



Ph.D DEGREE EXAMINATIONS: JUNE 2017

(Regulation 2015)

COMPUTER SCIENCE AND ENGINEERING

P15CSTE15 : Semantic Web

COURSE OUTCOMES

- CO1:** Show the overall architecture of the Semantic Web.
- CO2:** Identify the component technologies of the Semantic Web and explain their roles.
- CO3:** Illustrate the design principles of the Semantic Web by applying the technologies
- CO4:** Outline certain limitations of the Semantic Web technologies.
- CO5:** Identify the kinds of services semantic web can and cannot deliver.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. **Assertion (A):** The aim of the Semantic Web is to allow much more advanced knowledge management systems. CO1 [K2]
Reason (R): Despite improvements in search engine technology, a lot of difficulties are faced by users of the Web in information retrieval.

a) Both A and R are individually true but R is the correct explanation of A	b) Both A and R are individually true but R is not the correct explanation of A
c) A is true but R is false	d) A is false but R is true
2. _____ is focused on judging the ontology content from the users point of view CO4 [K1]

a) Ontology Verification	b) Ontology Assessment
c) Ontology Validation	d) Ontology evaluation
3. In a topic map, _____ represent hypergraph relationships between topics. CO3 [K1]

a) occurrences	b) associations
c) links	d) bars
4. Match List I items with List-II items and select the multiple choice code CO5 [K1]

List I	List II
A. Description logic	i. Declares and completely defines a class.
B. Frame specification	ii. Uses logical statement relating roles and/or concepts

C. Semantic network	iii. Allows the encoding of knowledge about specific domains and often include reasoning rules
D. Ontology language	iv. It represents semantic relations between concepts

	A	B	C	D
a)	ii	i	iv	iii
b)	iii	iv	ii	i
c)	ii	iv	iii	i
d)	iii	i	ii	iv

5. **Assertion (A):** Pellet is not a direct reasoner. CO5 [K2]
Reason (R): Direct reasoner means that the reasoner is invoked from Protege by calling directly the reasoner API.
- a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A
c) A is true but R is false d) A is false but R is true
6. _____ offers a significantly richer language for defining the structure of XML documents CO2 [K1]
a) XML Schema b) DTD
c) XML namespace d) UDDI
7. Which of the following statements are correct about SOAP Technologies? CO2 [K1]
1) Text based Protocol
2) Standard Driven
3) Soap documents must include Soap Header, Soap Envelope, Soap Body
a) 1 and 2 only b) 1,2,3
c) 1 and 3 d) 2 and 3
8. A _____ describes the meaning of knowledge precisely. CO4 [K1]
a) Formal pragmatics b) Formal syntax
c) Formal semantics d) Formal structure
9. _____ is used for querying RDF. CO3 [K1]
a) MYSQL b) ORACLE
c) SPARQL d) OWL
10. From bottom to top, give the correct sequence of the following layers used in Semantic Web: CO1 [K2]
1. Proof layer

2. XML
3. Trust layer
4. RDF Schema.

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|------------|------------|
| a) 2-3-4-1 | b) 1-3-2-4 |
| c) 3-4-2-1 | d) 2-4-1-3 |

PART B (10 x 2 = 20 Marks)

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| 11. What is the aim of developing semantic Web? | CO1 | [K1] |
| 12. Define Stovepipe system. | CO1 | [K1] |
| 13. In XML schema, list any two simple data types and any two complex data types.
State the main difference between the two categories. | CO2 | [K2] |
| 14. What is SOAP? State its advantages. | CO2 | [K2] |
| 15. Define reification. | CO3 | [K2] |
| 16. What is a taxonomy? List any two uses of it. | CO3 | [K2] |
| 17. Define pragmatics. | CO4 | [K2] |
| 18. How is description logic used in knowledge representation? | CO5 | [K2] |
| 19. What is a topic map? State any two of its uses | CO4 | [K2] |
| 20. List any four features of Protégé OWL. | CO5 | [K2] |

PART C (6 x 5 = 30 Marks)

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| 21. How is XML related to semantic web? Explain. | CO1 | [K2] |
| 22. Outline the features of a real time application of semantic web. State its advantages. | CO1 | [K2] |
| 23. Explain about Distributed Object Model. | CO2 | [K2] |
| 24. How can ontology spectrum be defined? Discuss the role of thesauri in it. | CO3 | [K2] |
| 25. Describe about any three Ontology-semantic mapping methods. | CO4 | [K2] |
| 26. Compare semantic networks with frames for knowledge representation using an example. | CO5 | [K2] |

Answer any FOUR Questions

PART D (4 x 10 = 40 Marks)

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| 27. Compare the features of Semantic Web with XML and Web services. | CO1 | [K2] |
| 28. Explain how UDDI is useful for Semantic Web. | CO2 | [K2] |
| 29. How is ontology querying using SPARQL carried out? Explain using examples. | CO5 | [K2] |

30. Develop an ontology for representing geography of a city. List the main stages in the ontology development process. CO4 [K3]

31. How can capturing of knowledge be carried out using RDF? Outline the features of RDF Schema. CO3 [K2]
