AR20

CODE: 20CAT201 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech.II Semester Supplementary Examinations, August, 2023

Fundamentals of Artificial Intelligence

(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.		Discuss how AI technique can be used to solve Water-Jug problem.	10M	CO1	K3
		(OR)			
2.		What do you mean by State Space Search? Describe state space representation for 8 puzzle Problem and explain how the problem can be solved by state space search.	10M	CO1	K3
		UNIT-II			
3.		Explain about Hill climbing algorithm and mention the problems with hill climbing. Differentiate between Simple Hill climbing and steepest-Ascent Hill Climbing Algorithm	10M	CO2	K2
		(OR)			
4.		Using constraint satisfaction procedure to solve the following crypt-arithmetic problem. S E N D + M O R E M O N E Y	10M	CO2	K3
		UNIT-III			
5.		Explain the algorithm of converting well-formed formulas to clause form.	10M	CO3	K2
		(OR)			
6.		Explain the resolution algorithm for predicate logic in detail.	10M	CO3	K2
		UNIT-IV			
7.		What do you mean by Conceptual Dependency? Explain any 5 rules of CD.	10M	CO4	K2
		(OR)			
8.		Explain how a semantic network gets evolved into a frame structure with an example.	10M	CO4	K2
		UNIT-V			
9.	a)	Explain Dempster-Shafer theory in detail?	5M	CO5	K2
	b)	Explain about Bayesian Theorem in detail?	5M	CO5	K2
		(OR)			
10.		Explain in detail about the various predicates and actions used by STRIPS to solve the Block's World problem.	10M	CO5	K3
		UNIT-VI			
11.	a)	Explain about MYCIN Expert System in detail.	5M	CO6	K2
	b)	What makes an Expert system feasible? Why we use Expert system?	5M	CO6	K2
		(OR)			
12.		What do you mean by Expert System? Explain Expert system architecture with neat diagram?	10M	CO6	K2

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CODE: 20CST205 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech. II Semester Supplementary Examinations, August, 2023

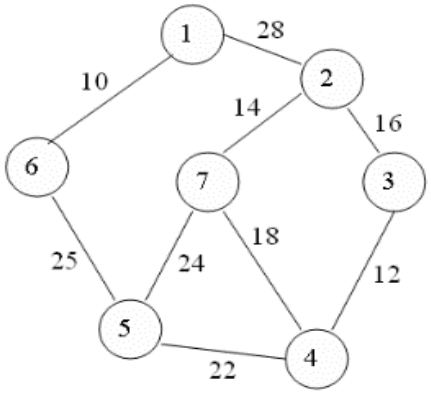
DESIGN AND ANALYSIS OF ALGORITHMS

(COMMON TO CSE & IT Branches)

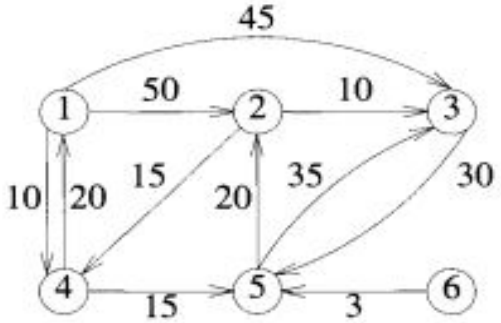
Time: 3 Hours **Max Marks: 60**

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.		Write the pseudo code conventions for expressing algorithms	10	CO1	K2
		(OR)			
2.	a	What is an algorithm? Explain the properties of an algorithm.	6	CO1	K2
	b	Differentiate between big-oh and omega notations.	4	CO1	K2
		UNIT-II			
3.		Explain the divide & conquer approach and discuss it with Quick Sort.	10	CO2	K2
		(OR)			
4.		Sort the list of elements 10, 5, 7, 6, 1, 4, 8, 3, 2, 9 using the Merge Sort algorithm and evaluate the time complexity of Merge Sort.	10	CO2	K3
		UNIT-III			
5.		Solve the following Knapsack problem using the Greedy method. m=30, n=4, (w1, w2, w3, w4) = (10,15,6,9) and (p1,p2,p3,p4) = (2,5,8,1)	10	CO3	K3
		(OR)			
6.		Write the prim's algorithm. Find the minimum cost of the spanning tree for the following graph using Prim's algorithm.	10	CO3	K3



		UNIT-IV			
7.		Find out all pairs shortest paths for the following graph.	10	CO4	K3

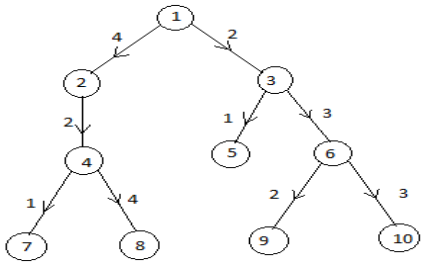


(OR)

8.		Compute the optimal sequence of matrix multiplications needed to find the product of A, B, C, and D matrices given A1 =5x4; A2= 4x6; A3=6x2; A4 =2x7	10	CO4	K3

UNIT-V

9.		Arrange the optimal placement of boosters for the following network. The loss tolerance level of the network is δ=5.	10	CO5	K3



(OR)

10.		Discuss the graph coloring problem. Draw the state space tree for m-coloring when the number of nodes n=3 and the number of colors m=3.	10	CO5	K3

UNIT-VI

11.		Solve the following instance of the TSP problem using LCBB and draw the corresponding state space tree.	10	CO6	K3

	1	2	3	4	5
1	∞	7	3	12	18
2	3	∞	6	14	9
3	5	8	∞	6	18
4	9	3	5	∞	11
5	18	14	9	8	∞

(OR)

12.	a	What is the relationship between P, NP, NP-Hard, and NP-Complete classes?	6	CO6	K2
	b	Explain the Satisfiability problem.	4	CO6	K2

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CODE: 20ECT205 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech.II Semester Supplementary Examinations, August, 2023
PULSE AND DIGITAL CIRCUITS
(ELECTRONICS AND COMMUNIATION 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	CO1	Blooms Level
		UNIT-I			
1.	a)	Explain the operation of RC high pass circuit with ramp input with circuit diagram.	5M	1	L-3
	b)	A pulse is applied to low-pass RC circuit. Prove that area under the pulse is same as area under the output waveform across the capacitor.	5M	1	L-2
		(OR)			
2.	a)	Sketch in integrating circuit with a square wave input. Explain how the wave shape obtained.	5M	1	L-2
	b)	Summarize the criteria for good differentiation and integration.	5M	1	L-3
		UNIT-II			
3.	a)	Explain about clipping at two independent levels using diodes.	5M	2	L-2
	b)	Explain the operation of practical clamper circuit for varying input amplitude.	5M	2	L-3
		(OR)			
4.	a)	Picturize the circuit of transistor clipper and explain its operation.	5M	2	L-3
	b)	A symmetrical 50 Hz square wave whose peak to peak excursions are ± 100 V with respect to ground is to be negatively clamped at 25 V. Draw the necessary circuit diagram and output waveform for this purpose .	5M	2	L-2
		UNIT-III			
5.	a)	Write about the piece-wise diode characteristics of a diode.	5M	3	L-1
	b)	Explain about design of transistor switch.	5M	3	L-3
		(OR)			
6.	a)	Interpret the operation of Schmitt trigger.	5M	3	L-2
	b)	Obtain a bistable multivibrator to meet the following specifications: $V_{CC} = V_{BB} = 12$ V, $I_{C(sat)} = 6$ mA, $h_{FE\ (min)} = 25$ and maximum triggering frequency = 25 kHz.	5M	3	L-2
		UNIT-IV			
7.	a)	Sketch the circuit diagram of collector coupled astable multivibrator and derive the expression for frequency of oscillations.	5M	4	L-2
	b)	Calculate the component values of a monostable multivibrator developing an output pulse of 500 μs duration. Assume $h_{FE(min)} = 25$, $I_{CE(sat)} = 5$ mA, $V_{CC} = 10$ V, and $V_{BB} = -4$V.	5M	4	L-2
		(OR)			
8.	a)	Derive the expression for gate width of a monostable multivibrator neglecting the reverse saturation current I_{CBO}.	5M	4	L-2
	b)	Explain how an astable multivibrator can be used as a voltage to frequency convertor.	5M	4	L-3
		UNIT-V			
9.	a)	Represent a simple current sweep circuit and explain its working with the help of diagrams	5M	5	L-2
	b)	With reference to voltage sweeps explain the following terms: i) Linearity of sweeps. ii) Sweep stability. iii) Recovery time.	5M	5	L-1
		(OR)			
10.	a)	Construct the circuit diagram and waveforms of a transistor bootstrap time base generator and explain principle of operation.	5M	5	L-3
	b)	With necessary waveforms, explain the operation of UJT Relaxation oscillator.	5M	5	L-1
		UNIT-VI			
11.	a)	Explain the operation of Unidirectional sampling gate and list any two advantages and disadvantages.	5M	6	L-2
	b)	Write about reduction of pedestal in sampling gates.	5M	6	L-3
		(OR)			
12.	a)	Explain the operation of a Four diode Sampling Gate and explain its operation. Derive the expression for $V_{C(min)}$ and Gain.	5M	6	L-2
	b)	List any three applications of sampling gates and explain any one of them in detail.	5M	6	L-1

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CODE: 20ESI204 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech.II Semester Supplementary Examinations, August, 2023

Python Programming

(Common to Civil, EEE, MECH Branches)

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.		Explain different operators in python.	10	1	5
		(OR)			
2.		Classify looping statements in python with example program for each.	10	1	4
		UNIT-II	Marks	CO	Blooms Level
3.	a)	Discuss about Numbers	5	2	6
	b)	Discuss about List methods.	5	2	3
		(OR)			
4.	a)	Develop a Python program to remove the characters which have odd index values of a given string.	5	2	5
	b)	Develop a python program to remove duplicates from the list	5	2	3
		UNIT-III	Marks	CO	Blooms Level
5.	a)	Explain about recursive functions.	5	3	5
	b)	List and explain File input output functions.	5	3	3
		(OR)			
6.	a)	Develop a python program To find sum of natural numbers using recursive function	5	3	1
	b)	Develop a python program to search string in a file.	5	3	3
		UNIT-IV	Marks	CO	Blooms Level
7.	a)	What is module? How to import module in python.	5	4	1
	b)	Explain different Module Built-in Functions	5	4	5
		(OR)			
8.	a)	Explain about packages.	5	4	5
	b)	Develop a python program to define a module to find Fibonacci Numbers and import the module to another program.	5	4	3
		UNIT-V	Marks	CO	Blooms Level
9.	a)	How to create a class in python.	5	5	1
	b)	Discuss about inheritance.	5	5	6
		(OR)			
10.	a)	Demonstrate instance methods	5	5	2
	b)	Develop a python program which Define a class, which have a class parameter and have a same instance parameter.	5	5	3
		UNIT-VI	Marks	CO	Blooms Level
11.	a)	Write about Special Symbols and Characters in python Regular expressions	5	6	2
	b)	Discuss the following methods supported by compiled regular expression objects. a) search() b) match() c) findall()	5	6	2
		(OR)			
12.		Write a Python program to check the validity of a password (input from users). Validation : □ At least 1 letter between [a-z] and 1 letter between [A-Z]. □ At least 1 number between [0-9]. □ At least 1 character from [$#@]. □ Minimum length 6 characters. □ Maximum length 12 characters.	10	6	2

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CODE: 18CET206 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, August,2023

Engineering Geology

(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)	Explain about weathering of rocks.	6M
	b)	Classify the methods of study of minerals?	6M
		(OR)	
2.	a)	What are the main and allied branches of geology?	6M
	b)	What is the significance of different physical properties in mineral identification?	6M

UNIT-II

3.	a)	Briefly discuss the classification of rocks.	6M
	b)	Explain about the rock cycle?	6M
		(OR)	
4.	a)	Identify the importance of Petrology in Civil Engineering?	6M
	b)	Summarize the organically formed rocks (Organic deposits)?	6M

UNIT-III

5.	a)	Categorize the causes for development of structures?	6M
	b)	Categorize the joints in igneous, sedimentary and metamorphic rocks?	6M
		(OR)	
6.	a)	What are the effects of faulting and their civil engineering importance?	6M
	b)	Illustrate the common faults types in the major tectonic activities?	6M

UNIT-IV

7.	a)	Explain the magnitude of earth quake?	6M
	b)	Explain the fluctuation of the water table level in unconfined aquifers.	6M
		(OR)	
8.	a)	Explain about plate tectonics and earthquake distribution.	6M
	b)	What are the effects of landslides and preventive measures for it?	6M

UNIT-V

9.	a)	What is the necessity of geological investigations?	6M
	b)	Explain the economic aspects of Reservoir?	6M
		(OR)	
10.	a)	Explain about the electrical resistivity method.	6M
	b)	Identify the effects of Joints at Tunnel site?	6M

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AR18

CODE: 18ECT210 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech II Semester Supplementary Examinations, August,2023

PULSE AND DIGITAL CIRCUITS

(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)	Derive an expression for the percentage tilt.	6M
	b)	Explain response of an RC high pass circuit for ramp input	6M
		(OR)	
2.	a)	Draw the response of high pass RC circuit for a square wave Input wave with different RC time constants.	6M
	b)	Prove that a low pass RC circuit acts as an integrator	6M

UNIT-II

3.		Explain the working of a two level diode clipper with the help of circuit diagram wave form and transfer character stics	12M
		(OR)	
4.	a)	Explain series clippers with need sketches	6M
	b)	Explain clamping circuit theorem	6M

UNIT-III

5.	a)	Explain transistor as a switch	6M
	b)	With the help of a diagram explain the working of a fixed bias of Bi stable multivibrator	6M
		(OR)	
6.	a)	Write about transistor switching times with neat sketches	8M
	b)	Explain diode as a switch	4M

UNIT-IV

7.	a)	Explain design procedure of Astable multivibrator	4M
	b)	Draw the circuit diagram and explain the operation of Monostable multivibrator with neat wave forms	8M
		(OR)	
8.	a)	Write about triggering methods of multivibrators	4M
	b)	Draw the circuit diagram and explain the operation of Astable multivibrator with neat wave forms	8M

UNIT-V

9.		Draw the circuit and explain the operation of miller sweep generator and derive the expression of slope error	12M
		(OR)	
10.		Explain with the help of a neat circuit diagram the working of a Bi directional Sampling gate. Suggest a circuit that minimizes (or) eliminates the pedestal	12M

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