APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIRST SEMESTER M. TECH DEGREE EXAMINATION
Electronics & Communication Engineering
(Telecommunication Engineering)
04EC6805- ADVANCED DIGITAL COMMUNICATION
Max. Marks: 60   Duration: 3 Hours

PART A
Answer All Questions, Each question carries 3 marks

1. Represent a linear band-pass system by its impulse response.
2. Enumerate the properties of a matched filter.
3. Design a channel with equivalent zero forcing equalizer.
4. What are the challenges in multicarrier modulation? Explain briefly.
5. Explain tapped delay line model of frequency selective slowly fading channel.
6. Write the characteristics of a frequency selective slowly fading channel.
7. Write notes on Jamming margin in spread spectrum systems.
8. Explain Frequency hopping spread spectrum.

PART B
Each question carries 6 marks

9. Explain Gram – Schmidt procedure for orthogonal expansion of signals in detail.

OR

10. Explain various memory less digital modulation methods.
11. For an M-ary baseband PAM signal with AWGN noise, determine the basis function and the output of correlation type demodulator

OR

12. Explain correlation demodulator in detail.
13. Design an optimum maximum likelihood receiver for digital transmission through a band limited channel with ISI and AWGN.

OR

14. If the frequency response of the channel is $A(f)e^{-j\theta(f)}$, where A(f) and   (f) are real , show that the necessary and sufficient conditions for distortion less transmission are $A(f) = K$ and (f) $= 2$ f to $\pm n$, n = 0, 1, 2, ..

15. Explain multicarrier modulation with overlapping sub channels.

OR

16. Explain discrete implementation of multicarrier modulation with necessary mathematical equations.

17. Explain the RAKE demodulator in detail.

OR

18. Explain statistical model for fading channels.
19. A DSSS system is used to resolve the multipath signal components in a two-path radio signal propagation scenario. If the path length of the secondary path is 300 m longer than that of the direct path, determine the minimum chip rate necessary to resolve the multipath components?

OR

20. Explain direct sequence spread spectrum in detail.