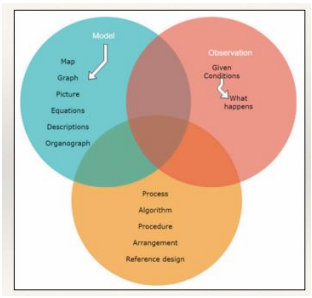
USN										

SCHEME - INTERNAL ASSESSMENT TEST – I – Dec 2023

Sub:	Research Methodology & Intellectual Property Rights							Code:	21RMI56
Date:	20/12/2023	Duration:	90 mins	Max Marks:	50	Sem:	V	Branch:	All

Answer any 5 full questions

		Marks	CO	RBT
1	What is research? Briefly explain the categories of knowledge in research. Explain the objectives of the research. Research refers to careful, well defined (or redefined), objective and systematic method of search for knowledge, or formulation of theory, that is driven by inquisitiveness for that which is unknown and useful on a particular aspect so as to make an original contribution to expand the existing knowledge base. **Categories of knowledge in research:** ❖ Observation ❖ Fundamental way for obtaining information. E.g., laboratory experiments, firmware's etc. ❖ Processed observation leads to model. ❖ Model ❖ Approximate representations. ❖ Statistical models, Mathematical models etc. ❖ Modelling equation captures the relationship between different attributes or the behaviour of the device in an abstract form. ❖ Processes ❖ Systematic arrangement of doing things. ❖ Algorithms, procedures, reference designs etc. ❖ Objective is to get the result.  **Objectivesof the research:** ❖ To solve new and important problems. ❖ Concluding research outcome should be new ❖ Circumstantial evidence, intuition and imagination may lead to possible conclusion. ❖ Rarely, the initial targets might change. ❖ Some targets might be unrealisable. ❖ Negative results ❖ May lead to non-target discoveries which might be new. ❖ To develop new theoretical and applied knowledge. ❖ Not necessarily limited to obtaining abilities to obtain the desired result. Objectives set to incorporate desired as well as undesired outcomes. ❖ Undesired outcomes lead to the fundamentals of understanding. ❖ Enables one to propose modification in methodology Desired outcomes have to be achieved indeed.	10	CO1	L2
2	Discuss in detail the different types of engineering research. Types of engineering research:	10	CO1	L2

	• Descriptive • Analytical research • Applied • Fundamental research • Quantitative • Qualitative research **Descriptive vs Analytical research** ❖ Descriptive research ❖ comparative and correlational methods, fact-finding investigation, No control over the variables rather focus on reports. ❖ Analytical research ❖ Facts available for analysis, critical evaluation, better control over variables, focus on the outcomes. **Applied vs fundamental research** ❖ Applied research ❖ Focuses on immediate problems facing the organisation, Research related to socio-economic trends. ❖ Fundamental research ❖ Pure or basic research, formulation of theory and generalisations. Eg. Mathematical researches. **Quantitative vs Qualitative research** ❖ Quantitative research ❖ Uses statistical observations, large data involved. ❖ Qualitative research ❖ Less volume of data, focus on few non representative cases.			
3	Briefly discuss the attributes to be considered for finding a worthwhile research problem and explain the steps to solve it. The qualities of good research are: Validity: The data used should be accurate and reliable, and the methods used should be appropriate for the research question. Reliability: Good research should be consistent and dependable, with results that can be replicated by other researchers. Steps to solve it, • Problem can be stated by research supervisor • Problem can be posed by other researchers • Problem can be formulated by going through various literatures. • Oral presentation of literatures followed by introspection by asking questions. • Researcher has to be convinced about the acceptance of the problem taken for study or research. • Do not select Open problems, universally considered as hard. • Consists of deep implications and connections to different concepts. Recommended steps to solve research problem: • Understand the problem • Restate or redefine the problem or visualise the problem by drawing figures and so on. • Systematic approach • Iterations in execution • Summarise and assimilate the path from beginning.	10	CO1	L2
4	What do ethics generally refer to? What are the ethical concerns in Engineering research? What is Plagiarism? State possible reasons for Plagiarism. Ethics generally refers to a set of rules distinguishing acceptable and unacceptable conduct, distinguishing right from wrong, or wise aphorisms like sayings of Chanakya. Technological developments raise a whole range of ethical concerns. ❖ Privacy issues related to data and surveillance systems. Research outcomes-based repercussions. Adopted practices for obtaining data valid?	10	CO1	L2

	Is the outcome of data analysis have any negative impact? Engineering Ethics deals with things "what to do" and "What not to do". Ethical perspective of Engineering research vs Technology ❖ By setting Ethically right requirements for research outcomes. Following ethical values during design process as well as decision making process. Choose different alternatives fulfilling similar functions. Academic authorship involves communicating scholarly work, establishing priority over their discoveries and building peer reputation, comes with intrinsic burden of acceptance of the responsibility for the contents of the work. **Plagiarism** Presenting work or ideas from another source as your own, with or without consent of the original author, by incorporating it into your work without full acknowledgement.\ **Possible reasons for Plagiarism** According to the literature, people commit plagiarism because of various reasons including pressure to meet deadlines; no basic knowledge about the domain, lack of knowledge what constitutes plagiarism; lack of good academic writing skills; convenience (Internet makes "copy and paste" easy); the high cost of studying			
5	Discuss the effective way of searching the literature. • The primary goal of a literature review is to: Identify the research problem. This includes understanding the current state of knowledge on the topic, identifying gaps in knowledge, and determining the research questions that need to be answered. • Advocate a specific approach. This involves evaluating the different approaches that have been taken to study the problem, and selecting the approach that is most likely to be successful. • Evaluate the choice of methods. This includes assessing the validity and reliability of the methods that have been used, and determining whether they are appropriate for the research problem. • Demonstrate the need for new research. This involves showing that the existing research is not sufficient to answer the research questions, and that new research is needed to make progress. • The quality of a literature review can be evaluated based on the following criteria: Breadth and depth of coverage. The literature review should cover a wide range of relevant sources, and provide a deep understanding of the research problem. • Clarity and rigor. The literature review should be written in a clear and concise style, and should use rigorous analytical methods. • Consistency. The literature review should be consistent with the research problem, approach, and methods. Effective analysis. • The literature review should provide a critical analysis of the existing research, and should identify the key findings and gaps in knowledge.	10	CO2	L2
6	Explain in detail the steps to be taken to analyze and synthesize the prior art search of research work. Analyzing and synthesizing prior art is a crucial step in any research work, helping you understand the existing knowledge in your field. Here are steps you can take to effectively analyze and synthesize prior art: **Define Research Objectives:** • Clearly define the objectives of your research. • Identify the specific problem or question you are addressing. **Conduct a Comprehensive Literature Review:** • Search academic databases, journals, conferences, and relevant publications. • Use relevant keywords, phrases, and controlled vocabulary terms. • Make use of citation indexes to find related works. **Organize and Document Findings:** • Create a systematic way to organize your findings. This could be through a literature review matrix or a citation management tool. • Document key information such as authors, publication dates, methodologies, and main findings.	10	CO2	L2

	Evaluate the Quality of Prior Art: • Assess the credibility and reliability of the sources. • Consider factors like the reputation of the journal, author credentials, and the methodology used. **Identify Trends and Patterns:** • Look for common themes, methodologies, or gaps in the existing research. • Identify trends and patterns across multiple studies. **Synthesize Information:** • Summarize the key findings from each piece of prior art. • Group related works together to form clusters of information. • Highlight the main arguments and conclusions. **Compare and Contrast Studies:** • Analyze the similarities and differences between various studies. • Identify conflicting findings or areas where consensus exists. **Identify Gaps in Knowledge:** • Determine areas where the existing literature falls short or lacks sufficient coverage. • Highlight gaps that your research can address. **Conceptual Framework Development:** • Develop a conceptual framework based on the synthesis of prior art. • This framework will serve as the foundation for your research design and methodology. **Critical Analysis:** • Critically evaluate the methodologies and limitations of prior studies. • Consider the implications of the findings on your research. **Create an Annotated Bibliography:** • Summarize and provide critical commentary on each source in your bibliography. This can serve as a quick reference for your analysis. **Draft a Synthesis Section:** • Write a synthesis section in your research paper where you integrate and discuss the findings from the prior art. • Clearly articulate how the existing literature informs your research. **Revise and Update:** • Periodically revisit and update your literature review as you progress in your research. • Incorporate new findings and adjust your synthesis accordingly.			

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