B.E (FULL TIME) ARREAR EXAMINATIONS, NOV/DEC 2024

ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH

EC7006 - COGNITIVE RADIO COMMUNICATION

(REGULATIONS: R-2015)

Time: 3 Hours **Answer ALL Questions** **Max. Marks: 100**

Part-A (10x2=20 Marks)

1. What is Software Defined Radio? Highlight its merits and demerits.
2. What are the goals of a successful plug-and-play modular architecture?
3. Draw the Phase Space diagram of software radio.
4. What domain-specific knowledge is represented in RKRL?
5. What is cognitive radio? Mention its features.
6. What is interference temperature constraint?
7. Highlight the significant challenges of spectrum sensing.
8. Distinguish underlay and overlay cognitive radio networks.
9. Enumerate the Cross-layer challenges in spectrum handoff.
10. What is meant by vertical spectrum sharing and horizontal spectrum sharing?

Part- B (5x13=65Marks)

11. a. With neat block diagram, explain the functional model of Software Defined Radio architecture.

(OR)

11.b. (ii) Explain how are state machines control access to many software radio resources. **(7)**

(ii)Enumerate and discuss the evolution of SDR. **(6)**

12. a. (i) With Software Radio Phase Space diagram, explain the Quantifying Degrees of Programmability. **(7)**

(ii) Illustrate and explain the mathematical model of plug-and-play architecture. **(6)**

(OR)

12.b. Explain the interface, characteristics and topological properties of top level interface topologies.

13. a. With neat cognitive cycle diagram, explain the functional architecture of cognitive radio.

(OR)

13. b. With neat diagram, explain the domains and topological maps behavior model of cognitive radio.

14. a (ii) Explain the concepts of Meso-world structure of cognitive radio. **(7)**

(ii) Explain the organization of the cognition tasks. **(6)**

(OR)

14. b. Explain the design rules and various ways to map the cognitive radio functions to the components of a wireless PDA architecture.

15. a. Explain the various non-cooperative spectrum sensing techniques and compare their features.

(OR)

15. b. Explain the Cooperative sensing as sensor detection and Cooperative sensing as data fusion.

Part- C (1x15=15Marks)

16. Explain how interference constraints of primary users are achieved in the underlay cognitive radio. Also explain the adaptive power allocation algorithms to maximize the system capacity.