

(3 hours)

Total Marks: 80

- N.B.: (1) Question No. 1 is compulsory.
(2) Solve any THREE questions from remaining FIVE questions.
(3) Draw neat diagrams and assume suitable data wherever necessary. Justify your assumptions.

1.
 - (a) Define and explain noise with its types. (5)
 - (b) Write a short note on 2.5G wireless networks (5)
 - (c) Find the carrier and modulating frequencies, the modulation index and maximum deviation of the FM represented by the voltage equation $V_{FM} = 14 \sin(9 \times 10^8 t + 7 \cos 1450 t)$. (5)
 - (d) Draw DPSK waveform for 01010101110. (5)
2.
 - (a) Explain generation of AM using the Third method. Also comment on type of AM signal generated at the output of this circuit. (10)
 - (b) Define: Directive Gain, Power Gain and Radiation Intensity. A half-wave dipole is capable of radiating 1kW and has a 2.15 dB gain over an isotropic antenna. How much power must be delivered to the isotropic antenna to match field strength directional antenna? (10)
3.
 - (a) With the help of suitable diagram explain the Armstrong method of FM generation. (10)
 - (b) Write a short note on electromagnetic spectrum. (5)
 - (c) Write a short note on Helical antenna. (5)
4.
 - (a) Explain the cellular concept in mobile communication. Also Explain frequency reuse, co-channel interference and adjacent channel interference. (10)
 - (b) Explain QPSK generation with its waveform. What do you mean by coherent and non-coherent reception? (10)
5.
 - (a) Explain sky wave propagation with its advantages and disadvantages. (10)
 - (b) Explain the process of amplitude demodulation using square law detector with neat waveforms. (10)
6.
 - (a) Draw the constellation diagram for 8-QAM. (5)
 - (b) What are the different types of communication channels explain in detail. (5)
 - (c) Explain the process of FM demodulation using Balanced Slope Detector. (10)
