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**R11**

**Code: 1G381**

*IV B.Tech. II Semester Regular & Supplementary Examinations Mar/Apr 2016*

**Cellular and Mobile Communications**

(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. a) Explain the operation of cellular system. Why hexagonal shape is preferred for cell site 7M  
b) Describe the uniqueness of mobile radio environment 7M
2. a) Derive the co-channel interference reduction factor in a hexagonal shaped cellular system 7M  
b) Describe the concept of frequency reuse and explain the factors that influence the choice of frequency reuse distance 7M
3. a) Describe the design of a directional antenna system for co-channel interference reduction 7M  
b) Describe the tests for measuring the co-channel interference in a system 7M
4. a) Explain clearly the mobile point-to-point (Lee) model and hence explain the path loss characteristics with the help of expression for received power  $P_r$  7M  
b) Explain mobile propagation in Near – In distance and long distance 7M
5. a) Write short notes on antennas used at cell site 7M  
b) Explain the sum and difference patterns and their synthesis 7M
6. a) Define channel Assignment. Explain the concepts sectorization and overlaid cells 8M  
b) Distinguish between fixed and non-fixed channel assignment algorithms 6M
7. a) What is handoff? Explain various types of handoffs 7M  
b) Explain the consideration of Dropped calls and get a relation among capacity, voice quality and dropped call rate and for dropped call rate general formula 7M
8. a) What is GSM? Discuss clearly about mobile management in GSM and general protocol architecture of GSM 7M  
b) Write short notes on CDMA digital cellular standard 7M

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**Code: 1G382**

*IV B.Tech. II Semester Regular & Supplementary Examinations Mar/Apr 2016*

**Digital Image Processing**

(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. What are the steps involved in Image Processing? Explain in detail with a neat block diagram. 14M
  
2. a) Discuss about 2D - DFT properties. 8M  
b) Write kernels of  
i) DCT    ii) Walsh Transform    iii) Hadamard Transform. 6M
  
3. a) What is meant by histogram of an image? Sketch histograms of basic images. 7M  
b) Explain histogram equalization in detail. 7M
  
4. a) Discuss about image sharpening filters in spatial domain. 7M  
b) What is homomorphic filter? Explain how it can be implemented. 7M
  
5. a) Explain sampling and quantization for color image. 7M  
b) Discuss about RGB color model. 7M
  
6. a) Explain the algebraic approach to image restoration. 7M  
b) Explain image degradation model in detail. 7M
  
7. a) Write short notes on  
i) Edge detection  
ii) Detection of discontinuities. 7M  
b) Explain in detail about various compression techniques. 7M
  
8. a) Explain what is meant by erosion and dilation. 6M  
b) What do you mean by error free compression? Write about variable length coding. 8M

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IV B.Tech. II Semester Regular &amp; Supplementary Examinations Mar/Apr 2016

**DSP Processors and Architectures**

(Electronics &amp; 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) Explain what is meant by instruction pipelining. Explain with an example, how pipelining increases the through efficiency 7M
  - b) What is meant by bit reversed addressing mode? What is the application for which this addressing mode is preferred? 7M
2. a) Show that the dynamic range of a signal increases by 6dB for each additional bit used to represent its value. 7M
  - b) Compute the dynamic range and the percentage resolution for a block floating-point with a 4-bit exponent used in a 16-bit fixed-point processor 7M
3. a) What is meant by overflow in an arithmetic computation? How is an overflow condition detected in an ALU? 7M
  - b) Explain the difference between a single-instruction, zero-overhead hardware looping and multiple-instruction, zero-overhead hardware looping in terms of architectural requirements and the performance. 7M
4. Write a TMS320C54xx program to read the cosine value of a variable from the table stored in the program memory and store it in the data memory. The variable is located at address VALUE in the data memory, and the cosine value should be stored at the same location. The cosine table is stored at address TABLE in the program memory. 14M
5. a) Determine the value of each of the following 16-bit numbers represented using the given Q-notation:
  - i. 440h as a Q0 number
  - ii. 4400h as a Q15 number
  - iii. 4400h as a Q7 number 7M
  - b) Develop a decimation filter program that can be used to decimate by a factor of  $2^5$  using a subroutine to decimate by a factor of 2 in conjugation with appropriate filters. 7M
6. A time domain sequence of 73 elements is to be convolved with another time-domain sequence of 50 elements using DFT to transform the two sequences, multiplying them, and then doing IDFT to obtain the resulting time-domain sequence. To implement DFT or IDFT, the DIT-FFT algorithm is to be used. Determine the total number of complex multiplies needed to implement the convolution. Assume that each butterfly computation requires one complex multiplication 14M
7. a) Design a circuit to interface a 4K x 16 and 2K x 16 memory chip to realize program memory space for the TMS320C54xx processor in the address ranges 03FFFFh-03F000h and 05F800h-05FFFFh respectively 7M
  - b) How does DMA help in increasing the processing speed of a DSP processor 7M
8. Explain the functional block diagram of Xilinx XC4000E family CLB with neat diagram 14M

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<b>R11</b>
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**Code: 1G48C**

*IV B.Tech. II Semester Regular & Supplementary Examinations Mar/Apr 2016*

**Database Management Systems**

(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. a) Draw and explain the three level architecture of database system. 7M  
b) Specify and explain various structural constraints of relationship type. 7M
2. a) What is a relational model? Explain its concept. 7M  
b) Compare and contrast Domain relational calculus and Tuple relational calculus 7M
3. a) List and explain the common data types available in SQL. 7M  
b) Explain the concept of trigger with appropriate example. 7M
4. a) Explain the need of normalization. 4M  
b) Describe various normal forms with suitable examples 10M
5. a) Describe the properties of a transaction. 7M  
b) Why the recovery is needed? Explain the concept of recovery. 7M
6. a) What is serializability? Explain its concept. 7M  
b) Describe two-phase locking protocol. 7M
7. a) Describe various methods of defining indexes on multiple keys. 7M  
b) When does a collision occur in hashing? Illustrate various collision resolution techniques. 7M
8. a) What is a RAID system? How it improves performance and reliability? 7M  
b) Explain different record formats with examples. 7M

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**Code: 1G386**

IV B.Tech. II Semester Regular &amp; Supplementary Examinations Mar/Apr 2016

**Satellite Communications**

(Electronics &amp; 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) List the various Benefits and Drawbacks of Satellite Communications. 7M  
 b) Define elevation and inclination angles of a satellite orbit. What are the primary factors needed for defining an orbit of a satellite? 7M
2. a) What are Orbital Perturbations? Explain the effects of earth's oblateness on orbital inclination of Geosynchronous Satellite. 7M  
 b) A satellite orbit has an eccentricity of 0.2 and a semi major axis of 10000 km. Find the value of  
 (i) The latus rectum,  
 (ii) The minor axis,  
 (iii) The distance between foci. 7M
- 3 a) Draw a neat diagram of Telemetry, Tracking and command and explain the operation. 7M  
 b) Explain the importance of reliability in the design and construction of Satellites. 7M
4. a) What is System Noise Temperature? Derive an expression for system noise temperature of the receiver. 7M  
 b) For a satellite earth station receiver, working on 4GHz, the various gain and equivalent noise temperatures are  
 $T_m = 50^0 K, T_{RF} = 50^0 K, T_m = 300^0 K$  and  $T_{IF} = 1000^0 K, G_{RF} = 23dB, G_m = 0dB, G_{IF} = 30dB$ .  
 Calculate the system noise temperature. 7M
5. a) Define and explain what is meant by frame efficiency in relation to TDMA operation. 7M  
 b) In a TDMA network the reference burst and the preamble each requires 560 bits, and the nominal guard interval between bursts is equivalent to 120 bits. Given that there are eight traffic bursts and one reference burst per frame, and the total frame length is equivalent to 40,800 bits. Calculate the frame efficiency. 7M
6. In Earth station explain:  
 (a) Low-noise amplifier  
 (b) High power amplifier and mention advantages and disadvantages and applications. 7M
7. Explain the set of specifications to illustrate non-geostationary satellite systems. 7M
- 8 a) Explain the position location in GPS. 7M  
 b) How clock error is avoided in GPS? 7M

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