365

7E7081

Roll No. _____ Total No of Pages: 3

7E7081

B. Tech. VII Sem. (Main/Back) Exam., Nov.-Dec. - 2017
Electronics & Communication Engineering
7EC1A Antenna & Wave Propagation

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. Graph 2. Table

UNIT-I

Q.1 (a) Derive an expression of radiated power and radiation resistance of a Hertzian dipole. [8]

(b) Define Reciprocity and antenna temperature. [4]

(c) Find the radiation resistance of a Hertzian dipole of length $\frac{\lambda}{40}$ and $\frac{\lambda}{60}$ [4]

OR

Q.1 (a) What is the effective area of a half wave dipole operating at 500 Mhz? [4]

(b) Briefly define the types of polarization.. [4]

(c) Find the directivity of a current element Idl. [8]

UNIT-II

Q.2 (a) What is multiplication of patterns? Explain with suitable examples. [8]

(b) An array contains 100 isotropic radiators with an inter element spacing of 0.5λ. It is required to produce broadside and end fire beams. [8]

(i) Find Null to Null beam width and half power width in degrees

(ii) Find the directivity of both forms of arrays

OR

Q.2 (a) A uniform lineary array is required to produce an end fire beams when it is operated at a frequency of 10 Ghz. It contains 50 radiators and are spaced at 0.5λ. Find the progressive shift required to produce the end fire beam. Find the array length. [8]

(b) Calculate the field strength of a uniform linear array. [8]

UNIT-III

Q.3 (a) Briefly explain reflector antennas and micro strip patch antenna. [12]

(b) Explain the method of Antenna radiation patterns measurements. [4]

OR

Q.3 (a) Discuss the characteristics and operation V and Rhombic antennas. [10]

(b) Design a three element Yagi-Uda antenna to operate at a frequency of 172 Mhz. [6]

UNIT-IV

Q.4 (a) Derive an expression of field strength due to space wave. [8]

(b) What are the factors for affecting space wave field strength? [8]

OR

Q.4 (a) Explain the following in brief: [8]

(i) Duct propagation

(ii) Trope scatter

(b) Derive an expression for radio horizon distance in kilometers [5]

(c) Find the radio horizon distance of a transmitting antenna whose height is 80 m. [3]

UNIT-V

Q.5 (a) Discuss the characteristics of different Ionosphere layers in brief. [8]

(b) Determine the critical frequency of EM wave for DCN = 400 electrons/cm^3), E (5×10^8 electrons/cm^3) and F (2×10^6 electrons/cm^3) layers. [8]

OR

Q.5 (a) Explain the following characteristic parameters of Ionosphere propagation. [12]

(i) Critical frequency

(ii) Maximum usable frequency, Muf

(iii) Skip distance

(iv) Virtual height

(b) An HF radio communication is to be established between two points on the earth's surface. The points are at a distance of 2600km. The height of the ionosphere layer is 200 km and critical frequency is 4? MHz. find MUF. [4]

3v8

7E7072

Roll No. _____ Total No of Pages 3

7E7072

B. Tech. VII Sem. (Main/Back) Exam, Nov– Dec. 2017
Applied Electronics Instrumentation & Engineering
7AI2A Digital Signal Processing
AI, EC, EIC

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) State Shannon's sampling theorem. Explain sampling with zero order hold and reconstruction of signals. [8]

(b) The signal $x_c(t) = \sin [2\pi(100)t]$ was sampled with sampling period T = 1/400 second to obtain a discrete time signal x[n]. What is the resulting signal x[n]. [8]

OR

Q.1 (a) Define Aliasing with suitable waveform. Explain its effect and how it can be prevented. [8]

(b) Let x(t) be a band limited signal such that $X(jw) = 0$ for $|w| \geq \pi/T$ [8]

If x(t) is sampled using a sampling period T, determine an interpolating function g(t) such that

$$\frac{dx(t)}{dt} = \sum_{n=-\infty}^{\infty} x(nT) \quad g(t - nT)$$

UNIT-II

Q.2 (a) Discuss Minimum phase system with example. [8]

(b) Check whether the following systems are linear: [8]

(i) $F[x(n)] = an\ x(n) + b$

(ii) $F[x(n)] = e^{x(n)}$

OR

Q.2 (a) Explain the condition for an LTI discrete time system to be causal. [6]

(b) Check whether the discrete time system represented by following equations are Linear and causal – [5×2=10]

(i) $y(n) = 3y^2(n-1) - n\,x(n) + 4x(n-1) - 2x(n+1)$

(ii) $y(n) = x(n+1) - 3x(n) + x(n-1)\ ;\ n \geq 0$

UNIT-III

Q.3 (a) Determine the direct form I and II realizations for a IIIrd Order IIR transfer function. [8]

$$H(z) = \frac{0.28z^2 + 0.319z + 0.04}{0.5z^3 + 0.3z^2 + 0.17z - 0.2}$$

(b) Explain cascade and parallel realization of IIR systems with example. [8]

OR

Q.3 Draw the structures of cascade & parallel realization of [16]

$$H(z) = \frac{(1 - z^{-1})^3}{(1 - \frac{1}{2}z^{-1})(1 - \frac{1}{8}z^{-1})}$$

350

UNIT-IV

Q.4 (a) Apply bilinear transformation to [8]

$$H(s) = \frac{2}{(s+1)(s+3)}$$

With T = 0.1s.

(b) Describe Chebyshev filters with its response. [8]

OR

Q.4 (a) Convert the analog filter into a digital filter whose system function is [8]

$$H(s) = \frac{s+0.2}{(s+0.2)^2+9}.$$

Use the impulse invariant technique. Assume T = 1s.

(b) Discuss FIR filters by windowing technique. Give the filter response of all window functions. [8]

UNIT-V

Q.5 (a) List out the properties of Discrete Fourier Transform (DFT). [8]

(b) Find the N point DFT for $x(n) = a^n$ for $0<a<1$ [8]

OR

Q.5 (a) Find the inverse DFT of X(k) = {1, 2, 3, 4} [10]

(b) Explain DIT (Decimation – In – time) algorithm. [6]

351

7E7078

Roll No. _____ Total No of Pages: 3

7E7078

B. Tech. VII Sem. (Main/Back) Exam., Nov– Dec. 2017
Electronic Instrumentation & Control Engineering
7EI3A Digital Image Processing
EC, EIC

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain zooming and shrinking of digital images. [8]

(b) What is color model or color system? Explain RGB and CMY and HSI color model. [8]

OR

Q.1 Explain various fundamental step in DIP with neat block diagram and also write applications of digital Image Processing. [16]

UNIT-II

Q.2 (a) Explain spatial filtering. Define spatial correlation and convolution with an example. [8]

(b) Explain first and second order derivatives of image sharpening. [8]

OR

Q.2 (a) Explain the intensity transformation function. [8]

(b) Describe the various types of image smoothing using frequency domain filters. [8]

UNIT-III

Q.3 (a) Explain Inverse filtering and Wiener filtering. [8]

(b) Explain noise probability density functions. [8]

OR

Q.3 (a) What is digital image degradation model? Explain noise models. [16]

UNIT-IV

Q.4 (a) Explain morphological reconstruction and smoothing. [8]

(b) What is the difference between erosion and dilation? [8]

OR

Q.4 Write a short notes: [16]

(a) Convex Hull

(b) Thinning

(c) Pruning

(d) Skeletons

UNIT-V

Q.5 Explain Lossy Compression techniques. [16]

OR

Q.5 Write short notes on: [16]

(a) Lossy predictive coding;

(b) Lossless predictive coding and compare both.

7E7083

Roll No. _____ Total No of Pages: 3

7E7083

B. Tech. VII Sem. (Main/Back) Exam., Nov– Dec. 2017
Electronics & Communication Engineering
7EC4A Wireless Communication

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain FHSS with basic block diagram and find the expression for processing gain (Gp) in fast and slow system. [12]

(b) How CDM is better than TDM and FDM? [4]

OR

Q.1 (a) Explain the working of DSSS with the help of binary phase shift keying. [8]

(b) What do you mean by code division multiplexing? [8]

UNIT-II

Q.2 Define the following terms for a digital wireless cellular system- [4×4=16]

(a) CIR

(b) Spectral efficiency

(c) First Fresnel Zone

(d) Path loss

OR

Q.2 (a) What is link engineering? Explain different types of link used in communication system. [8]

(b) What is multipath fading? Explain various fading channels present. [8]

UNIT-III

Q.3 (a) Explain the TDMA principle of operation with TDMA/TDD example and also write its advantages and disadvantages. [8]

(b) Explain following terms-

(i) CDMA power control

(ii) Handoff [2×4=8]

OR

Q.3 (a) The "Near-For interference" is a serious problem in a wireless cellular CDMA network. Explain the reason of this problem. [4]

(b) Compare FDMA, TDMA and CDMA. [12]

UNIT-IV

Q.4 (a) Explain the operation of DECT with its network architecture. [8]

(b) What is the principle of frequency re-use in the context of cellular network? [4]

(c) What is the difference between single cell and multiple cell wireless LAN? [4]

OR

Q.4 (a) Write short note on- (Any two) [2×8=16]

(i) Wi–Fi

(ii) Zigbee

(iii) Mobile IP

(iv) Bluetooth

(v) RFID Technology

UNIT-V

Q.5 (a) Explain following terms- [2×4=8]

(i) Orbital period

(ii) Orbital velocity

(iii) Coverage angle

(iv) Slant range

(b) Explain earth station antennas. [8]

OR

Q.5 Write short note on- [4×4=16]

(i) Low noise amplifier

(ii) High power amplifier

(iii) Up converter

(iv) AOCS and TTC

7E7084

Roll No. _____ Total No of Pages: 3

7E7084

B. Tech. VII Sem. (Main/Back) Exam., Nov– Dec.2017
Electronics & Communication Engineering
7EC5A VLSI Design

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain the NMOS fabrication process with suitable diagrams. [8]

(b) An enhancement type NMOS transistor with $V_t = 0.7V$ conducts I_D 100 μA when $V_{GS} = V_{DS} = 1.2V$. Find the value of I_D for V_{GS} 1.5V and V_{DS} 3V.

Also calculate the value of drain to source resistance r_{ds} for small $V_{DS} = V_{GS} = 3.2V$. [8]

OR

Q.1 (a) Find the relationship between drain to current source (I_{ds}) to voltage (V_{ds}) in non -saturated region. [8]

(b) What are various second order effect? Discuss how many have been included into device model of MOS transistor? [8]

UNIT-II

Q.2 (a) Determination of pull up to pull down ratio $[Z_{pu}/Z_{pd}]$ for NMOS inverter driven by another NMOS inverter. [8]

(b) Design the following logics using CMOS:

(i) $Y = ABC + \overline{ABC}$ [4]

(ii) $Y = AB\overline{C} + \overline{A}BC$ [4]

OR

Q.2 (a) Describe the structure of CMOS transmission gate. Explain why such a gate is desirable to control transmission of signal rather than single transistor? [8]

(b) What is noise margin? Explain the procedure to determine noise margin? [8]

UNIT-III

Q.3 (a) Draw the stick diagram layout for –

(i) 2 input CMOS NAND gate [4]

(ii) 2 input CMOS NOR gate [4]

(b) Explain the layout design rules. [8]

OR

Q.3 (a) Explain the layout for NAND gate with suitable example. [8]

(b) Find the network graph and common Euler path for PMOS and NMOS network in the given function $F = \overline{A + BC}$ [8]

UNIT-IV

Q.4 (a) Compare the SRAM and DRAM cell. [8]

(b) Explain various types of memories. [8]

OR

Q.4 (a) Define clocked CMOS logic and its advantages. [8]

(b) Briefly explain NORA and NP (zipper) logic. [8]

UNIT-V

Q.5 (a) Write a VHDL code for-

(i) J. K flip flop [4]

(ii) T flip flop [4]

(b) Explain the ECAD tools for first back design. [8]

OR

Q.5 (a) Write short note on:

(i) Behavioral Modelling [4]

(ii) Structural Modelling [4]

(b) Write a VHDL code for structural modelling of full Adder. [8]

360

7E7085

Roll No. _____ Total No of Pages: 3

7E7085

B. Tech. VII Sem. (Main/Back) Exam., Nov– Dec.2017
Electronic Instrumentation & Control Engineering
7EI6.2A Advanced Microprocessor
EC, EIC

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Draw and explain Read and Write cycle timing diagram of 8086. [8]

(b) Explain Addressing Modes of 8086 Microprocessor. [8]

OR

Q.1 Draw internal Architecture of 8086. Explain the function of various registers. [16]

UNIT-II

Q.2 (a) What is the difference between Macros and Subroutines? Explain with examples. [8]

(b) What is strings, Explain with example. [8]

OR

Q.2 (a) Explain Assembler Directives and Operators. [8]

(b) Explain classification of interrupts. [8]

UNIT-III

Q.3 Explain various programming modes of 8279 keyboard and display controller. Also draw a block diagram showing its interfacing with Microprocessor. [16]

OR

Q.3 Write short note on- (Any two) [8×2=16]

(a) RS – 232

(b) IEEE 488

(c) 8086 based process control system.

UNIT-IV

Q.4 (a) Draw the interfacing diagram of 8257 DMA controller and Explain its operation. [10]

(b) Compare static memory and dynamic memory. [6]

OR

Q.4 (a) What are I/O ports? What are programmable and non- programmable ports? [8]

(b) What is memory interfacing and decoding? [8]

UNIT-V

Q.5 Explain the architecture of following processors. [8×2=16]

(a) 80286

(b) 80486

OR

Q.5 (a) Explain the concept of multiuser/ multi tasking operating system. [10]

(b) Explain Register organization of 80386. [6]

7E7086

Roll No. _____ Total No of Pages: 4

7E7086

B. Tech. VII Sem. (Main/Back) Exam., Nov – Dec. 2017
Electronics & Communication Engineering
7EC6.3A VHDL

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Differentiate between synthesis and simulation process in VHDL. [6]

(b) List the advantages of VHDL for digital design over the traditional methods. [6]

(c) Describe Design flow of ASICs. [4]

OR

Q.1 (a) Assume that a gate array exists in which the logic cell used is a three inputs NOR gate. The inputs to each NOR gate can be connected to either 1 or 0, or to any logic signal. Show how the following logic functions can be realized in the gate array. (Use Demorgan's theorem). [12]

(i) $f_1 = (x_1 + x_3)(x_2 + \bar{x}_3)$

(ii) $f_2 = (x_2 + \bar{x}_3)(x_1 + \bar{x}_2 + x_3)$

(b) Describe History of various Hardware Description Languages in brief manner. [4]

UNIT-II

Q.2 (a) Consider the following VHDL assignment statements [12]

$F_1 <= ((x_1$ and $x_3)$ or (not x_1 and not $x_3))$

and $((x_2$ and $x_4)$ or (not x_2 and not $x_4))$;

$F_2 <= (x_1$ and x_2 and not x_3 and not $x_4)$ or

(not x_1 and not x_2 and x_3 and $x_4)$ or

(x_1 and not x_2 and not x_3 and $x_4)$ or (not x_1 and x_2 and x_3 and not $x_4)$;

(i) Write complete VHDL code to implement f_1 & f_2.

(ii) Draw its timing simulation waveforms.

(b) What is the difference between signals and data types? Mention in tabulation form. [4]

OR

Q.2 (a) (i) What do you mean by architectures and RTL schematics? [3]

(ii) Explain different types of architectures with examples. [3]

(iii) What are sizes of entity and architecture which is defined in VHDL coding? [2]

(b) Write short notes on any two: [2×4=8]

(i) Packages

(ii) Simulation approaches

(iii) Elaboration signal drivers simulator kernel process

UNIT-III

Q.3 (a) Write VHDL code that represents a BCD to 7–segment decoder. Also draw its timing simulation waveforms. [8]

(b) Describe multiplexer synthesis using Shannon's expansions by explaining implementation of the three input majority function using a 4 to 1 multiplexer. [8]

OR

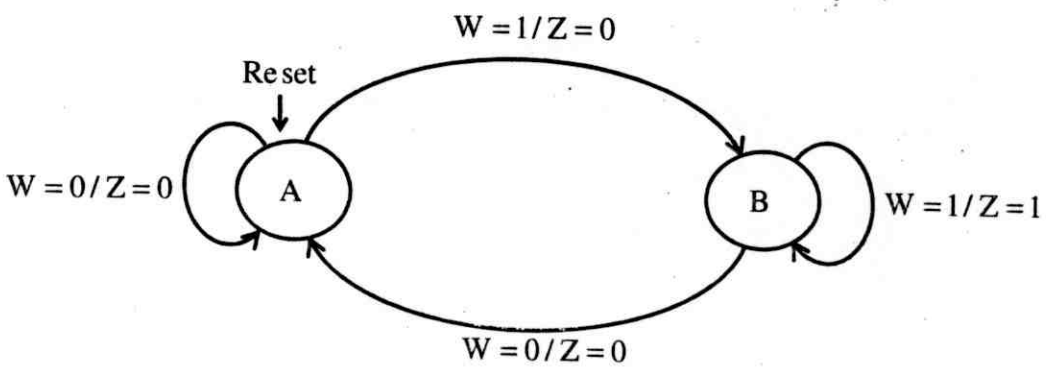
Q.3 (a) Write VHDL code for implementing D flip–flop using a WAIT–UNTIL statement. [8]

(b) What do you mean by counters? How many types of counters are there? Write their name. Write VHDL code for a down counter. [6]

(c) Define n – bit shift register. [2]

UNIT-IV

Q.4 (a) Write VHDL code for given state diagram of mealy type finite state machine. [8]



(b) Tabulate comparisons between synchronous and Asynchronous sequential circuits. [6]

(c) Define state diagram and state table. [2]

OR

Q.4 (a) What are the differences between Mealy and Moore Machines? Mention in tabular form. [4]

(b) What do you mean by vending machine controller? Explain its working and specifications. [4]

(c) Write VHDL code for Moore type FSM. [8]

UNIT-V

Q.5 (a) Write VHDL code for a n- bit register with an enable input. [12]

(b) Explain and draw data path circuit for the multiplier. [4]

OR

Q.5 (a) Explain clock synchronization using tristate buffers in the data path circuit. [8]

(b) Describe CPU organization and also explain its design concepts. [8]

7E4047

Roll No. _____ Total No of Pages: 3

7E4047

B. Tech. VII Sem. (Back) Exam., Nov. – Dec. - 2017
Electronics & Communication Engineering
7EC4 (O) IC Technology

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain different kind of Crystal defects. [8]

(b) What is float zone growth? What are different kinds of doping for float zone growth? [8]

OR

Q.1 (a) What is chemical etching and polishing? Explain the need of chemical cleaning. [8]

(b) Find the concentration of boron in crystal at 0.5 fraction solidified, if C_S at $X = 0.04$ is 2×10^{18} and segregation coefficient = 0.8. [8]

UNIT-II

Q.2 (a) Explain the electric field effect on diffusion. What is the maximum value of electric field enhancement factor? [8]

(b) What do you understand by diffusion in SiO_2? What are the basic techniques for measuring the diffusivity? [8]

OR

Q.2 (a) Explain the utility of ion-implantation for shallow junctions. [8]

(b) Explain the need of pre oxidation clearing before oxidation. [8]

UNIT-III

Q.3 Explain the chemical vapour deposition technique of silicon dioxide in detail. [16]

OR

Q.3 What are the different defects in epitaxial growth? How the slips are produced from epitaxial defects? [16]

UNIT-IV

Q.4 (a) Discuss the various parameters of performance of photolithography. [8]

(b) What is projection printer? Give the following values related to projection printers: [8]

(i) Resolution

(ii) Depth of focus

(iii) Spatial frequency

OR

Q.4 Write technical note on following:

(a) Wet etching [8]

(b) Plasma etching [8]

UNIT-V

Q.5 (a) Compare CMOS & NMOS IC technology [8]

(b) What are basic fundamental considerations for IC processing? [8]

OR

Q.5 Explain any two: [8+8=16]

(a) Bipolar IC technology

(b) Trench Isolation

(c) Metallization

7E4048

Roll No. _____ Total No of Pages: 3

7E4048

B. Tech. VII Sem. (Back) Exam., Nov. – Dec. - 2017
Electronics & Communication Engineering
7EC5 (O) VLSI Design

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) What is basic MOS transistor? Explain structure and operation of basic MOS transistor. [8]

(b) Derive the V – I characteristics of enhancement MOSFET in ohmic region and saturation region. [8]

OR

Q.1 (a) Draw & explain various steps involved in nwell CMOS fabrication. [8]

(b) How an NMOS transistor is fabricated? Explain the basic steps of NMOS fabrication in detail. [8]

UNIT-II

Q.2 (a) What is channel length modulation? How the V – I characteristics modify with channel length modulation.effect? [8]

(b) Draw MOS transistor circuit model. [8]

OR

Q.2 (a) Write short note on Aspect of Threshold Voltage. [8]

(b) Draw and explain Voltage Transfer Characteristic (VTC) of CMOS Inverter. [8]

UNIT-III

Q.3 (a) What is CMOS transmission gate? Draw two input multiplexer circuit using it. [8]

(b) Derive the expression of propagation delay in CMOS Inverter. [8]

OR

Q.3 (a) Explain CMOS logic and draw the circuit diagram for logic function $Y = \overline{(D+E+A)(B+C)}$ using CMOS. [8]

(b) What is noise margin? Explain the procedure to determine noise margin. [8]

UNIT-IV

Q.4 (a) Write short note on layout optimization. [8]

(b) Draw the transistor level diagram and layout of CMOS Inverter. [8]

OR

Q.4 (a) Draw layout of Two Input CMOS NAND and NOR gate. [8]

(b) Why scaling has a great importance in VLSI circuits? Explain Briefly. [8]

372

UNIT-V

Q.5 (a) Write VHDL code of Half – adder by following modeling style:

(i) Data flow [4]

(ii) Behavioral [4]

(iii) Structural [4]

(b) Differentiate signal and variable in VHDL. [4]

OR

Q.5 Define the following in VHDL:

(a) Entity [4]

(b) Architecture [4]

(c) Package [4]

(d) Configuration [4]

7E4051

Roll No. _____ Total No of Pages: 3

7E4051

B. Tech. VII Sem. (Back) Exam., Nov. – Dec. - 2017
Electronics & Communication Engineering
7EC6.3 (O) Operating System

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) What is operating system? Explain the various types of operating system. [8]

(b) How does the window handle various operating system services? Explain. [8]

OR

Q.1 (a) Why is Linux a preferred choice in big-companies? What is frame work? [6]

(b) Explain time shared and real time system. [6]

(c) Define system calls. [4]

UNIT-II

Q.2 (a) Explain state transition diagram of process and also explain Process Control Block (PCB). [8]

(b) Write short notes on:-

(i) Semaphores [4]

(ii) Monitor [4]

OR

Q.2 (a) Which CPU scheduling method will give the minimum average waiting time? What is the main difficulty in its implementation? [8]

(b) What is difference between preemptive and non-preemptive scheduling? [4]

(c) Explain the turnaround time and response time. [4]

UNIT-III

Q.3 Explain the following terms in memory management:-

(a) Fragmentation [4]

(b) Swapping [4]

(c) Paging [4]

(d) Segmentation [4]

OR

Q.3 Write short note on page replacement algorithm. [16]

UNIT-IV

Q.4 (a) Write short note on Firewall. [8]

(b) Explain protection domain of access matrix. [8]

OR

Q.4 (a) Explain the technique of user authentication. [8]

(b) Explain the implementation of Files and Directories management. [8]

UNIT-V

Q.5 (a) Write short note on system model. [6]

(b) Explain in detail about the method for deadlock detection. [6]

(c) What are the characteristic of deadlock? [4]

OR

Q.5 Write about deadlock avoidance algorithm in detail. How does deadlock avoidance differ from deadlock prevention? [16]

376

7E4054

Roll No. _____ Total No of Pages: 3

7E4054

B. Tech. VII Sem. (Back) Exam., Nov. – Dec. - 2017
Instrumentation Control Engineering
7EI3 (O) Computer Networks

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) What is a queuing problem? Explain queuing system, transient and steady state. [8]

(b) Express mathematical model for M/M/1 Queues. [8]

OR

Q.1 (a) Explain characteristics and classification of queuing models. [8]

(b) Explain the following terms briefly in context to Queuing -

(i) Birth – death process [4]

(ii) Service discipline [4]

UNIT-II

Q.2 (a) A channel has a bit rate of 4 kbps and a propagation delay of 20msec. For what range of frame sizes does stop-and-wait give an efficiency of at least 50 %? [8]

(b) Draw OSI architecture and explain briefly. [8]

OR

Q.2 (a) Draw and explain the frame structure of HDLC. [8]

(b) Write a short note on:

(i) Sliding window protocol [4]

(ii) Stop and wait protocol [4]

UNIT-III

Q.3 (a) Measurement of a slotted ALOHA channel with an infinite number of users show that 10 percent of the slots are idle. [8]

(i) What is the throughput?

(ii) Is the channel under loaded or over loaded?

(b) Discuss following terms:

(i) Token Ring [4]

(ii) FDDI [4]

OR

Q.3 (a) Consider building a CSMA/CD network running at 1Gbps over a 1-km cable with no repeaters. The signal speed in the cable is 200,000 km/sec. What is the minimum frame size? [8]

(b) Discuss following terms:

(i) Bridges [4]

(ii) Routers and gateways [4]

UNIT-IV

Q.4 (a) What is difference between IPv6 and IPv4? [8]

(b) Describe OSPF in detail. [8]

OR

Q.4 (a) What is congestion in Computer Networks? Write general principles of congestion control. [8]

(b) What are the basic design issues of Network Layers? Also explain the services provided by the network layer to the transport layer. [8]

UNIT-V

Q.5 (a) What is difference between Virtual Path Identifier (VPI) and Virtual Channel Identifier (VCI)? [6]

(b) Draw and explain ATM protocol architecture. [10]

OR

Q.5 (a) Discuss X.25 and Frame Relay. [6]

(b) Draw and explain ISDN system architecture. Also explain all channel of ISDN system. [10]

7E4055

Roll No. _____ Total No of Pages: 3

7E4055

B. Tech. VII Sem. (Back) Exam., Nov. – Dec. - 2017

Biomedical Engineering

7BM6.3 Fiber Optic Instrumentation

EIC, BM

Time: 3 Hours **Maximum Marks: 80**

Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) A glass clad fibre is made with core glass of refractive index 1.5 and the cladding is doped to give a fractional index difference of 0.0005. Find-

(i) The cladding index

(ii) The critical internal refection angle

(iii) The external critical acceptance

(iv) The numerical aperture [8]

(b) Differentiate between single mode and multimode fibre. [8]

OR

Q.1 (a) A single mode fibre is made with a core diameter of 10μm and is coupled to a laser diode that produces 1.3 μm light. Its core glass has a refractive index of 1.55- [8]

(i) Find the maximum value required for the normalized index difference.

(ii) Find the refractive index required for the cladding glass

(iii) Find the fiber acceptance angle.

(b) Explain mode theory for circular waveguides. Discuss the different types of modes [8]

UNIT-II

Q.2 (a) What are the types of optical correctors? What are the requirements of a good optical fibre connector design? Explain connector return loss. [8]

(b) Explain quantum efficiency and LED power. Also deduce the expression for quantum efficiency and LED power. [8]

OR

Q.2 (a) Explain LED emission pattern and characteristics of LED's. [8]

(b) Explain optical coupler, optical splitter and optical combiner with suitable diagrams. [8]

UNIT-III

Q.3 (a) Explain different processes of photo detectors. Discuss different types of optical detectors. What are the requirements of photo detector for good performance? [8]

(b) A pin photodiode has a quantum efficiency of 50% at a wavelength of 0.9 μm. Calculate- [8]

(i) its responsively at 0.9 μm.

(ii) the received optical power if the mean photo-currents is 10^{-6}A, and

(iii) The corresponding number of received photons at this wavelength.

OR

Q.3 (a) Discuss different noise source in photodiodes. [8]

(b) An InGaAs pin photodiode has the following parameters in wavelength of 1100 nm: I_D = 4 nA, η = 0.90, R_L = 1000 Ω and the surface leakage current is negligible. The incident optical power is 300nw and the receiver bandwidth is 20MHz. Find the value of primary photocurrent, quantum noise current, dark current and thermal noise current. [8]

UNIT-IV

Q.4 (a) The photoelectric coefficient and the refractive index for silica are 0.286 and 1.46 respectively. Silica has an isothermal compressibility of 7×10^{-11} m^2 N^{-1} and an estimated fictive temperature of 1400K. Determine the theoretical attenuation in decibels per kilometer due to the fundamental Rayleigh's scattering in silica at

optical wavelengths of 0.63 and 1.55 μm. Boltzmann's constant is 1.38×10^{-23} JK^{-1}. [8]

(b) What is Bending Loss? Explain Intermodal Dispersion and Intramodal Dispersion. [8]

OR

Q.4 (a) Consider a 30km long optical fibre that has an attenuation of o.8 dB/km at 1300nm. If 200 μw of optical power is launched into the fibre, find the optical output power. [8]

(b) Explain absorption losses. Discuss intrinsic absorption and extrinsic absorption loss. [8]

UNIT-V

Q.5 (a) Explain vertical cavity surface emitting LASERs. Discuss the characteristics of the emitted light by LASER diodes. [8]

(b) Compute the gain constant and the threshold concentration for a GaAs Laser if the absorption coefficient is $10cm^{-1}$ and the length of the cavity is 500 μm. Light is emitted at 0.84 μm, the bandwidth of the emission peak is 1.5×10^{13} Hz, the spontaneous decay time is 10n sec, and the index of refraction is n = 3.6. The mirrors on either and of the laser are formed by a cleaned GaAs surface. [8]

OR

Q.5 (a) Discuss how semiconductor LASER differs from other LASER in several aspects. Explain relationship between spontaneous and stimulated emission probabilities. [8]

(b) What is threshold condition in LASER diode in terms of gain loss relationship? How can you measure the threshold current of LASER diode? [8]

382

7E4056

Roll No. _____ Total No of Pages: 2

7E4056

B. Tech. VII Sem. (Back) Exam., Nov. – Dec. - 2017
Electronic Instrumentation & Control Engineering
7EI5 (O) Industrial Measurements

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain the principle of RTD with suitable diagram. [8]

(b) Explain the principle of Radiation Pyrometer. [8]

OR

Q.1 (a) Explain thermocouple and also explain its advantages and disadvantages. [8]

(b) Explain the principle of Bimetallic Thermometer. [8]

UNIT-II

Q.2 (a) Write short notes on:-

(i) Diaphragms [4]

(ii) Bellows [4]

(b) Explain the working of capacitive transducer and how it is used for measurement of pressure. [8]

OR

Q.2 (a) Explain Piezoelectric transducer. Also explain property of piezoelectric crystal. [8]

(b) Explain manometer and its type with suitable diagram. [8]

UNIT-III

Q.3 (a) Explain the working of Electro-magnetic flow meter. [8]

(b) Write short notes on:-

(i) Pitot Tube [4]

(ii) Rota meter [4]

OR

Q.3 (a) Explain the principle of mass flow meter. [8]

(b) Explain Ultrasonic Flow Meter. [8]

UNIT-IV

Q.4 (a) Explain capacitance transducer for measurement of level of Non-Conducting liquid. [8]

(b) Explain Radiation Densitometer. [8]

OR

Q.4 (a) Explain the working of Hydrometer for density measurement. [8]

(b) Explain ultrasonic densitometer. [8]

UNIT-V

Q.5 (a) Derive the expression for Gauge factor for electrical strain Gauge. [8]

(b) Explain strain Gauge calibration. [8]

OR

Q.5 Write short notes on:-

(a) Rosette Gauge [8]

(b) Wire and Foil Strain Gauge [8]

7E7073

Roll No. _____ Total No of Pages: 2

7E7073

B. Tech. VII Sem. (Main/Back) Exam, Nov – Dec. 2017
Electronic Instrumentation & Control Engineering
7EI4A Analytical & Environmental Instrumentation

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain the "Time of flight type Mass" spectrometer with the merits and demerits. [8]

(b) Explain the applications, advantages and disadvantages of X–ray spectroscopy.[8]

OR

Q.1 (a) How will you analysis with the help of photo acoustic spectroscopy. Explain in brief. [8]

(b) What is Beer – Lambert's Law? Explain the various terms involved in it. [8]

UNIT-II

Q.2 (a) Explain the principle of infra – red gas analyser with suitable examples. How hydrocarbons are detected by infra – red gas analyser. [8]

(b) What is chemiluminescence? How nitric oxide (NO) is measured with Carbon monoxide laser? [8]

OR

Q.2 (a) Explain the construction and working of ultraviolet absorption gas analyzers. [8]

(b) Discuss about the utility of oxygen analyzers in process Industry. Explain the working of paramagnetic oxygen analyzers. [8]

UNIT-III

Q.3 (a) What are the basic requirements of the detectors used in the gas chromatography? [8]

(b) What is the importance of electron capture detector? Explain its working with advantages and disadvantages. [8]

OR

Q.3 (a) What do you mean by "chromatography". Explain thin layer chromatography with neat sketch. [8]

(b) Give the block diagram of liquid chromatography and explain its various parts.[8]

UNIT-IV

Q.4 (a) How carbon monoxide (CO) and sulphur dioxide SO_2 are measured in air. [8]

(b) Explain the visible emission monitoring system with specified applications. [8]

OR

Q.4 (a) What are the air pollutants? How they are added in air? How solid suspended matters are measured in air. [8]

(b) Explain the construction and working of smoke monitoring systems. [8]

UNIT-V

Q.5 Write short notes on the following-

(a) Silica analyzers [8]

(b) pH meters [8]

OR

Q.5 Write short notes on the following-

(a) Conductivity meters [8]

(b) Ammonia analyzers [8]

7E4001

Roll No. _____ Total No of Pages: 2

7E4001

B. Tech. VII Sem. (Main/Back) Exam., Nov. – Dec. - 2017
Applied Electronics & Instrumentation Engineering
7AI1 Neural Networks and Fuzzy Logic Control
EIC. AI. BM

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain different types of artificial neuron model. [8]

(b) Compare single networks and multilayer networks. [8]

OR

Q.1 Explain the following:-

(a) Application of Neural Networks [8]

(b) Hopfield Nets and Simple Neural network model [8]

UNIT-II

Q.2 (a) Compare supervised and unsupervised learning. [8]

(b) Explain competitive learning with suitable example. [8]

OR

Q.2 Explain the following:-

(a) Recent trends and future directions of learning Algorithm. [8]

(b) Feed forward methods of learning Algorithm. [8]

UNIT-III

Q.3 (a) What is fuzzy set? Explain degree or membership. How does one represent a fuzzy set in a computer? [8]

(b) What are membership functions? Explain with the help of an example. [8]

OR

Q.3 Explain the following:-

(a) Membership value assignment [8]

(b) Uncertainty in information [8]

UNIT-IV

Q.4 (a) What are the various methods of defuzzification? Discuss sampling method of defuzzification. [8]

(b) Explain different Graphical techniques of reference. [8]

OR

Q.4 Explain the following:-

(a) Aggregation of fuzzy rules [8]

(b) Decomposition of compound rules [8]

UNIT-V

Q.5 Explain the following:-

(a) Industrial Application of Fuzzy Control System [8]

(b) General FLC Model [8]

OR

Q.5 Explain simple fuzzy logic controller using suitable diagram. [16]

388

7E7071

Roll No. _____ Total No of Pages: 4

7E7071

B. Tech. VII Sem. (Main/Back) Exam., Nov. – Dec. - 2017
Electronic Instrumentation & Control Engineering
7EI1A Neural Networks and Fuzzy Logic Control

Time: 3 Hours **Maximum Marks: 80**
Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain comparison between Artificial and Biological Neural Networks. [6]

(b) Develop a perceptron for AND function with binary inputs and bipolar targets without bias up to 2 epochs. (take first with (0, 0) & next without (0, 0)). [10]

OR

Q.1 (a) Realize the XOR function using McCulloch Pitts neuron. [8]

(b) (i) Using the Hebb rule, find the weight required to perform the following classifications. Vectors (1 1 1 1) & (-1 1 -1 -1) are members of class (with target value 1); Vectors (1 1 1 -1) & (1 -1 -1 1) are not members of class (with target value -1) [4]

(ii) Using each of the training X vectors as input, test the response of the net. [4]

UNIT-II

Q.2 Find the new weights when the network is presented the input pattern [0.6 0.8 0] and target output is 0.9. Use learning rate $\alpha = 0.3$ and use binary sigmoid activation function. [16]

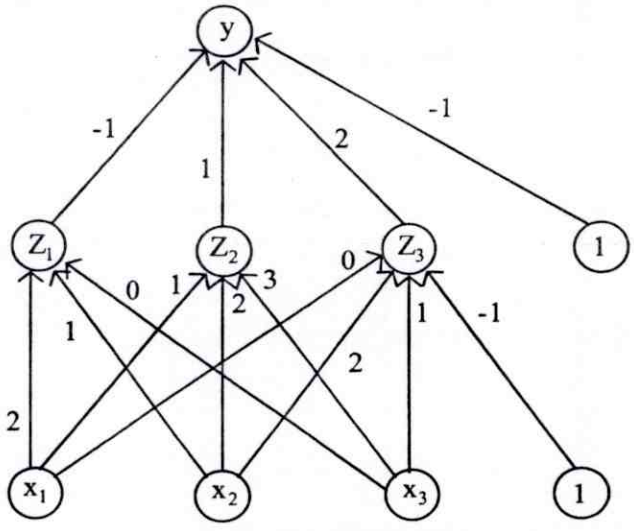


Fig. A Back propagation net

OR

Q.2 (a) Explain adaline as a linear adoptive filter. [8]

(b) Explain the last mean square (Widrow - Hoff) learning algorithm. [8]

UNIT-III

Q.3 In soil mechanics the stability & strength of a soil is largely dependent on how well a soil is gradiated & how well a soil is compacted. Suppose we have a fuzzy set defined on a universe of soil gradations, Poor, Moderate & Uniform as $X = \{x_1, x_2, x_3\}$ & a

fuzzy set defined on a universe of three levels of compaction, low, medium & high as $y = \{y_1, y_2, y_3\}$. We then define a "Poorly gradiated soil" as-

$$\underset{\sim}{A} = \left\{\frac{0.9}{x_1} + \frac{0.4}{x_2} + \frac{0.0}{x_3}\right\}$$

and a "well compacted soil" as

$$\underset{\sim}{B} = \left\{\frac{0.1}{y_1} + \frac{0.7}{y_2} + \frac{1}{y_3}\right\}$$

(a) Find the relation, $\underset{\sim}{R} = \underset{\sim}{A} \times \underset{\sim}{B}$ using a Cartesian product. Let $\underset{\sim}{C}$ be another fuzzy set which is a "sufficiently gradated soil" [8]

$$\underset{\sim}{C} = \left\{\frac{0.3}{x_1} + \frac{1.0}{x_2} + \frac{0.2}{x_0}\right\}$$

(b) Using min-max composition find $\underset{\sim}{S} = \underset{\sim}{C} \circ \underset{\sim}{R}$. [8]

OR

Q.3 (a) If two fuzzy sets namely: [10]

$$\underset{\sim}{D_1} = \left\{\frac{1}{1.0} + \frac{0.75}{1.5} + \frac{0.3}{2.0} + \frac{0.15}{2.5} + \frac{0}{3.0}\right\}$$

$$\underset{\sim}{D_2} = \left\{\frac{1}{1.0} + \frac{0.6}{1.5} + \frac{0.2}{2.0} + \frac{0.1}{2.5} + \frac{0.0}{3.0}\right\}$$

Find

(i) $\underset{\sim}{D_1} \cup \underset{\sim}{D_2}$

(ii) $\underset{\sim}{D_1} \cap \underset{\sim}{D_2}$

(iii) $\overline{\underset{\sim}{D_1}}$

(iv) $\overline{\underset{\sim}{D}_2}$

(v) $\underset{\sim}{D}_1 / \underset{\sim}{D}_2$

(vi) $\overline{\underset{\sim}{D}_1 \cap \underset{\sim}{D}_2}$

(b) Explain features of membership function. [6]

UNIT-IV

Q.4 (a) For the inference rule [8]

$[(A \rightarrow B) \wedge (B \rightarrow C)] \rightarrow (A \rightarrow C)$,

prove that the rule is a tautology.

(b) Explain aggregation of fuzzy sets. [8]

OR

Q.4 (a) Explain natural language in fuzzy logic. [8]

(b) Explain Linguistic Hedges in fuzzy logic. [8]

UNIT-V

Q.5 Explain the three – tank MIMO problem with fuzzy logic control. [16]

OR

Q.5 Explain fuzzy statistical process control with example. [16]
