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**Question Paper Code : 20397**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

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. Show the top level components of an ideal software radio handset.
2. Identify any two fundamental limitations of SDR implementation.
3. Write the functions of Load/Execute Interface component in SDR.
4. What is meant by plug and play in the SDR interface?
5. Define Spectral efficiency.
6. Devise a utility function to optimize the radio resources.
7. Name the functional components of Cognitive Radio Architecture.
8. Estimate the plan phase components in CRA.
9. What is the key enabling technology of an XG network?
10. Outline the purpose of Spectrum mobility.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Construct the architecture of SDR and explain with neat diagram. (6)
- (ii) Discuss with examples about concept of Software Radio. (7)
- Or
- (b) (i) Illustrate the SDR Architecture Model Showing Areas for Hardware Abstraction. (6)
- (ii) List the primary reasons that the military sector might embrace the open architecture SDR. (7)
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) Discuss in detail about Radio Geolocation and Time Services.
- Or
- (b) Illustrate in detail about the Boundary decisions to determine the location of a CR.
14. (a) (i) With neat diagram explain in detail about AACR Functional Component Architecture. (6)
- (ii) Elaborate the design rules which includes the functional component interfaces (for any 8 functional processes). (7)
- Or
- (b) (i) How cognitive radio functions are mapped to the components of a wireless PDA with the environment architecture? (6)
- (ii) Write a note on Inference Hierarchy. (7)
15. (a) (i) Explain the XG network communication functionalities with an appropriate diagram. (6)
- (ii) Compare the Inter network and Intra network sharing in XG networks. (7)

Or

- (b) (i) Outline the cross layer design in XG networks. (6)
- (ii) Elaborate the spectrum management challenges and the spectrum analysis. (7)

PART C — (1 × 15 = 15 marks)

16. (a) The SCA provides a method of defining the requirements for each application in XML. Justify this statement. (15)

Or

- (b) Compare the functional features of cognitive radio and software defined radio. (15)