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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**

Branch: CSE(DS)/AI & DS/CSE(IoT) **Duration: 3 hrs.**

Course Code: 23DS5AERMI **Max Marks: 100**

Course: Research Methodologies & IPR

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Provide a precise definition of research and explain its main objectives with examples.	CO1	PO 1	**5**
	b)	Differentiate between basic research and applied research with examples.	CO2	PO2	**5**
	c)	Elaborate on objectives of research and with examples explain the types of research.	CO1	PO1	**10**
		OR			
2	a)	Describe various types of research and provide an example for each.	CO1	PO1	**5**
	b)	Summarize the importance of research approaches in scientific studies.	CO2	PO2	**5**
	c)	Briefly elaborate on research methods v/s methodology with examples.	CO1	PO1	**10**
		UNIT - II			
3	a)	Consider a population divided into three strata: - $N_1 = 5000$, $\sigma_1 = 15$ - $N_2 = 2000$, $\sigma_2 = 18$ - $N_3 = 3000$, $\sigma_3 = 5$ use disproportionate sampling to allocate a sample of size n = 84. Also elaborate on Proportional Allocation.	CO3	PO3	**10**
	b)	Interpret and analyze the definition of sampling and elaborate on its necessity in research.	CO2	PO2, PO4	**5**
	c)	Discuss the important sampling distributions commonly used in statistical analysis	CO2	PO2	**5**
		OR			
4	a)	A researcher wants to determine if the preference for three different types of beverages (A, B, and C) differs among	CO2	PO2	**10**

			consumers in three age groups (18-25, 26-35, 36-45). The data collected is shown below: Age Group | Beverage A | Beverage B | Beverage C 18 – 25 | 30 | 10 | 10 26 – 35 | 20 | 30 | 10 36 – 45 | 10 | 20 | 30 At $\alpha = 0.05$, the critical value from the Chi-Square table for 4 degrees of freedom is *9.488*			
		b)	Elaborate on Basic Principle of ANOVA and Importance of ANOVA	*CO2*	*PO2*	**5**
		c)	Summarize the following with examples: I. Judgmental Sampling II. Mixed Methods Sampling	*CO2*	*PO2*	**5**
			UNIT - III			
	5	a)	Patents serve as a cornerstone for technological innovation and legal protection. I. Define what a patent is and describe the key laws governing patents in India. II. Justify the necessity of patent laws using a case study of a patent.	*CO1*	*PO1, PO2*	**10**
		b)	Technological research and innovation form the foundation of modern industrial progress. I. Elaborate on the key aspects of technological research and innovation, such as funding, collaboration, and intellectual property. II. Provide examples to illustrate these aspects.	*CO2*	*PO1, PO2*	**10**
			OR			
	6	a)	The PCT process simplifies international patent filing. I. With a neat diagram, explain the complete PCT process, emphasizing key steps such as international search and national phase entry. II. Discuss the significance of the PCT process for startups looking to expand globally.	*CO3*	*PO2*	**10**
		b)	The process of granting patents requires a thorough examination of the invention's novelty and utility. I. Outline the complete procedure for granting a patent, from drafting the application to receiving final approval. II. Provide a detailed flow diagram illustrating the key stages.	*CO3*	*PO2*	**10**
			UNIT - IV			
	7	a)	With an example elaborate on trademark and discuss the conditions that have to be met to be legally classified as trademark.	*CO2*	*PO2*	**10**

		b)	Case Study: A startup registers a trademark for its logo, but a competitor files a petition claiming that the logo is similar to an already registered trademark. I. Examine the conditions under which a trademark can be legally challenged. II. Discuss the steps the startup should follow to defend its trademark registration.	*CO2*	*PO2*	**10**
			OR			
	8	a)	Explain the stages involved in Technology Transfer with appropriate example in each stage.	*CO1*	*PO1*	**10**
		b)	Case Study: A global coffee brand discovers that a competitor in another country has been using a similar trademark for its products, leading to customer confusion. I. Evaluate the impact of this on the coffee brand's business. II. Propose strategies for resolving this trademark dispute.	*CO3*	*PO2*	**10**
			UNIT - V			
	9	a)	Elaborate the significance of a well-organized layout in a research report and explain how it influences the reader's understanding.	*CO1*	*PO1*	**5**
		b)	Identify and explain three precautions researchers must take when writing the conclusion of a research report to avoid misrepresentation of data.	*CO2*	*PO2*	**5**
		c)	A postgraduate student is writing a thesis on the impact of remote learning on university-level education. I. Outline the steps involved in writing a research report for their thesis. II. Explain the significance of each step in ensuring clarity, precision, and academic rigor.	*CO2*	*PO1, PO2*	**10**
			OR			
	10	a)	Justify the role of precautions in ensuring objectivity during the interpretation of research findings. Provide two examples of potential pitfalls they can help avoid.	*CO2*	*PO2*	**5**
		b)	Discuss two major challenges researchers face when interpreting longitudinal data with significant variation over time and suggest solutions for each.	*CO2*	*PO2*	**5**
		c)	A marketing team is drafting a research report on consumer behavior during the holiday season. I. Recommend an appropriate layout for the report to ensure clarity and impact. II. Discuss the precautions in writing a research report to avoid bias and maintain credibility.	*CO3*	*PO3*	**10**

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