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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, April-2019
GEOTECHNICAL ENGINEERING-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) Explain in brief about the following types of sampling methods.   [7M]
        i.   Piston sampler
        ii.   Rotary sampler
    b) With an aid of neat sketch, explain the procedure for conducting plate   [7M]
        load test.

(OR)

2. a) Explain in brief about standard penetration test. What are the   [7M]
        corrections to be applied for N value?
    b) Discuss about the site investigation report.   [7M]

UNIT-II

3. a) Derive an equation for determining the stability of an infinite slope in [7M]
        cohesion-less soil under dry condition.
    b) An infinite slope of 8 m high is inclined at an angle of 30°. The   [7M]
        slope was made with a soil having c' = 25 kN/m^2, ϕ = 15°, γ_{sat} = 19
        kN/m^3. Determine the critical height of the infinite slope for steady
        seepage condition and submerged condition. Write a comment on
        stability of embankment.

(OR)

4. a) Discuss about Bishop's method for stability of finite slopes with a   [10M]
        neat sketch.
    b) An embankment constructed with an inclination of 35^{0} and its height [4M]
        is 15 m. The angle of shearing resistance is 15^{0}, cohesion intercept is
        20 kN/m^2 and saturated unit weight of soil is 18.0 kN/m^3. If the
        embankment was fully submerged, then find the factor of safety with
        respect to cohesion.
        For i = 35^{0} and ϕ = 15^{0}, take S_n = 0.06.

UNIT-III

5. a) Explain the Culmann's graphical method for determining the active   [7M]
        thrust acting on a retaining wall.
    b) A retaining wall of 8 m high with a smooth vertical back used to retain   [7M]
        an inclined backfill, which is making an angle of 12° with the top of
        retaining wall. The soil having c = 35 kN/m^2, ϕ = 20°, γ = 17.5 kN/m^3.
        Determine the total passive earth pressure and point of application on
        the retaining wall.

6. a) Explain in brief about Coulomb's wedge theory with a neat sketch. [7M]
   b) A vertical gravity retaining wall retains 10 m of a backfill, having ϕ = [7M] 25°, γ = 17.7 kN/m³ and γ_{sat} = 19 kN/m³ with a uniform horizontal surface. The water table is at a depth of 6 m from the backfill surface. Determine the magnitude and point of application of the total active pressure.

UNIT-IV

7. a) What is a shallow foundation? Explain in brief about various types of [8M] shallow foundations.
   b) Determine the ultimate bearing capacity of a strip footing of 2 m width [6M] with its base at a depth of 1.5 m for the following conditions
      i) W.T is at a depth of 1 m from ground surface
      ii) W.T is at a depth of 3 m from ground surface.
      The properties of soil are c = 35 kN/m², ϕ = 15°, γ = 16.5 kN/m³ and γ_{sat} = 18 kN/m³.
      (For ϕ= 15°, N_c = 12.9, N_q = 4.4 and N_γ = 2.5)

(OR)

8. a) A square footing of size 1.5 m x 1.5 m was planned to construct in a [8M] sand deposit at a depth of 1.0 m from the ground surface. The soil is having c = 0, ϕ = 35°, γ = 19 kN/m³. Determine the net safe bearing capacity of soil. Also, determine the safe allowable load carried by the foundation.
      (For ϕ= 35°, N_c = 57.8, N_q = 41.4 and N_γ = 42.4)
   b) Determine the allowable bearing pressure of a shallow foundation of [6M] 2.5 m width with its base at 1.5 m depth. The water table is at a depth of 2 m from ground surface. The corrected N value obtained from SPT test at the base of foundation is 25. Use Teng's formulae. Take allowable settlement as 50 mm.

UNIT-V

9. a) Explain how load carrying capacity of pile foundations can be [7M] calculated from following dynamic pile formulae
      i. Engineering News formula
      ii. Modified Hiley formula
   b) A concrete pile, 30 cm diameter and is driven into sand (ϕ= 30° and γ [7M] = 21 kN/m³, k = 1 and tan δ = 0.70) up to a depth of 10 m. Estimate the safe load, taking a factor of safety of 2.5. (For ϕ= 30°, D_c/B = 7.5 and N_q= 25).

(OR)

10. a) Explain briefly about group action of piles. How the load carrying [8M] capacity of pile group is estimated.
    b) Write a short note on following terms [6M]
       i. Limitations of dynamic pile formulae
       ii. Routine pile load test

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UNIT-I

1. a) Explain how RC circuit acts as an Integrator?   7M
    b) Distinguish between high pass and low pass RC circuits?   7M
    (OR)
2. a) Explain how diode clipper acts as a squarer?   7M
    b) Draw and explain characteristics of clipper circuits?   7M

UNIT-II

3. a) Draw circuit diagram of clamper and explain its working?   7M
    b) State and prove clamping circuit theorem?   7M
    (OR)
4. a) Draw and explain emitter coupled clipper circuit?   7M
    b) Draw circuit of collector coupled monostable multivibrator and explain its   7M
       working?

UNIT-III

5. a) Discuss about AC and DC characteristics of an OpAmp?   7M
    b) Explain how OpAmp acts as voltage Comparator?   7M
    (OR)
6. a) Explain how OpAmp acts as wide Band pass filter and explain its response   7M
       characteristics?
    b) Explain how OpAmp acts as narrow Band reject filter and explain its response   7M
       characteristics?

UNIT-IV

7. a) Draw block diagram of PLL system and explain function of each block?   7M
    b) Draw circuit diagram of astable multivibrator using 555 timer and explain its   7M
       working?
    (OR)
8. a) Explain how weighted resistor DAC converts digital data to analog data?   7M
    b) Explain the working of successive approximation ADC.   7M

UNIT-V

9. a) Design AND and OR gates using CMOS technology?   7M
    b) Draw and explain working of TTL Logic family?   7M
    (OR)
10. a) Compare different logic families?   7M
    b) Explain working of diode logic with neat sketches and verify functionality using   7M
       truth tables?

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech. II Semester Regular Examinations, April-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) List a few commercially available CAD packages and discuss the modules available in it.   (6)
   b) Explain with block diagram, the CAD process with suitable examples.   (8)

(OR)

2. a) Explain the various graphic transformations required for manipulating the geometric information. Use sketches wherever necessary.   (9)
   b) Briefly explain Concatenation transformation.   (5)

UNIT-II

3. a) A set of control points are given by $P_0=(4,4,4)$, $P_1=(6,8,6)$ and $P_2=(10,3,4)$. Compute Bezier curve with two intermediate points.   (9)
   b) Compare and contrast 2D models and 3D Wireframe models.   (5)

(OR)

4. a) Explain constructive solid geometry technique. What is the role of primitive and Boolean operations in CSG. Explain with suitable examples.   (10)
   b) What are the limitations of Wireframe models?   (4)

UNIT-III

5. a) Explain the salient features of CNC machine tools in detail.   (8)
   b) Discuss the evolution and economics of NC machines.   (6)

6.   Write a part program for the given geometry.   (14)
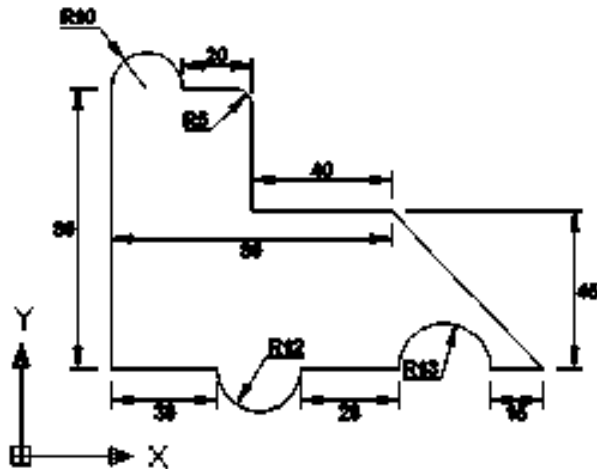
UNIT-IV

7. a) With a neat flowchart explain Generative type of   (9)
        Computer Aided Process Planning.
    b) List the different classification systems in Group   (5)
        Technology.

(OR)

8. a) Explain OPITZ classification system with an example.   (9)
    b) What are the limitations of CAD based process   (5)
        planning.

UNIT-V

9.   a) Explain the major elements of FMS in detail.   (8)
     b) What are the functions of material handling system?   (6)

(OR)

10. a) What are the different material handling systems   (9)
         recommended to be used in flexible manufacturing
         systems?
     b) Explain the following terms. i) lean manufacturing ii) (5)
         agile manufacturing and
         iii) flexibility

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, April-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) Explain Discrete time signals   7M
   b) Find Z-Transform of $a^n u[n]$ 7M
   (OR)
2. a) Find even and odd components of the signal $x(n) =$ 6M
   $\{-3, 2, \underset{\uparrow}{1}, -2, 5, 3\}$

   b) Prove any four properties of Z transform   8M

UNIT-II

3. a) Explain any four properties of Discrete Fourier Series   8M
   b) Find DFT of sequence $x(n) = [1, -1, 1, -1]$ is   6M
   (OR)
4. a) Explain decimation in-time Radix-2 FFT algorithm.   8M
   b) Discuss any three properties of DFT   6M

UNIT-III
5. a) Explain the following methods of realization of IIR   8M
   filters
   i) Direct form I   ii) Direct form II
   b) Discuss design of IIR digital filter from analog filter   6M
   using Impulse invariant technique.
   (OR)

6. a) Discuss Analog Low pass Butterworth filter.   7M
   b) Using bilinear transform, design a high pass filter   7M
   monotonic in pass band with cutoff frequency of
   1000Hz and down 10dB at 350 Hz. The sampling
   frequency is 5000Hz.

UNIT-IV

7. a) Explain frequency response of FIR filter for the   8M
   following cases
   i) Symmetrical impulse response, N odd   ii)
   Symmetrical impulse response N even
   b) Determine the direct form realization of system   6M
   function $H(z) = 1+2z^{-1}-3z^{-2}-4z^{-3}+5z^{-4.}$

(OR)

8. a) Explain the following windows   6M
   i) Rectangular   ii) Bartlett
   b) Design an ideal low pass filter with a frequency   8M
   response
   $$H_d(e^{jw}) = 1 \text{ for } -\pi/2 \le \omega \le \pi/2$$
   $$= 0 \text{ for } \pi/2 \le |\omega| \le \pi$$
   Find the values of h(n) for N=11. Find H(z). Plot the
   magnitude response.

UNIT-V

9. a) Explain the following (i) Memory Access Schemes   8M
   (ii) Multiple Access and Multiported Memory
   b) What are the special addressing modes of DSP   6M
   Processors? Explain

(OR)

10. a) Discuss the architecture of TMS320C5X DSP   8M
    Processor with neat block diagram
    b) Discuss Hardware looping, Interrupts and Stacks in   6M
    DSP Processors

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular Examinations, April,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)	Discuss Computer System Strategic risk.	7M
	b)	Explain Economics of SDLC Testing.	7M
		(OR)	
2.	a)	Discuss in detail Life Cycle Verification Activity.	7M
	b)	Discuss about Test Factors.	7M

UNIT-II

3.	a)	Explain Testing Techniques & Tool Selection Process.	7M
	b)	Explain the following Structural Testing Techniques	7M
		(OR)	
4.	a)	Explain the following Functional Testing Techniques	7M
	b)	Explain in detail Unit Testing Techniques.	7M

UNIT-III

5.	a)	Explain the procedure to Develop Test Plan.	7M
	b)	Discuss Requirements Phase Testing.	7M
		(OR)	
6.	a)	Write short notes on Acceptance Test.	7M
	b)	Explain the procedure of Testing a Data Warehouse.	7M

UNIT-IV

7.	a)	Discuss the 3- Primary Points quoted in Conventional Software Management Philosophy.	7M
	b)	Explain about Late Risk Resolution.	7M
		(OR)	
8.		Discuss the improvements in waterfall model to avoid development risk.	14M

UNIT-V

9.		Explain the important trends in improving Software Economics?	14M
		(OR)	
10.	a)	Discuss in detail Commercial Components?	7M
	b)	Discuss the reuse of Existing Components.	7M

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CODE: 13CE3017   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, April-2019

GEOTECHINICAL ENGINEERING -II
(Civil Engineering)

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

PART-A
ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Define 'area ratio' of sampler and mention its importance.
    b) What is the purpose of 'pressure meter' test?
    c) The angle of slope and frictional angles of soil in infinite slope are 30° and 40^0. What is factor of safety of slope.
    d) The critical condition for downstream slope of earth dam is _____
    e) For $\varphi = 30^0$, k_p is how many times k_a.
    f) Define at rest condition of earth pressure and give an example.
    g) Distinguish between 'strip' and 'strap' footing.
    h) Define 'allowable bearing pressure'.
    i) What are 'short piles'?
    j) Distinguish between 'displacement piles' and 'non-displacement piles'.

PART-B

Answer one question from each unit   **[5 x 12=60M]**
UNIT-I

2. a) Briefly explain 'Depth of exploration'   6M
    b) Briefly explain how to conduct 'cone penetration test'.   6M
    (OR)
3. a) Explain how can you conduct 'pressure meter test'?   6M
    b) Explain the number and disposition of trial pits and borings with reference to sub-soil investigations.   6M

UNIT-II

4. a) Derive factor of safety of infinite slopes in the case of c-φ soil.   6M
    b) A slope is to be constructed at an inclination of 30^0 with the horizontal. Determine the safe height of the slope at a factor of safety of 1.5. The properties of soil are cohesion = 15 kN/m^2, angle of internal friction = 22.5^0 and bulk unit weight= 19 kN/m^3. Table shows stability no values.   6M

Angle of internal friction (degrees)	Angle of slope (degrees)	Stability no
22.5	30	0.020
15	30	0.046

    (OR)
5. a) Explain 'Swedish arc method' to determine factor of safety of finite slopes.   6M
    b) An embankment 10 m high is inclined at an angle of 36^0 to the horizontal. A stability analysis by method of slices gives following forces per running metre. $\sum$ Shearing forces=450 kN; $\sum$Normal forces = 900 kN and $\sum$ Neutral forces = 216 kN. The length of failure arc is 27 m. The properties of soil are c = 20 kN/m^2 and $\phi = 18^0$. Determine factor of safety with respect to shearing strength.   6M

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UNIT-III

6. a) Explain briefly 'active', 'passive' and 'rest' conditions of earth pressures.   6M

   b) A retaining wall with a smooth vertical back is 10m high and retains a two layer   6M
sand backfill with the following properties:
0 - 3m depth   : $c = 0$; $\phi = 20^o$; bulk unit weight = 17kN/m^3.
Below 3m depth   : $c = 0$; $\phi = 30^o$; bulk unit weight = 18kN/m^3.
Show the active earth pressure diagram and determine total active earth pressure
and point of application.

(OR)

7. a) Briefly explain assumptions in Coulomb's theory of earth pressure.   6M

   b) A retaining wall 6 m high, vertical back, supports a saturated clay soil with a   6M
horizontal surface. The properties of the backfill are $\phi_u = 0$, $c_u = 35$ kN/m^2, $\gamma = 17$
kN/m^3. Assuming the back of wall to be smooth, determine:
       i) the depth of tension cracks.
       ii) the critical depth of a vertical cut.
       iii) the total active thrust against the wall and its point of application, if
       cracks are formed in the tension zone.
       iv)What will be the depth of tension cracks, if any, if the backfill carries a
       uniform surcharge of 30 kN/m^2 over the backfill surface? What will be the
       position of the total active thrust?

UNIT-IV

8. a) Distinguish clearly between general and local shear failure with neat sketches   6M

   b) A circular footing is resting on a stiff saturated clay with unconfined compressive   6M
strength, $q_u = 250$ kN/m^2. The depth of foundation is 2 m. Determine the diameter
of the footing if the column load is 600 kN. Assume a factor of safety as 2.5. The
bulk unit weight of soil is 20 kN/m^3 $N_C = 5.14$.

(OR)

9. a) Briefly explain the effect of following factors on bearing capacity.   6M
      (i)   Shape of the footing   (ii)   Water table

   b) A test plate 30 cm x 30 cm resting on a sand deposit settles by 10 mm under a   6M
certain loading intensity. A footing 150 cm x 200 cm resting on the same sand
deposit and loaded to the same load intensity settles by_____

UNIT-V

10. a) Explain briefly classification of pile foundations with neat sketches.   6M

   b) A square group of 25 piles extends between depths of 2 m and 12 m in a deposit   6M
of 20 m thick stiff clay overlying rock. The piles are 0.5 m in diameter and are
spaced at 1 m centre-to-centre in the group. The un-drained shear strength of clay
at the pile base level is 180 kPa and average value of un-drained shear strength
over the depth of the pile is 110 kPa. The adhesion factor is 0.45. Estimate the
capacity of pile group considering the overall factor of safety equal to 3 against
shear failure, N_c corresponding to $\phi_u = 0$ is 9.

(OR)

11. a) Explain how can you determine pile capacity for cohesionless soils by static   6M
method.

   b) A pile is driven with a single acting steam hammer of weight 15 kN with a free   6M
fall of 900 mm. the final set, the average of the last three blows, is 27.5mm. Find
the safe load using the Engineering News Formula.

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CODE: 13EE3018   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, April-2019

POWER ELECTRONICS
(Electrical and Electronics Engineering)

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

PART-A

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

1. a) What is the effect of source inductance on controlled rectifiers?
   b) List out the various methods to turn on the thyristor.
   c) The ripple frequency of output voltage for a two pulse converter is_____.
   d) Give the expression for average output voltage for a single phase full wave converter with RL-load.
   e) Give the expression for average output voltage for a three phase full wave converter with Rload in continous mode.
   f) Define AC voltage controller.
   g) List out various voltages control techniques for inverters.
   h) Draw the input and output characteristics of IGBT?
   i) Give any two applications of dc chopper
   j) What are the basic conditions required to commutate(Turn off) an SCR?

PART-B

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

UNIT-I

2. a) For an SCR, gate-cathode characteristics are given by $V_g = 1+10I_g$. For a trigger frequency of 400Hz and duty cycle of 0.1. Compute the value of the resistance to be connected in series with the gate circuit. The rectangular trigger pulse applied to the gate circuit has amplitude of 12V. The thyristor has an average gate power loss of 0.5W.   6M
   b) Describe the various anode voltage ratings as applicable to an SCR. Indicate these voltage ratings on a relevant voltage waveform.   6M

(OR)

3. a) Explain static characteristics of SCR   6M
   b) SCR with a rating of 1000V and 200A are available to be used in string to handle 6KV and 1KA. Calculate the number of series and parallel units is required, in case of derating factor is 0.2.   6M

UNIT-II

4. a) Describe the working of a single phase semi convertor with R-load.   8M
   b) A single phase full-converter is supplied from 230V,50HZ source. The load resistance is of R=7Ω and a large inductance to render the load current constant for angle delay of 45^0 ,determine
     (i) Average output voltage   (ii) Average output current   4M

5. a) Describe the operation of single phase two- pulse converter with relevant voltage and current waveforms.　　　　7M

 b) A single phase full converter is connected to ac supply of 330 sin 314t volt. It operates with a firing angle α = π/4 rad. The total load current is maintained constant at 5A and the load voltage is 140V. Calculate the source inductance, angle of overlap and the load Resistance　　　　5M

UNIT-III

6. a) Describe the operation of three-phase six-pulse bridge converter with R load for $α≤60^0$ with relevant voltage and current waveforms.　　　　8M

 b) Derive the expression for i) Average output voltage ii) Average load current　　　　4M

(OR)

7. Describe the operation of three phase dual converter with relevant voltage and current waveforms and derive the expression for peak circulating current　　　　12M

UNIT-IV

8. a) Describe the operation of single phase AC voltage controller for RL load with relevant waveforms and derive the expression for output voltage?　　　　7M

 b) A single phase AC voltage controller is employed for controlling the power flow from 230V, 50Hz source into a load circuit consisting of R=3 Ω and wL=4 Ω . Calculate i) the range of firing angle ii) the maximum value of RMS load current　　　　5M

(OR)

9. Describe the operation of single phase cyclo converter for R load with relevant waveforms for a frequency of $f_0 = 1/4f_s$　　　　12M

UNIT-V

10. a) A 100 V dc chopper operates using current limit control (CLC) strategy, the maximum value of load current is 250 A and the lower limit of current is 50 A. The ON- time and OFF –time of chopper are 20 ms and 30 ms respectively. Determine (8M) i) the limit of current pulsation ii) chopping frequency, iii) duty cycle iv) output voltage.　　　　6M

 b) Describe the operation of a buck converter with relevant wave forms.　　　　6M

(OR)

11. Describe the necessity of voltage control of an inverter and explain different PWM techniques in inverter　　　　12M

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PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]
1. Write a short note about the following.
   a) Production vs productivity
   b) Standard time
   c) Ineffective timing
   d) Margin of safety
   e) What is a run with respect to a control chart?
   f) Quality loss vs Quality cost
   g) Method study vs Time study
   h) Process capability
   i) Carrying cost vs shortage cost
   j) ABC analysis.

PART-B

Answer one question from each unit   [5 x 12 = 60M]

UNIT-I

2. Explain in detail about the following organizations bringing out their merits and   12M
   demerits.
   (i) Line organization
   (ii) Taylor's functional organization

(OR)

3. a. What is the need for project organization? Explain its concept in detail.   6M
   b. Explain the Lean and flat organization structure.   6M

UNIT-II

4. a. Discuss the importance of plant location. Compare the advantages, limitations and   6M
       suitability of rural and urban locations.
   b. Write a brief note on the methods of solving multi-facility location problems.   6M

(OR)

5. a. List out the objectives of a plant layout.   4M
   b. Discuss the merits and demerits of process layout and product layout.   8M

UNIT-III

6. a. What are the areas of application of method study?   4M
   b. Explain the steps involved in method study.   4M
   c. Differentiate micro-motion and memo-motion studies.   4M

(OR)

7. a. How does a work study technique improve productivity? Explain.   4M
   b. Explain the steps of time study.   4M
   c. The time study engineer of a company was asked to fix the standard time of   4M
       making a spindle using a lathe. The data of the time study are shown in the table
       below, the performance rating of the worker is 105 %. Find the standard time for
       the spindle by assuming an allowance percentage of 10%.

Cycle time in minutes	36	37	38	39	40
frequency	1	3	3	2	1

SET-I

UNIT-IV

8.	a.	Explain in brief about the trade-off between costs with a figure.	4M
	b.	What are the reasons for stocking items in inventory?	4M
	c.	List and explain different types of costs in inventory system.	4M

(OR)

9.	a.	Distinguish between a pre-purchase system and a post- purchase system.	4M

	b.	Explain in brief about
		   (i) ABC analysis
		   (ii) VED analysis
			8M

UNIT-V

10.	a.	Define inspection. Explain in detail about the kinds of inspection.	6M
	b.	Explain in detail about the sampling inspection by attributes.	6M

(OR)

11.	a.	Briefly explain the objectives/tasks of each of the five ISO 9000 standards.	6M
	b.	The following table gives the number of missing rivets noted in a newly fabricated bus. Construct a C-chart.	6M

Bus number	1	2	3	4	5	6	7	8	9	10
No. of missing rivets (c)	14	13	26	20	9	25	15	11	14	13

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, April-2019

DIGITAL SIGNAL PROCESSING
(Electronics & Communication Engineering)

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

PART-A

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

1. a) State the condition for a sequence to be periodic.
   b) State the condition for a sequence to be time invariant.
   c) Define DFT of a sequence x(n).
   d) Write the importance of unit circle in Z-transform.
   e) What is Warping effect?
   f) What is the main disadvantage of direct form-I realization?
   g) List the advantages of Kaiser widow.
   h) Distinguish between "decimation" and "down sampling".
   i) List different stages in pipelining.
   j) List on-chip peripherals of DSP processor.

PART-B

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

UNIT-I

2. a) Define stability of a system. Explain about BIBO stability criterion of a discrete system.   **6M**
   b) Check the linearity, stability, time-invariant and causality for the system described by $y(n)=2x(n+1)+[x(n-1)]^2$ **6M**

(OR)

3. a) What are the different operations that can be performed on a sequence? Explain with an example.   **6M**
   b) State and prove linearity and symmetry properties of DFS.   **6M**

UNIT-II

4. a) Find out the Z-transform for the following discrete time sequence $x(n) = kn$ for $n \geq 0$.   **6M**
   b) Find the IDFT of the sequence $X(k) = \{3, 2, 1, -2\}$ **6M**

5. a) By showing all the intermediate results, computer the 8-point DFT of the sequence y(n)={0.5,0.5,0.5,0.5,0,0,0,0} using DIF FFT algorithm   **6M**

   b) Discuss the applications of Z-transform.   **6M**

UNIT-III

6. Design a Butterworth low pass filter using bilinear transformation method to meet the following specifications:
Pass band attenuation ≤ 1 dB; Pass band edge=4 KHz; Stop band edge=8 KHz; Stop band attenuation ≥ 40 dB; Sampling rate=24 kHz.   **12M**

(OR)

7. a) Realize the following system equation in direct form-II.
y(n)+0.75 y(n-1)=x(n)-2x(n-1).   **6M**

   b) Compare the characteristics of Butterworth and Chebyshev Filters.   **6M**

UNIT-IV

8. a) What is Multi Rate Signal Processing? Explain any two applications of multirate signal processing.   **6M**

   b) The sequence x(n)=[0,2,4,6,8] is interpolated using interpolation sequence b_k =[1/2,1,1/2] and the interpolation factor is 2.find the interpolated sequence y(m).   **6M**

(OR)

9. a) Write the magnitude and phase function of FIR filter when
   i) impulse response is symmetric and N is odd
   ii) impulse response is symmetric and N is even   **6M**

   b) Design a FIR low pass filter with N=7 and cut off frequency of $\pi/4$ rad/sec.   **6M**

UNIT-V

10. With a neat sketch explain the Internal architecture of TMS320C5X Processors.   **12M**

(OR)

11. a) List the major architectural features used in DSP system to achieve high speed program execution.   **6M**

    b) Explain Memory Access schemes in DSPs.   **6M**

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, April-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) Compare Block and Stream cipher
   b) Find 8^7 mod 13
   c) What is avalanche effect?
   d) List four general characteristics of schema for the distribution of the public key
   e) Define one way property in hash function
   f) Draw the header format for an ISAKMP message
   g) What is the role of Ticket Granting Server in inter realm operations of Kerberos?
   h) How can the signed data entity of S/MIME be prepared? Write the steps
   i) What are the steps involved in SET Transactions
   j) Differentiate spyware and virus.

PART-B

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

UNIT-I

2. a) **Outline** following cryptanalysis attacks   6M
      i) Cipher text-only   ii) Known-plaintext
      iii) Choosen-plaintext   iv) Choosen-cipher text
   b) What is mono-alphabetic cipher? How it is different from   6M
      Caesar cipher?

(OR)

3. a) With a neat block diagram, Generalize the network security   6M
      model and the important parameters associated with it
   b) **Apply** additive cipher and encrypt the message   6M
      "Cryptography and Network Security" using with key=18.
      Hint: c=(k+p) mod 26.

UNIT-II

4. a) Explain about the single Round of DES algorithm.   6M
   b) For $E_{11}(1, 6)$, consider the point . G= (2,7). Compute 3G.   6M

(OR)

5. a) **Compare** Symmetric & Asymmetric Cryptography   6M
   b) **Outline** Elgamal Digital Signature Algorithm   6M

UNIT-III

6. a) i) In Kerberos, when Bob receives a Ticket from Alice, how does he know it is genuine?   6M
      ii) In Kerberos, when Alice receives a reply, how does she know it came from Bob (that it's not a replay of an earlier message from Bob)?
   b) **Illustrate** X.509 public-key certificates with neat diagram.   6M

(OR)

7. a) **Discuss** about S/MIME in detail.   6M
   b) Explain the key rings and its significance in PGP. Show how the message generation from sender to receiver and explain with suitable diagram   6M

UNIT-IV

8. a) **Define** the goal of each phase in the SSL Handshake Protocol.   6M
   b) **Summarize** the operation of Transport and Tunnel modes of AH & ESP.   6M

(OR)

9. a) **Illustrate** the concept of encapsulating the security payload with neat diagram   6M
   b) When a session is resumed with a new connection, SSL does not require the handshaking process. Show the messages that need to be exchanged in a partial handshaking.   6M

UNIT-V

10. a) Explain the firewall design principles?   6M
    b) What is a trusted system? Express the basic concepts of data access control in trusted system   6M

(OR)

11. a) Differentiate between statistical anomaly detection and rule based anomaly detection   6M
    b) Compare reactive password checking with proactive password checking   6M

AR13

CODE: 13IT3002   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, April-2019

COMPUTER NETWORKS
(Information Technology)

Time: 3 Hours   Max Marks: 70

<u>**PART-A**</u>

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Define Port address.
    b) Define flow control
    c) What is stuffing?
    d) Define collision
    e) What is CSMA
    f) What is spanning tree
    g) What is fragmentation?
    h) What is multiplexing and de multiplexing?
    i) List out the different topologies
    j) What is SMTP?

<u>PART-B</u>

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

<u>UNIT-I</u>

2. a) Describe the importance of Layered architecture.
    b) Explain about the components of data communication.
(OR)
3. a) Explain the functionality of OSI layers in detail .
    b) Describe the merits of TCP / IP protocol suite over
       OSI model.

UNIT-II

4. a) Explain the design issues of data link layer.
   b) Explain about Sliding window protocol.

(OR)

5. a) Explain about GO back – N protocol.
   b) Describe the HDLC protocol with format

UNIT-III

6. a) Explain about packet switching
   b) What is congestion. How its controlled explain in detail

(OR)

7. a) How optimality principle is achieved in Shortest path routing .
   b) Differentiate IP V4 and IP V6

UNIT-IV

8. a) Describe the transmission policy of transport layer
   b) Explain the connection establishment in transport layer.

(OR)

9. a) Describe the elements of transport protocols
   b) Describe the format of TCP segment.

UNIT-V

10.   Write a short note on following
           a) DNS   b) WWW architecture

(OR)

11. a) Define E-mail. Explain about architecture
    b) Explain about Hyper Text Transfer Protocol.