Hall Ticket No: **Question Paper Code:**

ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

III/IV B. Tech I- Semester Regular Examinations Nov– 2017

ANTENNAS AND WAVE PROPAGATION

(ECE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1. a) Define and explain in detail the terms "Radiation Resistance", "Gain", "Directivity", "effective aperture" and "polarization of an antenna" **(6M)**
   b) Derive the electric and magnetic field components of a Hertizian Dipole (**6M)**

(OR)

2. Derive the near field and far field electric and magnetic component of a finite length dipole and obtain the radiation pattern for various values of the length. (**12M)**

UNIT-II

3. a)Differentiate the V antenna from the Rhombic antenna. Explain their construction and principles in detail. (**6M)**
   b)List out the differences between resonant and non resonant antennas. (**6M)**

(OR)

4. a)With the neat diagram, explain the principle of Parabolic reflector antenna and various types of feed used. (**6M)**
   b)With suitable diagram explain the construction and principle of Helical antenna in different mode of operation. **(6M)**

UNIT-III

5. a) Derive the expression for the field produced by a linear array and deduce it for an end fire array (**8M)**

   b) Compare end fire and broad side array and also discuss about increasing directivity. **(4M)**

(OR)

6. a) What are the advantages with array technique in antenna system (**6M)**

b) By using the pattern multiplication technique, draw the radiation pattern of 4- element array antenna. (**6M)**

UNIT-IV

7. a) List the various method of measuring the gain of an antenna and explain any one with neat diagram. (**6M)**

   b) Explain the following : (i) Anechoic Chamber (ii) GTEM cell (iii) compact range test site (**6M)**

(OR)

8. a) With a neat diagram, explain the method adopted in measurement of antenna pattern. **(6M)**

   b) Explain the method of measuring the polarization of an antenna with necessary diagrams. (**6M)**

UNIT-V

9. a) Describe the space wave propagation and explain the importance of the line of sight propagation. (**6M)**

   b) Explain the following the terms with diagram (i) Duct propagation (ii) Critical frequency (iii) Skip zone. (**6M)**

(OR)

10. a) Explain the ground wave propagation of radio waves (**6M)**

    b) Write a short note on Faraday rotation. (**6M)**

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(AUTONOMOUS)

III/IV B. Tech I- Semester Regular Examinations Nov– 2017

COMMUNICATION SYSTEM ENGINEERING

(ECE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1. a) How the SSB is generated from DSB. Explain with mathematical analysis? CO1 **(7M)**

   b) What are the applications of linear modulation systems? Compare AM, DSB, SSB, VSB amplitude Modulation systems? CO1 **(5M)**

(OR)

2. a) What are the differences between square law modulator and balanced modulator? CO1 **(4M)**

   b) A 400W carrier is modulated to a depth of 75%. Calculate the total power in the modulated wave; assume the modulating signal to be sinusoidal. CO1 **(4M)**

   c) A broadcast radio transmitter radiates 5Kw power when the modulating percentage is 60%. How much is the carrier power? CO1 **(4M)**

UNIT-II

3. a) Draw and Analyze the Spectrum of an FM signal CO1 **(6M)**

   b) A carrier is frequency modulated by a sinusoidal modulating signal of frequency 2kHz, resulting in a frequency deviation of 5kHz.What is the bandwidth occupied by the modulated wave form? The amplitude of the modulating sinusoid is increased by a factor of 3 and its frequency lowered by 1kHz. What is the new bandwidth? CO2 **(6M)**

(OR)

4. a) Compare Phase Modulation and Frequency Modulation. CO2 **(4M)**

   b) What are the advantages of balanced frequency discriminator? Analyze the circuit diagram and its response? CO2 **(8M)**

UNIT-III

5. a) Explain the principle of operation of super heterodyne type AM radio receiver? CO3 **(6M)**

   b) Why the frequency conversion is required in receivers? Explain with one example? CO3 **(6M)**

(OR)

6. a) Explain the principle of operation of FM Transmitter with specifications? CO3 **(6M)**

   b) Compare pre-emphasis and de-emphasis circuits? CO3 **(8M)**

UNIT-IV

7. a) Prove that the figure of merit of DSB is same as SSB? CO4 **(9M)**

   b) The noise figure of an amplifier is 8 dB. The input signal-to-noise ratio is 45dB. Calculate output signal-to-noise ratio. CO4 **(3M)**

(OR)

8. Explain the threshold effect in angle modulation. Plot the output signal to noise ratio vs base band SNR for various values of beta for an FM system. CO4 **(12M)**

UNIT-V

9. a) Explain the principle of operation of Transponder ? What are the specifications of down link model? CO5 **(7M)**

   b) Explain Satellite system parameters? CO5 **(5M)**

(OR)

10. a) Derive Satellite system Link equations? CO5 **(7M)**

    b) Describe Geosynchronous Satellite orbits? CO5 **(5M)**

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ANIL NEERUKONDA INSTITUTE OF TECHNOLOGY & SCIENCES

(AUTONOMOUS)

III/IV B. Tech I- Semester Regular Examinations Nov– 2017

COMPUTER ARCHITECTURE AND ORGANIZATION

(ECE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1. a) Draw one stage of arithmetic logic shift unit and explain its operation with the help of function table. **(8M)**

   b) An 8-bit register contain the binary value 10011100. What is the register value after an arithmetic shift right? Starting from the initial number 10011100, determine the register value after an arithmetic shift left, and state whether there is an overflow. (**4M)**

(OR)

2. a) Draw the diagram of a bus system that connects eight registers with two bits in each of them. **(4M)**

   b) Show the hardware that implements the following statement. Include the logic gates for the control function and a block diagram for the binary counter with a count enable input. xyT0 + T1+ y'T2: AR <- AR+1 where T0, T1 and T2 are timing signals. **(8M)**

UNIT-II

3. a) Distinguish between hardwired control and microprogrammed control. **(4M)**

   b) Explain how the registers and memory of basic computer are connected to the common bus system with the help of a diagram. **(8M)**

(OR)

4. Illustrate the design of computer with microprogrammed control. **(12M)**

UNIT-III

5. a) Write programs to execute Y = (A-B) / (C + D*E) using one-address, two-address and three-address instructions. **(9M)**

   b) List the characteristics of CISC architecture. **(3M)**

(OR)

6. a) A computer has 32-bit instructions and 12-bit addresses. If there are 250 two-address instructions, how many one-address instructions can be formulated? **(3M)**
   b) Explain the addressing modes typically present in a computer. **(9M)**

UNIT-IV

7. a) Justify the need for memory hierarchy in a computer. **(6M)**
   b) Explain briefly the concept of virtual memory. **(6M)**

(OR)

8. a) Describe the concept of cache memory. Explain the direct mapping technique? **(4M)**

   b) How many 128 × 8 RAM chips are needed to provide a memory capacity of 2048 bytes? How many lines of the address bus must be used to access 2048 bytes of memory? How many of these lines will be common to all chips? **(4M)**

UNIT-V

9. Describe the process of Direct Memory Access in detail with the help of a block diagram. **(12M)**

(OR)

10. a) Explain daisy chaining priority interrupt scheme. (**6M)**
    b) Describe the interconnection structures used in multiprocessor systems. **(6M)**

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(AUTONOMOUS)

III/IV B. Tech I- Semester Regular Examinations Nov– 2017

INTEGRATED CIRCUITS AND APPLICATIONS

(ECE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1. a)Draw the circuit diagram, function table and logic symbol for a 3-input CMOS NOR gate. **(6M)**
   b). Explain how CMOS device is destroyed? **(6M)**

(OR)

2. a)Distinguish between static and dynamic power dissipation of a circuit? Derive an expression for static power dissipation. **(6M)**
   b).What is the difference between transmission time and propagation delay? Explain these parameters with respect to CMOS logic **(6M)**

UNIT-II

3. a)Design a wide-band pass filter having f_L = 400Hz, f_H = 2KHz and pass band gain of 4. Find the value of figure of merit (Q) of the filter **(6M)**
   b) Design a first order Low-pass filter for cut-off frequency of 2 KHz and pass-band gain of 2. **(6M)**

(OR)

4. a) How is voltage regulators classified? Explain a series voltage regulator. **(6M)**
   b) Explain the IC 723 general purpose voltage regulator **(6M)**

UNIT-III

5. a)Briefly explain the working of PLL with neat block diagram. Discuss the effect of Low pass filter time constant on the lock range and capture range of the system **(6M)**
   b)Draw the PLL circuit as frequency multiplier and explain **(6M)**

(OR)

6. a).Design monostable multivibrator using 555 timer to produce a pulse width of 100ms **(6M)**

b).With suitable block diagram, explain the operation of 566 voltage controlled oscillator Also derive an expression for the frequency of the output waveform generated **(6M)**

UNIT-IV

7. a). How many resistors are required for an 8-bit weighted resistors D/A converter?What are those resistor values, assuming the smallest resistance is R? **(6M)**

b). Draw the circuit of weighted resistor DAC and derive expression for output-analog voltage. **(6M)**

(OR)

8. a) Describe the operation of dual slope A/D converter with necessary diagrams. Give some of its advantages & disadvantages **(6M)**

b) With neat sketch explain the principle and operation of successive approximation ADC. **(6M)**

UNIT-V

9. a).Design a 16-bit comparator using 74x85 ICs. **(6M)**

b). Design a conversion circuit to convert a T-FF to JK-FF. **(6M)**

(OR)

10. a).With the help of logic diagram explain 74x157 multiplexer **(6M)**

b). Design a Modulo-12 ripple counter using 74x74 ICs. **(6M)**

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III/IV B. Tech I- Semester Regular Examinations Nov– 2017

MICROPROCESSORS AND APPLICATIONS

(ECE)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered at one place only

UNIT-I

1. With a neat diagram, explain the internal architecture of 8085 microprocessor. **(12M)**

(OR)

2. a) List out & explain the instructions which wont effect flag register of 8085 ? **(6M)**
   b) Differentiate between 8085 & 8086? **(6M)**

UNIT-II

3. a) Explain why segmentation is required and discuss about implementation of segmentation in 8086. **(5M)**
   b) What is addressing mode? Explain different type of addressing modes in 8086 with examples **(7M)**

(OR)

4. a) Draw the schematic diagram of 8086 in maximum mode with all necessary support components and explain the function of each support component. **(8M)**
   b) What is bus cycle? Draw memory write bus cycle in maximum mode operation. **(4M)**

UNIT-III

5. a) List and explain Bit manipulation instructions of 8086 with examples. **(4M)**
   b) What are assembler directives? Explain the significance of the following assembler directives with suitable examples i) LENGTH ii) DT iii) DB iv) EQU. **(8M)**

(OR)

6. a)List the string Instructions and Explain with suitable examples.? **(6M)**
   b)Write an ALP in 8086 to exchange two blocks of 8 bit numbers using string instructions? **(6M)**

UNIT-IV

7. Design an interface between 8086 CPU and four chips of 8K×8 EPROM and two chips of 32K×8 RAM. Select the starting address of EPROM suitably. The RAM address must start at 00000H **(12M)**

(OR)

8. a) With a neat sketch explain interfacing of stepper motor to 8086? **(6M)**
   b) Explain different modes of 8255 ? **(6M)**

UNIT-V

9. a) What is an interrupt? What are different interrupts available in 8086? **(6M)**
   b)What is the need for interrupt controller? With a neat block diagram, explain the cascading of PIC 8259A? **(6M)**

(OR)

10. a)what are the different modes of operation of 8253? Explain them briefly with clear timing diagrams **(6M)**
    b)Explain the functional aspects of 8251 USART chip with a neat block schematic diagram? **(6M)**

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