

# AR16

**CODE: 16CE4029**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**IV B.Tech I Semester Supplementary Examinations, August, 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) Elaborate the relationship between traffic flow characteristics with figures. 8
- b) Summarise the types of parkings with neat sketches. 6

**(OR)**

2. a) Illustrate methods of conducting speed studies and statistical methods for analysis of speed data? 8
- b) Illustrate the method of conducting traffic volume studies. 6

## **UNIT-II**

3. a) Define capacity. Write the factors affecting capacity. 7
- b) Discuss the significance of LOS criteria for urban arterial roads. 7

**(OR)**

4. Define LOS. Explain the concept and types of LOS using graphical representation 14

## **UNIT-III**

5. a) Draw the sketches of various types of grade separated intersection. Write its advantages and disadvantages. 7
- b) Define signal phasing and explain signal phasing & timing diagram with neat sketch? 7

**(OR)**

6. a) Explain types of traffic signal systems. 6
- b) Explain about Webster method of signal design . 8

## **UNIT-IV**

7. a) Describe Effect of traffic on environment? 6
- b) Define Air pollution? What are the pollutants emitted due to traffic? 8

**(OR)**

8. a) Write few measures to reduce environmental noise pollution. 7
- b) Briefly explain about measures for air pollution reduction due to traffic? 7

## **UNIT-V**

9. a) List out the types of traffic signs with figures. 7
- b) Write about different types of lane markings with neat sketch 7

**(OR)**

10. a) Illustrate pavement markings and what are the types of pavement markings available in traffic streams explain with examples? 7
- b) Explain mandatory signs with sketches. 7

# AR16

**CODE: 16EE4028**

**SET-2**

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

**IV B.Tech I Semester Supplementary Examinations, August, 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) What is the need for position feedback in the operation of switched Reluctance motor? Explain. [7M]  
b) List and discuss different applications of switched reluctance motors. [7M]
- (OR)**
2. a) Discuss the operating principle of switched reluctance motor. [7M]  
b) With a neat circuit diagram, explain the asymmetric bridge converter for a four-phase 8/6 switched reluctance motor. [7M]

## **UNIT-II**

3. a) Explain the construction and operation of a variable reluctance stepper motors. [7M]  
b) What is a step angle, Define stepping rate of a stepper motor? [7M]
- (OR)**
4. a) What are hybrid stepper motors? Explain its construction and operation. [7M]  
b) Discuss different applications of a stepper motor. [7M]

## **UNIT-III**

5. a) Draw and explain the back emf waveforms of a three-phase BLDC motor. [7M]  
b) Explain the commutation process in BLDC machines. [7M]
- (OR)**
6. a) Explain the constructional details of a PMBLDC motor. [7M]  
b) Prove that the PM BLDC machines have 15% more power density than the PMSM. [7M]

## **UNIT-IV**

7. a) Explain the principle of operation of a linear induction motor. [8M]  
b) Explain different applications of linear motors. [6M]
- (OR)**
8. With a neat diagram explain the operation of Permanent magnet motors, Derive the torque equation. List out the advantages. [14M]

## **UNIT-V**

9. a) Discuss the main characteristics of traction drives. [6M]  
b) Discuss the suitability of linear induction motors for traction drives. [8M]
- (OR)**
10. a) Discuss different AC motors suitable for traction systems. [6M]  
b) Compare between AC and DC traction systems. [8M]

# AR16

**CODE: 16ME4030**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**IV B.Tech I Semester Supplementary Examinations, August, 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) Define automation. Explain various layouts used in automated plants with neat sketches 6M
- b) Describe the reasons for automation 8M

**(OR)**

2. a) Explain the ten strategies used for automation and production systems 7M
- b) Describe the hydraulic components used in automation 7M

## **UNIT-II**

3. a) Explain linear transfer systems and Rotary Indexing work transfer mechanisms with neat sketches 6M
- b) An 8 station rotary indexing machine operates with an ideal cycle time of 20 sec. The frequency of line stops is 0.06 stops/ cycle on an average. When a stop occurs it takes an average of 3 min. to make repairs. Determine average production time, average production rate, line efficiency and proportion down time. 8M

**(OR)**

4. a) Explain analysis of transfer lines with and without storage buffer 8M
- b) Explain the terminology used in transfer line analysis 6M

## **UNIT-III**

5. a) Describe storage buffer and partial automation. 6M
- b) Explain automated assembly systems 8M

**(OR)**

6. a) Discuss briefly on (i) Precedence diagram (ii) Manual Rational Work Element 6M
- b) The total work content time of a certain assembly job is 7.8 min. The estimated downtime of the line is  $D = 5\%$  and the required production rate is  $R_p = 80$  units/hr. 8M
  - i) Determine the theoretical minimum number of workstations required to optimize balance delay.
  - ii) For the number of stations determined in part (i), compute the balance delay d.

## **UNIT-IV**

7. a) Explain the types of material handling systems and their applications 7M
- b) Describe various types conveyor systems and their applications 7M

**(OR)**

8. a) Explain various types material handling equipment 7M
- b) Discuss types of automated storage and retrieval systems 7M

## **UNIT-V**

9. a) Discuss CMM operation and programming 7M
- b) Explain machine vision applications 7M

**(OR)**

10. a) Discuss lean and agile manufacturing concepts. 7M
- b) Describe any two types of CMM with neat sketches. 7M

# AR16

**CODE: 16EC4032**

**SET-2**

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

**IV B.Tech I Semester Supplementary Examinations, August,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) What is computer Networks? How it differs from distributed system? 6  
b) Explain OSI reference model? 8
- (OR)**
2. a) Write about various categories of Network. 6  
b) What are the advantages of TCP/IP protocol stack over OSI model? 8

## **UNIT-II**

3. a) Explain data link layer design issues? 6  
b) Write about a protocol using Go Back N? 8
- (OR)**
4. a) Explain Hamming Code mechanism? 7  
b) Explain about Carrier Sense Multiple Access with Collision Detection (CSMA/CD). 7

## **UNIT-III**

5. a) Explain about Virtual Circuits with advantages and disadvantages. 6  
b) Discuss in detail about OSPF & BGP Routing protocols in the internet.? 8
- (OR)**
6. a) Explain Distance Vector Routing Algorithm.? 7  
b) Briefly explain about Token Bucket Congestion Control algorithm. 7

## **UNIT-IV**

7. a) Briefly discuss about the elements of transport protocol 6  
b) Discuss in detail about TCP protocol and its segment header? 8
- (OR)**
8. a) Differentiate between Reliable versus Unreliable services in transport layer. 6  
b) Write about operations and uses of UDP. 8

## **UNIT-V**

9. a) Can a machine with a single DNS name have multiple IP address? How could this occur? 7  
b) Write the differences between Static and Dynamic Web Pages. 7
- (OR)**
10. a) Briefly explain about Static Web Documents. 6  
b) Write about various messages of SNMP. 8

# AR16

**CODE: 16CS4031**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**IV B.Tech I Semester Supplementary Examinations, August,2021**

**CRYPTOGRAPHY AND CYBER SECURITY**

**(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 various security attacks (7M)  
b) Explain security mechanisms (7M)
- (OR)**
2. a) What are principles of symmetric key cryptography (7M)  
b) What are principles of asymmetric key cryptography (7M)

## **UNIT-II**

3. a) What are Block cipher design principles (7M)  
b) Explain IDEA (7M)
- (OR)**
4. a) Explain RSA (7M)  
b) What is elliptical curve cryptography (7M)

## **UNIT-III**

5. a) Explain type of malware (7M)  
b) What are security configuration settings (7M)
- (OR)**
6. a) What is obfuscation and mutation in malware (7M)  
b) Analyze attackers motivation and tactics (7M)

## **UNIT-IV**

7. a) Discuss Home office fire wall (7M)  
b) Analyze cisco fire wall as enterprise fire wall (7M)
- (OR)**
8. a) Discuss about gateways (7M)  
b) What is meant by filtering (7M)

## **UNIT-V**

9. a) List various approaches used for IPS (7M)  
b) Explain detection of polymorphic worms (7M)
- (OR)**
10. a) Discuss about SNORT (7M)  
b) Discuss security community approach to IPS (7M)

# AR13

**CODE: 13EE4023**

**SET-1**

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

**IV B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, AUGUST, 2021**

**POWER SYSTEM ANALYSIS  
(Electrical & Electronics Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) What is one line diagram?  
b) Write the size of the  $Y_{bus}$  matrix for n bus power system network?  
c) Discuss the necessity of load flow studies?  
d) What is the need of slack bus in power system?  
e) Define the bus incidence matrix  
f) Write the formula for short circuit MVA in terms of base MVA in symmetrical fault calculations?  
g) Write the order of severity of unsymmetrical faults on power system  
h) Write the formula for Synchronizing power coefficient.  
i) Define critical clearing angle.  
j) What are the essential factors affecting the stability

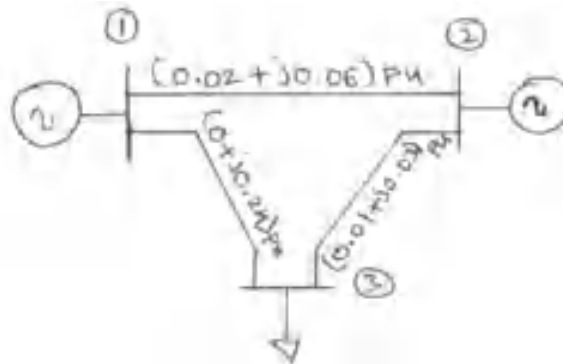
**PART-B**

**Answer one question from each unit**

**[5x12=60M]**

**UNIT-I**

2. a) Derive an expression to form  $Y_{BUS}$  using singular transformation. 6M  
b) A generator rated 25MVA, 11kv has a reactance of 15%. Calculate its p.u. reactance for a base of 50 MVA and 10 kv. 6M
- (OR)
3. a) What is per unit system? What are its advantages? 4M  
b) Compute  $Y_{bus}$  matrix for the power system shown in fig. 8M



**UNIT-II**

4. a) Compare Gauss –Seidel and Newton - Raphson methods. 5M  
b) What is Jacobian matrix? How the elements of Jacobian matrix are computed? 7M
- (OR)
5. a) How the buses are classified in power system? Discuss the significance of slack bus in power systems 6M  
b) With the help of a neat flow chart, explain the Newton - Raphson method of load flow solution when the system contains voltage controlled busses in addition to swing bus and load bus. 6M

# AR13

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SET-1

## UNIT-III

6. a) What is primitive network, primitive impedance matrix and primitive admittance Matrix. 6M  
b) Explain the procedure for modification of  $Z_{bus}$  when a line is added or removed which has no mutual reactance. 6M

(OR)

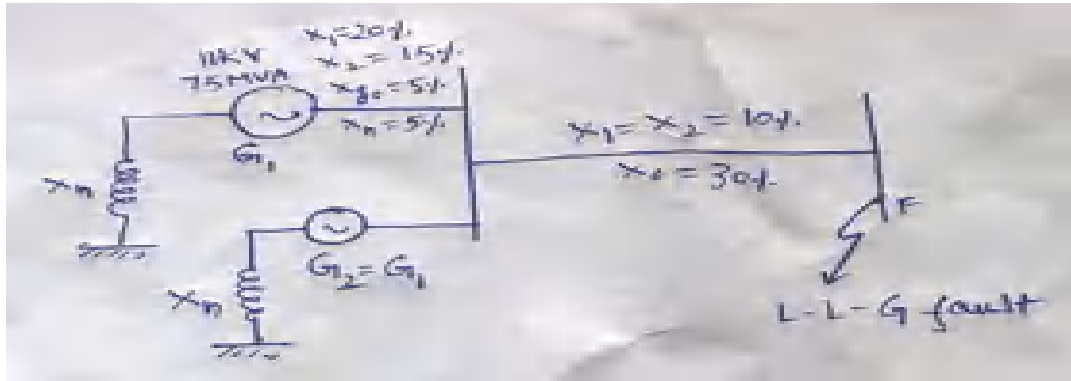
7. a) Form bus impedance matrix for the data given below. 8M

Element number	Bus code From bus – To bus	Self impedance
1	2-3	0.6 p.u.
2	1-3	0.5 p.u.
3	1-2	0.4 p.u.

- b) Explain the importance of symmetrical fault analysis in power systems. 4M

## UNIT-IV

8. a) Derive an expression for fault current in Line to ground fault. 5M  
b) For the system shown in figure below. **L-L-G fault** occurs at point F. Calculate the fault current. 7M



(OR)

9. a)  $P_{abc}$  is 3-phase power in a circuit and  $P_{012}$  is power in the same circuit in terms of symmetrical components. Show that  $P_{abc}=P_{012}$  7M  
b) What are the various types of faults? Discuss their frequency of occurrence and severity? 5M

## UNIT-V

10. a) Discuss the various factors affecting the transient stability of the system. 4M  
b) A generator with constant excitation supplies 35MW through a step up transformer and a high voltage line to an infinite bus bar. If the steady state stability limit of the system is 60MW, determine the maximum permissible sudden increase of generator output (resulting from sudden increase prime mover output) if the stability is to be maintained. 8M

Assuming resistance of generator, lines and transformers are neglected.

(OR)

11. a) Derive the expression for swing equation with a necessary diagram. 8M  
b) Explain the terms 4M  
i) Transient stability ii) Dynamic stability