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8E4097

8E4097

B. Tech. VIII Sem. (Back) Exam., April – May 2018
Electronics Instrumentation & Control Engineering
8EI2 (O) Non – Linear Control 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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 Explain the concept of phase plane Analysis. How it can be used for stability analysis?   [16]

OR

Q.1 (a) Explain the different types of Non – linearity in a physical system with suitable examples.   [10]

(b) Explain the term-limit cycles is detail.   [6]

UNIT-II

Q.2 Explain Lyapunov stability analysis. Describe the stability of the system given below using Lyapunov method –   [16]

$$\dot{X}_1 = X_2 \qquad \dot{X}_2 = -X_1 - X_2$$

OR

Q.2 Explain Autonomous & Non- Autonomous systems with suitable examples. [16]

UNIT-III

Q.3 Analyze existence and stability of periodic solutions by describing function analysis.[16]

OR

Q.3 Formulate the describing function of dead zone and saturation Non Linearity. [16]

UNIT-IV

Q.4 Explain how state feedback stabilization via linearization can be applied to a linear system. [16]

OR

Q.4 Describe various methods of Non Linear Control design with suitable examples. [16]

UNIT-V

Q.5 Describe different Adaptive Control Schemes. [16]

OR

Q.5 Explain methods of improving Robustness of Adaptive Control Systems. [16]

Roll No. _____

8E4096

Total No of Pages: 2

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Applied Electronics & Instrumentation Engineering
8AI1 Instrumentation in Industries
AI, EI

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.

1. NIL   2. NIL

UNIT-I

Q.1 (a) What do you mean by process industries instrumentation and explain it.   [8]

(b) Explain standardization of instrumentation.   [8]

OR

Q.1 (a) Discuss about specialised process plant instrumentation.   [8]

(b) What do you mean by man-power distribution in industry and explain man-power distribution system with example.   [8]

UNIT-II

Q.2 (a) Explain reactor pressure control by throttling flow of vent gas.   [8]

(b) Explain temperature control schemes by C&I.   [8]

OR

Q.2 (a) Explain working principle of continuous control of reactor pressure. [8]

(b) Explain working principle of reactor control by modulating gas make up with suitable example. [8]

UNIT-III

Q.3 (a) Explain C&I steam trap replaced by pass control. [8]

(b) Explain condenser control by changing the wetted surface area scheme. [8]

OR

Q.3 (a) Explain feedback control of steam heated exchanger control scheme. [8]

(b) Explain working principle of condenser on pressure control. [8]

UNIT-IV

Q.4 (a) Explain Horizontal tube. Control scheme of evaporators with suitable diagram.[8]

(b) Explain classification & control schemes for pumps. [8]

OR

Q.4 (a) Explain principle & classification of dryers. [8]

(b) Explain working principle of long tube vertical control scheme of evaporators. [8]

UNIT-V

Q.5 (a) Explain various criterion of selection of instrumentation. [8]

(b) Explain data logging automatic control systems in steam power plant. [8]

OR

Q.5 (a) Explain feed water control automatic control system and how it differs from traditional feed water control system. [8]

(b) Explain primary & secondary power plant measurement with suitable example.[8]

8E4090

8E4090

B. Tech. VIII Sem. (Back) Exam., April – May 2018
Electronics & Communication Engineering
8EC3 (O) Optical 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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) Draw a block diagram of Fiber – Optic communication system and describe the function of each component.   [6]

(b) What is intermodal Dispersion? Derive expression for multimode step index fiber. How graded index fiber shows lesser intermodal Dispersion than multimode step index fiber?   [10]

OR

Q.1 (a) Calculate the intermodal Dispersion of a step index fiber whose numerical aperture is 0.2 and core refractive index is 1.5 which is kept at a distance of 1 km to get a maximum pulse broadening.   [6]

(b) Describe with suitable sketch the outside chemical vapor deposition technique (OCVD). Also give its main features.   [10]

UNIT-II

Q.2 (a) Explain the concept of Population inversion and also describe the working of three & four level laser system. [8]

(b) Briefly explain the structures of LED with suitable diagram. [8]

OR

Q.2 (a) When a LED has 2V applied to its terminals it draws 10 mA and produces 2 mW of optical power. What is the LED's conversion efficiency from electrical to optical power? [8]

(b) Explain the optical Joint density of states concept for optical sources. What are the requirements for lasing emission to occur? [8]

UNIT-III

Q.3 (a) A p – n photo diode has a quantum efficiency of 70% for photon of energy 1.52×10^{-19} J. Calculate the wavelength at which the diode is Operating or the wavelength of incident photon. Also calculate the Responsivity of P – N photo diode. [8]

(b) A load resistor of 10 MΩ is connected across a silicon P–I–N photodiode whose area is $0.35 nm^2$ $\in = 10.5 \times 10^{-13}$ Fm^{-1} and saturation velocity of 10^5 ms^{-1}, if the width of the depletion layer is 10 um. Calculate:– [8]

(i) Transit time

(ii) Junction capacitance

(iii) Time constant

OR

Q.3 (a) Explain the principle of operation, construction and working of Avalanche photo detector using suitable diagram. [8]

(b) Explain the various types of noises in optical detectors. [8]

UNIT-IV

Q.4 (a) What are optical splices? Describe briefly the different types of optical splicing used in optical communication. [8]

(b) Explain the dense wavelength division multiplexing. [8]

OR

Q.4 (a) What are optical connectors? What are the principal requirements of a good connector design? [8]

(b) An ideal four port directional couples has a 4:1 splitting ratio:

(i) What fraction of the input power goes to each of the port? [4]

(ii) Compute the throughput loss, the tap loss and excess loss? [4]

UNIT-V

Q.5 (a) Explain different methods of measurement of total attenuation in optical fiber. [8]

(b) Briefly explain the measurement of dispersion in optical fibers by considering both time and frequency domain measurement techniques. [8]

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OR

Q.5 (a) Briefly explain the major techniques used for measurements of numerical aperture of optical fibers. **[8]**

(b) Explain different methods of measurement of refractive index profile of an optical fiber with suitable diagram. **[8]**

8E4089

8E4089

B. Tech. VIII Sem. (Back) Exam., April – May 2018
Electronics & Communication Engineering
8EC2 (O) Radar & TV Engineering

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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) A MTI Radar operates at 10 GH$_z$ with a pulse repetition frequency 3000 pulse

per second (PPS). Calculate its lowest blind speed.   [8]

(b) Describe Radar Range Equation.   [8]

OR

Q.1 (a) Explain the block diagram of Moving Target indicator (MTI).   [8]

(b) What do you understand by delay line canceller and explain types of delay

line?   [8]

UNIT-II

Q.2 (a) Explain the block diagram of DME interrogator. [8]

(b) Write short note on instrument Landing System. [8]

OR

Q.2 (a) What is TACAN? Explain briefly. [8]

(b) Explain the principle of operation of radar direction finder and range system. [8]

UNIT-III

Q.3 Draw and explain the block diagram of NTSC Transmitter and NTSC Receiver. [16]

OR

Q.3 Explain the construction and working of- [2×8=16]

(a) Videocon Camera tube

(b) CCD Camera tube

UNIT-IV

Q.4 (a) Write short note on picture, color and sound carriers [8]

(b) Explain TV transmission and reception antennas [8]

OR

Q.4 (a) What do you mean by chrominance signal and Chrominance Modulation? Explain briefly. [8]

(b) Explain the block diagram of T.V. transmitters [8]

UNIT-V

Q.5 (a) Explain the working of sync separation circuit to separate the Horizontal and

Vertical sync pulses in composite video signal. [12]

(b) How EHT is generated in T.V. Receiver [4]

OR

Q.5 (a) Write Short Notes on- [3×4=12]

(i) HDTV

(ii) DBS TV

(iii) 3-D TV

(b) What are the common faults that occurs in T.V. Receivers? [4]

8E4088

8E4088

B. Tech. VIII Sem. (Back) Exam., April – May 2018
Electronics & Communication Engineering
8EC1 (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.

1. NIL   2. NIL

UNIT-I

Q.1 (a) What is Queuing theory? Explain pure Birth, Pure death and Birth– death process in detail with an example. [12]

(b) Write short note on Little's formulae [4]

OR

Q.1 (a) Explain and Derive a Mathematical model for M/M/m/m queue [8]

(b) Drive a mathematical model for M/G/I Queuing model [8]

UNIT-II

Q.2 (a) Explain TCP/I/P Reference model with its layer's also describe how it is different from OSI Reference model. [10]

(b) Write short note on Data link layer in internet. [6]

OR

Q.2 (a) Explain and differentiate Packet, Circuit and Message switching in detail. [6]

(b) Explain simplex stop and wait protocol with the help of an appropriate example. [5]

(c) List out the differences between Go back N Protocol and Selective Repeat. [5]

UNIT-III

Q.3 (a) A Network using CSMA/CD having Maximum Propagation time 24 ms and having bandwidth -10 Mbps? What should be the minimum size of the frame? [5]

(b) Explain Routers and gateways with specifications [6]

(c) Explain 802.3 IEEE standards in detail [5]

OR

Q.3 (a) Explain 802.2 IEEE standards in detail. [5]

(b) What is ALOHA and how it is different from slotted ALOHA? Explain [5]

(c) Write short notes on- [6]

(i) Token Bus

(ii) Token Ring

UNIT-IV

Q.4 (a) State and explain various design issues related to Network Layer. [6]

(b) Explain Adaptive Routing algorithms also differentiate them from non-Adaptive Routing Algorithm. [5]

(c) Explain the algorithm used for flow control [5]

OR

Q.4 (a) What is the difference between IPV 4 and IPV6 frame format? Explain [6]

(b) Explain TCP Protocol Architecture in detail [5]

(c) Write short note on congestion control algorithms for TCP/IP Networks. [5]

UNIT-V

Q.5 (a) Explain ATM Protocol Architecture in detail [5]

(b) Discuss and Explain the Recognization algorithm in ATM Networks. [6]

(c) Write short note on Broadband ISDN [5]

OR

Q.5 (a) Explain ISDN System architecture in detail. [6]

(b) Write short notes on- [5×2=10]

(i) X .25

(ii) Frame Relay

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8E8102

8E8102

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electronic Instrumentation & Control Engineering
8EI2A Non – Linear Control Systems

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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) How is nonlinear system different from linear system in analysis & behavior point of view.   [8]

     (b) Explain 'Back lash' nonlinearity and hysteresis nonlinearity.   [8]

OR

Q.1 Discuss same common nonlinearities in control systems in detail.   [16]

UNIT-II

Q.2 (a) What is meant by singular points?   [4]

     (b) Find the equilibrium point for the system described by $\ddot{x} = x^3 - 3x$. [6]

     (c) Draw the phase portrait for the linear second order differential equation [6]

     $\ddot{x} + x = 0$

OR

Q.2 (a) State & explain Poincare – Bendixon theorem on existence of limit cycles. [8]

     (b) Explain the 'method of isocline' to draw the phase portraits.   [8]

UNIT-III

Q.3 Explain Describing function analysis in nonlinear control system. [16]

OR

Q.3 Discuss the describing function analysis of following non- linearities –

(a) Saturation [8]

(b) Dead – Zone [8]

UNIT-IV

Q.4 Briefly describe the concept of asymptotic stability and exponential stability. What is meant by Global & local stability state and explain the necessary theorems. [16]

OR

Q.4 (a) What is the idea of Direct and Indirect method of lyapunov stability? [8]

(b) The system dynamics is given by – [8]

$$\dot{x}_1 = x_1^2 - x_2$$

$$\dot{x}_2 = \sin x_1$$

Find the equilibrium point (s) and then find the linearized state equation about the equilibrium point & check its stability.

UNIT-V

Q.5 Explain the following concept in nonlinear control systems. [16]

(a) Feedback Linearization

(b) Input state linearization

OR

Q.5 (a) Sliding Mode Control [8]

(b) Gain Scheduling [8]

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8E8101

8E8101

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electronic Instrumentation & Control Engineering
8EI1A Industrial Electronics

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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) Classify and explain triggering methods of SCR with circuit diagrams.   [8]

   (b) Compare power BJT & IGBT on the basis of their Principle and
        characteristics.   [8]

OR

Q.1 (a) Discuss the two transistor model of a thyristor. Using this model describe the
        various mechanism of turning-on a thyristor.   [8]

   (b) How does a GTO differ from a conventional thyristor. Give its circuit symbol
        and static V-I characteristics. Under what conditions, it may work as a low gain
        transistor.   [8]

UNIT-II

Q.2 (a) Draw half controlled bridge rectifier with R-L load. How o/p voltage can be
        varied.   [8]

   (b) Draw circuit and waveshape of single phase full wave Bridge controlled rectifier
        with resistive load.   [8]

OR

Q.2 (a) Draw the output waveform of 1 phase half wave controlled rectifier with resistive load at firing angle- [8]

(i) $\alpha = 0°$

(ii) $\alpha = 90°$

(b) Draw circuit diagram of a basic series inverter.Describe its working principle. [8]

UNIT-III

Q.3 (a) Draw circuit of a Step-Down Chopper. State how output is related to Duty cycle. [8]

(b) Explain the working of SMPS with diagram. [8]

OR

Q.3 (a) Explain the working of UPS with diagram.. [8]

(b) Discuss the effect of source impedance on the performance of converters. [8]

UNIT-IV

Q.4 (a) Explain the speed control of DC motors using choppers. [16]

OR

Q.4 (a) Explain the stator voltage control methods for three phase squirrel cage induction motor. [16]

UNIT-V

Q.5 (a) Explain the hybrid stepper motor. [16]

OR

Q.5 (a) Describe the driver circuits for stepper motors. [8]

(b) Differentiate between variable reluctance and Permanent Magnet Stepper Motor. [8]

Roll No. _____

Total No of Pages: 3

8E8026

8E8026

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electronics & Communication Engineering
8EC4.3A Microcontroller & Embedded Systems

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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) Write those specific features of microcontrollers which are not there in

microprocessors because of which microcontrollers have become core part of an

embedded system. [8]

(b) What are the different families of microcontrollers? Briefly describe them. [8]

OR

Q.1 (a) Describe the architecture of 8051 microcontroller with the help of a neat

diagram? [8]

(b) Explain the serial communication mode of 8051 microcontroller. [8]

UNIT-II

Q.2 (a) State clear difference between LJMP, AJMP, SJMP instructions. [8]

(b) What are bit level instructions in 8051. Write their usage. Give few examples of instructions indicating such operations. [8]

OR

Q.2 (a) Explain the following instructions giving the proper format and example of each.

(i) DAA [2]

(ii) SWAP [2]

(iii) CALL & RET [2]

(iv) Rotate instruction [2]

(b) Write a program of 8051 microcontroller to find the sum of 10 numbers stored in an array. Draw the flow chart to specify the steps of the design flow? [8]

UNIT-III

Q.3 (a) Describe the interrupts used in 8051 microcontroller, give their priority addresses. [8]

(b) Draw the format of timer control register (TCON) and describe it. [8]

OR

Q.3 (a) 8051 microcontroller is most suitable for real time operations. Justify your statement. [8]

(b) Explain Timer/Counter of 8051 microcontroller in detail. [8]

UNIT-IV

Q.4 (a) Interface external program memory with 8051 microcontroller and explain how the data is transmitted. [8]

(b) Interface 8 – digit 7segment LED to 8051 microcontroller and write the assembly language program to display 1234 on it. [8]

OR

Q.4 (a) Draw the circuit and example how LED can be interfaced with 8051 microcontroller. [8]

(b) By drawing diagram explain how a keyboard can be interfaced with 8051? Write the codes for its working. [8]

UNIT-V

Q.5 (a) Describe the role of Real time operating system in system design. [8]

(b) What is Round Robin scheduling and pre – emptive scheduling? [8]

OR

Q.5 (a) How multitasking embedded systems are designed? Give brief review of commercial RTOS used. [8]

(b) Give brief description of microcontroller based measuring instrument. [8]

Roll No. _____   Total No of Pages: 3

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8E8025

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electronics & Communication Engineering
8EC4.2A Operating Systems

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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) What are the main functions of on Operating System? Explain the types of

Operating System in brief.   [8]

(b) Explain different type of services that are provided by Operating System in

detail.   [8]

OR

Q.1 (a) What is Virtual Machine? Also Explain Operating System view as a Virtual

Machine with the help of diagram.   [8]

(b) Explain the following: – [8]

   (i)   Kernel level Thread

   (ii) Boot Strap loader

   (iii) System Call

   (iv) User level thread

UNIT-II

Q.2 (a) What is the difference between preemptive and non – preemptive scheduling?

   Why Scheduling is required? [8]

   (b) What is the difference between process and program? Explain process states with

   the help of diagram. [8]

OR

Q.2 (a) Define race condition and critical section. Explain critical section problem and

   requirements of solution. [8]

   (b) Explain Semaphore and monitor. Also differentiate them. [8]

UNIT-III

Q.3 (a) What is Thrashing? Explain the causes of Thrashing. [8]

   (b) What is fragmentation? Differentiate external and internal fragmentation. [8]

OR

Q.3 (a) What is paging? Explain the concept of demand paging with example. [8]

   (b) Explain different types of disk scheduling. [8]

UNIT-IV

Q.4 (a) Explain File System. Explain various file operations. [8]

(b) What are the various access methods for file system? [8]

OR

Q.4 (a) Describe Free space management. [8]

(b) Explain uses Authentication and firewall. [8]

UNIT-V

Q.5 (a) What is deadlock? What are the necessary conditions which must be held for there to be a deadlock? [8]

(b) Explain various methods to recover from deadlock. [8]

OR

Q.5 (a) What are safe and unsafe state? And also compare deadlock avoidance and deadlock prevention. [8]

(b) Explain the difference between Deadlock and Starvation. [8]

Roll No. _____

8E8024

8E8024

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electronic Instrumentation & Control Engineering
8EI4.3A Computer Networks
EC, EI

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.

1. <u>NIL</u>   2. <u>NIL</u>

UNIT-I

Q.1 (a) Express a queue system and its various states. Also discuss logical measures of performance.   [8]

   (b) Discuss a generalized Poisson model.   [8]

OR

Q.1 (a) Discuss various types of queueing models.   [10]

   (b) What do you understand by pure birth & pure death processes?   [6]

UNIT-II

Q.2 (a) Explain TCP/IP model and protocols used on each layer.   [10]

(b) State the difference between packet & circuit switched networks. [6]

OR

Q.2 Explain sliding window protocol with the help of suitable diagram. [16]

UNIT-III

Q.3 Explain ATM protocol Architecture and frame structure. [16]

OR

Q.3 (a) Discuss ALOHA & Slotted ALOHA protocol. [10]

(b) Discuss and explain the difference between Router and Gateways. [6]

UNIT-IV

Q.4 Explain distance vector Routing algorithm with the help of suitable example. [16]

OR

Q.4 Explain link state Routing Algorithm with the help of suitable example. [16]

UNIT-V

Q.5 Discuss reason for network congestion and its controlling algorithms. [16]

OR

Q.5 Write short note on following – [8×2=16]

(a) DNS

(b) SMTP

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8E8023

8E8023

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electronic Instrumentation & Control Engineering
8EI4.2A MEMS and Nanotechnology
EC, EI

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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a)   What is density of states? Derive the relationship between density of states and

            energy for 2D, 1D and 0D materials.   [10]

     (b)   Write a short note on electronic structure of nanoparticles.   [6]

OR

Q.1 (a)   Discuss in detail about the two methods for each top-down and bottom-up

            approach for synthesis of nanomaterials.   [10]

     (b)   Differentiate between metal, semiconductor and insulator.   [6]

UNIT-II

Q.2 (a) How silicon Dioxide is converted into silicon? Explain in detail all the steps being used in silicon processing. [8]

(b) Write short note on (i) PVD and (ii) CVD [8]

OR

Q.2 (a) What is nanolithography? Differentiate between X-Ray lithography and particle beam lithography. [8]

(b) Write short note on :

(i) self assembly and catalysis

(ii) Wet and dry etching [8]

UNIT-III

Q.3 (a) Explain the working of X-Ray diffraction technique with the help of diagram. [8]

(b) Calculate the average particle size using Scherrer's equation for small particles of iron for a peak having full width at half maxima $2.76°$ at $20\beta=43°$. The wavelength of X-Ray used is $1.54A°$ [8]

OR

Q.3 (a) Explain in detail how SEM and TEM can be used for the analysis of morphology and particle size of the samples. [8]

(b) Write short note on:

(i) Dynamic light scattering and

(ii) Atomic force microscopy [8]

UNIT-IV

Q.4 (a) Discuss in detail about the electronic and electrical properties of metallic nanowires. [8]

(b) What role does nanotechnology play in nanomedicines and nanosensors? [8]

OR

Q.4 (a) What is quantum well? Solve the Schrodinger equation for an infinitely deep quantum well of width L to find energy Eigen values. [8]

(b) How magnetic properties of nanomaterials differ from bulk materials? [8]

UNIT-V

Q.5 (a) What do you understand by active substrate materials? Why silicon is a most prominent substrate material for MEMS devices? [8]

(b) Discuss about the various packaging methods being used in MEMS technology [8]

OR

Q.5 (a) What do you understand by micro-electro-mechanical systems? Write about some applications of MEMS in various fields. [8]

(b) Explain the fabrication and working of a pressure sensor being made using MEMS technology. [8]

8E8022

8E8022

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electronics & Communication Engineering
8EC2A Radar & TV Engineering

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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) Derive the Radar range equation and then discuss how does radar range depend

on transmitted power, duty cycle and noise figure. [10]

(b) What are the different limitations that affect the performance of MTI Radar? [6]

OR

Q.1 (a) What is Radar? Draw the neat and clean block diagram of Radar and explain

each block. [8]

(b) Calculate the maximum range of Radar operating at 2-5 GH_2 and using a pulse

power of 25 MW (Peak). The diameter of Antenna is 64m. The target cross

section of 1.0 m^2 and the receiver noise figure is only 1.1 Because of low PRF to

allow the pulse to return from long distance the receiver BW is only 5 KHz. [8]

UNIT-II

Q.2 (a) Explain Plumbicon Camera tube with its working and constructional diagram. [8]

(b) Explain with the help of suitable sketches how video signal is developed in a Videocon camera tube. [8]

OR

Q.2 (a) Draw and explain the block diagram of Monochrome TV transmitter and also explain each block in brief. [8]

(b) Which TV system is adopted in India? What are the Merits and Demerits of SECAM and NTSC system? [8]

UNIT-III

Q.3 (a) Define and discuss the function of chrominance modulation. [8]

(b) Explain the TV transmitter with neat and clean diagram. [8]

OR

Q.3 (a) Explain the TV transmitting and receiving antenna. [8]

(b) Draw vestigial sideband frequencies for channel TV in band III, specified on it, sound carrier, picture carrier and color subcarrier frequencies. [8]

UNIT-IV

Q.4 (a) Explain the working of IF amplifier and video amplifier in the TV receiver. [8]

(b) Explain with a block diagram the working of UHF Tuner. [8]

OR

Q.4 (a) What are the basic principle employed in HDTV and 3D-TV? Compare the key features of HDTV and 3D -TV. [8]

(b) Write short notes on- [4+4=8]

(i) RF tuner

(ii) AGC

501

UNIT-V

Q.5 (a) Explain the working of HDTV and IPTV. [8]

(b) Compare the analog TV and digital TV. [8]

OR

Q.5 Write short notes on-

(a) Dish TV [4]

(b) LCD Display [4]

(c) LED Display [4]

(d) Plasma Display [4]

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8E8021

8E8021

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electronics & Communication Engineering
8EC1A 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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) What are the basic features of float zone growth? Give its advantages and

disadvantages. Explain the top seed and bottom seed. [8]

(b) A boron – doped crystal is measured at its seed end with a four-point probe of

spacing 1mm. The (V/I) reading is 10 ohm. What is the seed end doping and the

expected reading at 0.95 fractions solidified? [8]

OR

Q.1 (a) What is electronic grade silicon (EGS)? Draw and explain the schematic of a

CVD reactor used for EGS production. [8]

(b) Discuss the different kinds of crystal defects with diagrams. [8]

UNIT-II

Q.2 (a) Discuss the oxidation growth mechanism, show that Deal-Glove mode oxidation,

$$\frac{d_o}{A/2} = \left[1 + \frac{t + \tau}{A^2/4B}\right]^{1/2} - 1, \qquad \text{reduces to}$$

$d_o^2 = Bt$ for long times and to $d_o = \dfrac{B}{A}(t + \tau)$ for short times. [10]

(b) List possible ways of growing an oxide on a substrate without forming oxidation induced stacking faults. [6]

OR

Q.2 (a) Derive expressions of concentration gradients for the erfc and Gaussian distributions. [10]

(b) What are the commonly used diffusion profile measurement techniques? [6]

UNIT-III

Q.3 (a) What do you mean by epitaxy? Discuss the several aspects of silicon vapor phase epitaxy. [8]

(b) Explain a basic chemical vapor deposition system. [8]

OR

Q.3 (a) Draw and explain molecular beam epitaxy (MBE) growth system. [10]

(b) Explain the epitaxial evaluation process methods. [6]

UNIT-IV

Q.4 (a) Draw the schematic lithographic process. Explain the process of contact and proximity printing. [10]

(b) Draw and explain the process for generation of a photo mask. [6]

OR

Q.4 (a) What are the commonly used analytical techniques to measure plasma parameters? Explain in detail. [6]

(b) Discuss the properties of an etching process. What are the major distinctions between reactive ion etching and parallel plate plasma etching? [10]

UNIT-V

Q.5 Discuss the following terms in brief: [4×4=16]

(a) Trench Isolation

(b) Planarization

(c) LOCOS method

(d) Junction and oxide Isolation

OR

Q.5 (a) Explain the IC fabrication process. [8]

(b) What are the fundamental considerations for CMOS IC technology? [8]

8E8046

8E8046

B. Tech. VIII Sem. (Main / Back) Exam., April – May 2018
Electrical & Electronics Engineering
8EX4.3A VHDL
EC, EX

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.

1. NIL _____   2. NIL _____

UNIT-I

Q.1 (a) What is VHDL? Explain its capabilities and features.   [8]

 (b) Explain different modeling styles used in VHDL with suitable examples.   [8]

OR

Q.1 (a) Explain the design flow of ASICs and standard logic circuits.   [8]

 (b) Explain following VHDL statements using one example for each: [4×2=8]

   (i) Concurrent assignment

   (ii) Case statement

   (iii) Loop statement

   (iv) If statement

UNIT-II

Q.2 (a) Using a conditional signal assignment statement, write a VHDL code for 8 to 3 encoder. [8]

  (b) Write a VHDL code for binary to BCD converter using select signal assignment. [8]

OR

Q.2 (a) Draw the diagram for 16:1 multiplexer using 4:1 multiplexer and write its VHDL code using structural modeling, [8]

  (b) Define data type and data operator in VHDL and write a VHDL code for 4 bit comparator. [8]

UNIT-III

Q.3 (a) State the difference between flip flop and latch and write a VHDL code for positive edge triggered D flip flop. [8]

  (b) Draw the schematic diagram for parallel access shift register and write its VHDL code. [8]

OR

Q.3 (a) Draw the truth table for T flip flop and write its VHDL code with an asynchronous reset. [8]

  (b) Write a VHDL code for modulo – 6 up counter. Also compare level triggered and edge triggered systems. [8]

UNIT-IV

Q.4 (a) State the difference between Melay and Moore FSM. Explain Melay FSM using

state diagram, state table and state assigned table. [8]

(b) Write the difference between synchronous and asynchronous sequential circuits

and write a VHDL code for following state diagram: [8]
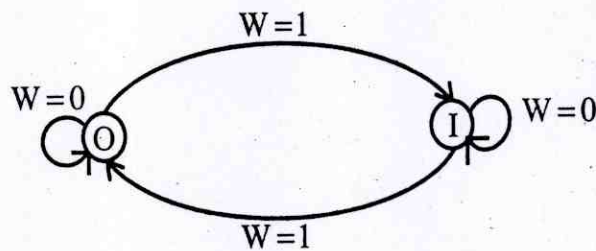
OR

Q.4 (a) Design a Moore type FSM for serial adder and also write its VHDL code. [8]

(b) A coin operated vending machine dispenses Candy under the following

condition: [8]

(i) The machine accepts nickels and dimes.

(ii) If takes 15 cents for a piece of Candy to be released from the machine.

(iii) If 20 cents is to be deposited, the machine will not return the change, but it

will credit the buyer with 5 cents and wait for the buyer to make a second

purchase. Draw the state diagram for vending machine and minimize it

using state minimization technique.

UNIT-V

Q.5 (a) Briefly explain the clock synchronization. [8]

    (b) Draw the schematic diagram of a 2^m X n SRAM block and explain it. [8]

OR

Q.5 Write a short note on: [2×8=16]

    (a) Shifting and sorting operation.

    (b) CPU organization.