

GUJARAT TECHNOLOGICAL UNIVERSITY**ME – SEMESTER – I (New)– EXAMINATION – WINTER-2019****Subject Code: 3710513****Date: 06-01-2020****Subject Name: Cognitive Radio****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) What is the difference between Software Define Radio and Cognitive Radio? Draw and Explain architecture of Cognitive Radio. **07**
- (b) What is the difference between cooperative sensing and non-cooperative sensing? Explain in brief. **07**
- Q.2** (a) What is the main objective of spectrum sensing? Briefly explain collaborative spectrum sensing. **07**
- (b) State comparisons between “match filtering”, “energy detection”, cyclo stationary detection and wavelet detection techniques **07**
- OR**
- (b) Explain hidden and exposed terminals problem in Cognitive Radio network with suitable diagrams. **07**
- Q.3** (a) Explain linear program, nonlinear program, integer program and convex program for resource optimization in Cognitive Radio network with suitable mathematical formulations. **07**
- (b) Briefly explain Dynamic Spectrum Access (DSA) models for Cognitive Radio. **07**
- OR**
- Q.3** (a) Write brief note on Piramal-Dual algorithm for constrained optimization in Cognitive Radio. **07**
- (b) What are the functions of Dynamic Spectrum Access technique? Write brief note on distributed dynamic spectrum access technique. **07**
- Q.4** (a) Briefly explain dynamic spectrum access using multi agent system model. **07**
- (b) What is the role of learning mechanism in Cognitive Radio? Briefly explain “Case based learning” technique. **07**
- OR**
- Q.4** (a) Write brief note on dynamic spectrum access using game theory model. **07**
- (b) What is the role of MAC layer? Give overview of centralized and distributed MAC protocols for Cognitive Radio networks. **07**
- Q.5** (a) Show the classification of spectrum trading for Cognitive Radio networks and explain in brief. **07**
- (b) Write short note on Cognitive Radio for Internet of Things **07**
- OR**
- Q.5** (a) Explain auction based spectrum trading technique for optimal satisfaction of secondary users. **07**
- (b) Write brief note on MIMO Cognitive Radio **07**
