AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February,2021

TRAFFIC ENGINEERING
(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)	Derive inter-relationship between traffic parameters of Greenshield model?	8M
	b)	What are different types of traffic volume studies?	6M

(OR)

2.	a)	What are the major causes of accidents? List out some of the preventive control measures.	6M
	b)	What is PCU? What are the factors effecting PCU and mention PCU values of heterogeneous flow.	8M

UNIT-II

3.	a)	Define peak hour factor? Application?	6M
	b)	Explain the concept of Level of service as per HCM method?	8M

(OR)

4.	a)	What is importance of capacity in highway transportation studies?	6M
	b)	What are the steps to determine LOS for a given Highway?	8M

UNIT-III

5.	a)	What are basic principles of traffic regulation?	7M
	b)	Explain parking regulations?	7M

(OR)

6.	a)	Explain the Webster method of traffic signal design.	7M
	b)	The average normal flow of traffic on cross roads A and B during design period are 400 and 250 PCU per hour, the saturation flow values on these roads are estimated as 1250 and 1000 PCU per hour respectively. The all red time required for pedestrian crossing is 12 Sec. design two phase traffic signal with pedestrian crossing by Webster's method.	7M

UNIT-IV

7.	a)	Illustrate different measures to reduce Noise pollution caused by traffic?	8M
	b)	How do you evaluate impact of present traffic on environment?	6M

(OR)

8.	a)	What are various factors contributing to noise pollution?	6M
	b)	What are major problems impacting environment due to traffic in Indian context?	8M

UNIT-V

9.	a)	Explain regulatory signs with figures. At which locations are these signs provided?	8M
	b)	Differentiate informative and mandatory signs	6M

(OR)

10.	a)	Explain cautionary signs with figures. At which locations are these signs provided?	8M
	b)	What are various pavement markings? Explain with examples and their suitability?	6M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February,2021
SPECIAL ELECTRICAL MACHINES
(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) Draw and explain the operation of SRM also mention its application.   7M
   b) Derive the instantaneous torque equation of switched reluctance motor.   7M
   (OR)
2. a) Explain about torque – speed characteristics of SRM.   7M
   b) Mention the types of control method used to control SRM and explain them.   7M

UNIT-II

3. a) Mention the types of stepper motors. Draw and explain the operation of stepper motor.   7M
   b) Write short notes on step angle and give its expression and also define about micro stepping.   7M
   (OR)
4. a) Draw and explain the operation of Hybrid stepping motor.   7M
   b) Explain about different control mechanism in stepper motor.   7M

UNIT-III

5. a) Mention the drawbacks of surface mounted PM dc machines and also give advantages of interior type construction.   7M
   b) Explain about control strategies of brushless dc motor.   7M
   (OR)
6. a) Draw the construction of permanent magnet brushless dc motor and explain its operation.   7M
   b) Give brief theory about BLDC motor as variable speed synchronous motor.   7M

UNIT-IV

7. a) Classify LIM and explain each motor in the classification briefly.   7M
   b) List out the application of LIM also mention the advantages and disadvantages of LIM.   7M
   (OR)
8. Derive the torque equation of Permanent magnet motor and draw its equivalent circuit and mention its application and advantages.   14 M

UNIT-V

9. a) Explain how DC traction is different from AC traction.   7M
   b) Explain the construction and operation of single sided linear induction motor   7M
   (OR)
10. a) What types of motors are used for traction? How are these motors different from LIM?   7M
    b) Explain the operation of DC and AC motors.   7M

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CODE: 16IME4030   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February,2021

INDUSTRIAL AUTOMATION
(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) Discuss in brief various types of pneumatic components used in automation with sketches   7M
   b) Distinguish between programmable automation and fixed automation with examples   7M

(OR)

2. a) Discuss in brief basic elements of automation with block diagram   8M
   b) Discuss in brief advance automated functions   6M

UNIT-II

3. a) Is storage buffers are used in automated productions lines. justify the statement using suitable reasons.   6M
   b) A rotary worktable is driven by a Geneva mechanism with five slots. The driver rotates at 48 rev/ruin. Determine (i) the cycle time, (ii) available process time, and (iii) indexing time each cycle   8M

(OR)

4. a) Discuss in brief various applications of automated production lines   6M
   b) A 20-station transfer line is divided into two stages of 10 stations each. The ideal cycle time of each stage is T_c=1.2 min. All of the stations in the line have the same probability of stopping, $p = 0.005$. We assume that the downtime is constant when a breakdown occurs, T_d = 8.0 min. Using the upper-bound approach, compute the line efficiency for the following buffer capacities: (i) $b = 0$,   (ii) b=infinity.   8M

UNIT-III

5. a) List out the various line balancing algorithms. Discuss in brief ranked position weight method.   7M

   b) A manual assembly line must be designed for a product with annual demand = 100.000 units. The line will operate 50 wk/yr, 5 shifts/wk, and 7.5 hr/shift. Work units will be attached to a continuously moving conveyor. Work content time = 42.0min. Assume up time efficiency of line $E = 0.97$, balancing efficiency $E_b = 0.92$, and repositioning time $T_r = 6$ sec. Determine; (i) hourly production rate to meet demand and (ii) number of workers required.   7M

(OR)

6. a) Illustrate the various types of automated assembly system configurations with neat sketch.   7M

   b) A manual assembly has 15 work stations with one operator per station. work content time to assemble the product is =28min. the production rate of the line= 30units/hr. assume that proportion up time E=0.94 and repositioning time T_r= 6sec. determine the balance delay   7M

UNIT-IV

7. a) Illustrate the various types of AGVs used in industry with sketches.   7M

   b) Explain the various types of automated storage and retrieval systems.   7M

(OR)

8. a) Discuss in brief different types of conveyor system used in the industry to transport material from one location to the another location.   7M

   b) An six aisle automated storage/ retrieval system is to contain 50 storage compartments in the length direction and 8 compartments in the vertical direction. All storage comportments will be the same size to accommodate standard size pallets of dimensions x= 36inchs, y= 48 inches. The height of a unit load z= 30inches using the allowances a= 6in, b=8in and c=18 inch. Find the number of unit loads can be stored in the AS/RS systems and also its dimensions. The rack structure will be built 18inches above the floor level.   7M

UNIT-V

9. a) Classify the various types of inspection method to check the quality of a product.   6M

   b) Illustrate with a neat sketch construction and working principle of CMM. also give its applications.   8M

(OR)

10. a) Compare the concept of lean production with agile manufacturing   7M

    b) Summarize the concept of basic principle involved in lean production   7M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February,2021

GLOBAL POSITIONING SYSTEM
Elective - II
(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 important features of various Global Navigation Satellite Systems.	7 M
	b)	Illustrate how we apply trilateration principle to GPS.	7 M

(OR)

2.	a)	List out the advantages and disadvantages of transit.	7 M
	b)	Explain in detail about the user or ground segment of GPS.	7 M

UNIT-II

3.	a)	Illustrate the principle of P-code generation with the help of neat diagram.	7 M
	b)	Explain in detail about Anti Spoofing (AS) and Selective Availability (SA)	7 M

(OR)

4.	a)	Mention the salient features of the GPS signal components.	7 M
	b)	Explain the structure of navigation message of the GPS signal.	7 M

UNIT-III

5.	a)	Describe the concept of GPS seconds of week and Julian Date.	7 M
	b)	Explain the significant features of Cartesian coordinate system.	7 M

(OR)

6.	a)	List the differences between geodetic and geocentric coordinate systems.	7 M
	b)	Elaborate the principle of Universal Coordinated Time (UTC) and GPS time.	7 M

UNIT-IV

7.	a)	Explain Kepler laws of planetary motion with a neat diagram.	7 M
	b)	Explain RINEX format in detail.	7 M

(OR)

8.	a)	Explain in detail about orbital dynamics.	7 M
	b)	Demonstrate the computational algorithm for calculating the position and velocity of the satellite using Keplerian elements	7 M

UNIT-V

9.	a)	Describe the salient features of GPS error sources.	7 M
	b)	Discuss how tropospheric error will degrade the GPS performance.	7 M

(OR)

10.	a)	Dual frequency GPS receiver is used for reducing the ionospheric error. Justify.	7 M
	b)	How multipath error can be minimized in GPS system?	7 M

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CODE: 16EC4032   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February,2021
COMPUTER NETWORKS
(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)	Briefly explain about applications of Computer Networks.	6
	b)	Briefly explain about interconnection of networks.	8
		(OR)	
2.	a)	Explain in detail about addressing concept in TCP / IP protocol suite.	6
	b)	Explain about layers in OSI reference model?	8

UNIT-II

3.	a)	Write short note of coaxial cable and fiber cables.	7
	b)	Explain any two collision free protocols?	7
		(OR)	
4.	a)	Briefly discuss about ALOHA?	6
	b)	Explain in detail about HDLC.	8

UNIT-III

5.	a)	Write about Shortest Path Routing algorithm.	7
	b)	Explain IPv4 header format.	7
		(OR)	
6.	a)	Briefly explain about Leaky Bucket Congestion Control algorithm.	7
	b)	Write about what are the services provided by network layer to transport layer?	7

UNIT-IV

7.	a)	Differentiate between connection less and connection oriented services.	6
	b)	Explain the service primitives of transport layer?	8
		(OR)	
8.	a)	Briefly explain about UDP header format?	7
	b)	Explain about TCP Connection Establishment.	7

UNIT-V

9.	a)	Briefly explain about dynamic web documents?	7
	b)	Explain about Hierarchy of Name Servers.	7
		(OR)	
10.	a)	Explain Electronic Mail architecture and its services.	7
	b)	Write about Hyper Text Transfer Protocol (HTTP).	7

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February,2021
CRYPTOGRAPHY AND CYBER SECURITY
(CSE Branch)

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)	Classify the security attacks and explain each.	6M
	b)	Describe the process of encryption in playfair cipher with an example.	8M

(OR)

2.	a)	Discuss about specific security mechanisms.	6M
	b)	Illustrate the five ingredients to a symmetric encryption scheme.	8M

UNIT-II

3.	a)	Describe the block cipher design principles	6M
	b)	Explain the RSA Algorithm in detail.	8M

(OR)

4.	a)	Explain about DES with neat diagram.	8M
	b)	Distinguish between Conventional and public-key encryption algorithms.	6M

UNIT-III

5.	a)	Explain about Phishing attack and role of anti-phishing.	7M
	b)	Describe zero-day vulnerabilities.	7M

(OR)

6.	a)	Discuss the activity of a Virus on computer.	7M
	b)	List and explain various types of malware.	7M

UNIT-IV

7.	a)	Elaborate the Network Address Translation in network.	7M
	b)	Illustrate the working packet filtering tool.	7M

(OR)

8.	a)	Explain about Application-Level gateway firewall.	7M
	b)	Compare and Contrast Four types of firewalls.	7M

UNIT-V

9.	a)	Explain the anatomy of SNORT rule.	7M
	b)	Show the block diagram for Network-based IDS/IPS.	7M

(OR)

10.	a)	Describe Expert –based IDS for anomaly detection.	7M
	b)	How Statistical-based IDS determines the intruders.	7M

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CODE: 16CS4029   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech I Semester Regular & Supplementary Examinations, February,2021
ADVANCED COMPUTER ARCHITECTURE
(Information Technology)

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 out the generations of electronic computer development and explain the major hardware and software technological changes in these generations.   8
   b) Explain about the various CPU performance parameters.   6

(OR)

2. a) Explain the PRAM model of a multiprocessor system with the available different memory updating options. List out the different variants of PRAM models.   8
   b) With a neat diagram explain the distributed memory multicomputer system and summarize the three early message passing multicomputer systems.   6

UNIT-II

3. a) Explain in detail about the types of storage devices.   6
   b) Explain the different types of basic cache optimization.   8

(OR)

4. a) Explain way prediction and sequence Interleaving. Write down the expressions to calculate Average memory access time2-way and Average memory access time4-way?   6
   b) Explain the following Advanced optimization of cache.   8
      1. Compiler optimization to reduce.
      2. Merging write buffer to reduce miss penalty.
      3. Non-blocking cache to increase the cache band width

UNIT-III

5. a) Explain the linear pipelining process with an example.   8
   b) A non-pipeline system takes 50 ns to process a task. The same task can be processed in a six-segment pipeline with a clock cycle of 10 ns. Determine the speedup ratio of the pipeline for 100 tasks. What is the maximum speed up that can be achieved?   6

(OR)

6.   Consider the following pipeline reservation table   14

	1	2	3	4	5	6	7	8cc
S1	×					×		×
S2		×		×				
S3			×		×		×	

(a) What are the forbidden latencies?
(b) Draw the state transition diagram.
(c) List all the simple cycles and greedy cycles.
(d) Determine the optimal constant latency cycle and the minimal average latency.

UNIT-IV

7. a) Explain with a neat diagram the crossbar switch. Demonstrate the following with a illustration by considering a crossbar switch with 4 CPU's and 4 memory modules.   8
    1. CPU 0 wants to access memory module 3 (needs to send address value to memory module 3)
    2. CPU 1 wants to access memory module 1 (needs to send address value to memory module 1)
    3. CPU 2 wants to access memory module 0 (needs to send address value to memory module 0)
    4. CPU 3 wants to access memory module 2 (needs to send address value to memory module 2).
    5. What happens when both CPU 0 and CPU 1 want to access the memory module 3 at the same time.

   b) Explain Shuffle exchange concept and how it is implemented in omega Network for 8 PE'S.   6

(OR)

8. a) Compare between the scalar and vector processors.   4
   b) Discuss in detail the vector architecture, vector operations and enhancement of the performance.   10

UNIT-V

9. a) Define cache coherence protocol. State the reasons for Cache Coherence Problem.   4
   b) Explain the snoopy based Cache coherence protocols with neat diagram   10

(OR)

10. a) Explain the necessity of virtual channels with an example   6
    b) Describe the message routing schemes with a message format and explain store and forward routing method.   8