

This question paper contains 6 printed pages]

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S. No. of Question Paper : 9943

Unique Paper Code : 2343010020

Name of the Paper : Research Methodology (Computer Science)

Name of the Course : Discipline Specific Elective

Semester : VII

Duration : 3 Hours

Maximum Marks : 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

Section A (Question No. 1) is compulsory.

Attempt any four questions from Section B (Question Nos. 2 to 7).

The use of a scientific calculator is allowed.

Parts of the question must be answered together.

Section A

1. (a) What is the difference between a primary journal and a secondary journal in scientific research ? 3
- (b) What is DOI ? How is it different from URL ? 3
- (c) What is plagiarism ? Name any two plagiarism detection tools. 3

P.T.O.

- (d) A researcher in a software company wants to examine whether there is a relationship between employees' years of experience and their monthly salary. What kind of correlation is likely to exist between years of experience and salary ? Interpret what a positive or negative correlation would mean in this context. 3
- (e) What is the purpose of including an acknowledgement section in a report ? What should be included in it ? 3
- (f) Explain the term "refereeing" with respect to research. What could be the possible fraud or misconduct that can occur while refereeing ? 3
- (g) Deductive research sometimes referred to as a "top-down" approach. Illustrate this using a suitable example. 3
- (h) Name any *three* tools of research that can be used to collect, manipulate or interpret data. 3
- (i) What is a Geographical Indication (GI) ? Give an example of product which is granted GI status in India. 3
- (j) What happens when a researcher rejects a true null hypothesis ? Which type of error is this ? How is it related to the significance value of a test ? 3

Section B

2. (a) Differentiate between limitations and delimitations of a research problem. Given a researcher is studying the impact of health education on adolescent nutrition in rural areas, identify which of the following is a limitation/delimitation. Justify your choice.
- (i) Study limited to adolescents aged 13–18 years.
 - (ii) Limited access to participants due to school schedules. 7.5
- (b) What is the purpose of copyright laws ? Is it possible to inherit a copyright ? What happens when a copyright expires ? What is the relaxation for 'fair use' or 'fair deal' with respect to copyright laws ? 7.5
3. (a) Write a short note on any *two* categories of plagiarism. Explain the strategies that can be followed to ensure plagiarism-free work. 7.5
- (b) Define any *three* types of data measurement scales and give *one* example for each. 7.5
4. (a) Ten software developers recorded the defect density (defects per 1,000 lines of code) for the modules they created. The observed defect density values are : 7.5
- 11, 13, 17, 19, 23, 25, 29, 31, 37, 41
- Compute the descriptive statistics : mean, median, mode, standard deviation and range.

- (b) While planning a literature search, a researcher should develop an effective search strategy. Discuss the aspects a researcher needs to decide before finalizing his/her search strategy. 7.5

5. (a) The Journal of Information Technology published articles according to the information given in the table : 7.5

Year	No. of Documents Published	Citations in 2024 to papers published in that year
2021	50	100
2022	60	180
2023	40	160

- (i) Compute the Impact Factor of the journal for the year 2024.
- (ii) Compute the CiteScore for the year 2024.
- (b) Compare the purpose, methodology and outcomes of Basic and Applied research. Indicate whether the following are examples of Basic Research or Applied Research with proper justification. 7.5
- (i) Understanding how to market a product to Gen Z or millennials in India.

- (ii) Researching the evolution of languages over time.
- (iii) Investigating the formation of mountain ranges.
- (iv) Developing more efficient and sustainable methods of food production.
6. (a) What is the placebo effect ? What are the ethical issues involved with it ? . 7.5
- (b) What is academic integrity in research ? Mention any *four* ways in which academic integrity can be maintained while writing a research report. 7.5
7. (a) Write any *two* differences between the following : 3×2.5=7.5
- (i) Experimental and Non-experimental research designs
- (ii) Quantitative and Qualitative research
- (iii) Process and Impact indicators for monitoring a project.
- (b) A large IT company introduces a flexible work-from-home policy for software engineers. Management believes that allowing employees to work remotely at least three days a week will increase productivity and better work-life balance. After three months, HR collects data on the average number of completed tasks per week for two groups :
- Group 1 : Employees following the traditional office schedule.
 - Group 2 : Employees under the flexible work policy.

The average number of tasks for each group were analysed using a t-test, which was conducted at a significance level of 0.05. The p-value of the test was 0.02. Considering the given scenario, answer the following questions :

- (i) Develop H_0 and H_1 .
- (ii) Given the significance value and p-value, will H_0 be accepted ?
Justify your answer.
- (iii) Should the management permanently adopt the flexible work-from-home policy ? Give reasons for your answer.

7.5