

(3 Hours)

Total Marks: 80

Note:

1. **Question No. 1 is compulsory.**
2. Attempt any **THREE** out of the remaining **FIVE** questions.
3. Assume suitable data if necessary.

Q. 1. Attempt any **Four**.

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| (a) | Discuss the potential benefits of Software Defined Radio(SDR). | 5 |
| (b) | Sketch the SDR architecture and explain its different components. | 5 |
| (c) | Draw and explain the conceptual model for location aware Cognitive Radio. | 5 |
| (d) | What are the challenges in spectrum sensing for Cognitive Radio ? | 5 |
| (e) | List the different types of spectrum access models and explain any one in brief. | 5 |
| (f) | What are the benefits of oversampling and under sampling ? | 5 |

Q. 2. (a) What are the distortion sources in the transceiver? Explain the impact of Flicker noise and converter noise on various architectures. 10

(b) Explain Software Tunable Analog Radio Components. 10

Q. 3. (a) Explain in any one linearization technique to avoid non linearization in SDR. 10

(b) Explain the waveform-based spectrum sensing for Cognitive Radio. 10

Q. 4. (a) Draw & explain Cognitive Radio transceiver architecture along with hardware requirements. 10

(b) List the spectrum sensing techniques used in Cognitive Radio, Illustrate in details about energy detector spectrum sensing. 10

Q.5 (a) What is multichannel and multiuser medium access control for dynamic spectrum access in Cognitive radio? Explain it in details. 10

(b) Differentiate between Infrastructure-based and Infrastructure less cognitive dynamic spectrum access architecture. 10

Q. 6 (a) Explain Cognitive radio architectures for Next Generation (XG) networks. 10

(b) How GNU Radio is useful tool for experimentation of Cognitive Radio, Explain in details. 10
