feedback system is $G(s) = \frac{1}{S(1+S)(1+0.5S)}$ Design a lag compensator for the system so that the static velocity error constant $K_v = 5\ sec^{-1}$, the phase margin is at least 40^0 and the gain margin is at least 10dB.	10	CO6	L3

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CODE: 20ECE312 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, January,2023

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Elaborate in detail about the different kind of errors that occur in measurement process and list the precautions to be taken to overcome them?	5M	CO1	L2
	b)	Discuss about DC Ammeter with neat diagrams?	5M	CO1	L2
		(OR)			
2.	a)	The expected value of current through a resistor is 20mA. However, the measurement yields a current value of 18mA. Calculate (i) absolute error (ii) percentage error (iii) percentage accuracy?	5M	CO1	L3
	b)	Illustrate in detail about operation of shunt type ohmmeter and derive the expression for shunt resistance?	5M	CO1	L2
		UNIT-II			
3.	a)	Illustrate the working of AF sine and square wave signal generators?	5M	CO2	L2
	b)	Discuss the working principle of a basic wave analyser?	5M	CO2	L2
		(OR)			
4.	a)	Interpret how the function generator generates sine and triangular waves?	5M	CO2	L3
	b)	Outline the working principle of frequency selective wave analyser?	5M	CO2	L2
		UNIT-III			
5.	a)	Draw the basic block diagram of CRO and explain about each block?	5M	CO3	L2
	b)	List the differences between sampling and storage oscilloscopes?	5M	CO3	L2
		(OR)			
6.	a)	Illustrate in detail about the working of digital readout oscilloscope?	5M	CO3	L2
	b)	Discuss the principle of operation of digital storage oscilloscope?	5M	CO3	L2
		UNIT-IV			
7.	a)	Illustrate the operation of weins bridge and explain how unknown frequency is calculated using weins bridge?	5M	CO4	L2
	b)	Derive the equation to find out the unknown inductance using Hays Bridge?	5M	CO4	L2
		(OR)			
8.	a)	Outline the working principle of kelvins bridge?	5M	CO4	L2
	b)	List the differences between maxwells and hays bridge?	5M	CO4	L3
		UNIT-V			
9.	a)	Define strain gauge and explain the different types of strain gauges?	7M	CO5	L2
	b)	A resistance strain gauge with a gauge factor of 2 is fastened to a steel member subjected to a stress of 1,050 kg/cm^2. The modulus of elasticity of steel is approximately $2.1x10^6$ kg/cm^2. Calculate the change in resistance ΔR, of the strain gauge element due to the applied stress?	3M	CO5	L3
		(OR)			
10.	a)	Elaborate in detail about the operation of resistive pressure transducer?	5M	CO5	L2
	b)	Discuss in detail about the classification of transducers?	5M	CO5	L2
		UNIT-VI			
11.	a)	List the differences between inductive and capacitive transducers?	3M	CO6	L2
	b)	Discuss the principle of operation of LVDT?	7M	CO6	L2
		(OR)			
12.	a)	Elaborate the working of piezo electric transducer?	5M	CO6	L2
	b)	Illustrate the measurement of temperature using thermocouple?	5M	CO6	L2

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CODE: 20ECE313 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

COMPUTER ARCHITECTURE & ORGANIZATION

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain about memory unit, ALU and Control unit.	5M	CO1	2
	b)	Contrast the multiprocessor and multicomputer.	5M	CO1	2
		(OR)			
2.	a)	What are the basic operational concepts of a computer?	5M	CO1	1
	b)	Identify that how performance is affected by technology and parallelism.	5M	CO1	3
		UNIT-II			
3.	a)	Explain the register transfer operation with the help block diagram and timing diagram.	5M	CO2	2
	b)	Illustrate the Arithmetic microoperations with examples	5M	CO2	2
		(OR)			
4.	a)	Explain briefly with examples about logic micro operations.	5M	CO2	3
	b)	Demonstrate the Arithmetic logic shift unit with a neat sketch.	5M	CO2	2
		UNIT-III			
5.	a)	Explain the Arithmetic addition (2's complement) and overflow condition with an example.	5M	CO3	5
	b)	. Show the process of addition and subtraction of two floating-point numbers with the help of flowchart	5M	CO3	2
		(OR)			
6.	a)	Why floating-point representation is needed and explain briefly.	5M	CO3	1
	b)	. Demonstrate the Booth's multiplication algorithm with a numerical example	5M	CO3	2
		UNIT-IV			
7.	a)	Explain the hierarchy of memory in a computer system.	5M	CO4	2
	b)	What is a mapping and explain about associative mapping.	5M	CO4	1
		(OR)			
8.	a)	Compare various types of auxiliary memory devices.	5M	CO4	4
	b)	Identify the process of mapping of virtual address to physical address and explain it with a neat diagram.	5M	CO4	3
		UNIT-V			
9.	a)	List and explain briefly various commands of an I/O interface.	5M	CO5	1
	b)	Classify the modes of transfer and explain the Interrupt driven I/O.	5M	CO5	2
		(OR)			
10.	a)	Distinguish the memory mapped I/O and an isolated I/O.	5M	CO5	4
	b)	Explain the concept of DMA transfer.	5M	CO5	2
		UNIT-VI			
11.	a)	What is pipelining and explain the instruction pipeline briefly.	5M	CO6	1
	b)	Demonstrate the microinstruction sequencing with an example.	5M	CO6	2
		(OR)			
12.	a)	Categorize the pipeline conflicts in an arithematic pipeline and describe them briefly with examples.	5M	CO6	4
	b)	Define the terms control memory, control word, microinstruction and microprogram.	5M	CO6	1

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CODE: 20EEE313 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

SWITCHING THEORY AND LOGIC DESIGN

(ELECTRICAL AND ELECRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Convert the following (i) $(123.589)_{10} = (\ )_8$ (ii) $(1011011111101.10101)_2 = (\ )_{16}$	5M	CO1	Understand
	b)	Perform the BCD addition and subtraction of following numbers (i) 679.6+536.8 (ii) 206.7-147.8	5M	CO1	Understand
		(OR)			
2.	a)	Subtract 46-14 using 2's complement method.	5M	CO1	Understand
	b)	What is a BCD code? Explain in detail.	5M	CO1	Understand
		UNIT-II			
3.	a)	Obtain the simplified expressions in sum of products for the following Boolean functions using Karnaugh-Map. i) F(A, B,C,D) = Σ (7,13, 14, 15) ii) F(w,x,y,z) = Σ (2,3,12,13,14,15)	5M	CO2	Apply
	b)	Convert the following expression into sum of products and product of sums. X'+X(X+Y')(Y+Z')	5M	CO2	Understand
		(OR)			
4.	a)	Define the standard SOP and POS forms with an examples.	5M	CO2	Understand
	b)	State any five laws and Postulates of Boolean Algebra.	5M	CO2	Remember
		UNIT-III			
5.	a)	Design a 4 bit binary Adder/ Subtractor circuit and explain its operation with circuit diagram.	5M	CO3	Understand
	b)	Design a half Subtractor and realize the circuit using NAND and NOR Gates.	5M	CO3	Apply
		(OR)			
6.	a)	What is a full adder? Write its truth table. List the applications of full adders.	5M	CO3	Understand
	b)	What is a half adder? Write its truth table. List the applications of full adders..	5M	CO3	Apply
		UNIT-IV			
7.	a)	Realise a 2 bit magnitude comparator using logic gates and explain briefly its operation.	5M	CO4	Apply
	b)	Realize the function f(A,B,C,D) = ∑ (1,2,3,4,6,7,8,10,12,14,15) using 8:1 MUX	5M	CO4	Apply
		(OR)			

8.	a)	With the help of a logic diagram and a truth table, explain a 3-line to 8-line decoder.	5M	CO4	Understand
	b)	Design a decimal to BCD encoder.	5M	CO4	Apply

UNIT-V

9.	a)	Obtain the characteristic equations of JK, SR, D and T flip-flops. Also explain excitation tables of all these flip-flops.	5M	CO5	Understand
	b)	What is a Sequential Circuit? Compare Synchronous and Asynchronous sequential circuits with suitable examples.	5M	CO	Remember

(OR)

10.	a)	What is a flip-flop? Explain the basic SR flip-flop using NAND gates and explain.	5M	CO5	Understand
	b)	Explain the D flip-flop with the help of truth table and excitation table.	5M	CO5	Understand

UNIT-VI

11.	a)	Design and explain a synchronous MOD-12 up-counter using JK flip-flop.	10M	CO6	Design

(OR)

12.	a)	Design and explain the operation of a 4 bit Universal Shift Register.	5M	CO6	Understand
	b)	Design and explain a 4-bit ring counter using D-flip flops with relevant timing diagrams.	5M	CO6	Understand

AR20

CODE: 20ITE311 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October-2023

Data Mining

(INFORMATION TECHNOLOGY)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Discuss the general Characteristics of Data Sets	4M	CO1	K2
	b)	Illustrates four of the core data mining tasks with Neat Diagram	6M	CO1	K2
		(OR)			
2.	a)	Why do we pre-process the data? Discuss?	4M	CO1	K3
	b)	Explain about the Dimensionality reduction methods?	6M	CO1	K2
		UNIT-II			
3.	a)	Explain three tier architecture of Data Warehouse with neat diagram?	6M	CO2	K2
	b)	How does a snowflake schema differ from a star schema? Name two advantages and two disadvantages of the snowflake schema	4M	CO2	K2
		(OR)			
4.	a)	What is Data generalization? List out the two approaches of Data Generalization?	5M	CO2	K2
	b)	Explain OLAP operations.	5M	CO2	K2
		UNIT-III			
5.	a)	How can we further improve the efficiency of Apriori-based mining? Explain with Suitable example?	7M	CO3	K3
	b)	Explain two steps process in association rule mining?	3M	CO3	K2
		(OR)			
6.		Explain about FP-Growth Algorithm to Mine frequent item sets.	10M	CO3	K2
		UNIT-IV			
7.		Describe the data classification process with a neat diagram. How does the Naive Bayesian classification works? Explain.	10M	CO4	K2
		(OR)			
8.	a)	Explain in detail about Attribute Selection methods in Classification	5M	CO4	K2
	b)	What are the advantages and disadvantages of decision tress over other classification methods?	5M	CO4	K2
		UNIT-V			
9.	a)	What do mean by clustering? Why clustering is required in data mining?	5M	CO5	K3
	b)	Explain Various types of data in cluster analysis?	5M	CO5	K2
		(OR)			
10.	a)	Explain about k-means partitioning algorithm with suitable equations and examples?	5M	CO5	K2
	b)	What is the drawback of k-means algorithm? How can we modify the algorithm to diminish that problem?	5M	CO5	K2
		UNIT-VI			
11.	a)	Define Outlier? Explain the Statistical Distribution-Based Outlier Detection	6M	CO6	K2
	b)	What are the advantages and disadvantages of outlier?	4M	CO6	K2
		(OR)			
12.		Explain Hierarchial clustering algorithm?	10M	CO6	K2

AR20

CODE: 20MEE311 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular Examinations, October,2023

CAD/CAM

(MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain about product life cycle in CAD/CAM system.	7	1	K2
	b)	Write down the short notes on the below mentioned Display devices: Raster Scan Displays, Random Scan Displays, Colour CRT Monitors.	3	1	K2
		(OR)			
2.	a)	Describe the working of any five of the input devices and any two of the output devices used in CAD systems.	5	1	K2
	b)	Briefly describe advantages of CAD system.	5	1	K2
		UNIT-II			
3.	a)	Explain surface modelling with neat sketch	5	2	K2
	b)	Write about the basic edit commands in drafting software?	5	2	K2
		(OR)			
4.	a)	Write short notes on Coons and Lofted curves with neat sketch	5	2	K2
	b)	Explain the different types of the geometric modelling methods used in a CAD. Give a comparative application of each.	5	2	K2
		UNIT-III			
5.	a)	Write a short note about the Solid Modelling.	5	3	K2
	b)	Give the names of the various solid modelling primitives.	5	3	K2
		(OR)			
6.	a)	Explain about CSG approach in solid modelling.	5	3	K2
	b)	Write a detailed note on homogenous transformations. Give suitable examples.	5	3	K2
		UNIT-IV			
7.	a)	Write a brief note on Machine centre?	5	4	K2
	b)	Write a sample part programming for turning operations with an example.	5	4	K2
		(OR)			
8.	a)	Write a sample part programming for milling operations with an example.	5	4	K2
	b)	Indicate any 5 G-Codes and M-Codes with their meaning.	5	4	K2
		UNIT-V			
9.	a)	What are part families in group technology?	5	5	K2
	b)	Discuss machine cell design in GT.	5	5	K2
		(OR)			
10.	a)	Give an account on the benefits of CAPP	5	5	K2
	b)	Explain briefly the MICLASS system of codification	5	5	K2
		UNIT-VI			
11.	a)	Draw the FMS layout and explain the function of each component of FMS.	5	6	K2
	b)	Give the detailed classification of FMS layouts.	5	6	K2
		(OR)			
12.	a)	Explain the working principle of any two rapid prototyping techniques.	5	6	K2
	b)	List out the advantages and limitations of the Rapid Prototyping techniques.	5	6	K2

AR16

CODE: 16CE3012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, October,2023

Structural Analysis – II

(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) A three hinged arch of span 40m and rise 8m carries concentrated loads of 200Kn and 150Kn at distances of 8m and 16m from the left end and an UDL of 50Kn/m on the right half of the span, find the horizontal thrust. 4M

   b) A parabolic three hinged arch carries a UDL of 30Kn/m on the left half of the span it has a span of 16m and a central rise of 3m. Determine the resultant reactions at the support find the bending moment, normal thrust and radial shear at xx, 2m from left support 10M

(OR)

2. a) Explain the different types of arches with diagram 4M

   b) A parabolic arch hinged at the ends has a span of 60m and a rise of 12m. A concentrated load of 8kN acts at 15m from the left hinge. The second moment of area varies as the secant of the inclination of the arch axis. Calculate the horizontal thrust and the reactions at the hinge. Also calculate the net bending moment at the section. 10M

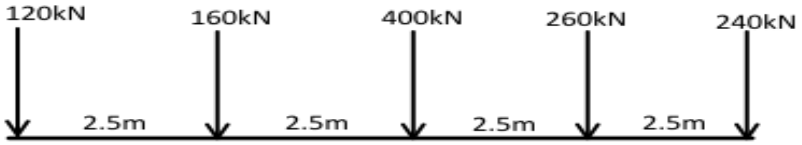
UNIT-II

3. a) Draw the ILD for shear force and bending moment for a section at 5m from the left hand support of a simply supported beam, 20m long. Hence, calculate the maximum bending moment and shear force at the section, due to an uniformly distributed rolling load of length 8m and intensity 10kN/m run. 4M

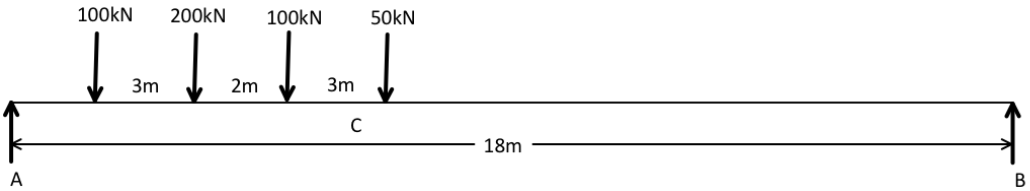
   b) A single rolling load 100kN moves on a girder of span 20m. (a) Construct the influence lines for (i) shear force and (ii) bending moment for a section 5m from the left support. (b) Construct the influence lines for points at which the maximum shears and maximum bending moments develop & determine these maximum values. 10M

(OR)

4. a) Find the resultants of loads for the given diagram 4M

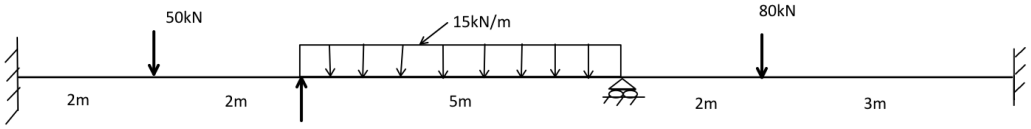


   b) A girder having a span of 18m is simply supported at the ends. It is traversed by a train of loads shown in figure, the 50kN loading. Find the maximum B.M which can occur (i) under 200kN load (ii) under 50kN load, using ILD 10M



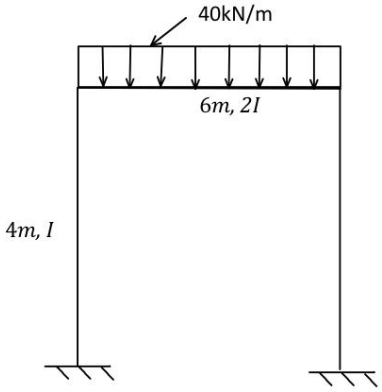
UNIT-III

5. a) Analyse the continuous beam shown in fig by moment distribution method 14M



(OR)

6. a) Analyse the fig shown in fig and draw BMD (Slope deflection method) 14M

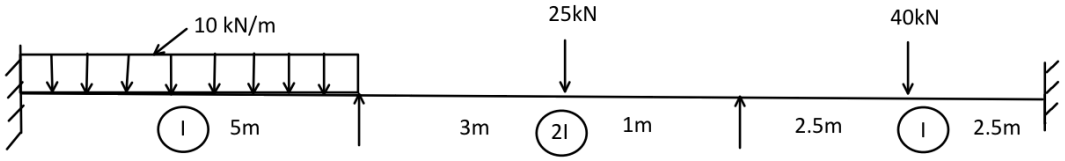


UNIT-IV

7. a) Define joint rotation 4M
   b) Explain kani's iteration procedure for beams 10M

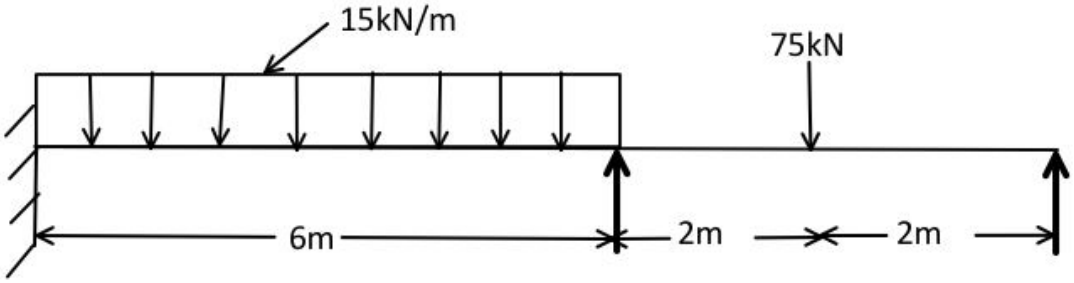
(OR)

8. a) Analyse the continuous beam loaded as shown in fig by kani's method. Sketch the bending moment diagram 14M

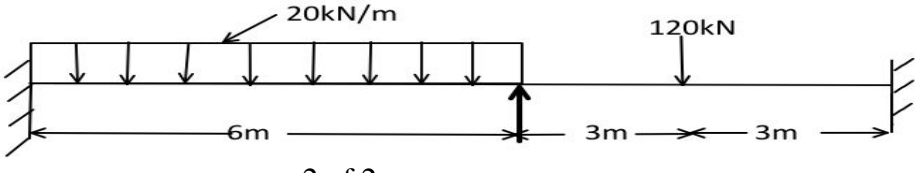


UNIT-V

9. a) Draw the fixed end moments diagram for fixed beam with UDL, fixed beam with point load at centre, fixed beam with moment at centre (clockwise or anticlockwise) 4M
   b) Analyse the continuous beam shown in figure by stiffness method, draw bending moment. Assume EI constant throughout the beam 10M



10. a) Find the degree of indeterminacy for fixed beams, cantilever, propped cantilever 4M
    b) Analyse the continuous beam by stiffness method sketch BMD 10M



AR16

CODE: 16EE3014 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, October,2023

POWER SYSTEMS-III

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Compare the arc rupture in oil and air blast circuit breakers and summarize the relative advantages and disadvantages of these types of switch gear	7M
	b)	Explain the operating duty of a circuit breaker	7M
		(OR)	
2.	a)	Draw a neat sketch of SF6 circuit breaker and explain its operation	7M
	b)	For a 132KV system, the reactance and capacitance upto the location of the circuit breaker is 3ohms and 0.015 μF respectively. Calculate the following: i) The frequency of transient oscillation ii) The maximum value of restriking voltage across the contacts of the circuit breaker iii) The maximum value of RRRV	7M

UNIT-II

3.	a)	Explain the operation of Induction cup type relay with neat diagram	7M
	b)	Derive the expression for Induction type relays	7M
		(OR)	
4.		Discuss about various types of over current relays by showing the characteristics	14M

UNIT-III

5.		An alternator rated at 10kv protected by the balanced circulating system has its neutral grounded through a resistance of 10 ohms. The protective relay is set to operate when there is an out of balance current of 1.8 amps in th pilot wires, which are connected to the secondary windings of 1000/5 ratio current transformers. Determine i) the percent winding which remains unprotected, ii)the minimum resistance required to protect 80% of the winding?	14M
		(OR)	
6.	a)	Explain Protection of generators against Stator faults.	7M
	b)	Represent the scheme for protection of transformers using percentage differential protection and explain the principle	7M

UNIT-IV

7.	a)	What is meant by three zone protection?	7M
	b)	Draw a connection diagram of the translay system for the protection of 3 phase feeder and explain its working operation.	7M
		(OR)	
8.		Discuss how the bus bars are protected by differential protection	14M

UNIT-V

9.	a)	Why neutral grounding is necessary ?	7M
	b)	Explain the operation of rod gap arresters.	7M
		(OR)	
10.	a)	Write short notes on reactance grounding?	7M
	b)	With a neat diagram describe the operation of horn gap type arresters?	7M

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AR16

CODE: 16ME3016 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, October,2023

AUTOMOBILE ENGINEERING
(MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Differentiate between super charging and turbo charging	7 M
	b)	What are the different components of an automobile? Explain them briefly.	7 M
		(OR)	
2.	a)	What are the different emissions from an automobile? Explain the methods to control NOx.	7 M
	b)	Explain Dry sump pressure lubrication system with a neat sketch.	7 M

UNIT-II

3.	a)	Explain Simple carburettor with a neat sketch.	7 M
	b)	Explain how the spray formation and injection timing influence the combustion in CI engines.	7 M
		(OR)	
4.	a)	What are the different types of air filters? Explain the air filters that are used for vehicles in a dusty area with a neat sketch.	7 M
	b)	Explain CRDI system with a neat sketch.	7 M

UNIT-III

5.	a)	What is the purpose of cooling? List out the effects of improper cooling.	7 M
	b)	Briefly explain the ignition timing and one method of doing it.	7 M
		(OR)	
6.	a)	What are the types of cooling systems? Explain thermo siphon cooling with a neat sketch.	7 M
	b)	Explain magneto ignition system with a neat sketch.	7 M

UNIT-IV

7.	a)	Explain the construction of differential with help of a neat sketch.	7 M
	b)	Discuss very briefly about the signs that are there on the dashboard of a passenger car.	7 M
		(OR)	
8.	a)	Explain Hotch-kiss drive and torque tube drive ith neat sketches.	7 M
	b)	Explain the starting system of a vehicle with a neat sketch.	7 M

UNIT-V

9.	a)	What are the different types of steering gear boxes? Explain anyone with a sketch.	7 M
	b)	Illustrate with a diagram the terms sprung mass and un sprung mass.	7 M
		(OR)	
10.	a)	Explain the principle of Hydraulic braking system. Explain wheel cylinder with a neat sketch.	7 M
	b)	What are the objectives of a suspension system? Explain how the stiffness of spring affects the ride comfort.	7 M

AR18

CODE: 18CET313 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, October,2023

Structural Analysis-II

(CIVIL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

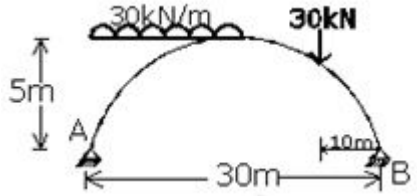
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. A three hinged parabolic arch of span 50m and rise 10m is subjected to a uniformly distributed load of 20kN/m on its left half and a single concentrated load of 500kN at 12.50m from the right support. Determine vertical and horizontal reactions at supports determine normal thrust and radial shear at 12.5m from the left support and under concentrated load. 12M

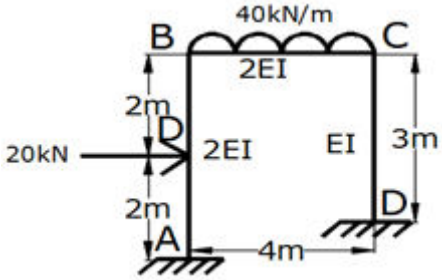
(OR)

2. Analyze the given two hinged arch as shown in fig., calculate support reactions, normal thrust, radial shear force and bending moment at 8m from left hand side. 12M



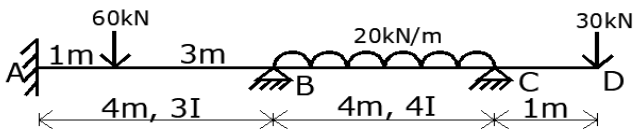
UNIT-II

3. Analysis the frame shown in fig. by slope deflection method. Draw the bending moment diagram. 12M



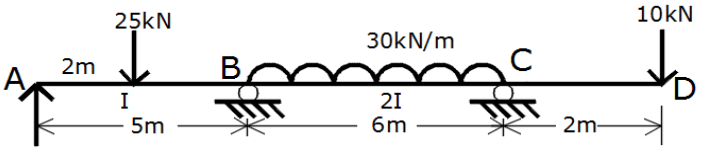
(OR)

4. Analyse the given continuous beam by three moment distribution method and Sketch the BMD. 12M



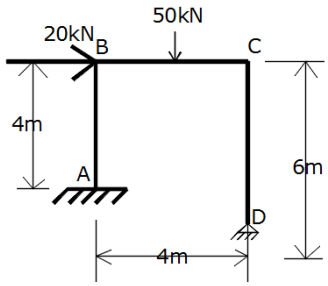
UNIT-III

5. Analysis the continuous beam by Kani's method. Sketch BMD. 12M



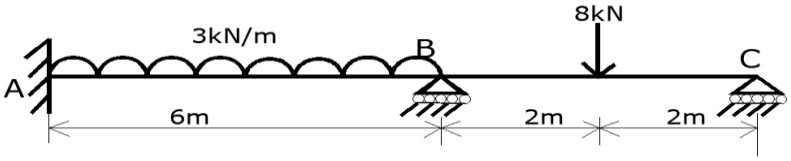
(OR)

6. Analysis the frame shown in fig. by Kani's method. Draw the bending moment diagram. 12M



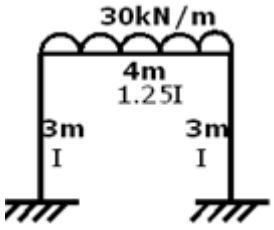
UNIT-IV

7. Analysis the continuous beam by stiffness matrix method. Determine the bending moments. Support B sinks by 10mm.Take I = 1600 x10^4 mm^4, E= 200kN/mm^2. Sketch the bending moment diagram. 12M



(OR)

8. Analyze the frame by stiffness matrix method. 12M



UNIT-V

9. A uniformly distributed load of intensity 2kN/m and 5m long crosses a simply supported beam of 20m span from left to right. Calculate maximum shear force and maximum bending moment at a section 8m from the left support. Also calculate absolute maximum bending moment. 12M

(OR)

10. Two point loads 75kN and 150kN spaced 3.5m apart cross a simply supported girder of span 18m from left to right with 7kN leading. Draw the influence lines for shear force and bending moment at a section 8m from the right support. 12M

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AR18

CODE: 18CSE312 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, October,2023

Advanced Computer Architecture

(COMMON TO CSE & IT)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the advantages and limitations of SIMD and MIMD architectures in parallel processing.	**6M**
	b)	Compare and contrast shared memory multiprocessors and distributed memory multiprocessors.	**6M**
		(OR)	
2.	a)	Explain with a neat sketch the basic elements of modern computer	**6M**
	b)	Compare and contrast the architecture and communication models of multiprocessors and multicomputer.	**6M**

UNIT-II

3.	a)	Discuss the trade-offs between the different levels of memory hierarchy in terms of access time, capacity and cost.	**6M**
	b)	Explain how way prediction works and its benefits in multi-way set-associative caches.	**6M**
		(OR)	
4.	a)	Explain cache memory and its purpose in improving memory access time.	**6M**
	b)	Explain the concept of pipelining in cache memory access .	**6M**

UNIT-III

5.	a)	Compare and contrast asynchronous and synchronous models in pipeline processors.	**6M**
	b)	Explain the concept of collision-free scheduling in pipeline processors.	**6M**
		(OR)	
6.	a)	Explain the concept of reservation tables in the context of pipeline processors.	**6M**
	b)	Explain the concept of data hazards and control hazards in pipeline processors.	**6M**

UNIT-IV

7.	a)	Explain multiport memory and its role in computer systems.	**6M**
	b)	Explain the principles of vector processing in multivector computers.	**6M**
		(OR)	
8.	a)	Explain with an example the concept of combining network routing in the context of multiprocessor system.	**6M**
	b)	Explain the importance of memory access schemes in vector processing and their impact on overall performance.	**6M**

UNIT-V

9.	a)	Explain the concept of a two-protocol approach to address cache coherence problems.	**6M**
	b)	Explain the concept of deadlock prevention in virtual channels.	**6M**
		(OR)	
10.	a)	Explain the concept of a directory-based cache coherence protocol.	**6M**
	b)	Explain the role of Multicast Routing Algorithms in communication.	**6M**

AR18

CODE: 18ECE301 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, October, 2023

ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

(ELECTRONICS AND COMMUNICATION ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	How do static characteristics differ between voltmeter and ammeters	6M
	b)	Discuss the sources of error in an ammeter and how they can be minimized	6M
		(OR)	
2.	a)	Discuss the concept of sensitivity in the context of a voltmeter. how is it measured	6M
	b)	Compare the working principles of series-type and shunt-type ohm meters	6M

UNIT-II

3.	a)	What is the primary function of a signal generator and explain it	6M
	b)	Write short notes on dynamic range in spectrum analyzers	6M
		(OR)	
4.	a)	Differentiate between analogue and digital spectrum analyzers	6M
	b)	What are the advantages using function generator over a signal generator	6M

UNIT-III

5.	a)	What is the significance of triggering in dual trace oscilloscope and how it works	6M
	b)	Write the limitations of storage oscilloscope	6M
		(OR)	
6.	a)	Discuss the principle behind the persistence mode in a storage oscilloscope	6M
	b)	Discuss the concept of sample rate and importance of digital storage Oscilloscope	6M

UNIT-IV

7.	a)	Discuss the operation of wheat-stone bridge	6M
	b)	How can you determine an unknown resistance using wheatstone bridge	6M
		(OR)	
8.	a)	Discuss the operation of Maxwell's bridge	6M
	b)	Discuss the advantages and dis advantages of schering and wien bridges	6M

UNIT-V

9.	a)	Describe the basic principle behind strain gauge operation	6M
	b)	What factors affect the sensitivity and accuracy of strain gauge measurements	6M
		(OR)	
10.	a)	What are thermistors and how do they differ from traditional resistors?	6M
	b)	What is an LVDT and how does it measure linear displacement	6M

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AR18(RA)

CODE: 18EET313 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, October, 2023

POWER SYSTEMS – II

(ELECTRICAL AND ELECTRONICS ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What is skin effect and proximity effect? 6M

   b) The three conductors of a 3-phase line are arranged at the corners of a triangle of sides 2 m, 2·5 m and 4·5 m. Calculate the inductance per km of the line when the conductors are regularly transposed. The diameter of each conductor is 1·24 cm. 6M

(OR)

2. a) Derive the expression for capacitance of a single phase two-wire line system. 6M

   b) A 3-phase, 50 Hz, 66 kV overhead line conductors are placed in a horizontal plane as shown in Fig.1. The conductor diameter is 1·25 cm. If the line length is 100 km, calculate (i) capacitance per phase, assuming complete transposition of the line. 6M

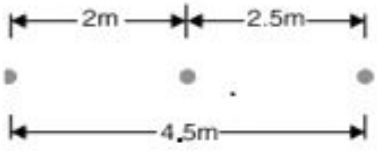

Fig 1

UNIT-II

3. a) Derive the regulation and efficiency for Medium transmission line with phase diagram (nominal T-Network only). 6M

   b) Explain Ferranti effect with phasor diagram. 6M

(OR)

4. a) Explain the effect of power factor on the regulation of the short transmission line. 6M

   b) A single phase overhead line is transmitting 1200 kW power to a factory at 11 kV and 0.75 power factor lagging. The total resistance and the loop reactance of the line are 3.1 ohm and 4.4 ohms respectively. Find the sending end voltage, sending end power factor, percentage of regulation and the transmission efficiency. 6M

UNIT-III

5. a) Derive the transmission parameters or A, B, C, D parameters of a long transmission line by use of complex exponentials. 6M

   b) A 3-phase transmission line has the following constants. Resistance/ ph/ km = 0.16 ohm; reactance/ ph/km = 0.25 ohm. Shunt admittance/ph/km = 1.5×10^{-6} mho. Calculate by rigorous method the sending end voltage and current when the line is delivering a load P-20MW at 0.8 p.f lagging. The receiving end voltage is kept constant at 110 kV. 6M

(OR)

6.	a)	Derive the expression of velocity of wave propagation in long transmission line.	6M
	b)	Explain the concepts of incident, reflected and refracted waves in the transmission lines.	6M

UNIT-IV

7.	a)	Define T-junction. Derive the reflected and refracted voltage for line terminated with short circuit.	6M
	b)	Two stations are connected together by an underground cable having a surge impedance of 60 ohms joined to an overhead line with a surge impedance of 400 ohms. If a surge having a maximum valve of 100 kV travels along the cable towards the junction with the overhead line, determine the value of the reflected and transmitted wave of voltage and current at the junction.	6M

(OR)

8.	a)	Derive the expression for velocity of travelling wave in a transmission lines.	6M
	b)	An overhead line with inductance and capacitance per km of 1.2 mH and 0.9 μF is connected in series with an underground cable having inductance and capacitance of 0.16 mH/km and 0.28 μF/km. Calculate the values of transmitted and reflected waves of voltages and currents at the junction due to a voltage surge of 110KV travelling to the junction along the line towards the cable	6M

UNIT-V

9.	a)	Define string efficiency. Why is it necessary to have high string efficiency?	6M
	b)	Explain the static shielding of Insulators String.	6M

(OR)

10.	a)	Derive the expressions for sag and tension when the supports are at unequal heights	6M
	b)	A transmission line conductor having a diameter of 19.5 mm weighs 0.85 kg/m. The span is 275 meters. The wind pressure is 40 kg/m ^{2} of projected area with ice coating 13 mm. The ultimate strength of the conductor is 8000 kg. Calculate the maximum sag, if the factor of safety is 2 and ice weighs 910 kg/m^3 ?	6M

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AR18

CODE: 18MET308 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, October, 2023

HEAT AND MASS TRANSFER

(MECHANICAL ENGINEERING)

Time: 3 Hours **Max Marks: 60**

Heat and mass Transfer Data book is permitted
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Write the formula for Fourier law of heat conduction and explain each term of the equation. 4M

   b) Derive the general heat conduction equation in a Cartesian coordinate system. 8M

(OR)

2. A spherical container of negligible thickness Holding a hot fluid at 140^0C and having an outer diameter of 0.4 m is insulated with three layers of each 50 mm thick insulation of $k_1 = 0.02$, $k_2 = 0.06$ and $k_3 = 0.16$ W/mK. (Starting from inside). The outside surface temperature is 30^0C. Determine (i) the heat loss, and (ii) Interface temperatures of insulating layers. 12M

UNIT-II

3. a) Explain the function of fins with at least 4 practical examples of use of fin. 4M

   b) A turbine blade 6 cm long with across sectional area of 4.65 cm^2 and perimeter 12 cm, is made up of stainless steel (k = 23.3 W/mK). The temperature at the root is 500^0C and the blade is exposed to hot gases at 870^0C. The heat transfer coefficient between the blade surface and gas is 442 W/m^2K. Determine the temperature of the blade at a distance 3,5 cm from the root and the rate of heat transfer from the fin assuming tip of the blade is insulated. 8M

(OR)

4. a) Explain the significance of Heisler charts in solving transient conduction problems. 4M

   b) A steel ball [Density =7800 kg/m^3, c = 0.46 kJ/kg ^{0}C, k =35 W/m ◦C] 5.0 cm in diameter and initially at a uniform temperature of 450^0C is suddenly placed in a controlled environment in which the temperature is maintained at 100^0C. The convection heat-transfer coefficient is 10 $W/m^2\ ^0$C. Calculate the time required for the ball to attain a temperature of 150^0C. 8M

UNIT-III

5. When 0.6 kg of water per minute is passed through a tube of 2 cm diameter, it is found to be heated from 20^0C to 60^0C. The heating is achieved by condensing steam on the surface of the tube and subsequently the surface temperature of the tube is maintained at 90^0C. Determine the length of the tube required for fully developed flow. 12M

(OR)

6. A thin 100 cm long and 10 cm wide horizontal plate is maintained at a uniform temperature of 150^0C in a large tank full of water at 75^0C. Estimate the rate of heat to be supplied to the plate to maintain constant plate temperature as heat is dissipated from either side of plate. 12M

UNIT-IV

7.	a)	Sketch the temperature variations in parallel flow and counter flow heat exchangers.	6M
	b)	Classify heat exchangers	6M

(OR)

8.		The flow rates of hot and cold water streams running through a double pipe heat exchanger (inside and outside diameter of the tube 80 mm and 100 mm) are 2 kg/s and 4 kg/s the hot fluid enters at 75°C and comes out at 45°C. The cold fluid enters at 20°C. If the convective heat transfer at the inside and outside surface of the tube is 150 and 180 W/m^2K, thermal conductivity of the tube material 40 W/m K, calculate the area of the heat exchanger.	12M

UNIT-V

9.	a)	Explain the terms reflectivity, transmissivity, Absorptivity.	6M
	b)	Two concentric spheres of diameters d_1 = 0.8 m and d_2 = 1.2 m have surface temperatures T_1 = 450 K and T_2 = 300 K respectively. If the surface emissivities are 0.5 and 0.05 respectively. Determine the net radiation heat exchange between the two spheres.	6M

(OR)

10.	a)	Define diffusion coefficient. What are its influencing parameters	4M
	b)	A mixture of O_2 and N_2 with their partial pressures in the ratio 0.21 and 0.79 is in a container at 25^0C. Calculate the molar concentration, the mass density, the mole fraction, the mass fraction of each species for a total pressure of 1 bar.	8M