

N.B. : 1) Question no. 1 is compulsory.

2) Answer any 3 questions from remaining five questions.

3) Assume suitable data if required and justify the same.

4) Figures to the right indicate full marks.

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| 1 | (a) | What are practical constraints and effect of imperfections in UWB? | 5 |
| | (b) | What are the applications of the UWB communication system? | 5 |
| | (c) | Describe UWB ad-hoc network. | 5 |
| | (d) | What are multiple access techniques in UWB and describe in short. | 5 |
| 2. | (a) | What are prolate spheroidal functions? Why are they attractive for UWB communications? | 10 |
| | (b) | Explain multiband OFDM UWB proposal for standardization. | 10 |
| 3. | (a) | Compare and contrast UWB communication system performance with direct sequence spread spectrum and frequency hopped spread spectrum on basis of SNR and BER for single and multiple users. | 10 |
| | (b) | Discuss time hopping PPM based UWB systems. | 10 |
| 4. | (a) | Explain two ray propagation model for UWB signals. | 10 |
| | (b) | Discuss frequency domain autoregressive model. | 10 |
| 5. | (a) | Explain the different data modulation schemes in IR-UWB communication systems and compare data modulation schemes. | 10 |
| | (b) | Explain self interference in UWB with special reference to IFI and IPI. | 10 |
| 6. | (a) | Discuss free space path loss model. Modify the same for UWB application. | 10 |
| | (b) | Explain any two networks based positioning techniques. | 10 |