

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**M.Sc. DEGREE EXAMINATION – PHYSICS****SECOND SEMESTER – APRIL 2023****PPH2MC03 – RESEARCH METHODOLOGY**

Date: 06-05-2023

Dept. No.

Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

SECTION A – K1 (CO1)**Answer ALL the questions****(5 x 1 = 5)****1. Fill in the blanks**

- a) Fundamental types of research include basic, applied and ____ research.
- b) According to the data, research projects are classified as, qualitative or _____ research.
- c) In _____ review both the authors' and reviewers' identity are known to each other.
- d) The _____ part of a scientific article should list the mentors and financial supporters.
- e) _____ is the plan that describes the methods and procedures you will use to collect and analyse your research data.

SECTION A – K2 (CO1)**Answer ALL the questions****(5 x 1 = 5)****2. Match the following**

- a) Research Proposal - questionnaires
- b) Primary sources - application of basic knowledge
- c) Coding - structured and numerical data
- d) Applied Research - ordering, classifying the raw data
- e) Quantitative Research - overall plan

SECTION B – K3 (CO2)**Answer any THREE of the following****(3 x 10 = 30)**

3. List and describe each research type under the following categories:
a) Fundamental types b) Studied discipline c) Aim d) Data.
4. What is literature review? What are its purposes and advantages? How can literature review be done?
5. What do you understand by a research design? Explain in detail the various aspects of a research design.
6. How do you collect, analyse and process data?
7. What are photovoltaic transducers? Explain the different types.

SECTION C – K4 (CO3)**Answer any TWO of the following****(2 x 12.5 = 25)**

8. With a specific example, illustrate how an editor responds to complaints about distorted images.
9. How should a research article's title be structured?
10. Solve $x^3 - x - 4 = 0$, correct to four decimals using the Newton Raphson method.
11. Explain in detail active and passive transducers.

SECTION D – K5 (CO4)

Answer any ONE of the following **(1 x 15 = 15)**

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| 12. | Describe the optimal practices for scientific publication and the transparency principle. |
| 13. | Using the Gauss Seidel method solve the following simultaneous equations:
$2x + 15y + 6z = 72$ $54x + y + z = 110$ $-x + 6y + 27z = 85$ |

SECTION E – K6 (CO5)

Answer any ONE of the following **(1 x 20 = 20)**

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| 14. | Explain how a potential authorship issue can be identified. |
| 15. | Clearly describe the peer-reviewing process using a flowchart. |

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