

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) Explain about methods of soil exploration. [7M]
- b) Explain in brief about the following two boring methods [7M]
 - i. Wash boring
 - ii. Percussion boring

(OR)

2. a) Explain in brief about the pressure meter test with a neat sketch. [7M]
- b) Standard penetrate test was conducted in a deposit of fully submerged fine sand and field N value was reported as 35 at a depth of 3 m. The average saturated unit weight of the soil is 17.5 kN/m^3 . Calculate the corrected N value. [7M]

UNIT-II

3. a) Derive an equation for determining the stability of an infinite slope in cohesive soil under steady seepage condition. [7M]
- b) A 7 m deep canal has side slope of 1:1. The soil has $C_u = 25 \text{ kN/m}^2$, $\phi_u = 10^\circ$, $\gamma_{\text{sat}} = 19 \text{ kN/m}^3$. Determine the factor of safety with respect to cohesion, when canal runs fully. Also, find the same in case of sudden drawdown condition. [7M]

For submerged condition, take $S_n = 0.11$ For sudden drawdown condition, take $S_n = 0.135$ **(OR)**

4. a) Discuss about Swedish circular method with a neat sketch. [7M]
- b) Explain brief about stability of slopes of earthen dam under following two conditions [7M]
 - i. Steady seepage condition
 - ii. Sudden drawdown condition

UNIT-III

5. a) Differentiate between Rankine's and Coulomb's earth pressure theory. [7M]
- b) A retaining wall 7.5 m high with a smooth vertical back is pushed against a soil mass having $c_u = 40 \text{ kN/m}^2$, $\phi = 15^\circ$, $\gamma = 18 \text{ kN/m}^3$. Determine the total passive earth pressure acting on retaining wall, if the horizontal soil surface carries a uniform load of 25 kN/m^2 . Also, determine point of application of thrust. [7M]

(OR)

6. a) Derive an equation for calculating the Rankine's active earth pressure in cohesive soil deposit. [7M]
- b) Determine the total active thrust acting on a retaining wall of 9 m high. [7M]
The retaining wall retains a 2-layered sand backfill each having a depth of 4.5 m. For top layer $\phi' = 30^\circ$ and $\gamma = 18.5 \text{ kN/m}^3$ and for bottom layer $\phi' = 32^\circ$ and $\gamma = 20 \text{ kN/m}^3$. Show the active earth pressure distribution diagram.

UNIT-IV

7. a) Explain how ultimate bearing capacity and settlements of a foundation can be determined from plate load test data. [7M]
- b) A rectangular footing of size 2.5 m x 3.5 m was constructed in a soil deposit at a depth of 2.0 m from the ground surface. The soil is having $c = 20 \text{ kN/m}^2$, $\phi = 25^\circ$, $\gamma = 17.5 \text{ kN/m}^3$. Determine the net safe bearing capacity of soil. [7M]
(For $\phi = 25^\circ$, $N_c = 25.1$, $N_q = 12.7$ and $N_\gamma = 9.7$)
- (OR)**
8. a) Explain how bearing capacity of shallow foundations can be determined as per IS Method. [10M]
- b) Determine the ultimate bearing capacity of soil under a circular footing. The size of the footing was 2.0 m constructed at a depth of 1.5 m from the ground surface. The soil is having $c = 50 \text{ kN/m}^2$, $\phi = 0^\circ$, $\gamma = 17 \text{ kN/m}^3$. [4M]

UNIT-V

9. a) Classify and explain in brief about the types of pile foundation based on
i) Method of installation. ii) Based on usage [7M]
- b) A group of 16 bored pile are installed in clayey soil having unconfined compression strength $q_u = 80 \text{ kN/m}^2$. Piles are 9 m long and 30 cm diameter with c/c spacing of 90 cm. Estimate the safe load of pile group. Take F.S = 3 and $\alpha = 0.9$. [7M]
- (OR)**
10. a) Explain in brief about the pile load test with a neat sketch. [7M]
- b) A concrete pile of 50 cm diameter and 8 m length is driven into loose sand deposit. The soil is having $\phi = 35^\circ$ and $\gamma = 21 \text{ kN/m}^3$. Estimate the safe load carrying capacity of pile when water table is at a depth of 5 m from ground level. Take F.S = 3.0, $k = 1$ and $\tan \delta = 0.5$. [7M]
(For $\phi = 35^\circ$, $D_c/B = 12$ and $N_q = 55$).

AR16

CODE: 16EC3016

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Supplementary Examinations, July-2019

ANALOG AND DIGITAL ELECTRONIC CIRCUITS

(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) Derive and draw the output response of RC low pass circuit for step input. 7M
b) Write short notes on RC high pass circuit. Show that a RC high pass circuit with small time constant acts as a differentiator. 7M
(OR)
- 2 a) With the help of neat circuit diagram and waveforms explain the working of emitter coupled clipper. 7M
b) Draw the circuit of positive peak clamper and explain its working with help of waveforms and equations. 7M

UNIT-II

- 3 a) Explain the operation of transistor as a switch. 7M
b) Explain in detail junction transistor switching times. 7M
(OR)
- 4 a) Explain the operation of astable multivibrator with neat circuit and waveforms. 7M
b) Derive the pulse width expression of collector coupled monostable multivibrator. 7M

UNIT-III

- 5 a) i. Draw the pin diagram of IC 741 and explain about each pin. 7M
ii. List out and explain the characteristics of an ideal op- amp.
b) i. What is inverting amplifier? Derive the expression for gain of an inverting amplifier. 7M
ii. List out the DC and AC characteristics of op-amp.

(OR)

AR16

CODE: 16EC3016

SET-1

- 6 a) Draw the diagram of op-amp differentiator and derive the expression for output voltage. 7M
- b) i. Explain all-pass filter with neat sketches. 7M
ii. For the all-pass filter, determine the phase shift between the input and output at $f=2\text{kHz}$. (Assume $C=0.01\mu\text{F}$)

UNIT-IV

- 7 a) Explain the working of 555 timer as astable multivibrator. 7M
b) Explain the concept of PLL. Mention its applications. 7M
- (OR)
- 8 a) List out various types of digital to analog and analog to digital converters. Compare their merits and demerits. 7M
b) Explain the operation of a parallel comparator type ADC with a neat circuit diagram. 7M

UNIT-V

- 9 a) Explain CMOS working principle. Design CMOS NOR gate and verify the operation with truth table. 7M
b) Design NOT gate using transistor logic and verify its working with truth table. 7M
- (OR)
- 10 a) Explain the operation of two-input TTL NAND gate. 7M
b) List out characteristics of ECL. Explain the operation of basic ECL circuit. 7M

AR16

CODE: 16ME3020

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Supplementary Examinations, July-2019

**CAD/CAM
(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) Explain the different types of 2D transformations with examples. (9)
b) Write short notes on Viewports and Windows. (5)
(OR)
2. a) Explain product life cycle with neat sketch. (9)
b) List a few CAD specific I/O devices. (5)

UNIT-II

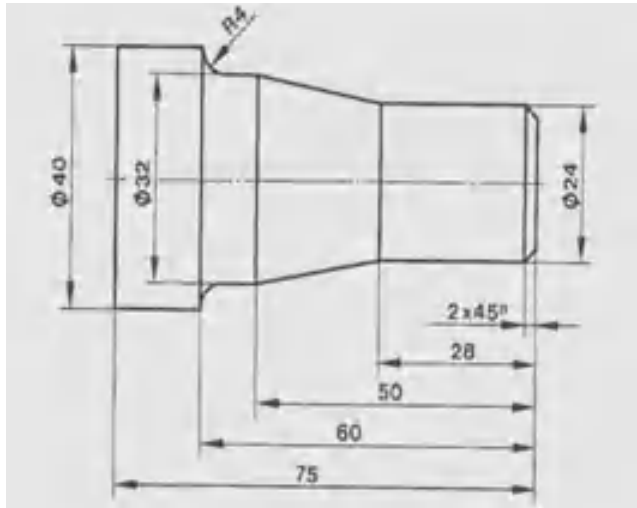
3. a) How does surface modelling differ from solid modelling? Explain B-rep type of solid modelling with a neat sketch. (9)
b) List out the various Bezier curves based on control points. (5)
(OR)
4. A cubic Bezier curve is given by the coordinates $P_0=[2 \ 2 \ 0]^T$, $P_1=[2 \ 3 \ 0]^T$, $P_2=[3 \ 3 \ 0]^T$ and $P_3=[3 \ 2 \ 0]^T$. Find the equation of the resulting Bezier curve. Also find the points on the curve for $u=0, 0.25, 0.50, 0.75$ and 1 . (14)

UNIT-III

5. a) Briefly explain the classification of CNC systems based on control system. (8)
b) Write short notes on Canned cycle with an example. (6)

(OR)

6. a) Differentiate open loop and closed loop system. (5)
b) Write an NC part program to turn the given part. (9)



UNIT-IV

7. a) Write a short note on MICLASS system used in Group Technology. (5)
b) Explain the structure of CAPP. (9)

(OR)

8. a) Enunciate the Variant type of process planning with an example. (9)
b) What are part families and how are they grouped? (5)

UNIT-V

9. a) What is meant by Lean manufacturing? Does lean manufacturing facilitate FMS or vice versa? (8)
b) Briefly explain Flexible Manufacturing Cells (FMC). (6)

(OR)

10. a) What are the various types of data associated with a flexible manufacturing system? (5)
b) Explain the various FMS layout configurations and the functions of material handling and storage systems in it. (9)

AR16

CODE: 16EC3021

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Supplementary Examinations, July-2019

**DIGITAL SIGNAL PROCESSING
(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) For the following discrete time signals, determine whether or not the system is linear, time invariant, causal and stable. 7M
(i) $y(n)=x(n+7)$ (ii) $y(n)=x^3(n)$
b) Determine the impulse response of for the system described by the following difference equation. 7M
 $y(n)+y(n-1)-2y(n-2)=x(n-1)+2x(n-2)$

(OR)

2. a) Define a signal. Classify them with an example 7M
b) Find the Z transform and ROC of the following sequences 7M

i) $x(n) = \left(-\frac{1}{5}\right)u(n) + 5\left(\frac{1}{2}\right)u(-n-1)$ ii) $x(n) = ((n+0.5)\left(\frac{1}{3}\right))^n u(n)$

UNIT-II

3. a) Find the circular convolution of the sequences $\{1,-1,1,1\}$ and $\{1,2,3,4,5\}$ 7M
b) Find the following sequences for $x(n) = \{1, -7, -8, 9, 10\}$. 7M
a. $x(n-3)$ b. $x(n/2)$ c. $x(-3-n)$ d. $5x(3n)$

(OR)

4. a) Contrast the transforms DTFT, DFS and DFT. 7M
b) An 8 point sequence is given by $x(n) \{1,2,3,4,4,3,2,1\}$ 7M
.Compute 8 point DFT of $x(n)$ by Radix - 2 DIF FFT

UNIT-III

5. a) Describe the technique of design of IIR filter by the bilinear transformation method. 7M
b) Develop the system with difference equation $y(n)=3/4y(n-1)-1/8y(n-2)+x(n)+1/3x(n-1)$ in cascade form ? 7M

(OR)

6. a) Design an Analog Butterworth filter that has a -2dB pass band attenuation at a frequency of 20 rad/sec & at least -10dB stop band attenuation at 30 rad/sec 7M
- b) For the given analog transfer function $H_a(s) = 3/(s+1)(s+4)$, determine $H(z)$ for $T=1$ sec using impulse invariant method. 7M

UNIT-IV

7. a) A low pass filter is to be designed, with the following desired specifications 10M

$$H_d(e^{j\omega}) = e^{-j\omega}, \quad \text{for } -0.75\pi \leq \omega \leq 0.75\pi$$
$$= 0 \quad \text{for } 0.75\pi < \omega \leq \pi$$

Determine the frequency response $H(e^{j\omega})$ for $N=7$ using a causal Blackman window.

- b) Explain designing of FIR filter using frequency sampling technique 4M

(OR)

8. a) A low pass filter is to be designed, with the following desired specifications 10M

$$H_d(e^{j\omega}) = 1, \quad -0.5\pi \leq \omega \leq 0.5\pi$$
$$= 0 \quad 0.5\pi < \omega \leq \pi$$

Find the filter coefficients $h_d(n)$, and also $h(n)$ using symmetric rectangular window with window length = 7

- b) Explain the need for the use of window sequence in the design of FIR filter. 4M

UNIT-V

9. a) Explain Von-Neumann and Harvard architectures with neat diagrams 7M
- b) Illustrate the role of address generation unit in the DSP implementation 7M

(OR)

10. a) Explain the special addressing modes of DSP Processors 7M
- b) What is the main idea pipeline operation? Analyze the Pipeline operation of TMS 320C5X processors 7M

AR16

CODE: 16CS3018

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Supplementary Examinations, July-2019

**SOFTWARE TESTING AND PROJECT MANAGEMENT
(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) | Explain software development life cycle.. | 10M |
| b) | Differentiate Functional Vs Structural Testing. | 4 M |
| (OR) | | |
| 2. a) | Differentiate Verification / Validation. | 4M |
| b) | Discuss the defects typically found in the software. | 10M |

UNIT-II

- | | | |
|-------------|----------------------------|-----|
| 3. | Explain the following | 14M |
| | i) Boundary value analysis | |
| | ii) White box testing | |
| (OR) | | |
| 4. | Explain the following | 14M |
| | i) Regression testing | |
| | ii) Gray box Testing | |

UNIT-III

- | | | |
|-------------|--|-----|
| 5. | Explain in detail about client-server testing | 14M |
| (OR) | | |
| 6. | Explain Eleven Step Testing Process life cycle | 14M |

UNIT-IV

- | | | |
|-------------|--|----|
| 7. a) | Discuss Protracted Integration & Late Design Breakage. | 7M |
| b) | Discuss about the Documents and Review meeting. | 7M |
| (OR) | | |
| 8. a) | Discuss Conventional Software Management Performance. | 7M |
| b) | Explain about Requirement – Driven Functional Decomposition. | 7M |

UNIT-V

- | | | |
|-------------|---|-----|
| 9. | Discuss about improving software processes. | 14M |
| (OR) | | |
| 10. | Discuss OO methods & Visual modelling. | 14M |

AR13

CODE: NO: 13CE3017

SET – 2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July-2019

GEOTECHNICAL ENGINEERING – II

(Civil Engineering)

Time: 3 Hours

Maximum Marks: 70

PART –A

ANSWER ALL QUESTIONS

[1 x 10 = 10 Marks]

1. a) Name the various methods of Sub soil investigation
b) What do you mean by Bore Hole Log?
c) Explain the three types of earth pressure on wall?
d) What are the different factors of safety with reference to Slope Stability?
e) Mention various criteria on stability of Earth Dam Slopes.
f) What is Taylor's Stability Number?
g) Define allowable bearing capacity & presumptive bearing capacity
h) Write Terzaghi bearing capacity equation and explain the terms
i) Differentiate Total and Differential settlement of foundation
j) Mention various methods of estimating the load carrying capacity of a pile

PART –B

Answer one question from each unit

[5x12 = 60 Marks]

UNIT-I

- 2 a) Explain in detail various methods of soil investigations? 8M
b) The observed SPT, N value in sandy soil at 8.0 metres level will be 35. The saturated unit weight of the soil above the 8.0 m level will be 1.90 t/m^3 . The water level is at 6.0 metres below the ground level. Estimate the corrected N value 4M

(OR)

- 3 a) Describe in detail sounding methods such as Standard Penetration Test and Cone Penetration Test 6M
b) Discuss about extent and depth of soil exploration 3M
c) Mention different types of soil samples used in soil exploration 3M

UNIT – II

- 4 a) Explain in detail the stability analysis of finite slope by Method of slices mentioning the assumptions and derivation 7M
b) A cutting is to be made in clay for which the cohesion is 40 kN/m^2 and angle of internal friction = 0 degrees. The density of the soil is 20 kN/m^3 . Find the maximum depth for a cutting of side slope 1.5: 1 if the factor of safety is to be 1.50. Take the stability number as 0.70 5M

(OR)

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SET – 2

- 5 a) Derive expression for factor of safety of infinite slopes in cohesionless soil and cohesion – friction soils under different conditions namely saturated, submerged and steady seepage 6M
- b) Derive expression for factor of safety of finite slopes by Bishop's method of analysis. 6M

UNIT – III

- 6 a) Derive expressions for active and passive earth pressure in cohesive and friction [C– Φ Soil] 5M
- b) A retaining wall 10 m high with a smooth vertical back retains horizontal backfill. The properties of the backfill are cohesion, $C = 10 \text{ kN/m}^2$, angle of internal friction, $\Phi = 30$ degrees, unit weight, $\gamma = 16 \text{ kN/m}^3$ and saturated unit weight, $\gamma_{\text{sat}} = 20 \text{ kN/m}^3$, The backfill carries a surcharge of 25 kN/m^2 . The water table is at a depth of 3 m below the surface of the backfill. Sketch the active earth pressure distribution on the back of the wall and determine the magnitude and line of action of resultant active earth pressure. 7M

(OR)

- 7 a) Compare Rankine's theory and coulomb's theory with assumptions 4M
- b) Explain in detail about different earth pressure 4M
- c) Discuss any graphical method of estimating earth pressure 4M

UNIT – IV

- 8 a) Explain in detail about settlement of soil deposits mentioning its causes, types and permissible values 6M
- b) Determine the allowable soil pressure for a raft $5 \text{ m} \times 5 \text{ m}$ placed at 4.0 metres below the ground in clayey soil having unconfined compressive strength of 20 t/m^2 Take a factor of safety of 3.0 6M

(OR)

- 9 a) What is the effect of water table, depth and width of foundation on Bearing Capacity? 5M
- b) What is plate load Test. Discuss the uses of plate load test 7M

UNIT – V

- 10 a) Classify different types of pile foundations according to material, load transfer, construction and function 6M
- b) A bored pile in a clayey soil failed at an ultimate load of 400 kN. If the pile is 400 mm diameter and 10 metres long, determine the capacity of a group of nine piles, spaced at 1.0 metre center to center both ways. 6M

(OR)

- 11 a) Discuss in detail different methods of estimating the load carrying capacity of piles 8M
- b) A 400 mm diameter pile of length 14 m was subjected to a pile load test and the following results were obtained. 4M

| | | | | | | |
|----------------|---|------|-------|------|------|------|
| Load [t] | 0 | 50 | 100 | 150 | 200 | 250 |
| Settlement[mm] | 0 | 8.50 | 12.00 | 24.0 | 40.0 | 60.0 |

Estimate the allowable load as per IS:2911 specifications.

Time: 3 Hours**Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1.
 - a) Why gate triggering is preferred for triggering SCR
 - b) Is GTO a fully controlled switch? Support your answer
 - c) Among half controlled and full controlled converters which has better form factor
 - d) Among half controlled and full controlled converters which has better supply power factor and why
 - e) Advantages of employing freewheeling diode are
 - f) What are the applications of ac voltage controllers
 - g) A single phase ac voltage controller (or regulator) fed from 50Hz system supplies a load having resistance and inductance of 2.0Ω and 6.36mH respectively. The control range of firing angle for this regulator is?
 - h) What are the advantages in operating choppers at high frequency
 - i) Draw the supply and load voltage for $1\frac{2}{3}$ Cycloconverter on the same time scale
 - j) In a three phase inverter the lowest order harmonic in the output line voltage

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

2.
 - a) What is the significance of latching current, holding current and Break over voltage of SCR. **4M**
 - b) Classify various power semiconductor devices and list out the voltage, current and frequency range at which they are employed **8M**
- (OR)
3.
 - a) Write short notes on voltage rating specifications of SCR **4M**
 - b) Draw the synchronised UJT firing circuit for SCR and substantiate the role of each component in the circuit **8M**

UNIT-II

4. The fully controlled full-wave, single-phase converter has a source of 240V rms, 50Hz, and a 10Ω , 50mH series load. If the delay angle is 45° , determine **12M**
 - i. the average output voltage and current, hence thyristor mean current
 - ii. the rms load voltage and current, hence thyristor rms current and load ripple factors
 - iii. the power absorbed by the load and the supply power factor

(OR)

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SET-1

5. a) Explain the effect of source inductance on the performance of a single-phase fully Controlled bridge converter. Draw the relevant wave forms **6M**
b) Explain single phase fully controlled convertor with R-load. **6M**

UNIT-III

6. a) Describe the working of a single-phase dual converter with appropriate waveforms **6M**
b) A single phase dual converter is fed from 230V, 50Hz source. The load is $R=30\Omega$ and the current limiting reactor has $L=0.05H$. For $\alpha_1=30^\circ$, calculate the peak value of Circulating current and also the peak currents of both the converters **6M**
(OR)
7. Explain the operation of three-phase semi converter with RL load with neat sketches and also derive average out put voltage equation. **12M**

UNIT-IV

8. A single phase bridge type cycloconverter has input voltage of 230v, 50Hz and load of $R=10\Omega$, output frequency is one-third of input frequency. For a firing angle delay of 30° . Calculate **12M**
a) rms value of output voltage
b) rms current of each converter
c) rms currents of each thyristors and
d) input power factor
(OR)
9. Explain AC voltage controller with R and RL load **12M**

UNIT-V

10. a) Explain the various control strategies for varying output voltage in dc choppers? Which of these control strategies is preferred over the other and why? **6M**
b) A dc battery is to be charged from a constant dc source of 220V. The dc battery is to be charged from its internal emf of 90V to 122V. The battery has internal resistance of 1Ω . For a constant charging current of 10 A, Compute the range of duty Cycle. **6M**
(OR)
11. a) Explain the working of 3phase inverter in 180 degrees mode of operation **8M**
b) Determine the magnitude of the Lowest order harmonic in the output phase voltage and line voltage of a 3ph inverter supplied by 48V supply and controlled in 180° mode of conduction **4M**

AR13

CODE: 13EC3020

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July-2019

DIGITAL SIGNAL PROCESSING (Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Discuss the properties of unit impulse signal.
b) Discuss the properties of periodic signal.
c) Discuss the Time reversal property of DFS.
d) Mention the need for Multirate Signal Processing
e) Mention the condition for a LTI system to be stable in Z – Transform.
f) Mention the use of Bilateral Z – Transform
g) Discuss the design steps of IIR filters.
h) Mention the advantages in Impulse Invariant method.
i) What do you mean by Canonical form?
j) Define Multirate System.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. For the following discrete time signals, determine whether or not the system is linear, time invariant, causal and stable. 12M
(i) $y(n)=x(n+7)$ (ii) $y(n)=x^3(n)$ (iii) $y(n)=2x(n)$
(OR)
3. a) Let $x(n)$ be a real and odd periodic signal with period $N = 7$ and Fourier Series Coefficients X_k . Given that $X_{15} = j$; $X_{16} = 2j$; $X_{17} = 3j$. Determine the values of $X_0, X_{-1}, X_{-2}, X_{-3}$. 3M
b) Suppose we are given the following information about a signal $x(n)$ 9M
(i) $x(n)$ is a real and even signal.
(ii) $x(n)$ has a period $N = 10$ and fourier coefficients x_k .
(iii) $X_{11} = 5$;
(iv) $\frac{1}{10} \sum_{n=0}^9 |x(n)|^2 = 50$
Show that $x(n) = A \cos(Bn + c)$ and specify numerical values for that constant A,B and C.

UNIT-II

4. a) Determine the Z – Transform and ROC of the signal using properties 6M
(i) $x(n) = u(n) - u(n-10)$
(ii) $x(n) = a^n \sin(\omega_0 n) u(n)$
b) An 8 point sequence is given by $x(n) \{1,2,3,4,4,3,2,1\}$. Compute 8 point DFT of $x(n)$ by Radix - 2 DIT-FFT. 6M

(OR)

AR13

CODE: 13EC3020

SET-1

5. a) Compute the IDFT of the sequence **6M**
 $X(K) = \{7, -0.707 - j0.707, -j, 0.707 - j0.707, 1, 0.707 + j0.707, j, -0.707 + j0.707\}$
using DIF – FFT algorithm.
- b) Find the 4-point circular convolution of $x(n)$ and $h(n)$ given by $x(n) = \{1, 1, 1, 1\}$ **6M**
and $h(n) = \{1, 0, 1, 0\}$ using radix – 2 DIT – FFT algorithm.

UNIT-III

6. a) Derive and discuss the relation between Analog and Digital filter pole and frequencies in Impulse Invariant Transformation method. **6M**
- b) Explain about Bilinear Transformation method. **6M**
- (OR)**
7. Design an IIR low-pass Butterworth filter using the Bilinear – Transformation for the following specifications **12M**
- PassBand: $0.8 \leq |H(e^{j\omega})| \leq 1$; $|\omega| \leq 0.2\pi$
- StopBand: $|H(e^{j\omega})| \leq 0.2$; $0.6\pi \leq |\omega| \leq \pi$
- and $T=1s$

UNIT-IV

8. a) Using a rectangular window, design an LPF with a pass-band gain of unity, cut off frequency of 1000 Hz and working at a sampling frequency of 5 kHz. Take the length of the impulse response as 7. **6M**
- b) Show that the Impulse response of an ideal LPF is non-causal. How it can be made causal? **6M**
- (OR)**
9. a) Show that the Decimator is linear, time variant systems. **6M**
- b) Explain the frequency – domain characteristics of down sampler and how you can avoid aliasing. **6M**

UNIT-V

10. a) Explain VLSI architecture with neat sketch. **6M**
- b) Explain special addressing modes and advantages of DSP processors. **6M**
- (OR)**
11. a) Explain about the importance of pipelining with an example. **6M**
- b) Explain MAC, and addressing modes. **6M**

AR13

CODE: 13CS3017

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July-2019

NETWORK SECURITY AND CRYPTOGRAPHY
(Computer Science Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Differentiate between passive attacks and Active attacks.
b) List the Conventional encryption principles.
c) Define Revocation of Certificate.
d) List any 4 Alerts Given by Alert Protocol.
e) Give any 2 differences of logic bombs & Trojan horse.
f) List the Characteristics of Firewall.
g) Write the encryption function of Hill Cipher.
h) Write the Public Key & Private formula of Elliptic Curve Cryptography.
i) Differentiate Symmetric Key Cryptography.
j) Define Security Association.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) With neat Sketch Explain the model for Network Security. 6M
b) With an Example Discuss the Process of Rail fence Transposition Technique. 6M
- (OR)
3. a) Describe Various Kinds of Security mechanisms. 6M
b) How packet blocking and Route table modification is done as part of TCP Session Hijacking? 6M

UNIT-II

4. Discuss about the Sub key Generation, Encryption and Decryption Functions of Blowfish Algorithm with Diagram. 12M
- (OR)
5. a) In What way Differ Hellman Key Exchange algorithm prone to man – in the - middle attack? Explain. 6M
b) Explain RSA Algorithm. 6M

UNIT-III

6. a) Compare Kerberos version '4' with version '5'. 6M
b) Explain about S/MIME. 6M

(OR)

7. a) What is radix 64 formats? What is its use in PGP? 6M
b) Explain about MIME Content Types & Transfer Encodings. 6M

UNIT-IV

8. a) What does SSL hand shake establish? How is it Performed? 6M
b) Explain about Combining Security Associations. 6M

(OR)

9. a) Draw the ESP Header and Explain. 6M
b) Describe in general how Online Payment Processing is done. 6M

UNIT-V

10. a) What are the Different types of Viruses? How do they get in to the System? 6M
b) Describe about various Firewall Configurations. 6M

(OR)

11. a) Explain about Intrusion Detection Techniques. 6M
b) Discuss about Password Protection. 6M

AR13

CODE: 13IT3002

SET-I

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July-2019

COMPUTER NETWORKS (Information Technology)

Time: 3 Hours

Max Marks: 70

ANSWER ALL QUESTIONS

PART-A

[1 x 10 = 10 M]

1. a) List the categories of networks.
b) What is logical address.
c) What are the functions of data link layer.
d) What are the different sliding window protocols.
e) Write short notes on transparent bridge.
f) Draw the IPv4 header format.
g) What are the services provided to transport layer.
h) Abbreviate SNMP, TCP and UDP.
i) What is static web document.
j) Write short notes on DNS.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What are the different Layers in the OSI Reference Model? Explain the Functionalities of each Layer. **6M**
b) Discuss how Internet has revolutionized many aspects of our daily lives **6M**
(OR)
3. a) Explain different Layers and their functionalities in TCP/IP Model. **6M**
b) Explain in detail about network addressing. **6M**

UNIT-II

4. a) What is checksum? How are bit strings represented using polynomials? How checksum is calculated using modulo 2 division? Give an example. How is checksum verified? **6M**
b) Compare Go back-n and selective repeat sliding window protocols. **6M**
(OR)
5. a) What is pure ALOHA and slotted ALOHA? Consider the delay of both at low load. Which one is less? Explain your answer. **6M**
b) Explain CSMA protocol. **6M**

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SET-I

UNIT-III

6. a) Explain various congestion control mechanisms in detail. **6M**
b) With a suitable example explain Distance Vector Routing algorithm. What is the serious drawback of Distance Vector Routing algorithm? Explain. **6M**

(OR)

7. a) Explain briefly about the shortest path routing algorithm. **6M**
b) Explain about the IP protocol in detail. **6M**

UNIT-IV

8. a) Explain the TCP connection establishment and termination using timeline diagram. **6M**
b) Explain about flow control and buffering. **6M**

(OR)

9. a) Write the differences between TCP and UDP. **6M**
b) List and explain transport layer services provided to the upper layer? **6M**

UNIT-V

10. a) Illustrate static, dynamic and active web documents. **6M**
b) Explain about SNMP. **6M**

(OR)

11. a) Explain in detail about HTTP. **6M**
b) Define Domain Name System and explain about it in detail. **6M**