

B

04000EC404052001

Pages: 2

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Eighth Semester B.Tech Degree Supplementary Examination August 2021



Course Code: EC404

Course Name: ADVANCED COMMUNICATION SYSTEMS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- 1 a) Explain the various diversity techniques in Microwave radio System. (8)
- b) Explain the need for digitization of video signals? Describe the compression steps involved in JPEG. (7)
- 2 a) With a block diagram explain the DVB-T system. (7)
- b) Write notes on: (8)
 - (i) Analog versus Digital in Microwave system
 - (ii) Frequency versus Amplitude Modulation in Microwave system
- 3 a) Explain the working principles of Liquid Crystal displays. Compare it with plasma and LED displays. (8)
- b) Explain Free-Space Path Loss and derive the expression. Determine the free space path loss at a distance 15Km from a microwave antenna at 18GHz. Express loss in dB. (7)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) i. Calculate the semi major axis for a satellite with mean motion is 14.23304826/day (8)
- ii. Calculate the apogee and perigee heights for orbital parameters considering major axis value from previous question with $e = 0.0011501$ & radius of earth 6371km.
- b) Compare the important characteristics of second-generation cellular networks, third generation wireless networks and fourth generation wireless technologies. (7)
- 5 a) Explain the TTC system & why omnidirectional must be used aboard a satellite for telemetry and command during launch phase. How is satellite powered during this phase? (7)

- b) Write notes on: (8)
- i. Wireless in Local Loop
 - ii. Wireless Local Area Networks
- 6 a) With a detailed block diagram explain transmit - receive earth station. Explain what do you mean by redundant earth station. (8)
- b) Write notes on: (7)
- i. Paging
 - ii. Cordless Telephone systems

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain Hard and Soft hand off strategies (7)
- b) Determine the number of channels per cluster and total channel capacity for a cellular telephone area comprising 10 clusters with 7 cells in each cluster and 10 channels in each cell (3)
- c) Write notes on: (10)
- (i) Spread spectrum multiple access
 - (ii) Space division multiple access
- 8 a) Explain Co channel interference & Adjacent channel interference (7)
- b) Determine (3)
- (i) the channel capacity for a cellular telephone area comprising seven macrocells with 10 channels per cell
 - (ii) channel capacity if each macrocell is split into 4 minicells
 - (iii) channel capacity if each minicell is further split to 4 microcells
- c) With diagrams explain the GSM system architecture and the various interfaces in GSM (10)
- 9 a) Why we go for MIMO systems? With a mathematical model describe a MIMO wireless communication system. (10)
- b) Write notes on: (10)
- (i) High Speed Circuit Switched Data
 - (ii) General Packet Radio Service
