Hall Ticket Number :										

R-15

Code: 5G472

IV B.Tech. I Semester Supplementary Examinations October 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. Explain OSI reference model and compare it with TCP/IP 14M

OR

2. How the message switching implemented in circuit switching networks? Explain with an example 14M

UNIT–II

3. a) With an example explain the sliding window protocols. 8M
   b) Explain binary exponential backoff algorithm. 6M

OR

4. a) Explain in detail about Ethernet. 7M
   b) A bit stream 10011101 is transmitted using the standard CRC method described in the text. The generator polynomial is x^3+1. Show the actual bit string transmitted. Demonstrate CRC algorithm in detail. 7M

UNIT–III

5. a) Explain briefly about the shortest path routing algorithm 7M
   b) What is datagram network? Compare and contrast of virtual circuit and datagram networks 7M

OR

6. a) With neat sketch explain the IP protocol IPV4. 7M
   b) List and explain internet control protocol. 7M

UNIT–IV

7. a) When User Datagram Protocol invoked? Explain. 7M
   b) Why is UDP faster than TCP? Differentiate between UDP and TCP 7M

OR

8. Briefly explain the Transmission Control Protocol. 14M

UNIT–V

9. a) Discuss in detail about RFC5322 internet message format 7M
   b) Explain HTTP Transaction with an example. 7M

OR

10. a) Define cryptography. Explain digital signature 7M
    b) Explain domain name system. 7M

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Hall Ticket Number :										

R-15

Code: 5G373

IV B.Tech. I Semester Imporvement Examinations October 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)	Define spatial and gray level resolution. Explain about Iso-preference curves.	7M		L1
	b)	Explain about the basic relationships and distance measures between pixels in a digital image.	7M		L3
		OR			
2.	a)	State and prove the following properties of 2D-Fourier Transform: (i) Periodicity and conjugate symmetry (ii) Separability.	7M		L6
	b)	Explain the functioning of CCD line scan sensor and CCD area sensor.	7M		L2
		UNIT–II			
3.	a)	Explain about various smoothing methods in spatial domain.	7M		L3
	b)	What is meant by Histrogram of an image? Explain about Histrogram Specification.	7M		L1
		OR			
4.	a)	Explain about various sharpening methods in frequency domain.	7M		L4
	b)	Discuss about Image negative and Log transformations.	7M		L5
		UNIT–III			
5.	a)	Describe both Gaussian noise model and Rayleigh noise model.	7M		L6
	b)	Explain the effect of diagonalization on the degradation model.	7M		L5
		OR			
6.	a)	Discuss the need for image restoration.	7M		L4
	b)	Explain in detail the least mean square (Wiener) Filter. Give necessary equations for it.	7M		
		UNIT–IV			
7.	a)	Discuss the procedure for conversion from RGB color model to HSI color model.	7M		L1
	b)	Discuss about Full-color image processing.	7M		L1
		OR			
8.	a)	Explain about RGB and CMY color models.	7M		L2
	b)	Explain about Gray level to color transformations and draw its functional block diagram.	7M		L2
		UNIT–V			
9.	a)	Explain the concepts i) Edge detection and ii) Gradient operator	7M		L5
	b)	Explain about region growing and region splitting.	7M		L5
		OR			
10.	a)	Determine the significance of Thresholding in image segmentation.	7M		L6
	b)	Classify and interpret about image compression models.	7M		L6

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Hall Ticket Number :										

R-15

Code: 5G375

IV B.Tech. I Semester Supplementary Examinations October 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) Discuss the process of Electron Microscopies? Explain the operation of Scanning probe Microscopies? 7M

   b) Explain the working principle of optical microscopy with neat sketches? 7M

OR

2. a) Define carbon nanotube? What are the types of carbon nano tubes, highlight the properties of carbon nano tubes? 7M

   b) List the methods for producing carbon nano tubes and explain any one of the method with a neat sketch? 7M

UNIT–II

3. a) Explain nano imprint lithography with a neat sketch? 7M

   b) Discuss about zero dimensional nano structures and write about quantum conductance of zero dimensional nano structures? 7M

OR

4. Brief out split-gate technology and also explain the process of self-assembly? 14M

UNIT–III

5. Explain Short channel MOS Transistor and split-gate transistor technologies? 14M

OR

6. a) Discuss quantum cellular automate with neat diagrams? 7M

   b) Describe the functioning of quantum dot array with proper sketches? 7M

UNIT–IV

7. a) What is RTDs? Explain three terminal RTDs technology? 7M

   b) Draw and explain digital circuit design based on RTDs technology of RTD 7M

OR

8. Explain the principle of SET and SET circuit design and compare between FET and SET circuit design? 14M

UNIT–V

9. a) Explain the process of Energy supply and heat dissipation? 7M

   b) Discuss Limits due to thermal particle motion? 7M

OR

10. a) Write and explain Nano systems as information processing machines? 7M

    b) Explain the hardware requirements of nano systems? 7M

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Hall Ticket Number :										

R-15

Code: 5G371

IV B.Tech. I Semester Supplementary Examinations October 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)	Calculate the numerical aperture of a plastic step-index fiber having a core refractive index of n_1=1.6 and a cladding index n_2=1.49	4M	CO2	L3
	b)	Draw the structure of step-index fiber and explain how optical ray can propagate in it?	4M	CO1	L2
	c)	How total internal reflection takes place in an optical fiber with neat sketches.	6M	CO2	L2
		OR			
2.	a)	Draw the structure of Step Index fiber and explain how optical ray can propagate in it?	4M	CO3	L2
	b)	A typical relative refractive index difference for an optical fiber designed for long distance transmission is 1%. Estimate the NA and the solid acceptance angle in air for the fiber when the core index is 1.46. Further, calculate the critical angle at the core–cladding interface within the fiber. It may be assumed that the concepts of geometric optics hold for the fiber.	5M	CO2	L3
	c)	Explain how to determine the mode field diameter of a single mode fiber.	5M	CO4	L3
		UNIT–II			
3.	a)	Write short notes on surface emitting LED.	7M	CO1	L1
	b)	The power generated internally within a double-heterojunction LED is 28.4 mW at a drive current of 60 mA. Determine the peak emission wavelength from the device when the radiative and nonradiative recombination lifetimes of the minority carriers in the active region are equal.	7M	CO4	L4
		OR			
4.		Discuss linewidth narrowing and wavelength tunability associated with single frequency injection lasers. Outline the major techniques which are being adopted to facilitate these characteristics.	14M	CO2	L5
		UNIT–III			
5.	a)	Draw the structures of InGaAs APDs and compare the different photo diodes	7M	CO3	L3
	b)	Describe the basic detection process in a photoconductive detector.	7M	CO1	L2
		OR			
6.	a)	Analyze the response time of a Photo Detector.	7M	CO2	L4
	b)	Compare and contrast the different types of Photo Detectors.	7M	CO2	L2
		UNIT–IV			
7.	a)	Briefly describe linear scattering losses in optical fibers with regard to: (i) Rayleigh scattering; (ii) Mie scattering.	8M	CO1	L2
	b)	Describe the mechanism of intermodal dispersion in a multimode step index fiber.	6M	CO2	L3
		OR			
8.	a)	What do you mean by pulse broadening? Explain its effect on information carrying capacity of a fiber.	7M	CO1	L1
	b)	Write short notes on optical (i) Isolators (ii) Couplers	7M	CO1	L2
		UNIT–V			
9.	a)	Briefly describe about analog links with neat sketch.	7M	CO1	L2
	b)	Discuss the multichannel transmission techniques.	7M	CO1	L1
		OR			
10.	a)	Write in brief about wavelength routers.	7M	CO1	L2
	b)	Explain the operation and principles of WDM.	7M	CO1	L1

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