Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : **70416**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Seventh Semester

Electronics and Communication Engineering

EC 6014 – COGNITIVE RADIO

(Regulations 2013)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What is Software-Defined Radio (SDR)?

2.   Define software flexibility and affordability.

3.   Illustrate the components present in the RF front end.

4.   What is CORBA and list out languages supported by SDR.

5.   Define Spectral efficiency.

6.   Devise a utility function to optimize the radio resources.

7.   Compare SDR with CR.

8.   Enumerate the challenges of spectrum sensing.

9.   Mention the upper layer issues in XG networks.

10. Relate spectrum hand off latency with spectrum mobility.

PART B — (5 × 13 = 65 marks)

11. (a)   Discuss in detail the evolution of architecture of Software-Defined Radio (SDR). (13)

Or

(b)   Discuss in detail about the technology tradeoffs in SDR with neat diagram. (13)

12. (a) (i) Outline the various functional allocation of software radio functional model. (6)

(ii) Demonstrate the Software architecture of SDR with suitable diagram. (7)

Or

(b) Explain in detail about four basic design Philosophies in software architecture of SDR.

13. (a) What are the primary concepts of Position awareness cognitive radio? Explain with neat architecture. (13)

Or

(b) Discuss any two Artificial Intelligent Techniques suitable for cognitive radio and its working principle with neat diagram. (13)

14. (a) Describe the cognition cycle in detail with neat diagram.

Or

(b) Describe the design rules which includes the functional component interfaces.

15. (a) (i) Elaborate the spectrum management challenges and the Spectrum analysis. (7)

(ii) Discuss the main functions for cognitive radio in XG network architecture. (6)

Or

(b) (i) Classify the concept of spectrum sharing and explain the details. (8)

(ii) Examine the Cross layer challenges in spectrum management. (5)

PART C — (1 × 15 = 15 marks)

16. (a) Discuss a success story of a real bio entrepreneur who achieved progress in his/her new Start up by adopting a suitable market strategy.

Or

(b) You are about to start a new business based on Enzyme production. Write a suitable business proposal to avail funding for your start up.

———————————