

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

1. a) Define Index of refraction in electromagnetic spectrum?
- b) Define SWATH?
- c) List out the fundamental fields in EMW?
- d) Define GPS. How many minimum numbers of satellites are required for a GPS to determine its position precisely?
- e) List out the most efficient absorbers in atmosphere?
- f) Define spectral reflectance curve?
- g) What do you mean by temporal GIS?
- h) Expand DBMS?
- i) List out input data sources in GIS?
- j) Define active and passive remote sensing?

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

2. a) Define EMR. Explain briefly about the regions of EMR with neat sketch 6M
- b) What are the basic components of remote sensing. Explain them with neat sketch? 6M

(OR)

3. a) Define atmospheric windows. Explain energy interactions with atmosphere with neat sketch? 6M
- b) Explain briefly about energy interactions with vegetation and water bodies with neat sketch? 6M

UNIT-II

4. a) Explain briefly about passive, active, airborne and space-borne remote sensing sensors with neat sketch? 6M
- b) Describe briefly about characteristic of an image? 6M

(OR)

5. Explain briefly about band interleaved by pixel, band interleaved by line, band sequential? 12M

UNIT-III

6. Explain in detail about supervised classification and unsupervised classification? 12M

(OR)

7. What are sources available for data input of GIS. Explain briefly about data input methods? 12M

UNIT-IV

8. a) Define GIS. Explain the components of GIS with neat sketch? 6M
- b) List out the differences between raster and vector GIS along with advantages and disadvantages? 6M

(OR)

9. a) Discuss in detail about raster data model? 6M
- b) Explain briefly about fundamental operations of GIS? 6M

UNIT-V

10. Explain briefly about remote sensing and GIS applications in various fields? 12M

(OR)

11. a) Explain briefly about layer based and feature based GIS with neat sketch? 6M
- b) Explain briefly about vector data model? 6M

AR13

CODE: 13EE4024

SET-2

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

IV B.Tech I Semester Regular & Supplementary Examinations, November-2018

POWERSYSTEM OPERATION AND CONTROL

(Electrical & Electronics Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Briefly discuss the optimization problem?
b) Define the control variables.
c) What are the different constraints that can be placed on the UC problem?
d) What are the scheduling methods for hydro-thermal co-ordination?
e) What is meant by area control error?
f) What is the need of a fly-ball speed governor?
g) What is a tie line?
h) What is the order of differential equation to describe the dynamic response of a two-area system in an uncontrolled case?
i) What are the objectives of load compensation?
j) List various fact controllers.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Explain the following terms with reference to power plants 6M
Heat input – power output curve, heat rate input, incremental input, generation cost and production cost.
b) What is a penalty factor in economic scheduling? Explain its significance? 6M

(OR)

3. a) A system consists of two generating plants with fuel costs of: 6M
 $C_1 = 0.05P_{G_1}^2 + 20P_{G_1} + 1.5$
 $C_2 = 0.075P_{G_2}^2 + 22.5P_{G_2} + 1.6$
The system operates on economic dispatch with 100MW of power generation by each plant. The incremental transmission loss of plant-2 is 0.2. Find the penalty factor of plant-1.
b) Obtain the condition for optimum operation of a power system 6M
with 'n' plants including the effect of transmission losses.

UNIT-II

4. a) Explain in detail about the short term hydro thermal scheduling. 6M
b) Explain in detail dynamic programming method in unit commitment. 6M

(OR)

5. a) What is unit commitment? Explain the need for unit commitment. 6M
b) Explain the different constraints considered in solving unit commitment problem. 6M

UNIT-III

6. a) For a single area system, show that the static error in frequency can be reduced to zero for single area load frequency control with integral control. 8M
b) A 200MVA synchronous generator is operating at 3000 rpm, 50Hz. A load of 40MW is suddenly applied to the machine and the station valve to the turbine opens only after 0.4 sec due to the time lag in the generator action. Calculate the Frequency to which the generated voltage drops before the steam flow commences to increase to meet the new load. Given that the valve of H of the generator is 5.5 kW-sec per kVA of the generator energy. 4M

(OR)

7. a) Two generators of rating 100 and 200 MW are operated with a droop characteristic of 6% from no load to full load. Determine the load shared by each generator, if a load of 270 MW is connected across the parallel combination of those generators. 4M
b) Derive the expression for generator load model and represent it by block diagram. 8M

UNIT-IV

8. Explain the steady state analysis of two area LFC system with controlled case and draw its block diagram. 12M

(OR)

9. Draw and explain the block diagram of uncontrolled two area load frequency control system. 12M

UNIT-V

10. a) Describe the features of load compensator and its specifications 6M
b) Compare the different types of compensating equipment for transmission systems. 6M

(OR)

11. a) What do mean by compensation of a line? Discuss briefly different methods of compensation. 6M
b) Explain the need of FACTS controllers in transmission systems. 6M

AR13

CODE: 13ME4028

SET-1

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

IV B.Tech I Semester Regular & Supplementary Examinations, November-2018

INDUSTRIAL HYDRAULICS & PNEUMATICS

(Mechanical Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What are different types of hydraulic motors?
b) What is the difference between pumps and motors?
c) What is the function of intensifiers?
d) Write the principle of hydraulic press.
e) What is the difference between Positive displacement and dynamic pumps?
f) Name any three different types of hydraulic fluids.
g) What is actuator?
h) List various types of valves.
i) Where did you find the application of time delay valves.
j) What is the difference between gauge and absolute pressures.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a. Explain the operation of gear type pump. 6
b. Draw the diagram of hydraulic actuator and explain. 6
- (OR)**
3. a. Explain the operation of vane type pump. 6
b. A vane pump is to have volumetric displacement of 70 cm. it 6
has a rotor diameter of 6cm, a cam ring diameter of 6.5 cm
and a vane width of 5cm. what must be the eccentricity?

UNIT-II

4. Classify different accumulators used in a hydraulic system and explain spring loaded hydraulic accumulator 12
(OR)
5. Explain the operation of hydraulic intensifier with neat sketch. 12

UNIT-III

6. Explain the speed control circuit for hydraulic motor using meter in and meter out circuits. 12
(OR)
7. a) Explain the operation of a hydraulic press circuit with sketch. 8
b) Explain with a neat hydraulic circuit diagram, application of accumulator as an auxiliary power source. 4

UNIT-IV

8. a) Give complete Classification of pneumatic actuators. 8
b) What are the differences between pneumatic actuators and hydraulic actuators? 4
(OR)
9. a) Explain the working principle along with graphic symbols of the following 8
i) Pilot operated solenoid valve ii) AND gate valve
b) What are air control valves? 4

UNIT-V

10. Explain pneumatic vacuum system? Describe the applications of the pneumatic vacuum system? 12
(OR)
11. a) What are the applications of time delay valves? 6
b) Explain speed control circuits. 6

AR13

CODE:13EC4029

SET-2

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

**IV B.Tech I Semester Regular & Supplementary Examinations, November-2018
MICROWAVE ENGINEERING**

(Electronics & Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL THE QUESTIONS

[10X1=10M]

- 1
 - a) Draw the field patterns for the dominant TM modes in rectangular waveguide?
 - b) For an X band rectangular waveguide find λ_c ?
 - c) What are the changes we incorporate in a two cavity klystron amplifier to work as an Oscillator?
 - d) Find the resonant frequency of TE_{101} of an air filled Rectangular cavity of dimensions 4cm X 3cm X 2cm.
 - e) What is the phase focusing effect in Magnetron?
 - f) Obtain a four port circulator using two three port circulators?
 - g) What is the effect of transit time?
 - h) Draw the equivalent circuit of Tunnel Diode?
 - i) Differentiate between O-type and M-type tubes?
 - j) Determine the value of VSWR, if the separation between two adjacent nulls is 2.5cm and the distance between twice minima power points is 20 mm.

PART-B

Answer one question from each unit

[5X12=60M]

UNIT-I

- 2
 - a) Deduce an expression for the cut off the frequency of a rectangular waveguide in TM mode? **7M**
 - b) The dominant mode TE_{10} is propagated in a rectangular waveguide of dimensions $a=6$ cm and $b=4$ cm. The distance between maxima and minima is 4.47cm. Determine the signal frequency of the dominant mode. **5M**

(OR)

- 3
 - a) Discuss various mode characteristic of rectangular waveguides? **6M**
 - b) When the dominant mode is propagated in an air filled rectangular waveguide, The guide wavelength at a frequency of 10GHz is 5 cm. calculate the breadth of the waveguide. **6M**

UNIT-II

- 4
 - a) Describe in detail the operation of two hole directional coupler. **6M**
 - b) In a H-plane Tee Junction, 20mW power is applied to port (3) that is perfectly matched to the junction. Calculate the power delivered to the load $60\ \Omega$ and $75\ \Omega$ connected to ports (1) and (2). **6M**

(OR)

- 5 a) Discuss about the waveguide attenuator. **6M**
 b) Derive the scattering matrix of magic Tee **6M**

UNIT-III

- 6 a) Describe the mechanism of velocity modulation in a two cavity klystron amplifier and hence obtain an expression for bunched beam current density? **7M**
 b) A Reflex Klystron operates at the peak of $n=1$ or $\frac{3}{4}$ mode. The DC power input is 40 mW and the ratio of V_1 over V_0 is 0.278. Determine the output power and efficiency of the Reflex Klystron. **5M**

(OR)

- 7 a) Draw the electronic admittance diagram of Reflex Klystron and explain the phenomenon of electronic tuning. **6M**
 b) A two cavity Klystron amplifier is operates at 9GHz with $I_0=3.5\text{mA}$, $V_0=10\text{KV}$. The drift space length is 3.5cm and output cavity total shunt conductance is $G_{sh}=20\mu\text{ mhos}$ with the beam coupling coefficient $\beta_2=0.92$. Find the maximum voltage and power gain. **6M**

UNIT-IV

- 8 a) Explain the role of slow wave structure in a TWT and name the different types of slow wave structures used? **4M**
 b) Explain the oscillation mechanism and electron trajectory concept of Magnetron Oscillator? **8M**

(OR)

- 9 a) Explain the concepts of Phase focusing effect and mode jumping in a cavity magnetron. **4M**
 b) Derive an expression for gain of TWT? **8M**

UNIT-V

- 10 a) Explain the VSWR measurements by using slotted line method? **6M**
 b) Draw the block diagram of microwave test bench and explain each block **6M**

(OR)

- 11 a) Explain the principle of operation and characteristics of IMPATT diode? **7M**
 b) A GUNN diode has the following specifications **5M**
 Operating Frequency : 8GHz
 Device Length : 50 μm
 Voltage Pulse Amplified : 20V
 Determine the threshold electric field.

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

1. a) Mention the three classes of processes in Linux.
- b) Why has the open source software become popular?
- c) How is sequences handled in MySQL.
- d) Define metadata.
- e) Give the syntax for viewing arrays in PHP.
- f) Write the general form of defining the function in PHP.
- g) List the PYTHON built-in methods for file object.
- h) How variables are created in PYTHON. Explain one example?
- i) What is the use of arrow operator in Perl?
- j) How will you open the file for reading/writing using Perl function?

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

2. a Define cloning. Explain in detail. 6M
- b Describe the general operating system structure. 6M

(OR)

3. a Compare and contrast kernel mode and user mode. 6M
- b Explain in detail applications of open sources. 6M

UNIT-II

4. a Illustrate sorting query results in MySQL. 6M
- b Define sequences and explain with example in MySQL. 6M

(OR)

5. a Explain SELECT statement by providing examples of the following 6M
 - i) Retrieving individual columns
 - ii) Retrieving multiple columns
 - iii) Retrieving distinct rows.
- b Write a short note on date and time in MySQL. 6M

UNIT-III

6. a How sending and receiving e-mails can be achieved in PHP. Explain with an example. 6M
- b Explain string manipulation and expressions in PHP. 6M

(OR)

7. a What is mean by an associative array in PHP? Explain with an example program. 6M
- b Discuss in detail security in PHP. 6M

UNIT-IV

8. a Discuss in detail classes and OOP in PYTHON. 6M
- b Explain Lists, Tuples, Dictionaries with syntax in PYTHON. 6M

(OR)

9. a Write a program to calculate the simple interest using python. 6M
- b Generalize a case study on the getting the students mark statements and analysis with exception handling in Python. 6M

UNIT-V

10. a Discuss in detail Perl parsing rules. 6M
- b Explain file handling in Perl. 6M

(OR)

11. a Differentiate between the following control statements of Perl. 6M
 - i) If and unless
 - ii) While and until
 - iii) Next and last
- b Write a Perl subroutine that takes a text string as input parameter and returns the frequency of occurrences of various words in the text as a hash. 6M

AR13

CODE: 13IT4010

SET-1

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

IV B.Tech I Semester Regular & Supplementary Examinations, November-2018

NETWORK SECURITY AND CRYPTOGRAPHY (Information Technology)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Differentiate between Active and Passive attack
- b) Differentiate conventional from public key encryption
- c) What is encipherment?
- d) Prove that 3 is a primitive root of 7
- e) What is weak collision resistance? What is the use of it
- f) List out the requirements of kerberos
- g) What are two levels of functionality that comprise a message authentication or digital signature mechanism
- h) Write the four SSL Protocols
- i) Why does ESP include a padding field
- j) What is application level gateway

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a **List** various types of Security Attacks, Mechanisms and Services with suitable Examples 5M
- b **Calculate** Decryption Key for the following Encryption key and produce cipher text for the given plain text “OK” using Hill Cipher and also restore plaintext from cipher text. 7M

$$\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$$

(OR)

3. a **Apply** Vigenere Cipher to generate cipher text using the key word “deceptive” for the following plain text “THISISSAMPLETEXT”. 6M
- b A generalization of the Caesar cipher, known as the affine Caesar cipher, has the following form: For each plaintext letter, substitute the cipher text letter: $C = E([a, b], p) = (ap + b) \bmod 26$. Encrypt plaintext “CRYPTOGRAPHY” using affine cipher. Take $a=3$; $b=2$. 6M

UNIT-II

4. a Which block cipher AES or DES follows Feistel cipher structure? 6M
Justify your answer?
- b **Prove** that if P and Q are two points then $P+Q$ is also a point on the same Elliptic curve where P & Q lies. Illustrate the statement with an example 6M
- (OR)
5. a In a public-key system using RSA, you intercept the cipher text $C = 10$ sent to a user whose public key is $e = 5$, $n = 35$. What is the plaintext M ? 6M
- b **Outline** Hash function based on Cipher block Chaining Mode 6M

UNIT-III

6. a **Draw** X.509 Certificate Revocation List. 6M
- b **Discuss** limitations of SMTP 6M
- (OR)
7. a **Discuss** Kerberos and name its Servers and briefly explain duties of each server. 6M
- b **Interpret** five header fields of MIME 6M

UNIT-IV

8. a 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
- b **Demonstrate** various combinations of Security Associations with neat diagrams 6M
- (OR)
9. a **Define** the following 6M
i) Master Key
ii) Session Key
iii) Nonce
iv) Key Distribution Center (KDC)
- b **Discuss** about Anti-Replay Service in Encapsulating Security Payload. 6M

UNIT-V

10. a Write short notes on 6M
i) Virus ii) Worms iii) Bacteria
- b What is an Intruder? Explain the changes that can be done by an Intruder? 6M
- (OR)
11. a Explain the Design principles of Firewalls? 6M
- b What are various password selection strategies? Explain? 6M