

Hall Ticket Number :

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R11/R13

Code: 1G382

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Digital Image Processing

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

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

1. a) Explain the fundamental steps in digital image processing? 7M
b) Define
 (a) neighborhood of a pixel
 (b) m-adjacency
 (c) closed path
 (d) connected set
 (e) Contour
 (f) chess board distance
 (g) digital curve 7M
2. a) Compute Discrete Cosine transform matrix for N=4 7M
b) Explain Slant transform. List the advantages and drawbacks of it 7M
3. a) Perform histogram equalization of image on 7M
b) Differentiate between spatial and frequency domain enhancement techniques? 7M
4. a) What is the need of frequency domain image enhancement? Explain the steps of filtering in frequency domain with a neat block diagram? 7M
b) Write short notes on spatial domain high pass filter with clear illustrations 7M
5. Describe the color transformations in case of full color image processing 14M
6. a) Explain constrained least squares filtering restoration? 7M
b) Derive the mathematical expression for a Wiener filter. Also give the advantages and drawbacks of it over an inverse filter? 7M
7. a) How to improve global thresholding
 i. using image smoothing 7M
 ii. using edges 7M
b) Explain in detail about region based segmentation 7M
8. a) Describe the need for image compression? Explain the three types of data redundancies? 7M
b) Write short notes on lossy compression. 7M

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IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

DSP Processors and Architectures

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

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

1. a) Explain about memory access schemes in Programmable DSPs? 8M
b) Discuss about the function of MAC unit and also explain how overflow and underflow conditions can be eliminated in MAC operations? 6M
2. a) Discuss about the errors that occur during the conversion of an analog signal to digital signal? 8M
b) Describe dynamic range and precision in DSP systems? 6M
3. a) What do you mean by programmability and program execution? Explain? 6M
b) How DSP processors support external interfacing? Explain in detail? 8M
4. a) Explain about the memory space related to TMS320C54XX DSP processor? 6M
b) Describe about the on-chip peripherals of TMS320C54XX DSP device? 8M
5. a) What is an interpolation filter? Explain the significance of interpolation filter in DSP? 6M
b) How an adaptive filter can be implemented in DSP? Explain? 8M
6. a) Determine the optimum scaling factor for the DIT-FFT butterfly? Justify How scaling prevents the overflow conditions in butterfly computations? 10M
b) Explain how bit-reversed index-generation is implemented in TMS320C54XX DSP? 4M
7. a) Choose a suitable CODEC interface circuit, explain its programming concept? 8M
b) Describe the interfacing concept of parallel I/O to P-DSPs with necessary sketches? 6M
8. a) Explain in detail about the FPGA based system design? 8M
b) Describe distributed arithmetic algorithm? 6M

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IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Satellite Communications

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

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

1. a) Discuss the applications of Satellite Communication. 7M
b) Explain the various reasons for preferring Satellites than Optical Fibers which are providing very high bandwidth. 7M
2. a) What is a Geosynchronous Orbit? Discuss the advantages and disadvantages of these orbits. 7M
b) The orbit for an earth-orbiting satellite orbit has an eccentricity of 0.15 and a semi major axis of 9000 km. Determine (i) Its periodic time, (ii) the apogee height, (iii) the perigee height. Assume a mean value of 6371 km for the earth's radius. 7M
3. a) Why blue light sensitive solar cell are preferred for power generation at satellite. 7M
b) Derive the expression for the power received by an earth station from a satellite transmitter. 7M
4. a) Explain the terms system noise temperature and G/T Ratio. 7M
b) A satellite at a distance of 40,000Km from a point on the earth's surface radiates power of 2W from an antenna with a gain of 17dB in the direction of the observer. Find the flux density at the receiving point, and the power received by an antenna with an effective area of $10m^2$. 7M
5. a) Show a base band correlator for discrete spread CDMA system? 7M
b) Illustrate the DS-SSCDMA with seven chip spread code sequence 1110100. 7M
6. a) What are the different types of antenna mounts? 4M
b) Consider a fast-hop FSK-FH-CDMA satellite channel where M hops are performed per bit. The number of frequency slots in the channel is n. Find the probability of intercepting k users in one bit interval. 10M
7. a) A 14/11 GHz antenna has a G/T ratio of 40.3dB at 11.2 GHz. The antenna gain is 64dB and the system noise temperature at 10 deg elevation angle in clear air conditions is 234k. The antenna aperture efficiency and noise temperature are detailed in the list below. During heavy rain, the slant path attenuation reaches 8dB for 0.01 percent of the year. Calculate G/T ratio for their fraction of the year and the corresponding reduction in C/N for the received signal.
Aperture efficiency: 71.3%
Sky noise at 10deg elevation: 30k
LNA noise temperature: 150k 7M
b) Explain in detail how geostationary satellites are tracked from the earth station? 7M
8. a) Explain the C/A code generator of GPS. 7M
b) Explain the simplified block diagram of a C/A code GPS receiver. 7M

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IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Wireless Communication Networks

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

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

1. a) Explain about the current Wireless systems and compare them. 10M
b) Discuss about the Wireless spectrum and its specifications. 4M
2. a) Explain about the features of Spread spectrum Multiple Access. 9M
b) Write short notes on SDMA. 5M
3. a) Explain about the development of Wireless networks. 6M
b) Explain about SS7 protocol and its performance. 8M
4. a) Discuss the features of Wireless session protocol. 9M
b) Write short notes on Mobile IP Encapsulation. 5M
5. a) Explain about the IEEE 802.11 protocol Architecture and services. 10M
b) Write short notes on Narrowband Microwave LANs. 4M
- 6 a) Explain the following core protocols of Bluetooth
(i) Link manager specification
(ii) Logical link control and adaptation protocols 12M
b) Mention the applications of Bluetooth. 2M
7. a) Explain about the classification of Mobile data networks. 7M
b) Explain about short messaging services in GPRS. 7M
8. a) Explain about the architecture of HIPERLAN-1 network. 9M
b) Write short notes on packet frame format of Wireless ATM. 5M
