

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**ME - SEMESTER-1 (NEW) EXAMINATION – WINTER 2018**

**Subject Code: 3710513**

**Date: 04/01/2019**

**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 mark.

- Q.1** (a) Explain cognitive radio architecture using protocol stack diagram. **07**  
(b) What is cognitive cycle? Explain cognitive radio transceiver component. **07**
- Q.2** (a) Explain importance of spectrum sensing and explain cooperative sensing method in detail. **07**  
(b) Explain Maximum likelihood channel estimator for cognitive radio. **07**
- OR**
- (b) Write Short note on collaborative sensing technique **07**
- Q.3** (a) Compare non linear programming and linear programming optimization technique. **07**  
(b) Explain Single-hop infrastructure-based cognitive radio network and list its feature. **07**
- OR**
- Q.3** (a) Write a short note on integer programming. **07**  
(b) Explain h infrastructure-based and infrastructure less distributed dynamic spectrum access method of for cognitive radio networks **07**
- Q.4** (a) Power and rate control for dynamic spectrum access **07**  
(b) What is centralized dynamic process? Explain Collaboration and fairness in spectrum allocation in detail. **07**
- OR**
- Q.4** (a) Discuss Distributed resource management algorithm in a cognitive radio network. **07**  
(b) Write routing and channel selection algorithm steps. **07**
- Q.5** (a) Write a S.N. on MIMO cognitive radio. **07**  
(b) Explain Different techniques applied designing a spectrum trading model. **07**
- OR**
- Q.5** (a) Draw figure for Classification of spectrum trading and explain it. **07**  
(b) Write a short not on cognitive radio for IoT. **07**

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