

**CODE: 13CE4026**

**AR13**

**SET-2**

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

**IV B.Tech I Semester Regular & Supplementary Examinations, October-2017**

**Remote Sensing & GIS Applications  
(Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

**PART-A**

**Answer all questions**

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

1. a) What is true color image?  
b) What is temporal resolution?  
c) Define spatial data  
d) What is vector data?  
e) What is RMS error  
f) Define land use  
g) What is build and clean in topology  
h) Define nadir point  
i) What is passive sensor?  
j) What is rubber sheeting?

**PART-B**

**Answer one question from each Unit**

**[5 x 12=60M]**

**UNIT - 1**

2. a) Explain stages of Remote Sensing?  
b) Explain EMR spectrum with neat sketch?  
(OR)
3. a) Explain the Electro Magnetic Radiation interaction with earth surface?  
b) Describe spectral reflectance of vegetation with neat sketch?

**UNIT-II**

4. a) List out various types of earth observation satellites and sensors?  
b) Explain SPOT satellite program  
(OR)
5. a) Define satellite? Explain about different satellite orbits  
b) Explain classification of remote sensing based on number of spectral bands?

**UNIT-III**

6. a) What is visual interpretation? What is the use of this in remote sensing? Explain?  
b) Explain pre processing techniques in digital image processing?  
(OR)

7. What is image classification? Explain in detail about the classification techniques

**UNIT-IV**

8. a) What is the definition of "GIS"? Explain about the history and introduction of GIS.  
b) Write about the fundamental operations of GIS.  
(OR)

9. a) What is a raster data model and explain?  
b) What is a map projection? Explain UTM projection.

**UNIT-V**

10. How remote sensing and GIS technology can be best utilized for Urban planning and Management  
(OR)

11. What is Land use/Land cover mapping? How this mapping is done using remote sensing?

# AR13

**CODE: 13EE4024**

**SET-1**

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

**IV B.Tech I Semester Regular & Supplementary Examinations, October-2017**

**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) What is incremental cost criterion?  
b) What is Incremental production cost curve?  
c) Name some thermal constraints in unit commitment problem.  
d) What is short term hydrothermal coordination problem?  
e) What is meant by control area?  
f) Define area control error?  
g) Which controller ensures the steady state frequency changes to zero  
h) How is area control error is shown in the block  
i) List out series and shunt compensator used for reactive power compensation?  
j) What is surge impedance compensation?

**PART-B**

**Answer one question from each unit**

**[5x12=60M]**

**UNIT-I**

2. a Give the algorithm for solving economic scheduling problem, without transmission loss. 4M  
b There are three thermal generating units which can be committed to take the system load. The fuel cost data and generation operating unit data are given below: 8M  
 $F_1 = 392.7 + 5.544 P_1 + 0.001093 P_1^2$  ;  $F_2 = 217 + 5.495 P_2 + 0.001358 P_2^2$   
 $F_3 = 65.5 + 6.695 P_3 + 0.004049 P_3^2$  ;  $P_1, P_2, P_3$  in MW,  
Generation limits:  $150 \leq P_1 \leq 600$  MW;  $100 \leq P_2 \leq 400$  MW;  $50 \leq P_3 \leq 200$  MW.  
There are no other constraints on system operation. Obtain an optimum economic load dispatch for the load level of 900 MW.

**(OR)**

3. a Derive the expression for generalised loss coefficients 6M  
b On a system consisting of two generating plants the incremental costs in Rs/ MWh with 6M  
 $P_1$  and  $P_2$  in MW's are  $\frac{dF_1}{dP_1} = 0.08P_1 + 8.0$  ;  $\frac{dF_2}{dP_2} = 0.012P_2 + 9.0$   
The system is operating on economic dispatch with  $P_1 = P_2 = 500$  MW and  
 $\frac{\partial F_L}{\partial P_2} = 0.2$ . Find the penalty factor of plant 1.

**UNIT-II**

4. Explain hydro thermal coordination and its importance. 12M  
**(OR)**
5. Explain briefly the constraints on unit commitment problem. What is spinning reserve and does this reserve help in operating a power system efficiently? 12M

**UNIT-III**

6. a What are the components of speed governor system of an alternator? Derive a transfer function and sketch a block diagram. 8M
- b The data pertaining to a single area power system with linear load-frequency characteristics are as follows: 4M
- Rated Capacity = 2000 MW, System Load = 1000 MW,  
Inertia Constant = 5 sec , Speed regulation = 0.03 pu,  
Load damping factor = 1 pu , Nominal Frequency = 50 Hz,  
Governor Time constant = 0 sec, Turbine time constant = 0 sec  
For a sudden change in load of 20 MW, determine the steady state frequency deviation and the change in generation in MW and reduction in original load in MW.
- (OR)**
7. a Derive the expression for steady state frequency deviation for single area load frequency control. 6M
- b A 210 MVA, 50 Hz Turbo Alternator operates at no load at 3000 rpm. A load of 75 MW is suddenly applied to the machine and the steam valves to the turbine commence to open after 1 sec due to the time lag in the governor system. Assuming Inertia Constant H of 5 KW-sec per KVA of generator capacity. Calculate the frequency to which the generated voltage drops before the steam flow commences to increase to meet the new load. 6M

**UNIT-IV**

8. Derive the expression for tie line power and hence obtain the block diagram of two area load frequency control problem? 12M
- (OR)**
9. a Obtain the state space representation of two area load frequency control problem 6M
- b What is the effect of integral controller on the tie line power change? 6M

**UNIT-V**

10. a What are the objectives of load compensation? 6M
- b List out the specification of load compensator. 6M
- (OR)**
11. a List out the advantages and disadvantages compensating equipment used in Transmission systems 6M
- b Explain any one type of compensation. 6M

# AR13

**CODE: 13ME4028**

**SET-1**

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

**IV B.Tech I Semester Regular & Supplementary Examinations, October-2017**

## **INDUSTRIAL HYDRAULICS & PNEUMATICS (Mechanical Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

### **PART-A**

**ANSWER ALL QUESTIONS**

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

1.
  - a) Why fluid power system is called muscle of the industry?
  - b) What is the function of an unloading valve?
  - c) List the applications of intensifier?
  - d) What is FRL unit?
  - e) What is a non positive displacement pump?
  - f) What is the purpose of a shuttle valve in a pneumatic circuit?
  - g) How do microprocessors differ from PLC's?
  - h) Where speed control circuits are required?
  - i) What are the main advantages of gear motors?
  - j) Draw the symbol of pressure relief valve?

### **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2.
  - a) List six basic components required in a hydraulic fluid power system and state their essential functions? [7M]
  - b) A fluid is to be lifted against a head of 120 m. The pumps that run at a speed of 1200 rpm with rated capacity of 300 liters per second are available. How many pumps are required to pump the water if specific speed is 700? [5M]

**(OR)**

3.
  - a) Differentiate between reciprocating pump and rotary pump with neat sketches? [5M]
  - b) What is meant by Hydraulic Actuators and how do you classify? [7M]

#### **UNIT-II**

4. Classify different accumulators used in a hydraulic system and explain spring loaded hydraulic accumulator. [12M]

**(OR)**

5. Draw the symbolic representations of the following control valves: [12M]
- i) Manually operated, spring centered, three position, four way valve
  - ii) Pressure reducing relief valve
  - iii) Simple pressure relief valve
  - iv) Four way, three position, proportional direction control valve
  - v) Pressure compensated flow control valve.

**UNIT-III**

6. a) Explain about plastic injection molding machine circuit with neat sketches? [8M]
- b) What are the problems caused by gases in hydraulic fluids? [4M]

**(OR)**

7. a) Explain about Speed control in one and both directions with neat sketches? [6M]
- b) Explain about meter-in & meter-out circuits with neat sketches? [6M]

**UNIT-IV**

8. a) Give complete classification of pneumatic actuator [6M]
- b) What do you mean by quick exhaust valve? Explain its working principle, with a neat sketch. [6M]

**(OR)**

9. a) Define PLC and explain the seven Basic electrical components to control the pneumatic system. [8M]
- b) State any six applications of pneumatic power? [4M]

**UNIT-V**

10. a) Explain pneumatic vacuum system? Describe the three applications of the pneumatic vacuum system? [4M]
- b) Briefly explain about position and pressure sensing? [8M]

**(OR)**

11. a) What are the essential elements of pneumatic circuit and state their functions with a neat sketch? [8M]
- b) What are the most common causes of hydraulic system break down? [4M]

# AR13

**CODE: 13EC4029**

**SET-1**

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

**IV B.Tech I Semester Regular & Supplementary Examinations, October-2017**

**MICROWAVE ENGINEERING  
(Electronics & Communication Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

## **PART-A**

**ANSWER ALL QUESTIONS**

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

1. a) Enumerate the basic advantages of microwaves  
b) What is meant by cavity resonator?  
c) Draw and mark all fields and currents of H-plane Tee  
d) List applications of directional couplers  
e) Explain the concept of bunching  
f) Write the expression for velocity modulation  
g) Discuss hull cut-off magnetic voltage  
h) List various types of slow wave structures  
i) Explain about negative resistance of IMPATT diode  
j) Discuss the importance of VSWR

## **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

### **UNIT-I**

2. a) Discuss about the TEM mode analysis of rectangular waveguide and also discuss about dominant and degenerate modes  
b) Derive the resonant frequency of rectangular cavity resonator  
(OR)
3. a) Discuss about Characteristic equation and cut off frequencies  
b) TM mode analysis of Rectangular waveguide

### **UNIT-II**

4. a) Discuss about Faraday rotation and explain any two devices which operates with Faraday rotation  
b) Discuss about the waveguide attenuation  
(OR)
5. a) Explain about the scattering matrix significance and properties of scattering matrix  
b) Derive the scattering matrix of directional coupler

**UNIT-III**

6. a) Explain about the velocity modulation process of two cavity klystron  
b) Discuss construction and operation of reflex klystron  
(OR)
7. a) Explain about the multicavity (four cavity) klystron amplifier  
b) Discuss the limitations of conventional tubes at microwave frequencies

**UNIT-IV**

8. a) Explain about amplification processes of TWT  
b) Discuss about 8 cavity cylindrical magnetron  
(OR)
9. a) Discuss about the hull cut-off voltage and magnetic flux density equation  
b) Discuss about construction of travelling wave tubes and define phase velocity, group velocity of TWT

**UNIT-V**

10. a) Discuss about the construction and operation of Gunn diode  
b) Explain about the power measurement using bolometer method  
(OR)
11. a) Discuss about the attenuation measurement  
b) Discuss about the measurement frequency and VSWR

**Time: 3 hours**

**Max.Marks:70**

**PART A**

**Answer all Questions**

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

1. a. Define Kernel.  
b. What is signals in LINUX?  
c. 'What are the data types in MySQL?  
d. What is sorting Query in MySQL?  
e. What is meant by PHP parser?  
f. How to call a PHP function?  
g. Define a Slicing String.  
h. What is Constructor?  
i. What is Perl Identifier?  
j. What is Perl Interpreter?

**PART B**

**Answer one question from each unit**

**[5 x 12=60]**

**UNIT-I**

2. a. Explain in detail about File management in LINUX OS. 6M  
b. Discuss about Scheduling in LINUX OS. 6M

**(OR)**

3. a. Write about the Features of open source software and Explain about Cloning and Personalities. 6M  
b. Write about Kernel mode and user mode. 6M

**UNIT-II**

4. Write SQL program to demonstrate String Operations 12M  
**(OR)**
5. a. Explain about Record selection Technique in MySQL 6M  
b. Write about working with Metadata. 6M

**UNIT-III**

6. What is Function in PHP? Explain about functions related to files (OPEN, READ, WRITE, CLOSE) with suitable examples. 12M  
**(OR)**
7. Explain about conditional and control statements in PHP with suitable examples 12M

**UNIT-IV**

8. What is an Exception? Demonstrate the use of Exception Handling in Python with program example 12M  
**(OR)**
9. Explain about  
a) Python List 6M  
b) Python String Operations 6M

**UNIT V**

10. a. Elaborate about the Perl Data Types. 6M  
b. Discuss about Perl Subroutine with example 6M  
**(OR)**
11. a. Discuss about working with files in Perl 6M  
b. Write about Perl Packages and Modules. 6M



# AR13

**CODE: 13IT4010**

**SET-2**

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

**IV B.Tech I Semester Regular & Supplementary Examinations, October-2017**

## **NETWORK SECURITY AND CRYPTOGRAPHY (Information Technology)**

**Time: 3 Hours**

**Max Marks: 70**

### **PART-A**

**ANSWER ALL QUESTIONS**

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

1. a) Define cryptanalysis.  
b) Define SQL injection.  
c) What is chosen plaintext attack?  
d) Mention various block cipher modes of operation.  
e) What is RSA?  
f) Write the fields of IPSec AH header.  
g) What is the purpose of change cipher spec protocol?  
h) Write the functions of PGP.  
i) Define Worm.  
j) Define Zombie.

### **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2. a) List and explain X.800 security mechanisms. 7M  
b) Draw and explain network access security model. 5M  
(OR)
3. a) What is substitution technique? With examples explain playfair and Hill ciphers. 7M  
b) Write about software vulnerabilities. 5M

#### **UNIT-II**

4. a) Explain IDEA algorithm in detail. 7M  
b) With neat sketches explain key distribution mechanisms of conventional encryption. 5M  
(OR)
5. a) Describe the process of HMAC algorithm. 6M  
b) Explain the man in the middle attack of Diffie and Hellman key exchange algorithm. 6M

## AR13

CODE: 13IT4010

SET-2

### UNIT-III

6. a) Write the summary of Kerberos v4 message exchanges and explain each message in detail. 8M  
b) Draw the format of X.509 certificate revocation list. 4M  
(OR)
7. a) Draw the general format of PGP message and explain the structure of private and public key rings. 8M  
b) Write about the cryptographic algorithms used in S/MIME. 4M

### UNIT-IV

8. a) Draw and explain the basic combinations of IPSec security associations. 5M  
b) Write about SSL handshake and alert protocols. 7M  
(OR)
9. a) List and explain the function of SET participants. 5M  
b) Write in detail about SET payment authorization and payment capture. 7M

### UNIT-V

10. a) Explain about statistical and rule based intrusion detection techniques. 6M  
b) Write about virus phases and structure. 6M  
(OR)
11. a) Explain firewall characteristics and types. 8M  
b) Explain how to build a trusted system. 4M