Hall Ticket Number :										

R-15

Code: 5G373

IV B.Tech. I Semester Supplementary Examinations August 2020

Digital Image Processing

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Discuss the concept of image sampling? How can you judge the number of samples required for good approximation of an image?	7M		L1
	b)	What is m-connectivity among pixels? Give an example.	7M		L3
		OR			
2.	a)	Solve the Hadamard transform matrix for N=4.	7M		L6
	b)	Interpret how formation of an image depends on illumination and reflectance component and also define digital image?	7M		L2
		UNIT–II			
3.	a)	Support how histogram equalization method gives uniform histogram for continuous images and also specify their limitations?	7M		L3
	b)	Illustrate low pass filters in frequency domain.	7M		L1
		OR			
4.	a)	Describe some simple Intensity transformations in Image Enhancement.	7M		L4
	b)	Interpret how derivative helps to derive tools for image sharpening.	7M		L5
		UNIT–III			
5.	a)	Analyze the necessity of Inverse filtering and formulate an expression for Inverse filtering, further, identify the drawbacks of this method in the presence of noise?	7M		L6
	b)	What is meant by image degradation? Discuss various possibilities for image degradation.	7M		L2
		OR			
6.	a)	Explain the image degradation model for continuous functions.	7M		L4
	b)	Interpret regarding estimation of noise parameters.	7M		
		UNIT–IV			
7.	a)	Explain the HSI Color model?	7M		L1
	b)	Explain about color fundamentals.	7M		L1
		OR			
8.	a)	Write about hardware-oriented models for color image processing. Explain them in detail?	7M		L2
	b)	Draw and explain the Schematic of the RGB Color cube.	7M		L2
		UNIT–V			
9.	a)	Describe the significance of Laplacian operator. Explain with an example how edges are detected with this operator.	7M		L5
	b)	What is meant by discontinuities in an image? Discuss about point detection and line detection.	7M		L5
		OR			
10.	a)	Define image compression and explain about temporal redundancy.	7M		L6
	b)	Explain about Basic global thresholding and basic adaptive thresholding processes used in image segmentation.	7M		L6

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Hall Ticket Number :										

R-15

Code: 5G472

IV B.Tech. I Semester Supplementary Examinations August 2020

Computer Networks

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Distinguish between OSI & TCP/IP Model. 7M

   b) What is relationship of layers and addresses in TCP/IP? 7M

OR

2. a) Describe the function of Data link and network layer in OSI Model. 8M

   b) Give the examples of Network hardware & software. 6M

UNIT–II

3. a) Derive expression of Throughput in slotted ALOHA. 8M

   b) Define Piggybacking and its usefulness. 6M

OR

4. a) Give all IEEE Standards with applications. 7M

   b) Compare a controlled access protocol with a channelizing protocol. 7M

UNIT–III

5. a) Give comparison between IP4 and IP6 packet headers. 8M

   b) What do you mean by routing and classify routing algorithm. 6M

OR

6. a) What is difference between Distance Vector Routing and Link State Routing Protocols? 7M

   b) Write about Internet protocol and types with their applications. 7M

UNIT–IV

7. a) What Do Mean By Tunnel Model and What Protocols fall Under The TCP/IP Internet Layer? 7M

   b) Why do you think that there exist two protocols in transport layer whereas there exists only one in Internet layer in TCP/IP reference model? 7M

OR

8. a) What are the differences between TCP and UDP services? Explain the TCP datagram format in detail. 8M

   b) Explain function of UDP in detailed form 6M

UNIT–V

9. a) What is the purpose of Domain Name system and discuss its divisions. 7M

   b) Write a short note on Application Layer Protocols. 7M

OR

10. a) What is ISDN? Explain types of services provided by ISDN. 7M

    b) State the difference between fully qualified and partially qualified domain name. 7M

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Hall Ticket Number :										

R-15

Code: 5G372

IV B.Tech. I Semester Supplementary Examinations August 2020

Embedded Systems

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. Explain about addressing modes of 8051 Microcontroller with examples. 14M

OR

2. Explain about Stepper motor interfacing Stepper motor interfacing 14M

UNIT–II

3 a) Describe about the overview of typical embedded system architecture in detail. 7M

b) What are the key parameters for an embedded system? 7M

OR

4. a) Explain about development tools suitable for advanced embedded systems. 7M

b) List out various development tools used for various applications with suitable examples. 7M

UNIT–III

5. a) Analyze any application using Watch dog Timer/Reset Circuitry with suitable example. 7M

b) Explain about the application software. 7M

OR

6. a) Describe hardware architecture of a communication interface? 7M

b) What are the services provided by an operating System? 7M

UNIT–IV

7. a) What are the features of communication interface? 7M

b) Explain how blue tooth communication will work? 7M

OR

8. a) Distinguish I2C and CAN interfaces. 7M

b) Describe CAN in detail. 7M

UNIT–V

9. Analyze examples for semaphores, message queues, mailboxes and pipes. 14M

OR

10. Explain about Embedded Operating Systems, Real Time Operating Systems, and Handheld Operating Systems. 14M

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Hall Ticket Number :										

R-15

Code: 5G375

IV B.Tech. I Semester Supplementary Examinations August 2020

Nano Electronics

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) What are the principal difference between the electron and scanning probe microscopies? 6M

   b) What are the characteristic properties of objects in the nano scale? Which of those properties we use to examine them? 8M

OR

2. Why is not possible to image nano objects with infrared or X-rays? What are the current capabilities with these techniques? What are their specific advantages? 14M

UNIT–II

3. a) How is quantum confinement manifested in various measurements? 7M

   b) How do you correlate absorption spectra with size of quantum dot? 7M

OR

4. a) What are the different types of quantum dots investigated? 7M

   b) How do you make biocompatible quantum dots? 7M

UNIT–III

5. a) Draw and explain the basic Quantum Cellular Automata elements. 7M

   b) Explain the majority gate realization with Quantum dots. 7M

OR

6. a) Explain the principle operation of Electron Spin Transistor. 7M

   b) Write short note on Electron – wave Transistor. 7M

UNIT–IV

7. a) What is mean by Tunnel effect? Explain the Tunneling effect in semiconductors. 6M

   b) Explain about Three terminal Resonant Tunneling Devices with neat band diagrams. 8M

OR

8. a) Explain the performance of the Single-Electron Transistor. 7M

   b) Write the comparisons between the FET and SET circuit designs. 7M

UNIT–V

9. a) What does a nanoelectronic interface look like? And explain each of interface. 8M

   b) Explain how reliability as limiting factor in integrated electronics. 6M

OR

10. a) How parameter spread as limiting effect in ICs 6M

    b) Explain the degree of parallelism performance and complexity of Information cube of information processing systems. 8M

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Hall Ticket Number :										

R-15

Code: 5G371

IV B.Tech. I Semester Supplementary Examinations August 2020

Optical Communication

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	With a neat sketch explain a typical digital optical fiber link.	8M	CO1	L2
	b)	List the advantages of optical fiber system over conventional copper systems?	6M	CO1	L1
		OR			
2.	a)	Define the normalized frequency for an optical fiber and explain its use in the determination of the number of guided modes propagating within a step index fiber (Single and Multimode).	8M	CO1	L2
	b)	Estimate the number of modes at 820 nm and 1.3 μm in a graded-index fiber having a parabolic-index profile (α = 2), a 25 μm core radius, n1 = 1.48, and n2 = 1.46. How does this compare to a step-index fiber?	6M	CO2	L4
		UNIT–II			
3.	a)	Mention the requirements of optical sources used in optical fiber transmission.	7M	CO1	L2
	b)	Derive the expression for the power transfer function of the fabry- perot filter	7M	CO2	L3
		OR			
4.	a)	Define internal quantum efficiency of LED and deduce the expression for the same	6M	CO2	L3
	b)	Discuss degradation mechanisms in injection lasers. Comment on these with regard to the CW lifetime of the devices.	8M	CO3	L4
		UNIT–III			
5.	a)	Explain the detection process in the *p–n* photodiode. Compare this device with the *p–i–n* photodiode.	7M	CO2	L2
	b)	An InGaAsP heterojunction phototransistor has a common emitter current gain of 170 when operating at a wavelength of 1.3 μm with an incident optical power of 80 μW. The base–collector quantum efficiency at this wavelength is 65%. Estimate the collector current in the device.	7M	CO4	L4
		OR			
6.	a)	Derive the relation between signals to noise ratio of optical detector.	7M	CO4	L4
	b)	Briefly Discuss about i. Detector Response Time ii. Temperature effect on Avalanche gain	7M	CO1	L1
		UNIT–IV			
7.	a)	A 15 km optical fiber link uses fiber with a loss of 1.5 dB km−1. The fiber is jointed every kilometer with connectors which give attenuation of 0.8 dB each. Determine the minimum mean optical power which must be launched into the fiber in order to maintain a mean optical power level of 0.3 μW at the detector.	8M	CO4	L5
	b)	Briefly describe fiber alignment and joint losses.	6M	CO1	L2
		OR			
8.		Discuss absorption losses in optical fibers, comparing and contrasting the intrinsic and extrinsic absorption mechanisms.	14M	CO2	L2
		UNIT–V			
9.	a)	Briefly describe about analog links with neat sketch.	7M	CO1	L2
	b)	Discuss the Radio and RF fiber analog links	7M	CO1	L1
		OR			
10.	a)	Write in brief about active optical components.	7M	CO1	L2
	b)	Explain the operation and principles of WDM.	7M	CO1	L1

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