

Code: 9A04801

1

B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**CELLULAR & MOBILE COMMUNICATIONS**

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Explain the operation of cellular systems.  
(b) Explain about the mobile fading characteristics.
- 2 (a) Explain the C/I in an omnidirectional antenna system and derive it.  
(b) What are the components considered in cellular systems? Explain it.
- 3 (a) Explain different methods used for reducing near end to far end interference.  
(b) Write notes on diversity.
- 4 (a) Explain propagation over water or flat open area.  
(b) Determine the phase difference between direct path and reflected path.
- 5 (a) What are directional antennas? Explain directional antennas for interference in detail.  
(b) Explain about omnidirectional antennas.
- 6 Explain about:  
(a) Channel sharing.  
(b) Channel borrowing.
- 7 (a) What is forced handoff? Explain it.  
(b) Explain the concept of delayed handoff.
- 8 (a) What are the difference between GSM and CDMA mobile phone?  
(b) Explain the TDMA technique.

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B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**CELLULAR & MOBILE COMMUNICATIONS**

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
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- 1 (a) Explain the basic cellular system with neat diagram.  
(b) Explain the items required for service quality in cellular mobile system.
- 2 (a) Explain the co-channel interference reduction factor and derive the formula for C/I.  
(b) Define cell splitting. How does cell splitting affect the system design?
- 3 (a) Discuss in detail the various techniques to measure co-channel interference.  
(b) Describe the effects of antenna parameters on the cell interferences.
- 4 (a) Explain the long distance propagation.  
(b) Explain about foliage loss in detail.
- 5 (a) What is the used of broadband umbrella pattern antenna? Explain it.  
(b) What are the antennas used at cell site? Explain them.
- 6 (a) Explain about non fixed channel assignment.  
(b) Explain about cell sectorization.
- 7 (a) Explain how handoff is initiated.  
(b) What are the different methods of delaying the handoff? Explain it.
- 8 (a) What are the major problems in AMPS system? How these can be overcome in GSM system?  
(b) Explain the difference between TDMA and CDMA.

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3

B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**CELLULAR & MOBILE COMMUNICATIONS**

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
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- 1 Describe the principle of operation of cellular mobile system and explain the cellular concept with a neat diagram.
- 2 (a) Explain the designing of the Omni directional antenna under the practical case conditions for  $K = 7$ ,  $K = 9$  and  $K = 12$  with all the suitable values and explaining each of them.  
(b) Describe the changes that effect in cellular architecture aspects due to cell splitting.
- 3 (a) What is adjacent channel interference? How can it be minimized?  
(b) Explain how co-channel interference is measured in real time mobile trans receiver.
- 4 (a) Explain point to point model and mention the types of point to point model and mention the merits.  
(b) Write the notes on cell site antenna height.
- 5 Explain about:  
(a) Omni directional antennas.  
(b) High gain antennas.
- 6 (a) Discuss the concept of frequency management concern to the numbering the channels and grouping into the subset.  
(b) Explain the different channel assignment algorithms in detail.
- 7 (a) Why handoff is necessary for cellular system? Determine the two types of handoffs based on signal strength and C/I ratio.  
(b) Define the dropped call rate. How dropped calls are considered?
- 8 Explain in detail GSM architecture.

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B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**CELLULAR & MOBILE COMMUNICATIONS**

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 Explain in detail the uniqueness of mobile radio environment.
- 2 (a) Explain the importance of  $N = i^2 + ij + j^2$ .  
(b) Explain the concepts of frequency reuse channels and frequency reuse distance.
- 3 (a) Distinguish between co-channel interference and non co-channel interference.  
(b) Discuss the diversity schemes for interference reductions at both mobile unit and cell site.
- 4 (a) State the major factors causing propagation path loss.  
(b) How is location of cell site and mobile unit influenced by foliage loss?
- 5 (a) Explain space diversity antenna in detail.  
(b) Explain mobile high gain antennas in detail.
- 6 (a) Explain how set-up channels act as control channels in a cellular system.  
(b) On what basis channels are assigned in an overlapped cell based system.
- 7 (a) How queuing is importance for the handoff procedure?  
(b) Explain how to calculate the number of handoffs per call.
- 8 (a) Explain GSM services and features.  
(b) Write the various parameters on which the capacity of CDMA depends. Explain it.

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Code: 9A04802

1

B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**DIGITAL IMAGE PROCESSING**

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Discuss about image model.  
(b) Explain the following relationship between pixels:  
(i) Distance measures. (ii) Connectivity.
- 2 (a) Discuss the usefulness of DCT.  
(b) Explain the implementation fast Walsh transform. How it is different from FFT?
- 3 (a) Explain following image enhancement techniques:  
(i) Bit plane slicing. (ii) Grey level slicing  
(b) Discuss the following spatial filtering techniques:  
(i) High pass filtering. (ii) High boost filtering
- 4 (a) Explain how image enhancement is done in frequency domain.  
(b) How image smoothing is done in frequency domain?
- 5 Discuss in detail the concept of pseudo-color image processing.
- 6 (a) Discuss the algebraic approach of unconstrained restoration.  
(b) Explain the concept of inverse filtering and what are the limitations of it?
- 7 (a) What are the applications of image segmentation?  
(b) Explain about edge detection.
- 8 (a) Explain how image redundancies can be eliminated.  
(b) Discuss the need for channel encoder and decoder.

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2

B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**DIGITAL IMAGE PROCESSING**

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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- 1 (a) What is non uniform sampling and how it is different from uniform sampling?  
(b) Explain the following relationship between pixels:
  - (i) Transitive closure
  - (ii) Labeling connected components
- 2 State and prove following 2D DFT properties.
  - (i) Translation in frequency domain
  - (ii) Scaling
  - (iii) Rotation
- 3 (a) Discuss about image enhancement using histogram processing.  
(b) Sketch the histograms of dark image, bright image, low contrast image and high contrast image and explain.
- 4 (a) Distinguish between enhancement in spatial domain and frequency domain.  
(b) How high pass filtering is used in frequency domain for image enhancement?
- 5 Explain about different color models used in color image processing.
- 6 (a) Explain the need for image restoration.  
(b) Explain about Wiener filtering  
(c) Explain about interactive restoration
- 7 (a) Discuss about region based segmentation.  
(b) Explain about edge formulation and its detection.
- 8 (a) Explain about objective and subjective image fidelity criterion.  
(b) How psycho visual redundancy is different from other redundancies?

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B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**DIGITAL IMAGE PROCESSING**

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Discuss about image sampling and quantization.  
(b) Explain the fundamental steps involved in digital image processing.
- 2 State and prove following 2D DFT properties:
  - (i) Periodicity
  - (ii) Separability
  - (iii) Rotation
- 3 (a) Explain following image enhancement techniques:
  - (i) Image negatives
  - (ii) Bit plane slicing  
(b) Discuss the following spatial filtering techniques:
  - (i) Derivative filters
  - (ii) Median filtering
- 4 (a) Distinguish between enhancement in spatial domain and frequency domain.  
(b) How image sharpening is done in frequency domain?
- 5 (a) Differentiate pseudo-color image processing and full color image processing.  
(b) What is the need for color model conversion?
- 6 (a) With the help of block diagram explain about degradation model.  
(b) Discuss about algebraic restoration.
- 7 (a) Explain the concept of edge linking and boundary detection.  
(b) Explain the different thresholding operations used in image segmentation.
- 8 (a) What is the need for image compression?  
(b) Discuss the transform domain compression with the help of block diagram.

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B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**DIGITAL IMAGE PROCESSING**

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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- 1 (a) Explain arithmetic and logic operations that can be performed on images.  
(b) List the applications of image processing.
- 2 State and prove following 2D DFT properties:
  - (i) Translation in spatial domain
  - (ii) Scaling
  - (iii) Average value
- 3 Discuss following techniques for image enhancement:
  - (i) Median filtering
  - (ii) Image subtraction
  - (iii) Derivative filters
- 4 (a) Explain how image enhancement is done in frequency domain?  
(b) How low pass filtering is used in frequency domain for image enhancement?
- 5 With the help of block diagram explain about full-color image processing.
- 6 (a) Explain about inverse filtering.  
(b) Compute circulant matrix when length  $f(x)$  is '4' and  $h(x)$  is '3'.
- 7 Explain the detection of discontinuities in images in detail.
- 8 (a) Discuss the loss less predictive coding with the help of block diagram.  
(b) Discuss about image compression standards.

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Code: 9A04803

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B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**SATELLITE COMMUNICATIONS**  
(Electronics and Communication Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 Discuss the future trends and advanced concepts relating to satellite communication.
- 2 What are orbit effects, which effects the performance of a satellite? Explain in detail.
- 3 Write in detail about:
  - (a) Altitude system.
  - (b) Orbit control system.
- 4 Discuss about design of satellite links for specified C/N in detail.
- 5
  - (a) Explain the demand access multiple access.
  - (b) Explain the TDMA frame structure.
- 6
  - (a) Explain in detail about tracking system in earth station.
  - (b) Explain of linear apertures.
- 7
  - (a) Explain the delay and through put consideration in satellite systems.
  - (b) How to determine the optimum orbital altitude.
- 8
  - (a) What is meant by P - code in GPS satellite?
  - (b) What are the major sources of error in a GPS receiver?

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2

B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**SATELLITE COMMUNICATIONS**  
(Electronics and Communication Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Explain the applications of satellite communications.  
(b) Write the history of satellite communications.
- 2 Discuss in detail effects of earth gravitational force on satellite.
- 3 Write notes on:  
(a) Space qualification.  
(b) Satellite antenna equipment reliability.
- 4 How does the system noise temperature effect the performance. Derive the expression for overall system noise temperature at the receiving earth station?
- 5 (a) Explain the spread spectrum transmission and reception.  
(b) Assume that the TDMA system uses a 125  $\mu$ s frame failure. Find the number channels/ earth station when a 5  $\mu$ s preamble is added to the beginning of each earth stations transmission.
- 6 Explain in detail about design of large antennas.
- 7 Explain about:  
(a) Elliptical orbits.  
(b) Molniya orbits.
- 8 (a) How the position location with GPS is obtained.  
(b) Explain the technology of range error budget used to provide accuracy in GPS C/A code receiver.

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3

B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**SATELLITE COMMUNICATIONS**  
(Electronics and Communication Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 Draw a basic block diagram of satellite communication system and explain each block in detail.
- 2 (a) Explain look angle determination.  
(b) Discuss the two types of launch sequence used to inject satellites.
- 3 (a) Explain the satellite antennas.  
(b) Explain about 6/4 GHz communication subsystem in detail with neat schematics.
- 4 Explain the design of uplinks and downlinks in detail.
- 5 (a) Explain the traffic burst in TDMA.  
(b) What is the guard time estimation in TDMA?
- 6 (a) What are the different types of antenna mounts?  
(b) Explain the functional elements of a satellite tracking system.
- 7 Write notes on:  
(a) Equatorial orbits.  
(b) Inclined orbits.
- 8 (a) Explain about GPS navigation message.  
(b) Explain about GPS C/A code accuracy.

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4

B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**SATELLITE COMMUNICATIONS**  
(Electronics and Communication Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 Discuss the advantages and disadvantages of satellite communication over other types of communication methods.
- 2 (a) Explain the expendable launch vehicles.  
(b) What are Kepler's three laws of planetary motion?
- 3 Explain telemetry, tracking, command and monitoring in detail.
- 4 Discuss about:
  - (a) Noise temperature.
  - (b) G/T ratio for earth station.
- 5 (a) Calculate the C/N with inter modulation.  
(b) Discuss the synchronization in TDMA networks.
- 6 Explain about:
  - (a) Rectangular apertures.
  - (b) Circular apertures.
- 7 (a) Which factors are influence to design any satellite communications systems.  
(b) Explain the terminal characteristics and common requirements of NGOSS.
- 8 (a) Explain about the GPS receiver.  
(b) Explain about the GPS codes.

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Code: 9A04806

1

B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**WIRELESS COMMUNICATIONS & NETWORKS**

(Common to ECE & ECC)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Explain in detail about packet radio protocols.  
(b) Explain the features of FDMA.
- 2 (a) Explain about the circuit switching.  
(b) What are the characteristics of wireless networks?
- 3 (a) Explain about ATM virtual circuits with a neat figure.  
(b) Explain the ISDN with neat block diagram.
- 4 (a) Explain in detail wireless transaction.  
(b) How agent registration takes place in mobile IP.
- 5 (a) Write notes on IEEE802 services.  
(b) Explain about infrared LAN's.
- 6 (a) Explain the error correction schemes in Bluetooth.  
(b) What are the advantages of WLL over a wired approach to subscriber loop support?
- 7 (a) Explain over view of SMS operation.  
(b) Explain the protocol layers in GPRS.
- 8 Explain about:  
(a) Wireless ATM  
(b) WPAN

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Code: 9A04806

2

B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**WIRELESS COMMUNICATIONS & NETWORKS**

(Common to ECE & ECC)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Compare DS-SS and FH-SS.  
(b) Discuss about CSMA protocols and reservation protocols.
- 2 (a) Explain the public switched telephone network.  
(b) Explain in detail about packet switching.
- 3 (a) Explain SS7 protocol architecture in detail.  
(b) Explain in detail about BLSDN.
- 4 (a) List the services provided by WAP.  
(b) Explain the important capabilities of WML script.
- 5 (a) With a neat sketch explain the architecture of IEEE802.11.  
(b) Explain the configuration for omnidirectional infrared LANS.
- 6 (a) Explain the use of logical channels to carry different types of payload traffic in Bluetooth.  
(b) Explain about the logical link protocol.
- 7 (a) Explain the architecture of GPRS with a neat diagram.  
(b) Explain about short messaging services in GSM.
- 8 Explain in detail about the adhoc network architecture.

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**WIRELESS COMMUNICATIONS & NETWORKS**

(Common to ECE & ECC)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
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- 1 (a) Explain the space division multiple access.  
(b) Classify the medium access protocols and explain them.
- 2 (a) Explain about traffic routing in wireless protocols.  
(b) How wireless networks are different from cellular networks.
- 3 (a) Write notes on RMD.  
(b) Explain the CCS network architecture with neat diagrams.
- 4 (a) Explain the WAP programming model with neat diagram.  
(b) Draw and discuss the fields in registration request message.
- 5 (a) Explain different wireless LAN applications.  
(b) Write notes on 802.11 physical layers.
- 6 (a) Explain the Bluetooth usage models.  
(b) Explain about L2CAP channels and L2CAP packets.
- 7 How mobile networks support data using GPRS.
- 8 (a) Write notes on HIPERLAN.  
(b) Explain in detail about the protocol entries in wireless ATM.

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4

B. Tech IV Year II Semester (R09) Regular Examinations, March/April 2013

**WIRELESS COMMUNICATIONS & NETWORKS**

(Common to ECE & ECC)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
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- 1 (a) Distinguish between TDMA and FDMA with a neat diagram.  
(b) Explain about the ALOHA protocols in detail.
- 2 (a) Explain the limitations in wireless networking.  
(b) Explain the first generation wireless networks with a neat diagram.
- 3 (a) Write the notes on cellular digital packet data.  
(b) What are the services offered by the SS7 network?
- 4 (a) Explain the operation of mobile IP.  
(b) Explain about the wireless datagram protocol.
- 5 (a) Discuss the transmission issues in spread spectrum LAN's.  
(b) Explain about narrow band microwave LAN's.
- 6 (a) Write notes on Bluetooth baseb and formats.  
(b) Explain Bluetooth protocols architecture in detail.
- 7 (a) Explain about the CDPD physical layer.  
(b) Explain the hand-off management in GPRS.
- 8 (a) What is the difference between a logical and a transport channel in HIPERLAN?  
(b) Explain the protocol entries in wireless ATM.

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