

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMUS)

IV B.Tech I Semester Supplementary Examinations, January-2019

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 a black body radiation?
b) What do you understand by spectral signature?
c) Define scattering of EMR?
d) What are the primary absorbers of electromagnetic energy in the atmosphere?
e) What are polar orbiting satellites?
f) Define resolution?
g) What is MSS?
h) What is RADAR?
i) What are the software components of a GIS?
j) What is reclassification in GIS?

PART-B

Answer one question from each Unit

[5 x 12=60M]

UNIT – 1

2. a) Explain the necessity and importance of remote sensing. [6M]
b) Explain energy interaction with the earth surface? [6M]
- (OR)
3. a) What are the advantages and disadvantages of using Remotely Sensed data? [6M]
b) What are the essential components of a remote sensing system? Explain? [6M]

UNIT – II

4. a) What is scattering? Explain about different types of scatterings. [6M]
b) What are the different digital image data formats and explain? [6M]
- (OR)
5. a) What are the different types of remote sensing platforms and sensors? [6M]
b) Write short notes on sensors and explain briefly about different types of resolution? [6M]

UNIT – III

6. Explain the supervised and unsupervised classification of an image? [12M]

(OR)

7. What is visual interpretation? What are the basic elements to be considered during visual interpretation of satellite images? [12M]

UNIT – IV

8. a) Define map projection? Explain commonly used map projections? [6M]

- b) Define maps and explain the types of maps. [6M]

(OR)

9. a) Explain about spaghetti data model with the help of a neat sketch. [6M]

- b) Differentiate between raster and vector Data models? [6M]

UNIT – V

10. Explain about applications of RS & GIS in Civil engineering [12M]

(OR)

11. Explain various methods of Geospatial data analysis [12M]

**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 an incremental fuel cost and what are its units?
- b) How is the inequality constraint considered in the determination of optimum allocation?
- c) Compare the UC problem with economic load dispatch.
- d) Define short-term hydro-thermal co-ordination?
- e) What is meant by dynamic response in LFC?
- f) Explain briefly need of a speed changer?
- g) Give the error criterion function for the two-area system?
- h) What is a tie line?
- i) Explain briefly need of compensation.
- j) What are the Characteristics of an ideal compensation?

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

2. a) Derive the transmission loss formula for a system consisting of n- 8M
generating plants supplying several loads inter connected through
a transmission networks. State any assumptions are made.
- b) Incremental fuel costs in Rs/MWh for 2 units in a plant are given 4M
by $\frac{dc_1}{dp_{G_1}} = 0.2P_{G_1} + 25$, $\frac{dc_2}{dp_{G_2}} = 0.2P_{G_2} + 32$

Determine the economic operating schedule and load is 250MW.
Assume both the units are operating.

(OR)

3. a) Incremental fuel costs in Rs/MWh for 2 units in a plant are given 6M
by $\frac{dc_1}{dp_{G_1}} = 0.2P_{G_1} + 25$, $\frac{dc_2}{dp_{G_2}} = 0.2P_{G_2} + 32$

Assuming continuous running with a total load of 150 MW,
calculate the saving per hour obtained by using the most
economical division of load between the units as compared with
loading each equally. The maximum and minimum operational
loadings are the same for each unit and are 125 and 20 MW,
respectively.

- b) Explain the need of economical load dispatch for a given power system? 6M

UNIT-II

4. a) Explain the dynamic programming method of solving unit commitment. 6M
b) Explain the need of hydro –thermal coordination. 6M
(OR)
5. a) Explain the need of an Optimal unit commitment problem 6M
b) Explain the short range hydrothermal scheduling problem. 6M

UNIT-III

6. a) How speed governor mechanism is modelled and Explain its operations with the speed load characteristics. 6M
b) Explain proportional plus integral load frequency control of a single area system with a neat block diagram. 6M
(OR)
7. a) Describe the load frequency control and economic dispatch control with necessary diagram. 6M
b) Explain briefly different parts of turbine speed governing system With a neat diagram? 6M

UNIT-IV

8. Draw the block diagram of uncontrolled two area load frequency control system and explain the salient features under static condition 12M
(OR)
9. Derive the expression for change in tie line power and draw its block diagram? 12M

UNIT-V

10. a) Discuss the transmission lines compensation? 6M
b) Define fundamentals of FACTS devices and Write the need for FACTS controllers. 6M
(OR)
11. a) Explain the uncompensated and compensated transmission lines 6M
b) Discuss the specification of load compensation. 6M

AR13

CODE: 13ME4028

SET-1

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

IV B.Tech I Semester Supplementary Examinations, January-2019

INDUSTRIAL HYDRAULICS & PNEUMATICS

(Mechanical Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Differentiate pump and motor
b) What are the application of fluid power systems
c) Name any two flow control valves
d) What is the purpose of direction control valves
e) What are advantages of pneumatic system over hydraulic system
f) What is the need of cylinder end cushion
g) Name any two types valves used for speed control of fluid power systems
h) What is PE converter
i) Write any two actuators
j) What are the main components of hydraulic cylinder

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Explain the operation of an external gear pump with a diagram. 6 M
b) What are the different types of hydraulic cylinders? 6 M
- (OR)**
3. a) Describe the advantages and disadvantages of hydraulic systems. 6 M
b) Explain the operation of vane pump. 6 M

UNIT-II

4. a) Give the constructional details of pressure control valve and explain its operation. 6 M
b) Draw the diagram of a bladder type of accumulator and explain its operation 6 M

(OR)

5. A hydraulic cylinder with a bore diameter of 80 mm and rod diameter of 25mm is to be used in a system with a $4.8\text{m}^3/\text{h}$ pump. What are the return flow rates when the cylinder is extending and retracting? Also calculate the speed of piston during extension and retraction stroke. 12 M

UNIT-III

6. a) Draw and explain the speed control circuit when cylinder should extend first and retract last 6 M
- b) Explain how double acting cylinder speed is controlled by using meter-in flow control valve. 6 M

(OR)

7. Design a hydraulic circuit to provide the following functions in a sequence for a machine tool. Explain the components of the circuit and its operation. 12 M
- (i) the clamping a job (ii) drilling a hole in the job
(iii) with drawal of the drill (iv) un-clamping the job.

UNIT-IV

8. a) Discuss the role of electrical components of pressure, temperature and limit switches in fluid power industry. 6 M
- b) Explain PE converter and PLC applications in fluid power systems 6 M

(OR)

9. a) Explain the operation of any one pneumatic actuator with a diagram. 6 M
- b) Why 3 position 4 way pneumatic direction control valve has 5 ports whereas 3 position 4 way hydraulic direction control valve has 4 ports. Give your reasons and arguments. 6 M

UNIT-V

10. a) Develop a single cylinder circuit for pneumatic systems using limit switches and relays. 6 M
- b) Explain the operation of any one pressure sequence valve 6 M

(OR)

11. a) Draw and explain the speed control circuit for pneumatic systems 6 M
- b) With neat sketch explain any one pneumatic vacuum systems 6 M

**MICROWAVE ENGINEERING
(Electronics & Communication Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) What are degenerate modes in a rectangular waveguide?
b) Mention the applications of waveguides.
c) Give the scattering matrix for directional coupler.
d) Define Hybrid ring. What is the other name for hybrid ring?
e) What are the limitations of conventional tubes at microwave frequencies?
f) Draw the Equivalent circuit of reflex klystron.
g) What is meant by hull cut-off condition in magnetrons?
h) State the characteristics of Magnetron.
i) What are factors reducing efficiency of IMPATT diode?
j) How do you measure microwave frequency?

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

2. a) What are TE modes in a rectangular waveguide? Sketch the field patterns for dominant modes in a rectangular waveguides. 6M
b) What do you understand by the terms cut-off wavelength, guide wavelengths, phase velocity and group velocity. Obtain the mathematical relations for each one of the term. 6M

(OR)

3. a) Show that the TEM, TM₀₁ and TM₁₀ modes in a rectangular waveguide do not exist. 6M
b) Derive the expression for resonant frequency in a rectangular cavity resonator. 6M

UNIT-II

4. a) Describe in detail wave guide irises and attenuators. 6M
b) What is faraday rotation? Give the constructional features and working principle operation of Isolator. 6M

(OR)

5. a) Describe the structure and explain the working of a H-plane Tee junction with neat sketch. Derive the S matrix for H plane Tee junction. 6M
- b) Mention the applications of magic tee and 3 port circulator. 6M

UNIT-III

6. a) A two cavity klystron amplifier has the following parameters 8M
Beam Voltage: $V_0 = 900\text{V}$, Beam Current: $I_0 = 30\text{mA}$, Frequency: $f = 8\text{GHz}$, gap spacing in either cavity: $d = 1\text{mm}$, Spacing between centres of cavities : $L = 4\text{cm}$, Effective shunt impedance: $R_{sh} = 40\text{ k}\Omega$. Determine (i) the electron velocity (ii) the d.c. electron transit time (iii) the input voltage for maximum output voltage (iv) the voltage gain in decibels.
- b) What is velocity and current modulation in reflex klystron? 4M

(OR)

7. a) By means of an applegate diagram, explain the principle and working operation of reflex klystron with neat diagram 8M
- b) Show that the theoretical efficiency of reflex klystron is 27.78 % 4M

UNIT-IV

8. a) Differentiate between Klystrons and TWT. 6M
- b) A TWT operates with following parameters: $V_b = 2.5\text{ kV}$, $I_b = 25\text{ mA}$, $Z_0 = 10$, circuit length: $L = 50$, $f = 9\text{GHz}$. Find the gain parameter and power gain. 6M

(OR)

9. a) What are crossfiled devices? How does a magnetron sustain its oscillations using this cross-field? Assume π – mode for explaining them. 6M
- b) Derive an expression for the cut-off magnetic flux density with reference to a cylindrical cavity magnetron. 6M

UNIT-V

10. a) A Gunn diode has a drift length of $5\text{ }\mu\text{m}$. what minimum voltage would be needed to initiate Gunn effect? What are the elements that exhibit Gunn effect? 6M
- b) Draw and explain in detail about IMPATT diode. 6M

(OR)

11. a) Explain the method of impedance determination at microwave frequencies, using a slotted line. 6M
- b) Two identical 30 dB directional couplers are used to sample incident and reflected power in a waveguide. $VSWR = 2$ and the output of the coupler sampling incident power = 4.5 mW . What is the value of reflected power? 6M

Time: 3 hours

Max.Marks:70

PART A

Answer all Questions

[1 x 10 = 10M]

1. a. What is Scheduling?
b. Define a process?
c. What is RDBMS?
d. What is meant by Redundancy?
e. List the characteristics of PHP
f. Write a sample "Hello World" script in PHP.
g. What is a Python IDLE?
h. Define a Nested Sequence.
i. Expand the full form of PERL.
j. What are the three basic data types of PERL

PART B

Answer one question from each unit

[5 x 12=60]

UNIT- 1

2. a. What is Open Source? Discuss in detail about Need, Advantage and Applications of Open Source 8M
b. List any five Open Source Operating Systems 4M
(OR)
3. Explain the architecture of LINUX OS and Discuss about Kernel and User Mode. 12M

UNIT- II

4. Explain in detail about the procedure to START, TERMINATE and WRITING SQL program with suitable example. 12M
(OR)
5. a. Explain how Date & Time manipulated in MySQL. 6M
b. Write short note on MySQL and Web. 6M

UNIT- III

6. What is Operator? List different types of Operators and Explain about each Operator with suitable examples 12M
(OR)
7. a. Explain different data types in PHP. 8M
b. Write short note on PHP and SQL database. 4M

UNIT- IV

8. Write a Python Script to Create, Write, Read and Close a file and explain each method 12M
(OR)
9. Explain about
i) Python Dictionary 6M
ii) Python Tuples 6M

UNIT- V

10. a. What is Perl? Explain about the features Perl. 6M
b. Write about Perl parsing rules. 6M
(OR)
11. Explain in detail about different types of LOOP in Perl with program examples 12M

AR13

CODE: 13IT4010

SET-2

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

IV B.Tech I Semester Supplementary Examinations, January-2019

NETWORK SECURITY AND CRYPTOGRAPHY (Information Technology)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
 - a) What are the key principles of security?
 - b) Define briefly about the conventional cryptography.
 - c) What is differential cryptanalysis?
 - d) What are the CFB and OFB modes
 - e) What is meant by one-way property in hash function
 - f) What is the difference between a message authentication code and a one-way hash function
 - g) What are the entities that constitute a full-service kerberos environment?
 - h) How is signed data entity of S/MIME prepared?
 - i) What is meant by Trojan horse?
 - j) What is meant by generic decryption technology

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2.
 - a) **Demonstrate** Model for Network security with a neat diagram? 5M
 - b) **Apply** Playfair cipher with the Key word "KEYWORD" and 7M
Encrypt the following plaintext "ALLTHEBEST".
- (OR)**
3.
 - a) **Show** the relationship between security mechanisms and services 6M
in terms of matrix.
 - b) **Apply** Caesar Cipher to generate cipher text using K = 10 for the 6M
following plain text using "DONOT" and also Prove decryption
to get original plain text using K = 10.

UNIT-II

4. a) Users A and B use the Diffie-Hellman key exchange technique with a common prime $q = 11$ and a primitive root $a = 2$ 6M
i) If user A has public key $Y_A = 9$, what is A's private key X_A ?
If user B has public key $Y_B = 3$, what is B's private key X_B ?
b) **Illustrate** HMAC structure with a neat diagram
(OR)
5. a) **Apply** RSA algorithm to perform encryption and decryption for the following: $p = 3$; $q = 11$, $e = 7$; $M = 5$.? 6M
b) On the elliptic curve over $y^2 = x^3 - 36x$, Find points P & Q that satisfy Curve? 6M

UNIT-III

6. a) **Outline** Simple Authentication Dialogue of Kerberos Version 4 6M
b) **Explain** about MIME content types. 6M
(OR)
7. a) **Compare** Security association database and security policy database. 6M
b) **Discuss** about S/MIME in detail. 6M

UNIT-IV

8. a) **Demonstrate** distribution of Public Keys 6M
b) **Define** the goal of each phase in the SSL Handshake Protocol. 6M
(OR)
9. a) **Illustrate** the concept of encapsulating the security payload with neat diagram 6M
b) **Illustrate** X.509 public-key certificates with neat diagram. 6M

UNIT-V

10. a) Explain attacks on packet filtering firewall. What are the counter measures of these attacks? 6M
b) What are advantages and disadvantages of Application Gateways? 6M
(OR)
11. a) Explain various Intrusion techniques? 6M
b) With neat diagram explain digital immune systems? 6M