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Question Paper Code : 40406

M.E./M.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Third Semester

Communication Systems

CU 5301 – MILLIMETER WAVE COMMUNICATION

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the main challenges in utilizing a 60 GHz channel.
2. List any four applications of millimeter wave communications.
3. Identify the major advantages to the use of CMOS over other technologies.
4. Distinguish noise figure and noise factor.
5. What is the need of calibration in millimeter waves?
6. Give the design considerations for millimeter waves.
7. List the diversity dimensions that are available for antenna arrays.
8. Differentiate spatial and frequency diversity.
9. List the antennas used in millimeter wave systems.
10. Name the techniques to improve the gain of on-chip antennas.

PART B — (5 × 13 = 65 marks)

11. (a) Write a short note on outdoor channel models.

Or

(b) Discuss about the characteristics of millimeter waves and their implementation challenges.

12. (a) Write short notes on millimeter wave transistor model evolution,

(i) BSIM model,

(ii) EKV model.

Or

(b) (i) Interpret the importance of low noise amplifiers noise performance.

(ii) Associate the steps to find noise figure of low noise amplifiers.

13. (a) With the help of neat block diagram explain the working of OFDM modulation scheme for millimeter wave communication.

Or

(b) Explain about the Transceiver architecture and transceiver without mixer.

14. (a) Write a short note on spatial multiplexing and spatial diversity of antenna arrays.

Or

(b) Describe seven-rod antenna with geometry for radiation coverage in hexagonal configuration.

15. (a) Identify the different antenna topologies for millimeter wave communication applications and various suggestions used for on-chip.

Or

(b) How device to device communication will be established over 5G systems? What is the role of millimeter waves in it?

PART C — (1 × 15 = 15 marks)

16. (a) Evaluate IEEE 802.15.3c and IEEE 802.11 ad channels models.

Or

(b) Generalise the improvement of probe station characterization of onchip or in-package antennas.

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