AR13

CODE: 13CE3017 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech II Semester Regular & Supplementary Examinations, April-2017

GEOTECHNICAL ENGINEERING -II
(Civil Engineering)

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

PART-A

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

1 a) What is a borelog?
b) What is the weight of the rammer/ hammer of the Standard Penetration Test as per IS Code?
c) Define Stability number?
d) Write the formula to determine the factor of safety of a dry infinite slope made of cohesionless soil?
e) How is Coulomb's earth pressure theory different from Rankine's theory?
f) What is the effect of water table of the lateral earth pressure?
g) What are the general considerations for the choice of a foundation type?
h) What is a raft foundation?
i) Which is the best test to separately determine the end bearing resistance and the skin friction resistance in pile foundations?
j) Define critical depth for piles?

PART-B

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

UNIT-I

2 Write a short note on rotary drilling technique? 12M

(OR)

3. What are the stages in the planning of a soil exploration programme 12M

UNIT-II

4. Derive the formula to determine the stability number of a slope? 12M

(OR)

5. A canal having side slopes 1:1 is proposed to be constructed in a cohesive soil to a depth of 10m below the ground surface. The soil properties are : $\Phi_u = 15^0$, c_u = 12kPa, e=1.0, G= 2.65. If Taylor's Stability Number, S_n is 0.08 and if the canal flows full, what is the factor of safety with respect to cohesion against failure of the canal bank slopes? If there is a sudden drawdown of water in the canal and if Taylor's Stability Number for the reduced value of Φ_u is 0.126, what will be the factor of safety with respect to cohesion against the failure of bank slopes? 12M

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UNIT-III

6. Explain Culmann's graphical method 12M

(OR)

7. Consolidated drained shear tests on silt yielded the following data. 12M

σ_3 (kN/m^2)	σ_1 (kN/m^2)
200	460
400	880

If this material is used as a backfill for a smooth vertical retaining wall of 10m height, what is the active earth thrust on the back of wall? What is its point of location? Density of the backfill is 16 kN/m^3.

UNIT-IV

8. Write brief critical notes on settlement of foundations. Describe the procedure of determining the safe bearing capacity based on the standard penetration test. 12M

(OR)

9. a. What is the ultimate bearing capacity of a rectangular footing, 1.5m x 2.5m, on the surface of saturated clay of unconfined compression strength of 150kN/m^2? c= 75kN/m^2, unit weight 18 kN/m^3, D=2m, for $\varphi=32^0$ N_c=35.5, N_q=23.2, N_γ=22 6M

b. A circular footing rests on a pure clay with unconfined compressive strength = 300kPa, at a depth of 2m. Determine the diameter of the footing if it has to transmit a load of 800kN. Assume the bulk unit weight of soil as 17kN/m^3 and the factor of safety as 3. c=150kpa for $\varphi=32^0$ N_c=35.5, N_q=23.2, N_γ=22 6M

UNIT-V

10. Discuss various pile dynamic formulae. What are their limitations? 12M

(OR)

11. A group of 16 piles of 12m length and 0.6m diameter is installed in a 10m thick stiff clay layer underlain by rock. The pile-soil adhesion factor is 0.45; average shear strength of soil on the side on the piles is 120kPa; undrained shear strength of the soil at the base is also 120kPa. 12M

(i)Determine the base resistance of a single pile

(ii)Assuming 100% efficiency, determine the group side resistance.

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Code No. 13EE3018 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMUS)
III B.Tech II Semester Regular & Supplementary Examinations, April-2017

POWER ELECTRONICS
(Electrical and Electronics Engineering)

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

PART-A

Answer all Questions **[1 x 10=10M]**

1. What are the methods to turn-on the SCR?
2. What is the function of snubber circuit?
3. State the advantages of IGBT over MOSFET
4. Why is power factor of semi converter better than full converter?
5. What is meant by line commutated inverter?
6. List various applications of phase controlled converters
7. What is meant by time ratio control in chopper?
8. Write the output R.M.S. voltage for single phase AC voltage controller with Resistance load.
9. What are the PWM methods for voltage control within the inverters?
10. What are the merits and demerits of current source inverter?

PART-B

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

UNIT-1

2. (a) Discuss the different modes of operation of thyristor with the help of its static V-I characteristics. [6M]
(b) What are the different methods for turning on an SCR? Explain any two methods in detail [6M]

(OR)

3 (a) What is necessity of connecting of SCRs in series? What are problems associated with series connection of SCRs? How are they eliminated? [6M]
(b) Calculate the number of SCRs, each with rating of 500V,75A required in each branch of series and parallel combination for a circuit with the total voltage and current rating of 7.5Kv and 1000A. Assume derating factor of 14% . [6M]

UNIT-II

4. (a) Discuss the operation of single phase semi controlled rectifier with inductive load. Also derive the average output voltage equation [6M]
(b) A single phase two pulse bridge converter feeds power to RLE load with R= 60Ω , L= 6mH, E = 60 V, AC Source voltage is 230 V, 50Hz for continuous Conduction. Find the average value of load current for a firing angle of 60 degrees. Find the average value of load current assuming the output current as continuous [6M]

(OR)

5. Describe the effect of source inductance on the performance of a single phase full converter indicating clearly the conduction of various thyristors during one cycle. Derive the expression for its output voltage. [12M]

UNIT-III

6. With necessary circuit and waveforms, explain the principle of operation of six pulse converter. Derive the expression for average output voltage ? [12M]

(OR)

7. Explain the operation of Single phase dual converter with circulating and non circulating current modes ? [12M]

UNIT-IV

8.(a) Describe the operation of single phase full wave a.c voltage controller with the help of voltage and current waveform. Also derive the expression for average value of output voltage? [6M]

(b) The single-phase full wave controller supplies an R load. The input rms voltage is Vs =120V , 50 Hz. The load is R = 2.5ohm, delay angles of thyristors are equal $\alpha1 = \alpha2 = \pi/2$. Determine

i) The conduction angle of thyristor T1
ii) The rms thyristor current
iii) The input power factor [6M]

(OR)

9. Describe the basic principle of working of single phase step down cycloconverter for both continuous and discontinuous for Midpoint type configuration with RL load [12M]

UNIT-V

10. (a) Discuss the principle of operation of DC-DC step down chopper with suitable Waveforms. Derive an expression for its average DC O/P voltage. [6M]

(b) A step down DC chopper has its input voltage of 230 V with 10 Ω load resistor connected, voltage drop across chopper is 2V when it is ON.
For a duty cycle of 0.5, calculate.
(i) Average and rms value of output voltage.
(ii) Power delivered to the load [6M]

(OR)

11. Explain the operation of 3-phase inverter with 180^0 conduction mode with neat sketches **?** [12M]

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CODE: 13ME3019 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular & Supplementary Examinations, April-2017

INDUSTRIAL ENGINEERING AND AMANAGEMENT
(Mechanical Engineering)

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

PART-A

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

1. Write a short note about the following.
   a) Types of production
   b) Ineffective timing
   c) Production Vs productivity
   d) Offline quality control
   e) Organization
   f) Zero defect
   g) O.C Curve
   h) Work study
   i) 100% inspection Vs acceptance sampling
   j) Carrying cost vs shortage cost

PART-B

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

UNIT-I

2. Explain in detail about the following organizations bringing out their merits and demerits. 12M
   (i) Line and Staff organization
   (ii) Committee organization

(OR)

3. Explain in detail about the following organizations bringing out their merits and demerits. 12M
   (i) Matrix organization
   (ii) Cellular organization
   (iii)Virtual organization

UNIT-II

4. a. What are the factors affecting plant location? 6M
   b. An organisation has seven plants in seven different locations, whose co-ordinates in km are: (100,300), (200,500), (300,600), (600,400), (500,300), (300,200), (200,100). The company wants to locate another plant, from which the quantity of raw materials transported to the plants in tones are 1000, 2500,1000,2700,1500,1200 and 1800 respectively. Find the optimal location for the new plant. 6M

(OR)

5. a. What are the different types of lay out? Explain each with an example. 8M
   b. Explain the concept of a Travel chart along with an example. 4M

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. Distinguish between method study and time study. 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 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%. 4M

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

UNIT-IV

8. a. Illustrate the construction of field matrix which combines ABC & VED analyses with a suitable example. 6M
   b. The store of an oil engine repair shop has 10 items whose details are shown in the following table. Apply ABC analysis to the store. 6M

Component Code	Price/unit (Rs.)	Annual demand (units/year)
C01	100	100
C02	200	300
C03	50	700
C04	300	400
C05	500	1000
C06	3000	30
C07	1000	100
C08	7000	500
C09	5000	105
C10	60	1000

(OR)

9. a. List out the functions of Stores department. 6M
   b. The annual demand of a product is 48,000 units. The average lead time is 4 weeks. The standard deviation of demand during the average lead time is 75 units/week. The cost of ordering is Rs. 400 per order. The cost of purchasing of the product per unit is Rs. 10. The cost of carrying per unit is 15% of the purchase price. The maximum delay in lead time is 2 weeks and the probability of the delay is 0.25. Assume a service level of 0.95. 6M
      (i) If Q system is followed, find the reorder level.
      (ii) If P system is followed, find the maximum inventory level.

UNIT-V

10. a. Discuss the need for controlling quality of goods and services. Also give the objectives of inspection. 6M
    b. How do you classify quality control techniques? 6M

(OR)

11. a. Explain the steps in obtaining ISO 9000 registration. 6M
    b. Give the benefits of ISO 9000 series. 6M

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CODE: 13EC3020 **SET 2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Regular & Supplementary Examinations, April-2017

DIGITAL SIGNAL PROCESSING

(Electronics and Communication Engineering)

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

PART – A

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

1. a) What are the basic operations on discrete-time signals?
   b) Give the necessary and sufficient condition for a discrete-time system to be BIBO stable?
   c) Distinguish between Deterministic and Random signals?
   d) What is the relation between Z-transform and DFT?
   e) What are the two basic classes of FFT algorithms?
   f) What is the relation between analog and digital frequencies in impulse invariance method?
   g) Define window?
   h) What is decimation?
   i) What are the special addressing modes of programmable DSPs?
   j) What is Instruction pipelining?

PART – B

Answer One Question from each Unit **[5 x 12 = 60]**

UNIT – I

2. a) Find the linearity, invariance and causality of the system $y(n) = x(n^2) + x(-n)$ [6M]
   b) Discuss various elementary discrete-time signals. Indicate them graphically. [6M]

(OR)

3. a) Find the frequency response of the causal system
   $$y(n) - y(n-1) + \frac{3}{16}y(n-2) = x(n) - \frac{1}{2}x(n-1)$$ [6M]
   b) Write the properties of frequency of LTI system. [6M]

UNIT – II

4. a) Find the Z-transform of the signal using convolution property of Z-transforms.
   $$x(n) = \left(\frac{1}{2}\right)^n u(n) * \left(\frac{1}{4}\right)^n u(n)$$ [6M]
   b) Develop the radix-2 DIT- FFT algorithm with necessary equations? [6M]

(OR)

5. a) Find the linear convolution of the sequences $x(n) = \{1, 2\}$ and $h(n) = \{2, 1\}$ h(n) using DFT [8M]
   b) How many complex multiplications and complex addition operations are required to compute the DFT of 256-point sequence using direct DFT and radix-2 FFT algorithms? [4M]

UNIT – III

6. a) Explain the design procedure for the IIR digital filter by using Bilinear transform method? [8M]
   b) Compare the Butterworth and Chebyshev type-I filters. [4M]

(OR)

7. a) Determine H(z) using Impulse Invariance technique for the analog system function $H(s)=\frac{s+0.5}{(s+0.5)^2+4}$ with T=1sec [6M]

b) Design an analog low-pass Chebyshev type-I filter that has pass band attenuation of 2.5 dB at 20 rad/sec and stop band attenuation of 30dB of 50rad/sec. [6M]

UNIT – IV

8. a) A filter is to be designed with the following desired frequency response $H_d(e^{j\omega})=\begin{cases} 0, & -\frac{\pi}{2}\le\omega\le\frac{\pi}{2} \\ e^{-j2\omega}, & otherwise \end{cases}$. Determine the filter coefficients h(n) and H(z), if the window function is defined as $w(n)=\begin{cases} 1, & 0\le n\le 4 \\ 0, & otherwise \end{cases}$ [8M]

b) What are the advantages and disadvantages of FIR filters [4M]

(OR)

9. a) What are the advantages of multi-rate signal processing? [4M]

b) Discuss the interpolation processing with a factor of I. [8M]

UNIT – V

10. a) What are the advantages of DSP processors over conventional microprocessors? [6M]

b) Write a short note on various on-chip peripherals of Programmable DSPs? [6M]

(OR)

11. a) List the status register bits of TMS320C5X and their functions. [8M]

b) What are the functional units of CPU of TMS320C5X processors? [4M]

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CODE: 13CS3017 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular & Supplementary Examinations, April-2017

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) Define spoofing.
   b) What do you mean by format string attacks?
   c) What is message confidentiality?
   d) Define the principles of public key cryptography.
   e) What is MIME?
   f) Why revocation of certificates are required?
   g) What is the use of Alert Protocol?
   h) Define TLS.
   i) What is a trusted system?
   j) Write the characteristics of Firewall.

PART-B

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

UNIT-I

2. a) Define computer security. Discuss about three key objectives of it. 6
   b) Explain OSI security architecture. 6

(OR)

3. a) Explain symmetric encryption model. 6
   b) What are the different types of attacks on encrypted messages? 6

UNIT-II

4. a) Explain Feistel cipher structure. Discuss about Feistel encryption and decryption technique. 6
   b) Briefly explain AES encryption technique. 6

(OR)

5. a) Explain public key cryptosystem. 6
   b) Describe RSA algorithm with an example. 6

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CODE: 13CS3017 **SET-2**

UNIT-III

6.	a)	How a user certificate is generated by a CA?	6
	b)	What are the principal difference between version 4 and version 5 of Kerberos?	6
		(OR)	
7.	a)	Explain the threats associated with user authentication over a network or internet.	6
	b)	Write limitations of SMTP.	6

UNIT-IV

8.	a)	Explain IP security architecture.	6
	b)	List and briefly define the parameters that define an SSL session connection.	6
		(OR)	
9.	a)	Discuss about S/MIME.	6
	b)	Explain the handshake protocol action.	6

UNIT-V

10.	a)	What do you mean by malicious programs? What are its effects?	6
	b)	Discuss about types of Firewalls.	6
		(OR)	
11.	a)	Discuss about various types of Viruses?	6
	b)	Describe password protection system	6

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CODE: 13IT3002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Regular & Supplementary Examinations, April-2017

COMPUTER NETWORKS
(Information Technology)

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

PART-A

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

1. a) What is the number of links to connect n nodes in a mesh topology?
   b) Which OSI layer defines the standards for cabling and connectors?
   c) Why do you require a limit on the minimum size of Ethernet frame?
   d) What is domain name? How is it alternatively known?
   e) What are the functionalities of an Optical Bypass Switch?
   f) What is subnet mask?
   g) What are proxy servers and how do the protect computer networks?
   h) What is the importance of encryption on a network?
   i) Explain URL.
   j) What is use of HTTP?

PART-B

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

UNIT-I

2. (a) Discuss in detail the architecture of OSI reference model.
   (b) Explain how networks are constructed from two classes of hardware building blocks.

(OR)

3. (a) Discuss the function of various layers in TCP/IP reference model.
   (b) State features of Star and Mesh Topologies with respect to: i) diagrammatic configuration ii) Operation iii) Complexity iv) Ease of installation.

UNIT-II

4. (a) Explain in detail about elementary data link proto calls.
   (b) Explain flow control and error control in data link layer.

(OR)

5 (a) Explain frame format in HDLC.
   (b) Compare and contrast stop and wait and sliding window protocol in detail with an illustration.

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CODE: 13IT3002 **SET-1**

UNIT-III

6 (a) What is routing? Explain in detail about Hierarchical routing.
(b) What is congestion? Explain the token bucket congestion control algorithm.

(OR)

7 (a) How is congestion prevented in different layers?
(b) Discuss shortest path routing and flooding with a suitable example.

UNIT-IV

8 (a) Explain how connections are established at the transport layer.
(b) How the congestion is controlled using TCP?

(OR)

9 (a) Describe briefly about the TCP transmission policy.
(b) Explain the features of UDP.

UNIT-V

10 (a) Discuss in detail about the role of DNS.
(b) Explain in detail HTTP about W3

(OR)

11 (a) Compare and contrast SNMP with SMTP with their pros and cons.
(b) Compare and contrast Static Web document and Dynamic Web document

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