Hall Ticket Number :										

R-11 / R-13

Code: 1G478

IV B.Tech. I Semester Supplementary Examinations November 2019

Computer Networks

(Electronics and Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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1. a) If a binary signal is sent over a 3-kHz channel whose signal-to-noise ratio is 20 dB, what is the maximum achievable data rate 4M
   b) With diagram, explain various layers of OSI model 10M
2. a) A channel has a bit rate of 4 kbps and a propagation delay of 20 msec. For what range of frame sizes does stop-and-wait give an efficiency of at least 50% 5M
   b) With an example, explain simplex stop-and-wait protocol 9M
3. a) A group of N stations share a 56-kbps pure ALOHA channel. Each station outputs a 1000-bit frame on average once every 100 sec, even if the previous one has not yet been sent (e.g., the stations can buffer outgoing frames). What is the maximum value of N 4M
   b) What are four types of Ethernet cabling. Explain each of them in details. 10M
4. a) In figure 1, compute the shortest path from node A to node D. Explain in details of five steps used in computing the shortest path from node A to node D.

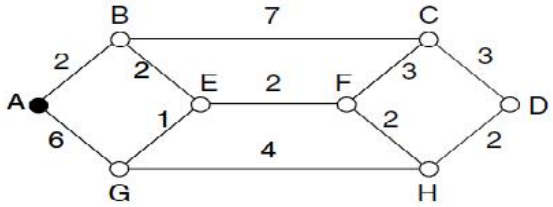

Figure 1. Network. 8M

   b) Analyse datagram and virtual-circuit with respect to the circuit setup, state information, routing, effect of router failure, QoS parameters 6M
5. a) Identify classes of following IP addresses
      i. IP address: 50.12.7.8
      ii. IP address: 222.20.5.1
      iii. IP address: 190.73.26.1
      iv. IP address: 126.20.3.5 6M
   b) Why we need fragmentation. Explain transparent fragmentation and nontransparent fragmentation 8M
6. a) What is the total size of the minimum TCP MTU, including TCP and IP overhead but not including data link layer overhead? 5M
   b) With diagram, explain TCP connection management finite state machine 9M
7. a) What is the bit rate for transmitting uncompressed 1200 × 800 pixel color frames with16 bits/pixel at 50 frames/sec 4M
   b) Explain five basic functions of email system 10M
8. a) In a system an RSA algorithm with p= 5 and q=11, is implemented for data security. What is the value of the decryption key if the value of the encryption key is 27 6M
   b) Explain digital signature using public-key encryption 8M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G373

IV B.Tech. I Semester Supplementary Examinations November 2019

Digital Design Through Verilog HDL

(Electronics & Communication Engineering)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks each**)

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1. Represent a module as a black box with its ports and then explain a module in Verilog HDL with a suitable example. 14M

2. Write a design module and test bench for half adder and draw its synthesized circuit output module. 14M

3. Write the syntax for the following constructs and give one example for each relevant to behavioral Verilog HDL modeling. 14M

4. a) How delay can be incorporated in data flow level using continuous assignments? Explain with suitable Verilog HDL program and waveforms of signals. 8M

   b) Write Verilog code for D-Latch with neat block diagrams 6M

5. Write Verilog code for CMOS Inverter and 2 – input CMOS NOR gate with neat circuit diagrams and also write the test bench program for it. 14M

6. What is SM chart? Explain the concept of realization of SM chart. 14M

7. a) Explain about FPGA with neat block diagrams 7M

   b) Explain about CPLD with neat block diagrams 7M

8. a) Design UART using Verilog HDL 8M

   b) Write a note on interfacing a memory to a microprocessor bus. 6M

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Hall Ticket Number :										

R-11 / R-13

Code: 1G372

IV B.Tech. I Semester Supplementary Examinations November 2019

Digital Signal Processing

(Common to EEE & ECE)

Max. Marks: 70 Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

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1. a) State and Prove the following properties of the discrete time Fourier transform
   (i) Time shifting (ii) Time Convolution 7M
   b) Determine the values of power and energy of the following signals. Find whether the signals are power, energy or neither energy nor power signal $X(n)=(1/3)^n u(n)$ 7M
2. a) State and prove the following properties of discrete Fourier series
   (i) Linearity (ii) Time reversal 7M
   b) Compute the discrete Fourier transform of the sequence x(n) = {1,1,1,1} 7M
3. What is the need of FFT? Explain 16-point radix-2 DIT-FFT algorithm with the help of flow-graph and necessary steps 14M
4. A causal system is represented by the following difference equation
   $y(n) + (1/4)\, y(n-1) = x(n) + (1/2)\, x(n-1)$
   (a) Find the system function H(z) and give the corresponding ROC
   (b) Find the unit step response of the system in analytical form
   (c) Determine the frequency response $H(e^{j\omega})$ and also find magnitude and phase response 14M
5. a) Compare an analog lowpass Butterworth and Chebyshev filters 7M
   b) List out the merits and demerits of the digital filters over analog filters 7M
6. Design a digital FIR filter with
   $H_d(e^{j\omega}) = e^{-j\omega 3}$; $-\pi/4 \le \omega \le \pi/4$
   $= 0$; $\pi/4 \le |\omega| \le \pi$
   Using a Hamming window with N=7 14M
7. a) List out the applications of multirate signal processing 7M
   b) Consider a signal x(n) = u(n)
   (i) Determine and sketch a signal with a decimation factor '3'
   (ii) Determine and sketch a signal with a interpolation factor '3' 7M
8. Discuss the need of signal compression 14M

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