AR16

CODE: 16CE4025 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM

(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)	Show and explains the various wave length regions of electromagnetic spectrum?	7
	b)	What is meant by atmospheric windows and explain it with a neat sketch?	7
		(OR)	
2.	a)	Differentiate between Active Remote sensing and Passive Remote sensing.	7
	b)	Explain components of remote sensing.	7

UNIT-II

3.	a)	Classify sensors in remote sensing.	7
	b)	Report very briefly on " Black body radiation".	7
		(OR)	
4.	a)	Brief note on Sun Synchronous satellites.	7
	b)	Explain about the digital data image formats.	7

UNIT-III

5.		Review in detail about the various elements of image interpretation in remote sensing.	14
		(OR)	
6.		Define the term image enhancement and explain about the various methods of image enhancement?	14

UNIT-IV

7.	a)	Explain Azimuthal projection and its significance.	7
	b)	Describe the parameters of projection.	7
		(OR)	
8.	a)	Describe the software and hardware components of GIS.	7
	b)	Illustrate GIS architecture with the help of neat sketches.	7

UNIT-V

9.	a)	Write about the logical operators in spatial analysis?	7
	b)	Discuss the role of RS urban planning?	7
		(OR)	
10.	a)	Explain with the help of case study, the methodology for using satellite imagery and GIS to identify potential zones of ground water.	7
	b)	Analyse the applications of Remote Sensing in the land use and land cover.	7

AR16

CODE: 16EE4023 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

POWER SEMICONDUCTOR DRIVES

(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) Plugging braking method of dc motor is highly inefficient, justify. [7M]
   b) A 220V, 970 rpm, 100A dc separately excited motor has an armature resistance of 0.05 Ω. It is braked by plugging from an initial speed of 1000 rpm. Calculate resistance to be placed in armature circuit to limit braking current to twice the full load value. [7M]

(OR)

2. A 220V, 750 rpm, 200A separately excited motor has an armature resistance of 0.05Ω. armature is fed from a 3-ϕ non-circulating current dual converter consisting of fully-controlled rectifiers A and B. Rectifier A and B provides motoring operation in forward and reverse direction respectively. Line voltage of ac source is 400V. calculate firing angles of rectifiers for the following assuming continuous conduction. [14M]
   (i) Motoring operation at rated torque and 600 rpm.
   (ii) Regenerative braking operation at rated torque and 600 rpm.

UNIT-II

3. a) A 220V, 1500 rpm, 10A separately excited dc motor is fed from a single-phase fully-controlled rectifier with an ac source voltage of 230V, 50Hz. Ra=2Ω. Conduction can be assumed to be continuous. Calculate firing angles for [9M]
   (i) Half the rated motor torque and 500 rpm.
   (ii) Rated motor torque and -1000 rpm.
   b) Explain the operation of dc series motor fed by single phase half controlled rectifier [5M]

(OR)

4. a) Show that a given dc motor works in one and fourth quadrants in speed(y-axis) torque(x-axis) plane when fed by 1-phase fully-controlled rectifier. Draw output voltage and current waveforms, speed torque characteristics. [9M]
   b) Give the disadvantages of rectifier fed dc drives compared to chopper fed drives. [5M]

UNIT-III

5. a) Discuss the control of two-quadrant chopper fed separately excited dc motor. [9M]
   b) Is an innermost voltage loop necessary for fast response of the dc motor drive? [5M]

(OR)

6. a) A 220V, 24A, 100 rpm, separately excited dc motor has an armature resistance of 2Ω. Motor is controlled by a chopper with frequency of 500 Hz and source voltage of 230V. Calculate the duty ratio for 1.2 times rated torque and 500 rpm. [7M]

   b) Draw and explain regenerative braking characteristics of chopper controlled dc series motor. [7M]

UNIT-IV

7. a) Why stator voltage control is an inefficient method of induction motor speed control? [7M]

   b) Explain the operation of closed-loop control of current regulated voltage source inverter fed induction motor drive. [7M]

(OR)

8. a) Variable frequency control of induction motor is more efficient than stator voltage control, why? Explain with speed torque characteristics. [9M]

   b) Compare current source inverter and voltage source inverter fed drives [5M]

UNIT-V

9. a) What are the advantages of static rotor resistance control over conventional methods of rotor resistance control? [5M]

   b) Explain briefly modes of variable frequency control of synchronous motor drives. [9M]

(OR)

10. Explain the performance of wound field induction motor drive controlled by any one slip power recovery scheme with speed torque characteristics. [14M]

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AR16

CODE: 16IME4026 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

INDUSTRIAL HYDRAULICS AND PNEUMATICS

(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)	List out the important specification of hydraulic pump	7M
	b)	Explain the construction and working of a linear axis piston pump? what are its salient features?	7M
		(OR)	
2.	a)	Analyse cushioning needed in hydraulic cylinder ? Explain with a neat sketch ,the principle and operation of a fixed cushion cylinder.	7M
	b)	Explain construction and function of external gear motor.	7M

UNIT-II

3.	a)	Describe the working principle of counter balance valve and state its application.	7M
	b)	Explain the construction and working of Pressure compensated flow control valve	7M
		(OR)	
4.	a)	With the help of neat sketch Describe the function of an unloading valve.	7M
	b)	Describe four way directional control valve	7M

UNIT-III

5.	a)	With the help of neat sketch explain regenerative circuit	7M
	b)	With the help of neat sketch explain a clamping circuit	7M
		(OR)	
6.		With the help of suitable sketch explain various components of hydraulic press	14M

UNIT-IV

7.	a)	With the help of neat sketch explain about various rotary compressor	7M
	b)	Write short notes on various direction control valves used in pneumatic systems	7M
		(OR)	
8.		Draw the ladder diagram and list the input/output devices for a double acting cylinder operated by three positions, double soleniod valve for automatic reciprocation. The forward stroke to commence every 30 seconds and return sroke commences every 60 seconds	14M

UNIT-V

9.	a)	With the help of neat sketch and explain the working of "AND" gate and "OR" gates	7M
	b)	Write short notes on pneumatic switching elements	7M
		(OR)	
10.		With the help of neat circuit diagram explain pneumatic logic sequencing circuit	14M

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AR16

CODE: 16EC4027 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

MICROWAVE ENGINEERING

(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)	Analyze wave propagation of rectangular wave guide	7M
	b)	Derive the field components of TE wave in rectangular waveguide	7M
		(OR)	
2.	a)	Discusses about the impossibility of TEM in rectangular wave guide	7M
	b)	Discuss in detailed about dominant and degenerate modes in rectangular wave guide.	7M

UNIT-II

3.	a)	Explain the working principle of E plane tee and Its scattering matrix?	7M
	b)	Analyze the Hybrid ring operation with scattering matrix	7M
		(OR)	
4.	a)	How a magic tee can acts like a mixer in RF communication systems and explain	7M
	b)	Discuss in detailed about the construction and operation of Gyrator	7M

UNIT-III

5.	a)	Discusses about the construction and operation of two cavity klystron amplifier.	7M
	b)	Discusses in brief about the bunching process of two cavity klystron	7M
		(OR)	
6.	a)	Analyze the output power and efficiency of two cavity klystron	7M
	b)	Discusses about the construction and operation of reflex klystron.	7M

UNIT-IV

7.	a)	Explain the mechanism how slow wave structure can provide maximum interaction between electron beam and RF signal	7M
	b)	Express Hull cut off Magnetic field B_{OC} for a fixed voltage in the cylindrical magnetron	7M
		(OR)	
8.	a)	Describe the construction and working of magnetron as an Oscillator	7M
	b)	Explain the principle of PI mode oscillations in cylindrical magnetron	7M

UNIT-V

9.	a)	Describe the RWH theory of the GUNN diode	7M
	b)	Explain clearly about the microwave power measurement using Bolometer method with neat sketch.	7M
		(OR)	
10.	a)	Explain how an IMPATT diode exhibits a differential negative resistance	7M
	b)	Demonstrate clearly about the microwave bench setup and precautions.	7M

AR16

CODE: 16CS4024 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

UML & DESIGN PATTERNS

(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)	Explain briefly the basic features of object orientation?	7M
	(b)	Explain Software development life cycle process?	7M
		(OR)	
2.	(a)	Define Relationship? Explain the four adornments that apply to an association and dependency?	7M
	(b)	Draw and Explain Object diagram that contain a three level hierarchy of objects?	7M

UNIT-II

3.	(a)	Explain the steps to model flow of control by time ordering?	7M
	(b)	Draw and explain a Sequence Diagram that specifies the flow of control involved in initiating a simple ,two- party phone call?	7M
		(OR)	
4.	(a)	Draw and explain briefly a use case diagram that depicts the context of a credit card validation system?	7M
	(b)	Draw and explain the activity diagram for bank ATM system?	7M

UNIT-III

5.	(a)	Explain States and Events and discuss the preparation of state chart diagram?	7M
	(b)	Draw a state chart diagram using sequential sub states and concurrent sub states?	7M
		(OR)	
6.	(a)	Explain the steps to model executables and source code using component diagrams?	7M
	(b)	Explain in detail about deployment diagram with an example?	7M

UNIT-IV

7.	(a)	List and explain the four essentials elements of pattern?	7M
	(b)	Describe the sections and their use in design patterns?	7M
		(OR)	
8.	(a)	Describe the different approaches to find the design pattern?	7M
	(b)	Explain the steps involved in applying design pattern effectively?	7M

UNIT-V

9.	(a)	Explain the useful techniques for implementing abstract factory pattern?	7M
	(b)	List out the benefits of singleton pattern? Explain the implementation issues considered when using singleton pattern?	7M
		(OR)	
10.	(a)	Explain briefly about bridge pattern?	7M
	(b)	Explain briefly about composite pattern?	7M

AR13

CODE: 13EC4029 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

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 advantage of Microwaves.
   b) Calculate the resonant frequency of Circular resonator of dimensions a=3 cm, b=2 cm and l=4 cm when the mode of operator is TE 101.
   c) Why S-parameters used in a microwave network analysis?
   d) List out the applications of Magic Tee.
   e) What are the limitations of Conventional vacuum tubes at microwave frequencies?
   f) Write down the performance characteristics of Reflex Klystron.
   g) What is meant by strapping in magnetron.
   h) Define Transit time.
   i) List out the applications of microwave solid state devices.
   j) What is a slotted section?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. Explain the propagation of waves in Rectangular waveguides and Obtain all the field components in TM mode. 12M

(OR)

3. a) Discuss in detail about Guide Wave length, Group velocity and phase velocity. 6M
   b) A rectangular waveguide has a=4 cms, b=3 cms as its sectional dimensions. Find all the modes which will propagate at 5000MHz. 6M

UNIT-II

4. a) What is a phase shifter? Explain its principles of operation with a neat sketch. Give is applications. 6M
   b) Find the S parameters for a lossless 10 dB directional coupler. The directivity is 30 dB, and the VSWR at each port is 1.0 under matched condition. 6M

(OR)

5. a) Explain the operation of H-Plane Tee Junction and Derive it scattering matrix with the help of the properties. 6M
   b) Discuss how to obtain S -parameters for a N-port network 6M

AR13

CODE: 13EC4029 SET-2

UNIT-III

6.		Explain the principle of operation of a two-cavity Klystron with a neat diagram and derive its Bunching Parameters.	12M
		(OR)	
7.	a)	Prove that Theoretical efficiency of reflex klystron is 27.78%.	6M
	b)	Discuss in detail about Multi -Cavity Klystron.	6M

UNIT-IV

8.	a)	Based on the constructional features and its operation of TWT, Justify how the power conversion efficiency can be improved	6M
	b)	Derive Hull cut off voltage equation.	6M
		(OR)	
9.	a)	A normal Circulator magnetron has following parameters: Cathode radius=2mm, anode radius=4mm. Determine Hull cutoff voltage if the magnetic flux density is $0.3Wb/m^2$ and the cutoff magnetic flux density if Vo=15KV.	6M
	b)	Write down the differences between TWT and Klystron	6M

UNIT-V

10.	a)	Explain Gunn effect using two valley theory.Also explain several modes of operation and applications of Gunn diodes.	6M
	b)	Discuss methods for the measurement of low and high microwave power.	6M
		(OR)	
11.	a)	Describe briefly the equipment that is used to measure impedance using a slotted line.	6M
	b)	Explain the principle of operation of an IMPATT diode.	6M

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