Question 6.

A: To determine the polarization of sun-glasses. Research Methodology:

1. Define the research objective: Clearly state the purpose of the study, such as understanding the polarization properties of sun-glasses.
2. Literature review: Conduct a comprehensive review of existing research and studies related to sun-glasses polarization to gain a better understanding of the topic.
3. Formulate research questions: Develop specific research questions that will guide your investigation, such as "What are the factors affecting the polarization of sun-glasses?"
4. Research design: Determine the appropriate research design, such as experimental or observational, to investigate the polarization of sun-glasses.
5. Data collection: Decide on the methods to collect data, such as using a polarimeter or conducting surveys with participants wearing sun-glasses.
6. Interpretation and reporting: Interpret the findings and present them in a clear and concise manner, including any limitations or recommendations for further research.

Research Methods:

1. Experimental method: Conduct controlled experiments to measure the polarization of sun-glasses under different conditions.
2. Survey method: Administer surveys to a sample of individuals wearing sun-glasses and collect their perceptions and experiences regarding polarization.
3. Observational method: Observe and record the behavior of individuals wearing sun-glasses in different lighting conditions to understand the polarization effects.
4. Data analysis: Analyze the collected data using statistical techniques to draw conclusions about the polarization properties of sun-glasses.

B: To determine the magnetization of a ferromagnetic material. Research Methodology:

1. Research objective: Clearly define the purpose of the study, such as investigating the magnetization properties of a specific ferromagnetic material.
2. Literature review: Review existing research and studies related to magnetization of ferromagnetic materials to gain background knowledge.
3. Research questions: Develop specific research questions, such as "What factors influence the magnetization of the chosen ferromagnetic material?"
4. Research design: Determine the appropriate research design, such as experimental or observational, to investigate the magnetization of the material.
5. Data collection: Decide on the methods to collect data, such as using a magnetometer or conducting experiments with the ferromagnetic material.
6. Interpretation and reporting: Interpret the findings and present them in a clear and concise manner, including any limitations or suggestions for further research.

Research Methods:

1. Experimental method: Conduct controlled experiments to measure the magnetization of the ferromagnetic material under different conditions, such as varying temperature or magnetic field strength.
2. Magnetic measurement method: Use a magnetometer to directly measure the magnetization of the material.

3. Microscopy method: Utilize microscopy techniques, such as magnetic force microscopy, to visualize and analyze the magnetization patterns in the material.
4. Data analysis: Analyze the collected data using appropriate statistical techniques to draw conclusions about the magnetization properties.

C: To verify that a signature recorded in an accelerator is a new particle. Research Methodology:

1. Research objective: Clearly state the purpose of the study, such as verifying the existence of a new particle based on recorded signatures.
2. Literature review: Review existing research and studies related to particle physics and the detection of new particles to gain background knowledge.
3. Research questions: Develop specific research questions, such as "What are the characteristics of the recorded signature that indicate the presence of a new particle?"
4. Research design: Determine the appropriate research design, such as experimental or observational, to verify the recorded signature as a new particle.
5. Data collection: Collect data from the accelerator's recorded signatures and any associated experimental setups or detectors.
6. Interpretation and reporting: Interpret the findings and present them in a clear and concise manner, including any limitations or recommendations for further research.

Research Methods:

1. Particle detection method: Analyze the recorded signatures using particle detectors and sophisticated data analysis techniques to identify unique characteristics associated with the presence of a new particle.
2. Statistical analysis method: Apply statistical methods, such as hypothesis testing or regression analysis, to determine the significance of the recorded signature and its correlation with the existence of a new particle.
3. Data analysis: Analyze the collected data using advanced statistical and computational techniques to identify patterns or anomalies that suggest the presence of a new particle.