AR16

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 down the classification of roads by Nagpur road plan.	7M
	b)	How the preparation of master plan is done?	7M

(OR)

2.	a)	What are the factors affecting alignment	7M
	b)	Write a detailed note on various engineering surveys to be done in Highway planning	7M

UNIT-II

3.	a)	Derive an expression for overtaking sight distance.	7M
	b)	How the attainment of super elevation can be done? Describe briefly with neat sketch.	7M

(OR)

4.	a)	Explain briefly the calculation of length of the transition curve.	7M
	b)	Derive an expression for extra widening on highway pavement with neat sketch	7M

UNIT-III

5.		Explain briefly desirable properties of road aggregates.	14M

(OR)

6.		What are the various tests conducted on bituminous materials?	14M

UNIT-IV

7.	a)	Write a detailed note on the following 1) 30th highest hourly volume 2) AADT 3) Role of Mechanical counters in Traffic Volume Study	7M
	b)	Write a note on the common methods of on-street parking	7M

(OR)

8.	a)	Discuss various traffic studies and their importance	7M
	b)	Explain the concept of "EEE" that may be taken to prevent accidents.	7M

UNIT-V

9.	a)	Explain various advantages and disadvantages of grade separated intersections	7M
	b)	Explain the design considerations of rotary elements.	7M

(OR)

10.	a)	Explain the various types of Traffic islands used	7M
	b)	Explain different types of intersections	7M

***

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, November, 2018

FUNDAMENTALS OF SIGNALS AND SYSTEMS
(Electrical and Electronics Engineering)

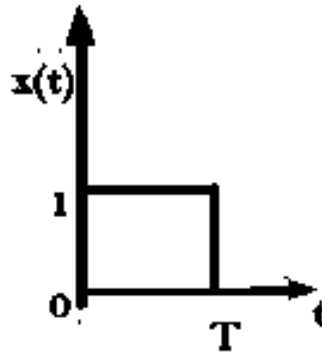**Time: 3 Hours**   **Max Marks: 70**

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) Prove Sinusoidal signal with amplitude 'A', and time period   4M
   'T' is periodic signal
   b) Function x(t) is given below. Draw even and odd parts of x(t)   10M

(OR)

2.   Sketch the following singal $x(t)=e^{-a|t|}$ for a>0. Also determine
      whether the singal is power signal or an energy signal or
      neither

UNIT-II

3. a) What is sampling? State and prove sampling theorem   7M
   b) By using continuous convolution integral, find out the
      response of the system to unit-step input signal. Impulse   7M
      response is given as

   $$h(t) = \frac{R}{L} e^{-\frac{R}{L}t} \cdot u(t)$$

(OR)

4.   What are the properties of convolution sum and give the   14M
      prove them.

UNIT-III

5.   What is Fourier series? Explain in brief about the (i)   14M
      trigonometric and (ii) exponential Fourier series

<div align="center">(OR)</div>

6. a) Explain about the sampling function and **sinc** Function,   7M
        explain their significance

    b) Find the Fourier transform of everlasting sinusoidal signal   7M
        $x(t) = \cos(w_o t)$

UNIT-IV

7. a) What is inverse Laplace Transform   4M

    b) Mention the applications of Laplace transforms in Electrical   10M
        Circuits

<div align="center">(OR)</div>

8.   Determine the Laplace transform of the following signals and   14M
      comment on region of convergence (ROC)

      (i) $x(t) = e^{-2t}u(t) - e^{2t}u(-t)$

      (ii) $x(t) = 3e^{-2t}u(t) - 2e^{2t}u(-t)$

UNIT-V

9.   Define z-transform, what are its characteristics. Mention and   14M
      prove any four properties of z-transforms

<div align="center">(OR)</div>

10. a) Determine the Z-transform of the following signals and also   7M
        find the ROC.

        (i)$x(n) = a^n u(n)$

        (ii) $u(n) - \sin wn)u(n)$

    b) Given the z-transform of any signal $x(z) = 2 + 3z^{-1} + 4z^{-2}$.   7M
        Determine the initial and final values of the corresponding
        discrete time signal x(n)

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B. Tech I Semester Regular Examinations, November, 2018

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 front wheel drive engine with rear wheel drive engine	8M
	b)	What are different engines used in Marine applications? Explain.	6M
		(OR)	
2.	a)	Describe the working of a pressure lubrication system with a neat sketch.	7M
	b)	What are the pollutants emitted by SI engines? Indicate their sources.	7M

UNIT-II

3.	a)	Classify different fuel delivery systems for petrol engine? Explain.	6M
	b)	What are different problems faced by fuel transfer pump? Explain.	8M
		(OR)	
4.	a)	Describe the working of a fuel feed system in diesel engines.	7M
	b)	Describe the requirements of an ideal injection.	7M

UNIT-III

5.	a)	Explain the working of evaporative cooling system.	7M
	b)	What are the merits of evaporative cooling system over conventional water-Cooling system?	7M
		(OR)	
6.	a)	What are the requirements of an ignition system?	7M
	b)	What are the types of ignition system and describe the working of Battery Ignition system?	7M

UNIT-IV

7.	a)	Describe the working of a solenoid switch used for starter motor.	7M
	b)	What is the importance of temperature indicator	7M
		(OR)	
8.	a)	Explain the working of a centrifugal clutch.	7M
	b)	Explain the working differential in an automobile.	7M

UNIT-V

9.	a)	Describe the Ackermann and Davis Steering Mechanisms.	10M
	b)	What are their relative merits?	4M
		(OR)	
10.	a)	Compare disc brakes with drum-type brakes in regard to construction and Operation.	8M
	b)	Describe the working of master cylinder.	6M

AR16

CODE: 16HS3005   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, November, 2018
MANAGERIAL ECONOMICS AND MANAGEMENT SCIENCE
(Electronics and Communication 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) Discuss the Determinants of Demand   7M
    b) Define Elasticity of Demand and Explain its types   7M
    (OR)
2. a) What are the factors governing Demand Forecasting   7M
    b) Recall controlled experiments and Expert method of Demand Forecasting   7M

UNIT-II

3. a) Outline Isoquants and Isocosts in detail   7M
    b) MRTS: Define and Explain   7M
    (OR)
4. a) What is Least Cost Combination of Input and explain with a neat diagram   7M
    b) Summarize Opportunity cost, Fixed cost and Variable cost with examples   7M

UNIT-III

5. a) Demonstrate the characteristic features of Monopolistic Competition?   7M
    b) Write a brief note on Monopolistic Competition   7M
    (OR)
6. a) Describe the features of Perfect competition   7M
    b) Relate the following pricing Strategies with good examples: Penetration Pricing,   7M
       Skimming Pricing & Premium Pricing

UNIT-IV

7. a) Write a short note on Nature and Importance of Management   7M
    b) Describe any three functions of Management   7M
    (OR)
8. a) Discuss the Fayol's Principles of Management   7M
    b) Elaborate the social responsibilities of Management   7M

UNIT-V

9. a) Outline the Channels of Distribution   7M
    b) Explain the Marketing Strategies that the marketer should follow during Growth   7M
       and Declining Stages of PLC
    (OR)
10. a) What are basic functions of HR Manager?   7M
    b) Relate the Job Evaluation and Merit Rating   7M

AR16

CODE: 16CS3014   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular Examinations, November, 2018
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE & IT)

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) What is an algorithm? Describe the criteria that an algorithm   7 M
   must satisfy
   b) The factorial function n! has value 1 when n<=1 and value   7 M
   n*(n-1)! When n > 1. Write both a recursive and iterative
   algorithm to compute n!

(OR)

2. a) What is asymptotic notation? Elaborate on Asymptotic   7 M
   Notations with examples.
   b) Write an algorithm to add two m X n matrices. Determine the   7 M
   time complexity of the algorithm in terms of program steps
   by using the count variable and step count approaches.

UNIT-II

3. a) What is divide and conquer strategy? Write control   7 M
   abstraction for it.
   b) Explain binary search with suitable example and derive its   7 M
   time complexity.

(OR)

4. a) Illustrate merge sort technique by means of relevant example.   7 M
   Calculate the best, average and worst case time complexity
   for the merge sort.
   b) State the Greedy Knapsack. Find an optimal solution to the   7 M
   Knapsack instance: n=3, m=20, (P1, P2, P3) = (25, 24, 15)
   and (W1, W2, W3) = (18, 15, 10).

UNIT-III

5. a) What is principal optimality? Dynamic programming is best   7 M
   compared to the greedy method. Justify the statement.
   b) Compare the time complexities of solving the All Pairs   7 M
   Shortest Path problem using Floyds algorithm and using the
   Dijkstra's algorithm by varying the source node. Justify your
   answer.

(OR)

6. a) Describe the Matrix chain multiplication problem. Apply the recursive solution of dynamic programming to determine optimal sequence of pair wise matrix multiplications.   7 M

     b) Assume that there are 4 cities A,B,C,and D that are to be visited by a salesperson. Following matrix represents the cost of moving from one city to the other. Solve this TSP using dynamic programming approach.   7 M

$$
\begin{array}{c|cccc}
 & A & B & C & D \\
\hline
A & 0 & 2 & 9 & 10 \\
B & 1 & 0 & 6 & 4 \\
C & 15 & 7 & 0 & 8 \\
D & 6 & 3 & 12 & 0 \\
\end{array}
$$

UNIT-IV

7. a) What is a bi-connected component? Write the steps of the algorithm for finding bi-connected components in a given graph.   7 M

     b) Write and explain the backtracking algorithm for solving sum of subsets problem using the state space tree corresponding to the fixed tuple size formulation.   7 M

(OR)

8. a) What is graph coloring problem? Describe its solution using backtracking approach.   7 M

     b) Solve sum of subsets problem using back tracking for n = 4 (w1, w2, w3, w4) = (11,13,24,7) & m = 31. Find all possible subsets of w that sum to m using the backtracking algorithm for sum of subsets problem.   7 M

UNIT-V

9. a) Discuss various methodologies of Branch and Bound technique.   7 M

     b) Draw the portion of the state space tree generated by FIFO BB for the knapsack instance: n=5, (p1, p2, ..., p5) = (10, 15, 6, 8, 4), (w1, w2, ..., w5) = (4, 6, 3, 4, 2), and m = 12.   7 M

(OR)

10. Write short notes on the following: 14 M
     i. Dead node   ii. Live node   iii. E-node
     iv. Bounding function   v.Non-deterministic algorithms
     vi. NP-Complete Problems   vii. Cook's Theorem

***

AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, November, 2018
TRANSPORTATION ENGINEERING-I
(Civil Engineering)

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

PART-A

ANSWER ALL QUESTIONS   **[1 X 10 = 10 M]**

1.
   a) What are the requirements of ideal alignment.
   b) What are the classifications of urban roads.
   c) What is the importance of geometric design
   d) What are different types of vertical curves?
   e) What are the different types of transition curves?
   f) What are the factors affecting sight distance?.
   g) Define traffic volume.
   h) Draw the neat sketch of lane marking?
   i) Draw various forms of at grade intersections.
   j) Explain various disadvantages of grade separated intersection.

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. (a) Discuss about first 20 year road development plan
   (b) Explain about various engineering surveys involved in road project.

(OR)

3. (a) What is highway alignment? Explain the factors affecting alignment.
   (b) Explain about various drawings & reports to be submitted for new highway project.

UNIT-II

4. Derive an expression for extra widening with neat sketch.

(OR)

5 (a) Calculate the safe stopping distance for design speed of 50kmph for two-way traffic on a two lane road. Assume coefficient of friction as 0.35 and reaction time of driver as 2.5seconds..
   (b) What are the steps to design superelevation?

AR13

UNIT-III

6 (a) Write about parking studies & draw various parking patterns of off-street parking

   (b) Write the difference between collision & condition diagram

(OR)

7 (a) Write the objects and uses of Traffic volume studies?

   (b) Write about Spot Speed studies?

UNIT-IV

8 (a) What are the warrants for traffic control signal?

   (b) Write about mandatory signboards.

(OR)

9 (a) Write about IRC method of signal design

UNIT-V

10 (a) What are the various types of rotaries? Explain the design elements.

   (b) Draw various channelized intersection with traffic movements.

(OR)

11 (a) Write a note about grade separated structures. Draw neat sketches of various types.

   (b) Write the selection criteria for grade separated intersection.

***

AR13

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Find the impulse response h(n) for the following causal LTI discrete time system $y(n) = x(n) - 2x(n-2) + x(n-3)$.[

   b) Define Unit step function. How do you obtain unit impulse function from it?

   c) Determine the sequence x(n) whose Z-transform is given by $X(Z)=(1+2Z)(1+3Z^{-1})(1-Z^{-1})$

   d) State with reasons if the following function is periodic. In case of periodic find the period $x(t)=a \sin 4t + b \cos 7t$.

   e) show that Inductor is Time Invariant.

   f) Detrmine the Laplace of
      $x(t) = e^{-at}u(t)$

   g) What is the relation between laplace transform and Continous time fourier transform?

   h) What is the condition for the system to become stable?

   i) Find the Z-transform of x(n)={1,2,-4,5, 6}?
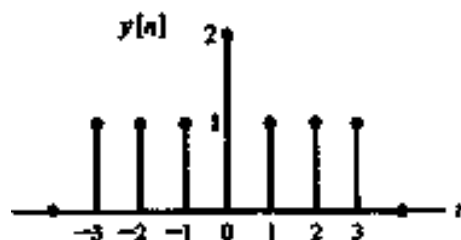
   j) State duality of fourier transform?

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. a) Find the signal x[n] such that even{x[n]} = y[n] for n≥0, and   **6M**

      odd{x[n]} = y[n] for n<0.

b) Find whether the given signals are energy signals, power **6M**
signals or neither (1) $x[n]=2e^{j3n}$

(2) $x(t)=Ae^{\alpha}t\ u(t)$

(OR)

3. a) Let $y(t)=e^{-t}u(t)*\sum\limits_{k=-\infty}^{\infty}\delta(t-3k)$ .Show that [CO3] **6M**

$y(t)=Ae^{-t}$ for $0\le t<3$, and determine the value of A.

b) Let y[n] denote the convolution of h[n] and g[n] where **6M**

$h[n]=\left(\dfrac{1}{2}\right)^{n}u[n]$ and g[n] is causal sequence. If y[0]=1 and y[1]=

$\dfrac{1}{2}$ Then g[1]= ?

UNIT-II

4 a) Find the Fourier series for periodic extension of $f(t)=\frac{1}{2}t$, t $\in$ [0, **6M**
2); with periodicity T= 2seconds. Determine the sum of this series.

b) Find the exponential Fourier series coefficients of **6M**
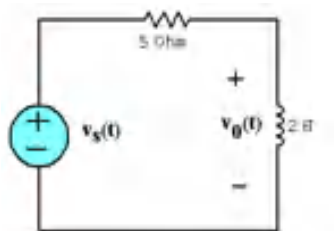$x(t)=\cos 2t+\sin 3t+\cos(5t+60^{o})$

(OR)

5 a) Determine the exponential fourier series from trigonometric Fourier **6M**
series?

b) The circuit shown in figure has non sinusoidal voltage source $V_s(t)$ **6M**
that has Fourier

$series\ V_s(t)=\dfrac{1}{2}+\dfrac{2}{\pi}\sum\limits_{n=1}^{\infty}\dfrac{\sin(2n-1)\pi t}{2n-1}$. Find the voltage across inductor and correspond

magnitude spectrum

UNIT-III

6. a) Find the Fourier transform of the following and sketch **6M**
   Magnitude and Phase spectrum
   (i) $e^{at}u(-t)$ a>0   (ii) $t\,e^{-at}u(t)$ a>0

   b) Explain the development of Fourier transform from Fourier **6M**
   series

(OR)

7. a) state and prove frequency shifting property and **6M**
   Differentiation property of Fourier transform.

   b) Find the Fourier transform of the signal $g(t) = \dfrac{4t}{(1+t^2)^2}$ **6M**

UNIT-IV

8. a) State and prove initial and final value theorem of Laplace **6M**
   Transform.

   b) L.T $\{h(t)\} = \frac{1}{s^2-s-4s}$, Find Inverse laplace Transform such that **6M**
   system is   i) Causal   ii)Stable iii) Anti-causal

(OR)

9. a) Find the I.L.T $\{ \log(s+a)/(S+b)\}$ using differntiation **6M**
   property

   b) A system described by a differential equation is given by **6M**
   $\frac{d^2y(t)}{dt^2} + 4\frac{dy(t)}{dt} + 3y(t) = x(t)$ and system is initially at rest. Find the
   Step Response?

UNIT-V

10. a) Solve the following difference equation for y(n) using z- **6M**
    transform and the specified initial condition

    $y(n) - y(n-1) + \dfrac{1}{4}y(n-2) = x(n); n \geq 0$ y(-1)=2   and   y(-2)=4.

    where $x(n) = 2\left(\dfrac{1}{8}\right)^n$

    b) Find the inverse z-transform of **6M**

    $X(Z) = \dfrac{1}{1-1.5Z^{-1} + 0.5Z^{-2}}$ for ROC: $0.5 < |Z| < 1$

(OR)

11. a) Determine the z-transform and region of convergence for the following sequence: **6M**

$$x(n) = \begin{array}{ll} 2^n & n \geq 0 \\ 3^{-n} & n<0 \end{array}$$

b) Find the convolution between x(n)={ 1,2,3,4} and y(n) = {4,3,2,1} using Z-transform. **6M**

AR13

CODE: 13ME3016   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, November, 2018

CAD/CAM
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) List benefits of CAD.
   b) Write down a 2D transformation matrix for reflecting an object about X axis.
   c) Draw some solid entities.
   d) Write about Fundamentals of solid modelling.
   e) What do you mean by canned cycle?
   f) Write applications of NC.
   g) List various parts classification and coding systems.
   h) Define Part Family.
   i) What is the role of Process Planning?
   j) List various components of FMS.

PART-B

Answer one question from each unit   [5x12=60M]

UNIT-I

2. a) Explain briefly about computer graphics image drawing techniques.   6M
   b) List various types of input devices and explain about any two of them with neat diagrams.   6M

(OR)

3. a) Perform a 45^0 rotation of a triangle A (0,0), B(1,1) and C (5,2) about the origin and about the point (-1,-1).   6M
   b) Explain the following transformations in 2D and 3D concept of computer graphics with an example: 6M
   i) Translation   ii) Scaling   iii) Rotation

UNIT-II

4. a) What is meant by B-Representation? Explain it with an example.   6M
   b) What are the various types of Wireframe models? Briefly explain them with neat diagrams.   6M

(OR)

5. a) What is CSG representation in solid modeling? Explain the importance in the construction of the CSG solid models with examples.   6M
   b) Discuss the important properties of Bezier Surface & B-Spline surface.   6M

UNIT-III

6. a) Discuss about Basic components of NC systems.   6M
   b) Explain any four turning cycles used in CNC part program.   6M

(OR)

7. a) Draw the block diagram of DNC and list advantages of DNC.   4M
   b) Write CNC part program for contour milling operation for the following figure   8M
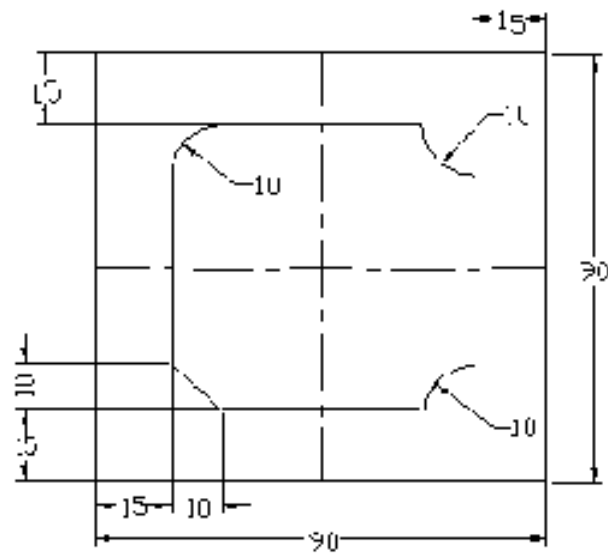
UNIT-IV

8. a) Describe the factors considered in selecting a part in parts classification and coding system. **6M**

   b) Develop the Form Code using OPITZ Coding System for the part illustrated in Figure below. **6M**
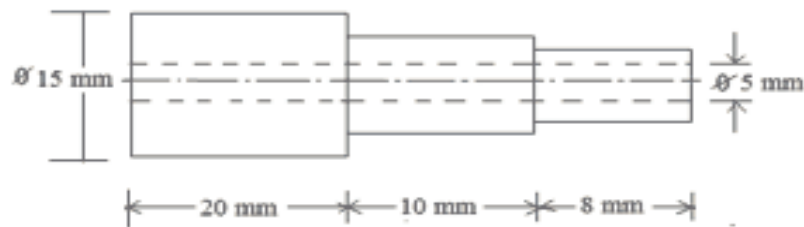
(OR)

9. a) Discuss various benefits of Group Technology. **4M**

   b) Apply the Rank Order Clustering technique to the machine-part incidence matrix in the following table to identify logical part families and machine groups. Parts are identified by letters, and machines are identified numerically. **8M**

Machines	Parts								
	A	B	C	D	E	F	G	H	I
1	0	0	1	1	1	0	0	0	0
2	1	1	0	0	0	0	1	1	1
3	0	0	0	0	0	1	1	1	0
4	1	1	0	1	0	0	0	0	0
5	0	0	1	0	1	0	0	0	0
6	0	1	0	0	0	0	0	1	1
7	1	0	1	1	0	0	0	0	0
8	0	1	0	0	0	1	0	1	1

UNIT-V

10. a) List out the two basic approaches in computer-aided process planning. Explain any one of them. **8M**

    b) Discuss some of the benefits derived from computer-aided process planning. **4M**

(OR)

11. a) Discuss about various functions performed by the FMS Computer Control System. **6M**

    b) Explain In-Line Layout configuration with a neat sketch. **6M**

***

AR13

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Define antenna beam efficiency.

   b) Prove that the total solid angle subtended by a hemisphere is 2π Sr.
   c) Define pattern multiplication.
   d) Draw the field pattern of an array of two point source antennas excited with equal amplitudes and opposite phase.
   e) What is a travelling wave antenna?
   f) The bidirectional radiation pattern of a long wire antenna can be converted into unidirectional pattern by:
      P) Making a V – antenna with two long wire antennas
      Q) Terminating other end of the long wire antenna with characteristic impedance
      A) Statement - P alone is correct   B) Statement – Q alone is correct
      C) Both P and Q are correct   D) Neither P nor Q is correct
   g) State the advantages of 90° corner reflector antenna.
   h) What are the general precautions to be taken during antenna measurements?
   i) State the ranges of frequencies for different modes of wave propagation.
   j) Define maximum usable frequency.

PART-B

Answer one question from each unit   [5x12=60M]

UNIT-I

2. a) Find out the directivity of an antenna with radiation intensity $U=2\sin\theta$ 6M

   b) Define antenna parameters
      i) Gain ii) Directivity iii) Radiation resistance   6M

(OR)

3. a) Distinguish between physical aperture and effective aperture and give the reason why always effective aperture is smaller than physical aperture.   6M

    b) An antenna in free space receives $2\mu W$ of power when the incident electric field is 20 mV/m rms. Find the effective aperture of the antenna.   6M

UNIT-II

4. a) Derive the expression for total far field pattern of a linear array of n- isotropic point sources.   6M

    b) Obtain the expression for beam width of broadside array.   6M

(OR)

5. a) Discuss the salient features of broadside array.   6M

    b) Find out null to null beam width of a broadside array when the array length is 10λ and number of elements are 20   6M

UNIT-III

6. a) What are the advantages of Helical antenna over other wire antennas?   6M

    b) Make a comparison in the performances of long wire, V and Rhombic antennas.   6M

(OR)

7. a) Write a brief notes about V-Antenna. What are the advantages of inverted V antenna?   6M

    b) Distinguish between Maximum output design and alignment design of rhombic antenna.   6M

UNIT-IV

8. a) What are the salient features of corrugated horn antenna?   6M

    b) What is the input impedance significance of Folded dipole? How is this aspect useful in Yagi-Uda antenna?   6M

(OR)

9. a) State the applications, advantages and disadvantages of lens antenna.   6M

    b) Design an experimental set up to measure the gain of an antenna using comparison method.   6M

UNIT-V

10. a) Briefly explain space wave propagation.   6M

    b) Define i) Critical frequency ii) Skip Distance iii) Optimum Working frequency   6M

(OR)

11. a) The electromagnetic wave in ionosphere takes a curved path instead of a straight path. Explain the reason.   6M

    b) What is tropospheric scattering? What is its impact on communication system?   6M

AR13

CODE: 13CS3013　　　　　　　　　　　　　　　**SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, NOVEMBER, 2018

DESIGN AND ANALYSIS OF ALGORITHMS
(Computer Science and Engineering)

Time: 3 Hours　　　　　　　　　　　　　　　　　　Max Marks: 70

PART-A

ANSWER ALL QUESTIONS　　　　　　　　　　**[1 x 10 = 10 M]**

1.　a)　Define Time Complexity.
　　b)　Define omega notation.
　　c)　Define the divide and conquer method.
　　d)　What is greedy method.
　　e)　What is branch and bound algorithm
　　f)　What is meant by feasible solution?
　　g)　Define Dead Node.
　　h)　List the features of dynamic programming.
　　i)　Applications of Minimum Cost Spanning tree
　　j)　Define NP-hard problem

PART-B

Answer one question from each unit　　　　　　　　**[5x12=60M]**

UNIT-I

2.　a)　What are the different mathematical notations used for algorithm analysis..　　[6M]
　　b)　Explain in detail about Amortized and Probabilistic analysis.　　[6M]

(OR)

3.　a)　Explain the usefulness of the following functional operations on sets.　 (i) DELETE (ii) FIND (iii) UNION (iv) INSERT　　[6M]
　　b)　What is the time complexity of following function fun () and Explain procedure
　　　 int fun(int n) { for (int i = 1; i <= n; i++) { for (int j = 1; j < n; j += i) { Sum = Sum +i*j; } } return(Sum); }　　[6M]

UNIT-II

4.　a)　Write Divide And Conquer recursive Merge sort algorithm and derive the time complexity of this algorithm　　[8M]
　　b)　What are the advantages and disadvantages of Divide – And – Conquer?　　[4M]

5. a) Define Greedy Method. Explain about Knapsack Problem with an example. [8M]

b) Describe the control abstraction for divide and conquer. [4M]

UNIT-III

6. a) Construct an optimal binary search tree for the following data: n=4, (a1,a2,a3,a4)=(do, if, int, while), p(1:4)= (3,3,1,1) and q(0:4)= (2,3,1,1,1). [8M]

b) Explain the Knapsack problem with an example? [4M]

(OR)

7. a) Define dynamic programming. Give the solution for the problems of Reliability design and derive it's time complexity. [8M]

b) Explain Optimal Binary Search tree [4M]

UNIT-IV

8. a) Briefly explain 8-queen problem using Backtracking. Explain its applications [8M]

b) Using backtracking technique solve the following instance for the subset problem s=(1,3,4,5) and d=11. [4M]

(OR)

9. a) Briefly explain Hamiltonian cycles using backtracking [6M]

b) Explain the Graph – coloring problem. And draw the state space tree for m= 3colors n=4 vertices graph. Discuss the time and space complexity. [6M]

UNIT-V

10. a) Explain the principles of FIFO Branch and Bound. [6M]

b) Explain the principles of Control Abstractions for LC-search [6M]

(OR)

11. a) Compare and contrasts between NP-HARD and NP-COMPLETE [6M]

b) Briefly explain Cooks-theorem. [6M]

AR13

CODE: 13EC3019   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, November, 2018
MICROPROCESSORS & MICRO CONTROLLERS
(Information Technology)

Time: 3 Hours   Max Marks: 70
PART-A
ANSWER ALL QUESTIONS   [1 X 10 = 10 M]
1. a)   Give an example of indirect addressing mode in 8086.
    b)   List the registers associated with ISR.
    c)   List out the general purpose registers in 8086.
    d)   Give an example of I/O Port addressing.
    e)   List out the features of 80386.
    f)   How to calculate physical address in 80386.
    g)   Write one difference between microprocessor and microcontroller.
    h)   Explain PSW in 8051.
    i)   Draw pin diagram of 8255.
    j)   What is scan and display section of 8279.

PART-B
Answer one question from each unit   [5x12=60M]
UNIT-I

2. (a)   With a neat architectural diagram explain the functioning of 8086.   [8M]
    (b)   Explain how 8086 provides 1MB memory and space using segment registers.   [4M]
          Also, list the addresses of segment registers.

(OR)
3. (a)   Draw the pin diagram of 8086 and explain of each pin.   [8 M]
    (b)   Draw timing diagram of READ and WRITE cycles of 8086[maximum   [4 M]
          models].
UNIT-II

4. (a)   Write an ALP to display string 'AITM' on the screen.   [2M]

    (b)   Write an ALP of 8086 to find average in the array of 10 numbers.   [5M]

    c)   Write an ALP to arrange a given set of hexadecimal bytes in
          increasing order.   [5M]

5   (a)   What is an assembler directive? Explain any four assembler directives.   [4M]
    (b)   Write an ALP to find LCM of two 16 bit unsigned numbers.   [8M]

UNIT-III

6   (a)   What are the advantages of 80386 over 8086?   [2M]
    (b)   What is meant by co-processor? List out the features of 80387.   [5M]
          (c) Explain register organization in 80386.   [5M]
          (OR)

7   (a)   Briefly explain the architecture of 80386?   [6 M]
    (b)   Explain the concept of segmentation in 80386.   [6 M]

UNIT-IV

8   (a)   Explain the working of Programmable Interrupt Controller (8259).   [8M]
    (b)   List out features of 8259 microcontrollers.   [4M]
          (OR)
9   (a)   Explain the need for DMA and discuss DMA transfer method in brief.   [6M]
    (b)   Explain the following control words of 8251 with suitable examples.   [6M]
          (i)   MODE word
          (ii)   COMMAND word

UNIT-V

10   Explain architecture of 8051 with neat block diagram and list all the registers   [12M]
        of 8051.

          (OR)
11 (a)   Differentiate PIC and flash microcontrollers.   [6M]
    (b)   Write a 8051 program to find BCD for the numbers between 0 to 9.   [6M]