

Roll No. _____

[Total No. of Pages : 2]

8E 8021**8E 8021**

B.Tech. VIII Semester (Main & Back) Examination, April-2019
Electronics & Communication Engg.
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).*

Unit - I

1. a) Explain the various steps for shaping of crystal obtained from float zone or Cz method. (10)
- b) Find the concentration of Boron in crystal at fraction solidified of 0.4, if solid concentration (C_s) at fraction solidified 0.05 is 2×10^8 atoms/ cm^3 and segregation coefficient is 0.8. (6)

(OR)

1. a) Mention the reason for the following :
 - i) Point defects.
 - ii) Surface defects.
 - iii) Volume defects.
 How these defects changes during the fabrication process. (8)
- b) How EGS is obtained from MGS. Also draw the block diagram for the production of EGS and also write it's chemical reaction. (8)

Unit - II

2. a) Define the following terms with respect to oxidation:
 - i) Oxidation techniques. (4)
 - ii) Oxide properties. (4)
- b) Arsenic is diffused in silicon with a doping concentration of 5×10^5 atoms/ cm^3 . Arsenic doping assumes a profile of Gaussian type. Arsenic is diffused for 30 minutes and a junction depth of $20 \mu\text{m}$ is achieved with a surface concentration of 2×10^{18} per cm^3 . Find the diffusivity of arsenic. (8)

637
(OR)

2. a) Show analytic solutions of Fick's law and explain the correction in this theory. (8)
b) Write the range theory of Ion Implantation. (8)

Unit - III

3. a) Explain chemical equilibrium and the law of mass action. (7)
b) What is autodoping and how can this be minimized? (5)
c) Compare LPCVD with APCVD. (4)

(OR)

3. a) What do you mean by Epitaxy? Explain vapor phase epitaxy and defects in epitaxial growth. (8)
b) Explain the molecular beam epitaxy. (8)

Unit - IV

4. a) Explain the projection printing with suitable diagram. (8)
b) Compare Wet Etching with plasma Etching. (8)

(OR)

4. a) What is optical lithography? Explain proximity printing and compare it with contact and projection printing. (8)
b) Draw the Flow chart for Mask generation process. Explain each term with proper explanation. (8)

Unit - V

5. a) Write the fabrication process sequence for twin tub CMOS process. (8)
b) Write technical note on:
i) Metallization. (4)
ii) Planarization. (4)

(OR)

5. a) Explain Bipolar IC fabrication process sequence with help of neat sketch. (8)
b) Write short notes on following :
i) LOCOS method. (4)
ii) SOI techniques. (4)

8E4088

Roll No. _____

[Total No. of Pages : **2**]**8E4088**

B.Tech. VIII - Semester (Back) Examination, April-2019
Electronics and 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.

UNIT-I

1. Analyze M/M/1 queuing system to calculate following: **(6+5+5=16)**
- a) Average No. of packets in system.
 - b) Probability of having at least 'r' packets in the system.
 - c) Average time spent by packet in system.

(OR)

1. a) What is the queueing model? How you characterize queueing model? **(4)**
b) Explain and derive a mathematical model for M/M/m queue. **(8)**
c) Explain the concept of pure birth process by taking suitable example. **(4)**

UNIT-II

2. a) What is the difference between internet architecture and OSI architecture? **(8)**
b) State the difference between packet & circuit switch network. What is TCP/IP model? **(6+2=8)**

(OR)

2. a) Discuss the principle of stop and wait flow control algorithm. Draw time line diagram as well as explain how loss of a frame and loss of an ACK are handled? What is the effect of delay-bandwidth product on link utilization? Differentiate it with sliding window protocol. **(8)**
b) What is HDLC and also explain frame structure and frame types in HDLC. **(8)**

UNIT-III

3. a) Measurement of slotted ALOHA channel with an infinite number of users show that 20% slots are idle. (3×4=12)
- i) What is the channel load?
 - ii) What is the through put?
 - iii) Is the channel under load or overload? Show with graph.
- b) Write short note on bridges application in computer networks. (4)

(OR)

3. a) What is Token Bus and Token Ring? What happens in a token bus if a station accepts the token and then crashes immediately? (4+4=8)
- b) Write short note on: (4+4=8)
- i) CSMA
 - ii) FDDI

UNIT-IV

4. a) What will happen if in a network using link state routing? If a router announces that its distance to every host is Zero? How the situation is handled in OSPF? (8)
- b) Draw protocol header of IPv6. Discuss enhanced feature available in IPv6 compared to IPv4. (8)

(OR)

4. a) Explain the TCP transmission policy, congestion control. (8)
- b) Explain following: (4+4=8)
- i) Network layer design issues in computer network.
 - ii) OSPF & BGP

UNIT-V

5. Diagrammatically illustrate and discuss the ATM architecture. (16)

(OR)

5. a) What is the need for frame relay? How does it differ from conventional packets switching? What are the functions of its layers? (8)
- b) Short note on: (2×4=8)
- i) Congestion control Algorithms.
 - ii) ISDN system architecture.

8E 4089

Roll No. _____

[Total No. of Pages : 2]

8E 4089

B.Tech. VIII - Semester (Back) Examination, April. 2019
Electronics & Communication Engg.
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.

Unit - I

1. a) What is Blind Speed? Calculate the minimum blind speed for a radar, which is operating at a frequency 20 GHz and sends 2000 pulses per second. (8)
- b) Draw the block diagram of frequency modulated CW radar and explains its application in measurement of range. (8)

(OR)

1. a) Derive the basic Radar range equation, as governed by the minimum receivable echo power P_{min} . (8)
- b) With the help of neat diagram, explain the operation of amplitude compression monopulse radar. (8)

Unit - II

2. a) Write the short notes on:
 - i) Aircraft tracking system
 - ii) Instrument landing systems. (8)
- b) Draw the block diagram of TACAN and explain its principle of operation. (8)

(OR)

2. a) Briefly explain the operation and various components of LORAN Hyperbolic Navigational Electronic System. (10)
- b) Discuss the operation of DME and write applications. (6)

Unit - III

3. a) Why scanning is needed in TV? Compare interlaced scanning with rectangular scanning. (8)
- b) Explain key features of a composite video signal. Draw neat diagram in support to your answer. (8)

(OR)

3. a) Explain the working principle of LCD and compare it with Plasma display panels. (8)
- b) Draw the constructional diagram of Plumbicon camera tube and show the formation and elimination of Red halo. (8)

Unit - IV

4. a) Explain the following characteristics of colour light in brief (8)
- i) Hue
- ii) Luminance.
- b) Draw the block diagram of TV transmitters employing high level and low level modulations. (8)

(OR)

4. a) Discuss Chrominance modulation. (6)
- b) Briefly explain the antennas used for TV transmission and reception. (6)
- c) Discuss the vestigial transmission. (4)

Unit - V

5. a) Draw the functional block diagram of a TV receiver and explain it. (10)
- b) What are the common faults in TV receivers? (6)

(OR)

5. Write the short note on any two: (2×8=16)
- a) EHT
- b) HDTV
- c) DBS-TV
- d) 3D TV
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8E 8022

Roll No. _____

[Total No. of Pages : 2]

8E 8022

B.Tech. VIII - Semester (Main & Back) Examination, April-2019

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.)

Unit - I

1. a) What is the necessity of delay line canceller? Describe various types of delay lines using an MTI radar. (2×4=8)
 - b) What is blind speed? Calculate the minimum blind speed for a Radar, Which is operating at a frequency 20GHz and sends 1000 pulses per second (8)
- (OR)

1. a) Explain the (2×6=12)
 - i) Aircraft landing and
 - ii) Aircraft tracking systems
- b) Explain the working of different marker beacons used in radar navigational aids. (4)

Unit - II

2. a) Explain the working of CCD camera tubes and compare their performance with other camera tubes (8)
- b) Calculate the peak value of resultant signal when saturated yellow colour is added to the luminance Y signal. (4)
- c) Determine the resultant peak signal when luminance signal is white and the resultant colour difference signals are added to it. (4)

(OR)

2. a) What do you understand by interlaced scanning? Show that interlace scanning reduces the flicker. (8)
- b) Sketch composite video signal waveform for atleast three successive line and indicate: (8)
 - i) Extreme white level
 - ii) Blanking level
 - iii) Pedestal height
 - iv) Front porch and back porch

Unit - III

3. a) Explain the phenomenon of interleaving of colour signals. How does it help in ensuring compatibility? (8)
b) Write a note on weighting factors. Give the weighting factors for U and V (8)

(OR)

3. a) Justify the use of vestigial side band transmission for TV system. Draw the frequency band for channel III and IV in third band and show their respective sound carrier and colour sub carrier frequencies (4+4=8)
b) Explain the compatibility issues related to colour and monochrome TV system. (8)

Unit - IV

4. a) Explain the need of attenuating IF video signal within ± 0.75 MHz of the video IF carrier. Draw the shape of the frequency response curve before detection and after detection. (8)
b) Explain the need and working of AFC circuits. (8)

(OR)

4. a) Draw the circuit diagram for (4×2=8)
i) Horizontal and vertical sync. separator
ii) RF tuner
iii) EHT generator
iv) AGC
b) Explain the use of (4×2=8)
i) Delayed AGC
ii) Simple diode detector
iii) Pilot carrier scheme for colour sub carrier signals
iv) Quadrature modulation in chrominance signal.

Unit - V

5. Write the short notes on **any Two**: (16)
i) Modern TV receiver with LCD, LED and plasma displays
ii) DISH TV
iii) IPTV

(OR)

5. a) Explain transmission and reception process of digital TV system (8)
b) Write the name of common faults and their diagnosis in TV receiver. (8)

8E 4090

Roll No. _____

[Total No. of Pages : 2]

8E 4090

B.Tech. VIII Semester (Back) Examination, April.2019
Electronics & Communication Engg.
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.*

Unit - I

1. a) Using ray theory, describe the mechanism for transmission of light within an optical fiber and show how acceptance angle is related to the fiber numerical aperture? (8)
- b) What are the causes of signal attenuation in optical fiber? Explain. (8)

(OR)

1. a) Explain any one fiber fabrication process with neat diagram. Compare the different methods of fabrication. (8)
- b) Briefly explain intramodal and intermodal dispersion. (8)

Unit - II

2. a) Compare the properties of laser diode and LED's used for optical communication. (6)
- b) What is population inversion? Explain threshold condition for laser oscillation. (6)
- c) Draw the structure of Surface Light Emitting Diode (SLED). (4)

(OR)

2. a) Describe different LED structures for optical fiber Communication. Discuss their relative merits and drawbacks. (8)
- b) Explain the modulation of LASER diode. (8)

Unit - III

3. a) Distinguish between a p-n diode, a p-i-n diode and an APD. (8)
- b) A p-n photodiode has a quantum efficiency of 40% at $\lambda = 0.80 \mu\text{m}$. Calculate
- Its responsivity at $\lambda = 0.80 \mu\text{m}$.
 - The received optical power if the mean photo current is 10^{-5}A . (8)

(OR)

3. a) Explain the structural features and working principle of p-n photodiode. What is the functional significance of the intrinsic layer inserted in between the *p* and *n* layer. (8)
- b) Define quantum efficiency and responsivity of a photodiode. Determine the wavelength at which quantum efficiency and responsivity are equal. (8)

Unit - IV

4. a) What are optical splices? Describe the different types of optical splices with neat diagram. (8)
- b) Explain the coarse and dense wavelength division multiplexing. (8)

(OR)

4. a) What are optical couplers? What are the various factors to be taken in account while coupling? (8)
- b) Explain fiber to fiber joints with suitable diagrams. (8)

Unit - V

5. a) Describe the measurements of fiber attenuation. (8)
- b) Explain the frequency domain intermodal dispersion measurements. (8)

(OR)

5. a) Explain the method of measurement of numerical aperture of an optical fiber. (8)
- b) Explain one method of measurement of refractive index profile of an optical fiber with suitable diagram. (8)

Roll No. _____

[Total No. of Pages : 2]

8E 8023**8E 8023**

B.Tech. VIII-Semester (Main & Back) Examination, April-2019
Electronic Instrumentation & Control Engg.
8EI4.2A MEMS and Nanotechnology
(Common with 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).*

Unit - I

1. a) Explain the top down and bottom up approach of nanotechnology with suitable diagrams. (8)
- b) Give the difference between metals, insulator and semiconductors with band structures. (8)

(OR)

1. a) What is the effect of size and dimensions on nanostructured crystal? Explain Quantum dot, wire and Quantum well. (10)
- b) Briefly explain the graphene and CNT. (6)

Unit - II

2. a) Briefly explain the physical vapour deposition techniques of thin films. (8)
- b) Classify the different CVD techniques of thin film deposition with their process parameters and explain any one. (8)

(OR)

2. a) Explain the different steps in lithographic process of pattern writing with suitable diagrams. (8)
- b) Compare the x-ray and e-beam litho process. (8)

Unit - III

3. a) Discuss the XRD technique of characterization of thin films with D-by Scherrer's formula. (8)
- b) Compare Raman spectroscopy with NMR spectroscopy technique. (8)

646
(OR)

3. Write the short notes on any **Two** : (2×8)
- i) SEM
 - ii) AFM
 - iii) XPS
 - iv) DLS

Unit - IV

4. a) What are Nano medicines? Which approach has been used for developing nano medicines? (8)
- b) Explain the application of nano technology in sensing with suitable examples. (8)

(OR)

4. a) Discuss the electrical, mechanical and optical properties of nano particles. (12)
- b) What do you mean by nano biology? (4)

Unit - V

5. a) Discuss the case study of pressure sensor with packaging. (8)
- b) Explain various types of MEMS packages. (8)

(OR)

5. a) Explain the applications of MEMS. (8)
- b) Discuss the following in brief.
- i) Wafer.
 - ii) Substrate and active substrate. (8)
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8E 8024

Roll No. _____

[Total No. of Pages : 2]

8E 8024

B.Tech. VIII Semester (Main/Back) Examination, April.2019

Electronic Instrumentation & Control Engg.

8EI4.3A Computer Networks

Common with 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).*

Unit - I

1. a) Derive and explain mathematical model for $M/M/\infty$ queue in detail. (10)
- b) Explain Little's formulae with the help of appropriate example. (6)

(OR)

1. a) Derive and explain mathematical model for $M/M/m/m$ queue in detail.(10)
- b) Explain the concept of pure death and pure birth process with the help of appropriate example. (6)

Unit - II

2. a) Explain TCP/IP reference model in detail. (10)
- b) What is Virtual Circuit Network? Explain. (6)

(OR)

2. Write short notes on:

- a) Sliding window protocol (8)
- b) Go back N Protocol (8)

Unit - III

3. a) Explain static and dynamic channel allocation schemes in detail. (8)
b) Describe Network connection devices in detail. (8)

(OR)

3. Write short notes on:

- a) Token Ring and Token bus. (8)
b) ALOHA and Slotted ALOHA. (8)

Unit - IV

4. a) Explain Link State Routing algorithm along with suitable example. (10)
b) Explain OSPF and BGP. (6)

(OR)

4. a) Explain Adaptive routing algorithms in detail. (8)
b) Write short note on IPV4 and IPV6. (8)

Unit - V

5. Explain heavy bucket and Token bucket algorithms in detail. (16)

(OR)

5. Write short notes on:

- a) Data Traffic descriptors (8)
b) Congestion Control algorithms (8)
-

8E8026

Roll No. _____

[Total No. of Pages : 2]

8E8026

B.Tech. VIII - Semester (Main & Back) Examination, April-2019
Electronics & Communication Engg.
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).

Unit - I

1. a) Define programming Model. Draw and Explain programming Model of 8051. (08)
- b) Explain the working of ALE, RST, EA and PSEN. (4×2=8)
(OR)
1. a) Write down the working of 8051 ports. Configure Port 1 as an Input and output with suitable diagram. (10)
- b) Draw and explain bit format of TMOD and SCON register. (2×3=6)

Unit - II

2. a) What are the Instruction sets? Explain Arithmetic Instruction set in detail. (08)
- b) What do you understand by bit level and byte level logical operation? (08)
(OR)
2. a) What are the addressing Modes of 8051 μc ? Explain all addressing modes with an example. (08)
- b) Role of conditional jump and conditional jump in Microcontroller. (08)

Unit - III

3. a) What are the interrupts? Draw and explain Interrupt structure in detail. (10)
- b) What do you understand by Maskable and Non-maskable Interrupt? (06)
(OR)
3. a) Write a program in Assembly language to find the count to be loaded into timer register to generate a timer delay of 500 μs and also write a program for same using Timer 0 Model. Assume crystal frequency is 12 MHz. (12)
- b) Differentiate Software and Hardware control of timers. (04)

Unit - IV

4. What is difference between synchronous and Asynchronous serial communication? Explain Mode 1 of serial communication. (16)

(OR)

4. Differentiate SRAM and DRAM. Interface 8kB of RAM and 8k byte of ROM, both starting address in 0000H. (16)

Unit - V

5. a) What is Multitasking? Explain types of Multitasking. (08)
b) What do you understand by scheduling? Explain Round Robin scheduling with an example. (08)

(OR)

5. a) What do you understand by Real time operating system for system design? What is difference between hard real time operating system and soft real time operating system? (08)
b) Explain the Architecture and requirements for development process of embedded system. (08)
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8E 8046

Roll No. _____

[Total No. of Pages : 3]

8E 8046

B.Tech. VIII Semester (Back) Examination, April. 2019

Electronics & Communication Engg.

8EC4.2(O) VHDL

Common with 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.

Unit - I

1. a) What is VHDL? Explain different modeling styles used in VHDL with example. (8)
- b) Explain how variables, signals and constants are declared and used in VHDL. (8)

(OR)

1. a) Describe design flow of ASICs. (6)
- b) Write important features of HDL in brief. (4)
- c) Differentiate between synthesis and simulation process in VHDL. (6)

Unit - II

2. a) Describe the 4 to 1 multiplexer synthesis using Shannon's expansions implementation. (8)
- b) Write VHDL code for implementing D flip flop using a WAIT- UNTIL statement. (8)

(OR)

2. a) Write VHDL code for BCD to 7 segment Decoder. (8)
- b) How 16×1 mux can be implemented using two 8×1 mux? Write VHDL code using structural modeling. (8)

Unit - III

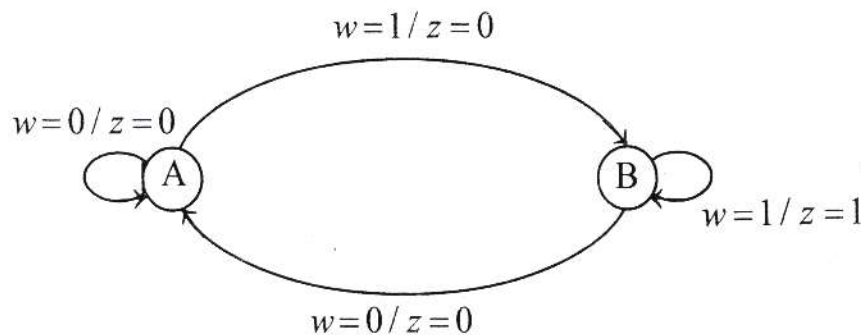
3. a) Write VHDL structural description for n bit serial-in-serial out shift register. (8)
- b) What do you mean by counters? How many types of counters are there? Write VHDL code for a down counter. (8)

(OR)

3. a) Write VHDL code for S-R latch using conditional signal assignment statement. (8)
- b) Write VHDL code for n bit register with an enable input. (8)

Unit - IV

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



- b) Explain state diagram and state table. (4)
- c) Draw data path and controller ASM chart of divider circuit. (4)

(OR)

4. a) Write VHDL model for implementation of serial adder using moore type FSM. (8)
- b) What do you mean by vending machine controller? Explain its working and specifications. (8)

Unit - V

5. a) Describe CPU organization and its design concepts. (8)
- b) Briefly explain clock synchronization. (8)

652
(OR)

5. Write short notes on : (any Two)

- a) Shift and sort operation.
- b) SRAM.
- c) Clock Skew.

(2×8=16)

