SRM INSTITUTE OF SCIENCE & TECHNOLOGY (Deemed to be University u/s 3 of UGC Act, 1956)

SRM Institute of Science and Technology
College of Engineering and Technology
SCHOOL OF COMPUTING

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

Academic Year: 2023-24 EVEN

MODE OF EXAM
OFFLINE
SET A

Test: CT 2 | **Date**: 28-03-2024
Course Code & Title: 21GNH101J – Philosophy of Engineering | **Duration:** 1 period (50 mins)
Year &Sem: I/II | **Max. Marks: 30**

Registration Number															

Part – A (5 x 1 = 5 Marks)

Instructions: Answer all

Q. No	Question	Marks	BL	CO	PO	PI Code
1	What is the primary concern of ontology in the philosophy of engineering? a) The study of ethical principles in engineering **b) The study of the nature of being and existence in engineering** c) The study of mathematical principles in engineering d) The study of historical developments in engineering	**1**	1	3	1	1.6.1
2	Which of the following disciplines significantly contributes to the epistemology of engineering design? a) Engineering b) Psychology c) Sociology **d) All of the above**	**1**	1	2	1	1.6.1
3	According to the RIASEC model, which personality types are most likely to excel in engineering careers? **a) Realistic and Investigative** b) Artistic and Social c) Enterprising and Conventional d) Investigative and Social	**1**	1	3	1	1.6.1
4	How does product life cycle ontology contribute to knowledge management in engineering? a) By providing real-time data analysis for decision-making **b) By facilitating the organization and retrieval of product-related information** c) By implementing algorithms for automated production d) By ensuring compliance with regulatory standards	**1**	1	3	1	1.6.1
5	What is the primary focus of epistemology in engineering? a) Understanding the ethical implications of engineering decisions b**) Examining how knowledge is acquired and validated in engineering** c) Exploring the historical development of engineering principles d) Analyzing the economic impact of engineering projects	**1**	1	2	1	1.6.1

Part-B (2 x 5= 10 Marks)

Instructions: Answer Any Two

Q. No	Question	Marks	BL	CO	PO	PI Code
6	Describe the key functions and capabilities of a reference ontology in engineering. **Standardization:** One of the primary functions of a reference ontology is to establish standardized terminology and definitions for engineering concepts. **Classification and Taxonomy**: The ontology classifies engineering concepts into hierarchical categories and taxonomies, organizing knowledge in a structured manner. **Interoperability:** A reference ontology promotes interoperability among different engineering systems, tools, and datasets by providing a common framework for representing engineering knowledge. **Semantic Enrichment:** The ontology enriches engineering data and information with semantic annotations, adding context and meaning to	**5**	2	2	4	4.4.1

	raw data. **Knowledge Representation and Integration:** By capturing engineering knowledge in a structured and formalized manner, the ontology facilitates knowledge representation and integration across different domains and disciplines. **Support for Analysis and Decision Making:** Engineers can use the reference ontology as a knowledge discovery tool to explore relationships and dependencies between engineering concepts. **Evolution and Maintenance:** As engineering knowledge evolves over time, the reference ontology can be updated and expanded to accommodate new concepts, discoveries, and advancements.					
7	Compare and contrast the ontological structures of different phases in the product life cycle. How do these structures contribute to effective product management? **Introduction Phase:** **Ontological Structure**: In the introduction phase, the ontological structure may focus on foundational concepts related to product ideation, market analysis, and initial design considerations. It may include nodes representing market research data, customer needs, conceptual designs, and feasibility studies. **Contribution to Product Management:** The ontological structure in the introduction phase helps product managers and engineers understand the initial requirements, constraints, and opportunities associated with a new product. **Growth Phase:** **Ontological Structure:** During the growth phase, the ontological structure may expand to include nodes representing scaling strategies, production processes, supply chain management, and quality control measures. **Contribution to Product Management:** The ontological structure in the growth phase enables product managers to monitor and optimize production processes, respond to changing market demands, and identify opportunities for product differentiation **Maturity Phase:** Ontological Structure: In the maturity phase, the ontological structure may emphasize nodes related to product optimization, cost reduction strategies, lifecycle management, and customer support services. **Decline Phase:** Ontological Structure: During the decline phase, the ontological structure may focus on nodes related to product phase-out planning, inventory management, and disposition strategies for unsold inventory. **Contribution to Product Management:** The ontological structure in the decline phase enables product managers to navigate end-of-life considerations, mitigate risks associated with declining sales, and responsibly manage product discontinuation.	**5**	2	3	1	1.6.1
8	Discuss how the RIASEC model can be applied to understand career choices in engineering. Provide examples to illustrate your answer. In the 1950s, John Holland theorized that personality and work environment are measurable, and that the two should be matched in order to find a satisfying career. Holland's theory describes six basic personality types (RIASEC, described below). One type is typically dominant; an individual's top three types -- in order -- make up that person's Holland Code. The goal is to match an individual's code, or personality type, with his or her career.	**5**	2	3	4	4.4.1

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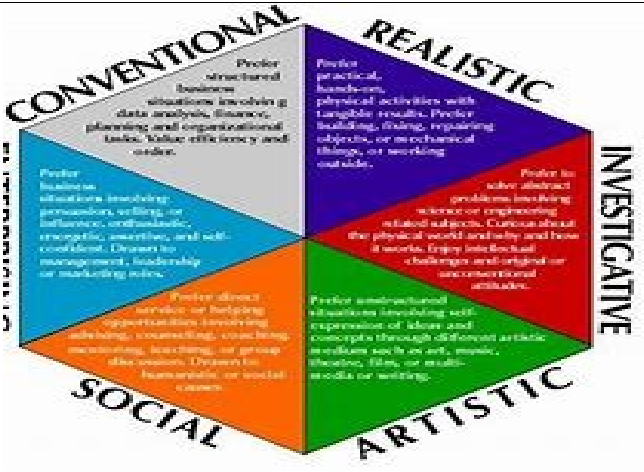
<tr><td></td><td>
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<tr><td colspan="7">Part – C
(1x15 = 15 Marks)</td></tr>
<tr><td>9</td><td>Analyze the distinctive features of the epistemology of engineering design and how they differ from other forms of knowledge acquisition in engineering.

Design as activity is related to the conceptualization (pre-execution) stages of making new products. Design as activity is usually further organized under “art versus technique” or “form versus function”. Fine art, industrial design (applied art), architecture and engineering are typical examples of design as activity.

Design as planning is related to the systematic mental processes prior to actions and conceptualization (pre-execution) stages for planning composing and decision making. While design as activity is more related to professional endeavors like art or engineering, design as planning is more affiliated with management of a wide range of fields from business to military and from hospitals to academy.

Design as epistemology is related to the synthetic methodologies needed for the mental apprehension of appropriateness for change. Design epistemology is distinct from analytic methodologies, which is crucial to develop scientific initiatives. Taking as a reference the proposed four-dimensional model and the epistemology of design briefly discussed in the previous section, the remainder of the talk analyses the epistemology of engineering in light of the four key questions of the philosophy of knowledge: the ontological, the epistemological, the methodological, and the axiological questions.
how they differ from other forms of knowledge acquisition in engineering.
Interdisciplinary Nature
Iterative and Reflective Process
Human-Centered Design
Emphasis on Communication and Collaboration.</td><td>15</td><td>4</td><td>2</td><td>4</td><td>4.4.1</td></tr>
<tr><td colspan="7">(or)</td></tr>
<tr><td>10</td><td>List out the differences between Reference ontology and Application Ontology. Demonstrating the advantages of using reference ontology and Application ontology in the domain of healthcare

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<tr><th>Reference Ontology</th><th>Application Ontology</th></tr>
<tr><td>theoretical Focus on representing</td><td>theoretical Focus on representing</td></tr>
<tr><td>establishes consensus about meaning of terms</td><td>offers terminological services for semantic access, checking constraints between terms</td></tr>
<tr><td>maximal coverage</td><td>provides a minimal terminological structure</td></tr>
<tr><td>Fits the needs of a large community</td><td>fits the needs of a specific community</td></tr>
<tr><td>Fits the needs of a large community</td><td>lightweight ontologies</td></tr>
<tr><td>Can't be derived from application ontology</td><td>can be derived from [illegible]ence ontolog</td></tr>
</table></td><td>15</td><td>4</td><td>3</td><td>4</td><td>4.4.1</td></tr>
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The implementation of a both reference and application ontology in healthcare significantly improved data management, interoperability, and collaboration within the organization. By providing a standardized framework for representing medical knowledge, the ontology enhanced patient care, research outcomes, and operational efficiency across various healthcare settings. .