Code : 1G371

R-11

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014
Optical Communication
(Electronics & Communication Engineering)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) Explain optical communication with a neat diagram in detail. — 6M

   b) Calculate the numerical aperture of a step index fiber having n1 = 1.48 and n2 = 1.46. What is the maximum entrance angle max for this fiber of the outer medium in the i) air, with n = 1.0   ii) water, with n= 1.33. — 8M

2. a) Derive the expression for critical radius of curvature for single mode and multimode fibers. — 7M

   b) Explain the light propagation conditions of single mode fibers with neat figures. — 7M

3. a) Explain the operational concept of a three point circular with a neat diagram — 7M

   b) Explain clearly about the mechanical misalignment? — 7M

4. a) Explain about single mode fibers? — 7M

   b) Explain the surface emitters and edge emitter LEDs? — 7M

5. a) With neat sketch explain power coupling between source and fiber? — 7M

   b) Explain about fiber techniques of source to fiber power launching? — 7M

6. a) What are the requirements of Photo detector and why photo diode is preferred in fiber optic communication systems? — 7M

   b) Explain about different noises present in Photo diodes? — 7M

7. a) Describe briefly about Power budget analysis of a fiber. — 8M

   b) Describe briefly component choice for design of a fiber optic link? — 6M

8. a) What are the different types of WDM? Explain in detail. — 6M

   b) Describe the principle and necessity of WDM technique In optical communication systems? — 8M

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Code : 1G376

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014
Radar Engineering
(Electronics & Communication Engineering)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) Explain the following terms with reference to a Radar system

    i) false alarm probability
    ii) Integration efficiency
    iii) Radar cross section and
    iv) Blind speeds   8M

    b) What is the difference between the pulse interval and the PRF? What are the factors that govern the selection of PRF for particular radar?   6M

2. a) Derive the expression for the echo energy received by radar and discuss the influence of various parameters on the performance.   8M

    b) Discuss the war and peace time applications of Radar   6M

3. a) With the aid of block diagram explain the operation of a FM-CW radar altimeter. Estimate the measurement errors resulting in.   7M

    b) For an unambiguous range of 81n.mile in a two frequency CW radar, determine f_2 and Δ_f when f_1 =4.2Hz.Derive the expression you have used.   7M

4. a) Distinguish between MTI Radar and Pulse Doppler Radar and explain the operation of MTI with power amplifier with neat diagram.   7M

    b) What is a delay line and what are the various techniques with which delay can be introduced. Explain the working principal a delay line canceller with a neat diagram. 7M

5. a) Draw the block diagram of a two coordinate amplitude comparison monopulse tracking radar and explain its operation   8M

    b) Bring out the comparison of various trackers.   6M

6. a) What is matched filter? Derive the matched filter characteristics using Schwartz inequality.   9M

    b) Describe the operation of coherent detector.   5M

7. a) Explain various techniques that can be used to electronically interfere with radar performance.   7M

    b) What Electronic Counter Measures be taken to overcome them? Describe them.   7M

8. a) Define Noise figure, Noise temperature. How is noise figure measured? Derive an expression for the noise figure of a network in cascade.   7M

    b) Bring out the difference between branch type and balanced duplexers and explain the operation of balanced duplexer with neat diagram.   7M

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Code : 1G478

IV B.Tech. I Semester Regular Examinations Nov/Dec 2014
Computer Networks
(Electronics & Communication Engineering)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) What are the different Hardware elements of a computer network? What are the functions performed by them.   7M

   b) What is Wireless Local LooP. What are the characteristics of a wireless network?   7M

2. a) When do you prefer error detection over error correction and vice versa? What are the applications where error detection is preferred over error correction?   5M

   b) How the Sliding window works. Explain with an example.   9M

3. a) How Binary exponential backoff algorithm works. When it is used in Ethernet.   6M

   b) How Switched Ethernet and Fast Ethernet achieve better performance over Ethernet.   8M

4. a) What are the criteria for evaluating the routing algorithm?   4M

   b) How flooding is achieved and how it is controlled. What are the applications of flooding?   10M

5. a) What is the need for internetworking?   5M

   b) Explain the different fields of the IP header.   9M

6. a) Explain the different fields of UDP header.   6M

   b) How connections are released in TCP. Explain with the help of a diagram.   8M

7. a) What is the need for DNS?   4M

   b) Explain how the actual computer systems are identified using DNS.   10M

8. a) What are the differences between symmetric and asymmetric algorithms?   7M

   b) Explain how Digital signatures are used to provide security.   7M

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IV B.Tech. I Semester Regular Examinations Nov/Dec 2014
Digital Design Through Verilog HDL
(Electronics & Communication Engineering)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
****

1. a) Explain the ASIC design and development flow with neat block diagrams and flow charts. 8M

   b) Explain levels of design description with suitable examples. 6M

2. a) Write short notes on

   i. Module   ii. Simulation and synthesis   iii. Test benches 6M

   b) Write Verilog code, truth table and circuit diagram for AOI gate? 8M

3.   Write Verilog code, truth table and timing diagrams for the ALU with suitable diagrams and descriptions. 14M

4. a) Write Verilog code for Shift register with right and left shift and test bench for the same 8M

   b) Explain blocking and non-blocking assignments with examples. 6M

5. a) Draw the flow chart and explain Simulation flow in behavioral modeling. 8M

   b) Explain delays in Verilog? 6M

6. a) Write Verilog code for RAM cell with neat circuit diagram in switch level modeling. 8M

   b) Discuss about System tasks and functions. 6M

7. a) Design and explain Moore finite state machine with suitable examples 8M

   b) Write Verilog code for 2X2 multiplier. 6M

8. a) Explain about Static RAM memory. 8M

   b) Write short notes on FPGA. 6M

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IV B.Tech. I Semester Regular Examinations Nov/Dec 2014
Digital Signal Processing
(Common to EEE & ECE)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) Test the following systems for linearity, time-invariant, stability and causality.

    (i)   y(n) = x(n) x(n-2)   (ii) y(n) = $\log_{10}$ | x(n) |.   7M

   b) Determine the impulse response h (n) for the system described by the difference equation   y(n) = 0.6 y(n-1) – 0.08 y(n-2) + x(n).   7M

2. a) Prove the following DFT properties

    (i) Time reversal (ii) Circular time shift (iii) Circular convolution.   7M

   b) Compute the DFT of the sequence x(n) = {2, 2, 2, 2, 1, 1, 1, 1}.   7M

3. a) Derive the necessary three stage computation equations for radix-2 DIT FFT method.   7M

   b) Find the DFT of the sequence x(n) = {2,1,2,1,2,1,2,1,2}.   7M

4. Determine the impulse response and step response of the causal system given below and discuss on stability.

    y(n) – y(n-1) - 2 y(n-2) = x(n-1) + 2 x(n-2).   14M

5. a) What is warping effect? How can you eliminate this problem?

                                                                                    4M

   b) Design the third order Butterworth digital filter using impulse invariant technique. Assume sampling period T = 1 sec   10M

6. a) Derive and draw the frequency of linear phase FIR filter when impulse response is symmetrical and N is odd   10M

   b) Compare the parameters of rectangular, triangular, Hanning and Hamming windows.   4M

7. a) What is decimation?   2M

   b) How can a sampling rate conversion by a factor of I/D achieved?   12M

8. Explain about

    a) Digital music synthesis.   7M

    b) Trans multiplexers.   7M

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IV B.Tech. I Semester Regular Examinations Nov/Dec 2014
Embedded Systems
(Electronics & Communication Engineering)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
****

1. a) Explain about the necessity of processor selection in an embedded system.   6M

   b) What type of programming languages and development tools are required for embedded systems?   8M

2. a) Explain about application software and communication software with examples.   8M

   b) Describe the software architecture of an embedded system.   6M

3. Explain about register organization of 8051 microcontroller.   14M

4. a) Describe the TMOD and TCON registers of 8051 microcontroller.   8M

   b) Explain how serial communication is established with 8051 microcontroller.   6M

5. a) Write an assembly language program to display "SWACHA BHARATH" on LCD which is interfaced with 8051 µC.   7M

   b) Draw the schematic of LCD interface with 8051µC.   7M

6. a) Explain about I^{2}C protocol.   8M

   b) What is the need for MAX232?   6M

7. What is Mutex? Explain about priority inversion problem.   14M

8. What is the difference between operating system and real time operating system? Explain with an example of each.   14M

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