R-15

Code: 5G472

IV B.Tech. I Semester Regular & Supplementary Examinations November 2019

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)	Draw block diagram of OSI Model with detailed description of each layer.	7M
	b)	What do you mean by network topology and classify them with advantages.	7M

OR

2.	a)	Classify layers of TCP/IP Model with their application	8M
	b)	Explain Protocols & their standards referred in communication system.	6M

UNIT–II

3.	a)	Illustrate sliding window protocols.	7M
	b)	Write a brief note on Multiple Access Protocols.	7M

OR

4.	a)	Elaborate CSMA/CD in detail.	7M
	b)	Explain IEEE 802.3 frame format.	7M

UNIT–III

5.	a)	Distinguish between adaptive and non-adaptive routing algorithms.	8M
	b)	What is an IP address? Discuss the various IP address classes.	6M

OR

6.	a)	Define fragmentation and explain why the IP4 and IP6 protocols need to fragment some packets.	7M
	b)	What is need of Congestion Control Algorithms in data communication?	7M

UNIT–IV

7.	a)	Discuss application of Transport layer in data communication.	7M
	b)	What are the functions of transport layer? Draw the segment structure of TCP.	7M

OR

8.	a)	Give detailed description of performance issues in transport layer protocols.	8M
	b)	Compare TCP and UDP Headers.	6M

UNIT–V

9.	a)	Define cryptography. Explain digital signature	6M
	b)	Explain domain name system.	8M

OR

10.	a)	What are the advantages & disadvantages of public and secret key encryption?	8M
	b)	Briefly explain world wide web.	6M

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IV B.Tech. I Semester Regular & Supplementary Examinations November 2019

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 Register Organization of 8051 Microcontroller. 　　14M

OR

2. Describe about the Internal and External Memory architecture of 8051 Microcontroller. 　　14M

UNIT–II

3. a) Describe the programming languages used for embedded systems. 　　7M

　 b) Write an application program to blink alternate LEDs with 1s of delay.
　　 (Note. Consider 8-LEDs, and clock frequency is 10MHz) 　　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) Discuss about categories of Embedded Operating Systems. 　　7M

　 b) How the Software Architecture can be described? 　　7M

OR

6. a) What are the services provided by an operating System? 　　7M

　 b) Explain the process of generating executable image in an embedded system. 　　7M

UNIT–IV

7. a) Need for Communication interface? 　　4M

　 b) Explain about USB interface? 　　10M

OR

8. a) Distinguish I^2C and CAN interfaces. 　　4M

　 b) Describe I^2C in detail. 　　10M

UNIT–V

9. a) Explain about Inter process Communication. 　　7M

　 b) What is meant by Priority Inversion Problem? 　　7M

OR

10. a) Describe about architecture of Kernel. 　　7M

　 b) Distinguish Embedded Operating System and Real Time Operating System. 　　7M

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R-15

Code: 5G375

IV B.Tech. I Semester Regular & Supplementary Examinations November 2019

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) Explain the historical mile -stones in the age of nano.   7M
   b) If nature is full of nano, what limits us from making nano material or nano devices?   7M

OR

2. a) Every property processed by bulk materials is also processed by nano objects. So, how can one study nano objects uniquely?   7M
   b) How will nano technology will work if positioned atoms and molecules do not stay at the specific location?   7M

UNIT–II

3. a) How would one make and stabilize a quantum dot?   5M
   b) What are the unique chemical properties of quantum dots? Give specific examples and illustrate how these are possible.   9M

OR

4. a) What makes quantum dot luminance attractive?   5M
   b) Derive the energy expression using confined Wannier excitation Hamiltonian for spherical semiconductor quantum dot.   9M

UNIT–III

5. a) Explain the Short- Channel MOS transistor. And also explain the quantum effect appears in terms of oscillations based on channel length.   7M
   b) Explain the Split-Gate Transistor operation in three different operating conditions.   7M

OR

6. a) Explain about Electron-wave Transistor in wave guides in detail.   7M
   b) Explain the Quantum Dot Arrays with neat diagrams.   7M

UNIT–IV

7. Draw and explain the basic configurations of RTBT, FET-RTD and SET.   14M

OR

8. a) Explain the Principle of the Single - Electron Transistor(SET)   7M
   b) Draw and explain the Inverter and OR gates based on RTDs.   7M

UNIT–V

9. a) Explain the limits due to thermal particle motion in ICs.   6M
   b) Draw the architecture of Nanoelctronic systems and describe their implementations.   8M

OR

10. a) What are the physical limits in ICs?   5M
    b) Explain the concept of an evolutionary hardware on the basis of FPGA.   9M

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IV B.Tech. I Semester Regular and Supplementary Examinations November 2019

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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UNIT–I

1. a) What are the various elements of an optical communication system? Explain each element in brief.   7M
   b) Draw the electromagnetic spectrum, explain different ranges and their wavelengths. Clearly show the range of wavelengths used for optical fiber communication   7M

OR

2. a) Define an optical fiber. Explain in detail different types of optical fibers with neat sketches   7M
   b) Write about Scattering losses in an optical fiber.   7M

UNIT–II

3. a) Explain the operation of edge emitting double – hetero junction LED, with a neat schematic diagram   7M
   b) With the help of a neat diagram explain the construction and working of SLED   7M

OR

4. a) Explain the working principle of n hetero structure LED with necessary diagrams   9M
   b) Glass fiber exhibits material dispersion given by $2(d2n1/d 2)$ of 0.025. Determine material dispersion parameter at a wavelength of 0.85µm and estimate rms pulse broadening/km for good LED source with an rms spectral width of 20 nm at this wavelength.   5M

UNIT–III

5. a) Derive relation between signal to noise ratio of optical detector.   7M
   b) Differentiate between the photo diode parameters, 'Quantum limit' and 'Dark current'   7M

OR

6. a) Compare different photo detectors.   7M
   b) Briefly Discuss about
      i) Avalanche Multiplication Noise ii) Temperature effect on Avalanche Gain   7M

UNIT–IV

7. a) Describe three types of misalignment that contribute to insertion loss at an optical fiber joint.   7M
   b) Explain clearly what are the different Lensing schemes for Coupling Improvement   7M

OR

8. a) Explain what is material dispersion? Derive an expression for material dispersion starting from the expression for group delay.   7M
   b) Write short notes on
      i) Fiber connectors ii) optical isolators and circulators   7M

UNIT–V

9. a) Discuss in detail about the principle of WDM network with suitable diagram.   7M
   b) Discuss system considerations in point to point optical link.   7M

OR

10. a) Write in brief about Tunable light Sources   7M
    b) Discuss the Radio and RF fiber analog links   7M

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IV B.Tech. I Semester Regular & Supplementary Examinations November 2019

Digital Design Through Verilog HDL

(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) Explain with examples the different ways of number representation in Verilog.   7M

    b) What are a scalars and vectors? How can it be represented?   7M

OR

2. a) What is meant by simulation? List out the advantages of testing.   7M

    b) Contrast different data types in Verilog   7M

UNIT–II

3. a) Explain in detail the basic gate primitives used in Verilog.   7M

    b) Explain the structure of Verilog module taking an example of AOI gate circuit.   7M

OR

4. a) Explain the different bidirectional gates used in Verilog.   8M

    b) Explain in detail the basic switch primitives available in Verilog.   6M

UNIT–III

5. a) Explain with examples various binary operators in Verilog.   8M

    b) Write a Verilog dataflow model for BCD adder.   6M

OR

6. a) Write a Verilog code and test bench for 2:4 decoder using case statements.   7M

    b) With example explain the various loops in Verilog.   7M

UNIT–IV

7. a) Explain UDP's with an example.   6M

    b) Design a Verilog module for 2 bit adder using half adder & full adder tasks.   8M

OR

8. a) Explain $monitor and $strobe tasks with examples.   7M

    b) What are the compiler directives available in Verilog?   7M

UNIT–V

9. a) Derive the SM chart for serially linked state machine.   6M

    b) Name and contrast components of SM chart .Analyze any one SM chart using them.   8M

OR

10.   Explain architecture of Xilinx 3000 series FPGA   14M

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Code: 5G373

IV B.Tech. I Semester Regular and Supplementary Examinations November 2019

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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UNIT–I

1.	a)	Discuss in detail sampling and quantization of images	7M
	b)	State and explain various methods of image acquisition	7M

OR

2.	a)	Obtain the Walsh transform for N=4	7M
	b)	Explain the properties of 2-D DFT transform	7M

UNIT–II

3.	a)	Explain about the following point processing operations in spatial domain With example	
		(i) Image negative　(ii) contrast stretching	7M
	b)	Discuss about histogram specification and enhancement	7M

OR

4.	a)	Explain about image smoothing in frequency domain	7M
	b)	Discuss about various spatial filters for image sharpening operations	7M

UNIT–III

5.	a)	Draw the image degradation model and explain it	7M
	b)	Explain about various mean filters and order static filters	7M

OR

6.	a)	Write brief notes on inverse filtering and What are the drawbacks of the method in the presence of noise.	7M
	b)	Explain the image restoration using wiener filter and also write advantages and disadvantages of this method.	7M

UNIT–IV

7.	a)	Explain about primary, secondary and HIS color models	7M
	b)	Discuss about pseudo color image processing technique	7M

OR

8	a)	Explain about full color image processing.	7M
	b)	Differentiate the different color models and give the conversions from one model to other model.	7M

UNIT–V

9	a)	Write short notes on point, line and edge detection	7M
	b)	Explain about region based segmentation	7M

OR

10.	a)	Explain about the basic image compression model with neat block diagram	7M
	b)	Discuss about arithmetic coding with example	7M

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