RM & IP (BRMK557)
VTU Model QP 1, 2 & 3 – Answers

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Note:

- All answers (keywords), diagrams, and flowcharts are taken from the official VTU-prescribed textbook and notes. ChatGPT was used only to simplify the answers.
- VTU has released three Model question papers for RM & IP under 2022 scheme:
  - **MQP 1:** https://vtu.ac.in/pdf/QP/BRMK5574.pdf
  - **MQP 2 & 3:** https://vtu.ac.in/pdf/QP/BRMK557.pdf

MODULE 1

MQP 1

1a. Explain Research Flow cycle with a Neat Diagram

Ans:

Definition of Research

Research is a **systematic investigation** aimed at creating new knowledge or creatively using existing knowledge to develop new concepts, methods, and understandings. It involves forming hypotheses, analyzing data, and drawing conclusions to either support or refute these hypotheses. Research contributes original insights, adding to the existing knowledge base.

Research Flow Cycle with Explanation

The Research Flow Cycle is a systematic process that guides researchers from identifying a practical problem to finding a solution. Below is a detailed explanation of each step in the cycle:
Practical Problem → Research Question → Research Project → Result → (Back to Practical Problem).

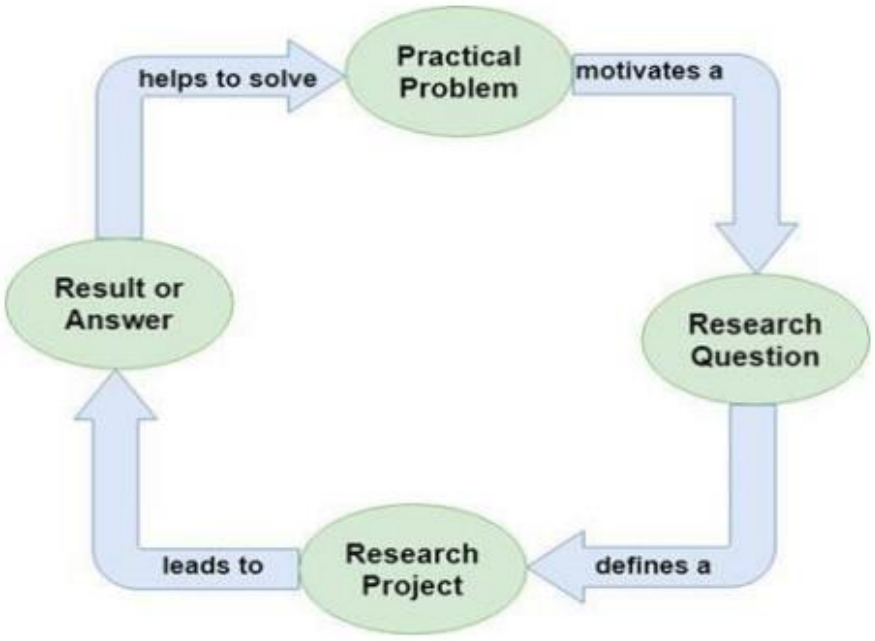


Fig.1.1: Research Flow (Cycle) Diagram

Step 1: Practical Problem

- **Description:** The research cycle begins with identifying a practical problem that needs to be solved.
- **Key Points:**
    1. The researcher must clearly understand what the problem is and why it is important.
    2. This step provides the motivation for conducting the research.
- **Example:** A company facing declining sales might identify the problem as "Why are sales decreasing?"

Step 2: Research Question

- **Description:** Based on the practical problem, the researcher formulates a research question.
- **Key Points:**
    1. The research question defines the scope and direction of the research project.
    2. It should be specific, measurable, and answerable.
- **Example:** "What factors are contributing to the decline in sales?"

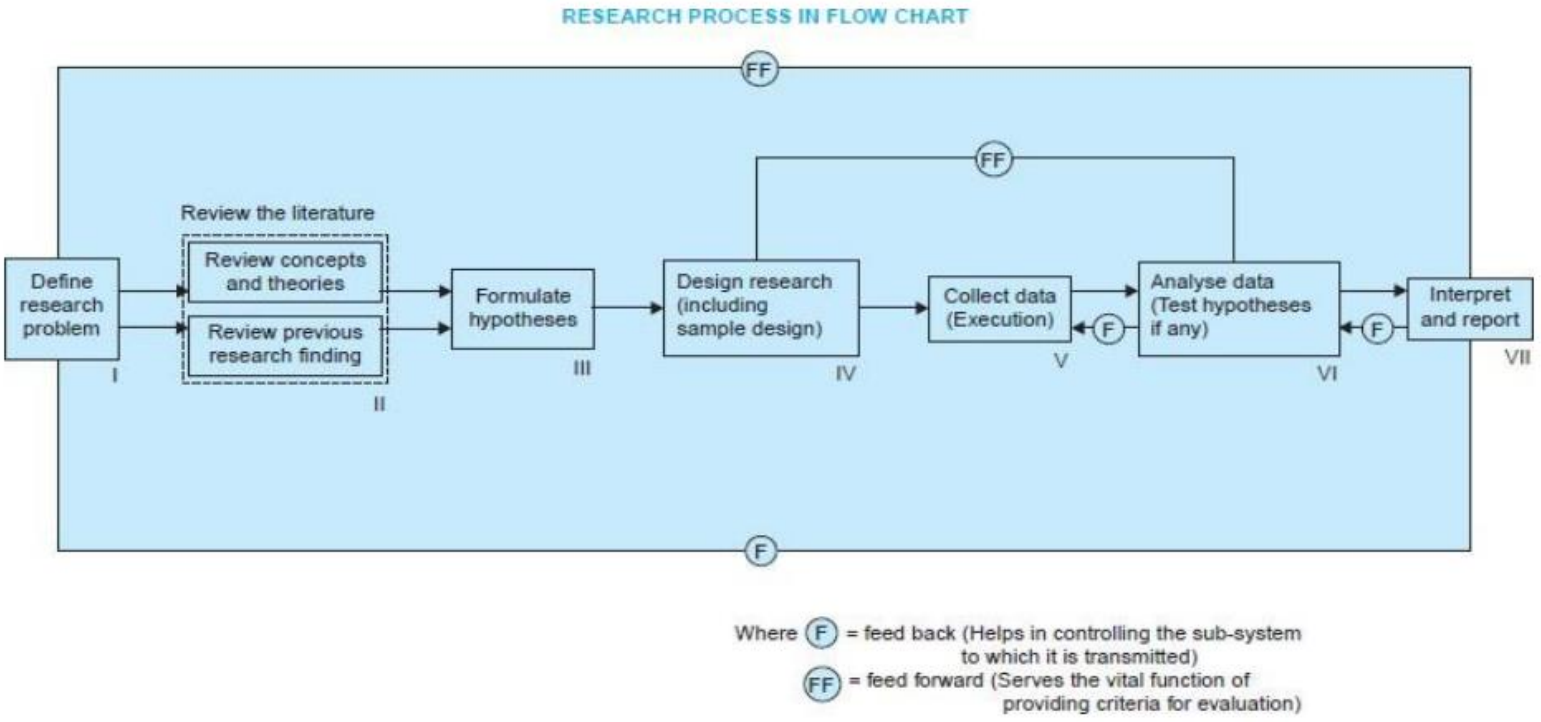
Step 3: Research Project

- **Description:** The research question leads to the design and execution of a research project.
- **Key Points:**
    1. The research project involves activities like data collection, analysis, and interpretation.
    2. It is aimed at finding an answer or solution to the research question.
- **Example:** Conducting surveys, interviews, or experiments to identify factors affecting sales.

Step 4: Result

- **Description:** The research project produces a result or answer to the research question.
- **Key Points:**
    1. The result helps to solve the practical problem identified at the beginning of the cycle.
    2. It may also lead to new insights or further research questions.
- **Example:** Identifying that poor customer service is a major factor in declining sales.

Detailed Research Process (Flow Chart Explanation)



Research Process Steps

1. **Formulating the Research Problem**
   - Identify a specific problem to study (e.g., declining sales or climate change effects).
   - Decide whether the problem relates to states of nature or relationships between variables.
2. **Extensive Literature Survey**
   - Review existing research to understand the topic and identify gaps.
   - Write a synopsis for approval, especially for higher-level research like a Ph.D.
3. **Development of Working Hypotheses**
   - Formulate a tentative assumption to guide the research.
   - Ensure the hypothesis is specific and testable for accurate results.
4. **Preparing the Research Design**
   - Create a detailed plan for data collection and analysis.
   - Ensure the design is efficient, saving time, effort, and resources.
5. **Determining Sample Design**
   - Choose a sampling method (e.g., random, stratified, or cluster sampling).
   - Ensure the sample represents the population for accurate results.
6. **Collecting the Data**
   - Gather data using methods like surveys, experiments, or observations.
   - Ensure data is relevant, accurate, and collected systematically.
7. **Execution of the Project**
   - Carry out the research plan carefully and systematically.
   - Monitor for unexpected factors to ensure reliable results.
8. **Analysis of Data**
   - Process data using tools like coding, tabulation, and statistical tests.
   - Condense large data into manageable groups for easier interpretation.
9. **Hypothesis-Testing**
   - Test hypotheses using statistical methods like Chi-square or t-tests.
   - Determine if the data supports or rejects the hypotheses.
10. **Generalizations and Interpretation**
    - Draw conclusions based on the analysis of data.
    - If hypotheses are supported, arrive at generalizations or build theories.
11. **Preparation of the Report or Thesis**
    - Write the report with a clear structure: introduction, findings, conclusion.
    - Include preliminary pages (title, acknowledgements) and end matter (appendices, bibliography).

Summary:

- The **Research Flow Cycle** involves identifying a **practical problem**, formulating a **research question**, designing and executing a **research project**, and obtaining **results**. The process is iterative and aims to address real-world issues systematically.
- The **detailed research process** includes problem formulation, literature review, hypothesis development, research design, data collection, analysis, and report preparation, ensuring a thorough and efficient approach to research.

1b. What are three broad categories of developing and accessing knowledge in Research with diagram

Ans: **Three Broad Categories of Developing and Accessing Knowledge in Research**

1. **Observation**
   - **Definition:** The most basic way of gathering information by seeing or measuring something directly.
   - **Purpose:** It helps in studying unusual or hard-to-reach subjects.
   - **Types:**
     - Laboratory measurements, like testing a material under different conditions.
     - Surveys or experiments with groups of people to gather data.
   - **Example:** Observing the growth of plants under different light conditions.

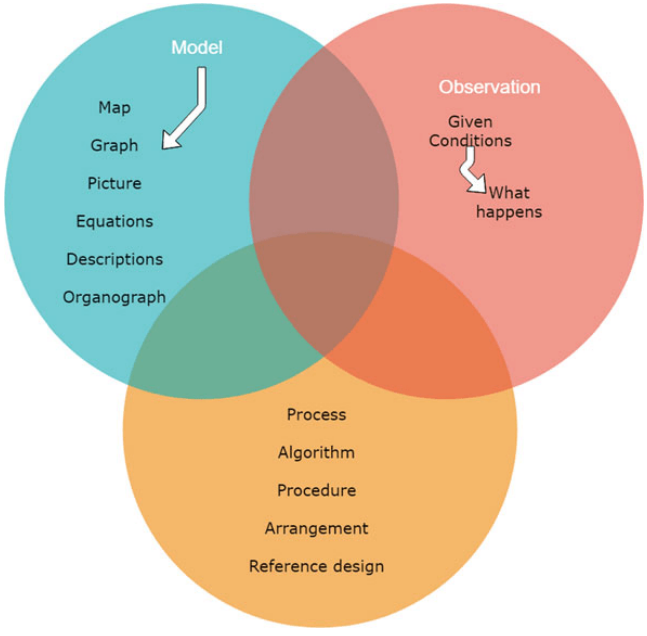
2. **Models**
   - **Definition:** Simplified representations or descriptions of complex data or systems.
   - **Purpose:** Models help in understanding and interpreting the data from observations in an abstract way.
   - **Forms:**
     - Mathematical equations or graphs showing relationships between variables.
     - Statistical models predicting future trends or behaviors.
   - **Example:** Using a formula to predict the speed of an object based on distance and time.

3. **Processes and Algorithms**
   - **Definition:** Methods or designs to achieve specific results or solve problems.
   - **Purpose:** These methods help organize and analyze the data, leading to solutions or insights.
   - **Types:**
     - Algorithms for sorting data or solving complex problems.
     - Procedures for experiments or designing systems.
   - **Example:** An algorithm used to sort a list of numbers from smallest to largest.

Diagram Representation

A Venn diagram can represent the overlap among **Observation**, **Models**, and **Processes and Algorithms**:

- **Observation**: The starting point, where raw data is gathered.
- **Models**: Built using data from observations to create a simplified representation.
- **Processes and Algorithms**: Use observations and models to develop methods for solving problems.



The diagram above represents the three broad categories of developing and accessing knowledge in research: **Observation**, **Models**, and **Processes and Algorithms**.

- The intersections illustrate how these categories overlap and contribute to comprehensive knowledge development in research.

For example:

- **Observation + Models**: Data interpretation through simplified representations.
- **Observation + Processes**: Practical solutions using collected data.
- **Models + Processes**: Optimizing methods based on models.

1c. Explain the three different types of Research? Give distinct examples of each.

Ans:

Types of Engineering Research

1. Descriptive vs. Analytical

- **Descriptive Research:**
  - Focuses on describing the current state or conditions of a phenomenon without altering or controlling variables.
  - Example: Collecting data on urban traffic patterns to report congestion levels in peak hours.
- **Analytical Research:**
  - Utilizes existing data to critically evaluate relationships, identify causes, and propose actionable solutions.
  - Example: Analyzing traffic data to identify major causes of congestion and recommend strategies like signal optimization.

2. Applied vs. Fundamental

- **Applied Research:**
  - Oriented toward solving specific, practical problems with immediate applicability.
  - Example: Developing a cost-effective water purification system tailored for rural areas facing water scarcity.
- **Fundamental Research:**
  - Aims to broaden theoretical understanding and generate foundational knowledge without direct application.
  - Example: Studying the molecular structure of water to understand its properties and behavior under different conditions.

3. Quantitative vs. Qualitative

- **Quantitative Research:**
  - Involves collecting measurable, numerical data and analyzing it statistically to derive conclusions.
  - Example: Testing the load-bearing capacity of a bridge design using systematic stress tests and data analysis.
- **Qualitative Research:**
  - Focuses on understanding non-numerical insights, such as perceptions or behaviors, through methods like interviews and observations.
  - Example: Interviewing engineers to understand challenges faced in designing sustainable construction projects.

4. Conceptual vs. Empirical

- **Conceptual Research:**
  - Concerned with abstract theories and ideas, often aimed at building new frameworks or reinterpreting existing ones.
  - Example: Proposing a theoretical model for sustainable energy usage in urban infrastructure.
- **Empirical Research:**
  - Based on experimentation and observation to validate hypotheses or draw conclusions.
  - Example: Testing the efficiency of a new solar panel design under real-world conditions to determine its performance.

Summary of Types:

1. **Descriptive vs. Analytical**:
   - Descriptive: Describes phenomena as they are (e.g., traffic congestion analysis).
   - Analytical: Examines underlying causes and suggests solutions (e.g., strategies for managing congestion).
2. **Applied vs. Fundamental**:
   - Applied: Practical problem-solving (e.g., developing new water purification systems).
   - Fundamental: Expands theoretical understanding (e.g., studying water molecules).
3. **Quantitative vs. Qualitative**:
   - Quantitative: Focuses on measurable data (e.g., bridge load tests).
   - Qualitative: Provides detailed insights through narrative feedback (e.g., interviews about challenges).
4. **Conceptual vs. Empirical**:
   - Conceptual: Explores abstract ideas or theories (e.g., theorizing new energy models).
   - Empirical: Based on observations and experiments (e.g., testing solar panel efficiency).

2a. List the different types of Research misconduct ?Provide examples for each

Ans:

Types of Research Misconduct

1. Fabrication (Illegitimate Creation of Data)

- **Definition:** Creating fake data or experiments without actual research.
- **Example:** A researcher invents survey responses for 1,000 participants to meet a publication deadline without conducting the survey.

2. Falsification (Inappropriate Alteration of Data)

- **Definition:** Manipulating or misrepresenting data to support a desired hypothesis.
- **Example:** Adjusting experimental results, such as altering temperature readings, to make it appear that a reaction occurred when it did not.

3. Plagiarism (Using Others' Work Without Attribution)

- **Definition:** Copying text, data, or ideas from others without giving proper credit.
- **Example:** Copying a table or figure from another research paper and including it in your publication without citing the original source.

4. Self-Plagiarism

- **Definition:** Reusing one's own previously published work without proper acknowledgment or citation.
- **Example:** Publishing the same research findings in multiple journals under different titles to increase publication count.

5. Other Aspects of Research Misconduct

- **Definition:** Serious deviations from accepted research practices.
- **Examples:**
    - Submitting the same manuscript to two journals simultaneously to increase acceptance chances.
    - Failing to disclose known errors in previously published work, leading to misinformation in the field.
    - Conducting studies without informing participants of the risks involved, violating ethical guidelines.

Summary in Points with Sub-Headings

Fabrication

- **Definition:** Creating fake data or experiments.
- **Example:** Inventing laboratory results for experiments never conducted.

Falsification

- **Definition:** Manipulating data to support a hypothesis.
- **Example:** Editing research data to falsely indicate the success of a new drug.

Plagiarism

- **Definition:** Using others' work without proper credit.
- **Example:** Including text from another author's article in your research paper without citation.

Other Misconduct

- **Definition:** Deviations from ethical research practices.
- **Example:** Simultaneously submitting the same article to multiple journals.

2b. What are the objectives of Engineering Research and its motivation?

Ans:

Objectives of Engineering Research (Even Aims of Engineering Research)

1. **Innovation and Advancement**
    - Pushes the boundaries of knowledge and technology.
    - Example: Developing cutting-edge technologies like AI-driven systems or renewable energy solutions.
2. **Problem Solving**
    - Focuses on addressing real-world challenges.
    - Example: Designing low-cost housing solutions for disaster-prone areas.
3. **Optimization**
    - Improves efficiency, reduces costs, and minimizes environmental impact.
    - Example: Enhancing the performance of electric vehicles through better battery technology.
4. **Knowledge Expansion**
    - Contributes to fundamental understanding in various disciplines.
    - Example: Studying material properties to develop stronger and lighter composites.
5. **Interdisciplinary Collaboration**
    - Involves collaboration across fields to solve complex problems.
    - Example: Engineers working with biologists to design prosthetics with improved functionality.
6. **Education and Training**
    - Supports the development of future engineers and scientists.
    - Example: Publishing research to teach new methodologies in academic curricula.

7. **Technological Transfer**
    - Ensures research findings are applied practically in industries.
    - Example: Transferring lab-scale nanotechnology processes to commercial production.
8. **Societal Impact**
    - Addresses critical societal issues for the betterment of communities.
    - Example: Developing affordable healthcare devices like portable ECG monitors.
9. **Quality and Safety Improvement**
    - Enhances safety and quality in critical industries.
    - Example: Improving safety standards for autonomous vehicles.
10. **Global Challenges**
    - Tackles issues like climate change and resource scarcity on a global scale.
    - Example: Innovating water purification systems for drought-affected regions.

Factors That Motivate Individuals to Engage in Engineering Research

1. **Personal Fulfillment**
    - **Desire to Solve Problems:** Motivated by solving unsolved challenges and contributing to the community.
    - **Respect and Joy:** Intellectual satisfaction and respectability from meaningful discoveries.
2. **Competition and Collaboration**
    - **Outperforming Peers:** A drive to achieve better results than competitors.
    - **Team Efforts:** Collaborative work enhances societal impact and research output.
3. **Intrinsic and Extrinsic Factors**
    - **Intrinsic:** Passion for learning, creativity, and problem-solving.
    - **Extrinsic:** Career advancement, monetary rewards, and public recognition.
4. **Contribution to Society**
    - **Advancing Technology:** Motivation to improve quality of life through innovation.
    - **Societal Betterment:** A desire to address critical issues like healthcare and sustainability.
5. **Government Directives and Funding Opportunities**
    - **Funding Influence:** Availability of grants motivates researchers to explore specific fields.
    - **Policy Priorities:** National directives can guide the focus of research towards priority areas.

In summary, **engineering research objectives** aim to innovate, solve problems, and address global challenges, while motivations stem from personal goals, societal needs, and external support systems.

2c. Give a detailed description of Ethics and Ethical practices in Research

Ans:

Ethics in research refers to applying moral principles and standards to guide the entire research process. **Ethical practices** ensure credibility, integrity, and the well-being of all stakeholders, including participants, researchers, and society.

Key Ethical Practices in Research

1. **Informed Consent**
    - Obtain voluntary consent from participants after explaining the purpose, risks, and benefits of the research.
    - Example: A researcher conducting a survey ensures participants are aware of how their data will be used.

2. **Confidentiality and Privacy**
    - Protect participants' personal information and ensure data security.
    - Example: Storing sensitive health records in encrypted formats accessible only to authorized personnel.
3. **Responsible Data Handling**
    - Maintain data accuracy, integrity, and security. Handle sensitive information in line with regulations.
    - Example: Using secure systems to prevent data breaches during clinical trials.
4. **Avoiding Plagiarism**
    - Acknowledge sources accurately and give credit to prior contributors.
    - Example: Properly citing journal articles and including references in research publications.
5. **Research Integrity**
    - Conduct research honestly, avoiding fabrication, falsification, or manipulation of data.
    - Example: Reporting all experimental results, including negative or inconclusive findings.
6. **Safety and Risk Mitigation**
    - Prioritize safety and minimize risks for researchers, participants, and the environment.
    - Example: Following proper waste disposal methods during chemical experiments.
7. **Ethical Review and Compliance**
    - Obtain approval from institutional review boards for studies involving human subjects or sensitive data.
    - Example: Submitting a research protocol for ethical review before beginning a clinical trial.
8. **Conflict of Interest Disclosure**
    - Disclose any financial or personal interests that might influence research outcomes.
    - Example: A researcher working with a sponsor discloses funding sources in their publication.
9. **Respect for Intellectual Property**
    - Respect and adhere to intellectual property laws, including patents, copyrights, and trademarks.
    - Example: Seeking permission to use copyrighted images in a research paper.
10. **Social and Environmental Impact Consideration**
    - Evaluate the potential societal and environmental consequences of research outcomes.
    - Example: Developing sustainable technologies to minimize environmental harm.
11. **Continuous Ethical Reflection and Education**
    - Engage in ongoing learning about ethical guidelines and best practices.
    - Example: Attending workshops on research ethics to stay updated on emerging challenges.

Importance of Ethical Practices

- **Ensures Credibility:** Builds trust in research findings.
- **Protects Stakeholders:** Safeguards participants' rights and welfare.
- **Promotes Integrity:** Upholds the honesty and quality of the research process.
- **Enhances Impact:** Ensures societal and environmental benefits from research outcomes.

Upholding ethical standards is critical for responsible research and contributes to innovations that benefit humanity while minimizing harm.

MQP 2

1a. List the different types of research misconduct and provide a brief explanation for each one.
Ans: (same as 2a from MQP 1)

1b. Define Engineering Research and list its aims and objectives
Ans:
Definition of Engineering Research
Engineering research refers to a systematic method of inquiry aimed at expanding the existing knowledge base, solving new and important problems, and making original contributions to the field of engineering.

Aims and Objectives of Engineering Research
(same as 2b from MQP 1)

2a. What ethical considerations and responsibilities should be taken into account when determining authorship in engineering research?
Ans:
Ethical Considerations and Responsibilities in Determining Authorship

1. **Clear Authorship Criteria**
    - Include only individuals who make significant contributions to the research.
    - Avoid honorary authorship (adding names without real contributions).
2. **Transparency and Agreement**
    - Discuss and agree on authorship roles and order at the start of the project.
    - Ensure all contributors are informed of changes in authorship, if any.
3. **Avoiding Guest and Ghost Authorship**
    - Do not grant authorship based on seniority, affiliations, or courtesy (guest authorship).
    - Acknowledge all significant contributors, avoiding ghost authorship.
4. **Conflict Resolution**
    - Address disagreements about contributions or order ethically through discussion.
    - Use mediation if disputes remain unresolved.
5. **Accountability of Authors**
    - Authors must ensure data accuracy and the integrity of the research.
    - The corresponding author is responsible for managing communication with journals and ensuring all authors review the final manuscript.
6. **Acknowledgment of Equal Contributions**
    - Clearly indicate if multiple authors contribute equally to the work.
7. **Responsibilities in Collaborative Research**
    - Allocate credit fairly in multi-institutional or interdisciplinary projects.
    - Ensure contributions from all collaborators are properly represented.
8. **Avoiding Position-Based Authorship**
    - Do not assign authorship based solely on titles or affiliations without active involvement in the research.

Steps to Prevent Ethical Issues in Authorship

1. **Define Roles Early**
    - Establish clear criteria for authorship at the start of the research.
2. **Document Contributions**
    - Maintain records of each contributor's role and effort throughout the project.

3. **Use Ethical Guidelines**
    - Follow institutional or journal-specific authorship guidelines.
4. **Communicate Regularly**
    - Conduct discussions about authorship during project milestones to avoid conflicts later.
5. **Acknowledge Non-Authors**
    - Provide proper acknowledgment for individuals who contributed but do not qualify for authorship.

By adhering to these practices, ethical issues in authorship can be minimized, ensuring fairness and credibility in engineering research publications.

2b. Enlist and Explain different types of engineering research

Ans: (similar to 1c from MQP 1)

Types of Engineering Research

1. **Basic Research**
    - Expands fundamental understanding of scientific principles without immediate practical use.
    - Example: Investigating the behavior of materials at atomic levels.
2. **Applied Research**
    - Focuses on solving real-world problems using knowledge from basic research.
    - Example: Developing a new battery technology.
3. **Interdisciplinary Research**
    - Combines expertise from multiple fields to address complex challenges.
    - Example: Using AI to improve renewable energy systems.
4. **Design-Oriented Research**
    - Enhances the engineering design process through new tools and methodologies.
    - Example: Improving CAD software for faster prototyping.
5. **Developmental Research**
    - Refines and improves existing technologies, products, or systems.
    - Example: Upgrading a smartphone's camera technology.
6. **Experimental and Empirical Research**
    - Uses experiments and data analysis to test hypotheses or evaluate system performance.
    - Example: Testing the durability of a new bridge material.
7. **Computational and Modelling Research**
    - Utilizes computer simulations and numerical analysis to predict behaviors and optimize designs.
    - Example: Simulating aerodynamic performance for car designs.
8. **Innovative and Breakthrough Research**
    - Focuses on creating disruptive technologies and groundbreaking innovations.
    - Example: Developing quantum computing systems.
9. **Industry-Driven Research**
    - Targets specific challenges faced by industries, often with direct applications.
    - Example: Designing machinery to improve manufacturing efficiency.
10. **Sustainability and Environmental Research**
    - Develops eco-friendly technologies to reduce environmental impact and enhance resource efficiency.
    - Example: Creating biodegradable materials for packaging.

MQP 3

1a. What are the key ethical issues related to authorship? Explain each one.
Ans: (same as 2a from MQP 2)

1b. What are the three broad categories of developing and accessing Knowledge in research? Explain with a diagram.
Ans: (same as 1b from MQP 1)

2a. Explain Fabrication, Falsification and Plagiarism related to engineering Research
Ans:

Fabrication (Creating Fake Data):

- **Definition:** Creating fake data or results that were never actually observed or conducted.
- **Reasons Behind Fabrication:**
  - Pressure to meet deadlines or expectations.
  - Desire to meet research goals without waiting for real data.
- **Impact on Engineering Research:**
  - Damages trust in research data and results.
  - Leads to false conclusions and wastes resources.
  - Can result in unsafe or inefficient products or systems.

Falsification (Changing Data):

- **Definition:** Changing or misrepresenting data to make it appear as if it supports a certain conclusion, even if it doesn't.
- **Examples of Falsification:**
  - Changing data to fit expected outcomes.
  - Misrepresenting data to match a hypothesis.
  - Ignoring data that contradicts the desired conclusion.
- **Impact on Engineering Research:**
  - Misleading information is published, distorting the scientific record.
  - Damages researcher and institutional credibility.
  - Causes delays in technological progress by presenting false evidence.

Plagiarism (Copying Other's Work):

- **Definition:** Using someone else's work without proper credit, including text, ideas, or data.
- **Types of Plagiarism:**
  - **Verbatim Plagiarism:** Copying text or ideas directly without citation.
  - **Self-Plagiarism:** Reusing your own work without acknowledging it.
  - **Patchwork Plagiarism:** Combining ideas from different sources without crediting them.
- **Detection of Plagiarism:**
  - **Automated Software:** Tools like Turnitin detect similarities between sources.
  - **Human Judgment:** Plagiarism is confirmed by human review, not just similarity scores.
- **Impact on Engineering Research:**
  - Leads to the spread of incorrect or incomplete information.
  - Damages academic integrity and can result in penalties.
  - Limits creativity and original thinking by reusing existing ideas.

Ethical Practices to Avoid Fabrication, Falsification, and Plagiarism:

- **Accurate Data Representation:** Only present real, unaltered data and acknowledge errors or limitations.

- **Proper Citation:** Always cite sources for someone else's ideas or findings and avoid copying directly.
- **Paraphrasing and Summarizing:** Use your own words and cite the original source to avoid plagiarism.
- **Collaboration with Supervisors:** Keep open communication with mentors to maintain ethical research standards.
- **Training and Awareness:** Researchers should understand ethical guidelines and the importance of integrity in research.

2b. Discuss the different types of engineering research. Clearly point out the Differences between all of them with examples.
Ans: (same as 1c from MQP 1)

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MODULE 2

MQP 1

3a. What are the primary goals of Literature Review?
Ans:

Primary Goals of a Literature Review

- **Identify Unsolved Issues:** Discover gaps or unresolved problems in existing research and models.
- **Present Novel Ideas and Recommendations:** Introduce fresh perspectives and suggestions based on findings.
- **Analyze Available Materials:** Evaluate the relevance and quality of existing research for your study.
- **Assess Existing Problems:** Spot flaws or limitations in current models and experimental designs.
- **Ensure Authority:** Verify the author's credentials and affiliations to ensure credibility.
- **Ensure Accuracy:** Cross-check information with known facts and reputable sources, looking for proper citations.
- **Assess Scope:** Determine whether the source fits your research needs and comprehension level.
- **Save Time:** Rely on scholarly articles or patents to speed up the research process.
- **Summarize Relevant Work:** Summarize key findings and contributions from existing literature.
- **Identify Missing Links:** Pinpoint challenges or open questions in the field that need addressing.
- **Develop Your Own Ideas:** Build your own research concepts based on the literature reviewed.
- **Stay Updated:** Keep track of new developments and emerging issues in the research area.

This simplifies the key points, focusing on the goals of conducting a literature review in academic research.

3b. How does new and existing Knowledge contribute to Research

Ans:

Contribution of New and Existing Knowledge to Research Process

1. **Contextual Foundation:**
   - New knowledge is interpreted through the lens of existing knowledge.
   - This context helps researchers evaluate findings meaningfully.
2. **Problem Identification:**
   - Existing knowledge reveals gaps or issues in the field.
   - Analyzing past studies ensures the research addresses relevant problems.
3. **Methodological Framework:**
   - Previous research guides the choice of effective methodologies.
   - Understanding past techniques enhances the reliability of new studies.
4. **Theoretical Development:**
   - New findings can refine or challenge existing theories.
   - They encourage innovative thinking and exploration of concepts.
5. **Validation and Credibility:**
   - A strong foundation in existing knowledge increases the credibility of new research.
   - Well-referenced studies are more likely to be accepted in the academic community.
6. **Synthesis of Information:**
   - A literature review connects diverse ideas and insights.
   - This synthesis can lead to new perspectives and solutions to complex issues.
7. **Informed Decision-Making:**
   - Awareness of past successes and failures aids in research planning.
   - It helps define the research direction, scope, and focus effectively.
8. **Identification of Trends:**
   - Reviewing existing literature reveals trends and shifts in the field.
   - Recognizing these trends informs future research directions.
9. **Enhancing Research Quality:**
   - A thorough literature review ensures critical evaluation of previous work.
   - This rigor avoids common pitfalls and enhances overall research quality.
10. **Facilitating Collaboration and Networking:**
    - Knowledge of existing research helps identify shared interests with others.
    - Collaborations can deepen and broaden the scope of research efforts.

3c. What are datasheets enumerate their contents?

Ans:

Datasheets:

Datasheets are instruction manuals for electronic components that provide essential information about the component's functionality, usage, and specifications. They are crucial for engineers and researchers working with electronics, as they enable the design and debugging of circuits.

Contents of a Datasheet

1. **Summary and Features:**
   - Overview of the component's primary functions and features.
   - Key specifications relevant to its operation.
2. **Functional Block Diagram:**
   - Visual representation of the internal functions of the component.
   - Helps in understanding how the component works.

3. **Pinout Information:**
    - Details the physical location and arrangement of the component's pins.
    - Indicates pin 1 for correct orientation when connecting to circuits.
4. **Performance Graphs:**
    - Graphs illustrating performance metrics against various criteria (e.g., supply voltage, temperature).
    - Information on safe operating regions for reliable use.
5. **Truth Tables:**
    - Tables outlining input-output relationships for the component.
    - Helps in understanding the logical behavior of the device.
6. **Timing Diagrams:**
    - Diagrams showing how and at what speed data is sent and received.
    - Important for timing-related applications in circuits.
7. **Dimensions:**
    - Accurate measurements of the component's physical dimensions.
    - Essential for printed circuit board (PCB) layout and design.

Reading a datasheet carefully is crucial when working with electronic components to ensure proper integration and functionality in projects.

4a. Explain the terms critical reading and creative reading?

Ans:

Critical Reading

- **Purpose:** Analyze the text with a judgmental and cautious mindset.
- **Focus Areas:**
    - Identify mistakes or weaknesses in the arguments.
    - Evaluate whether the problem addressed is appropriate.
- **Key Considerations:**
    - **Reasonableness of Assumptions:** Are the assumptions valid and logical?
    - **Logical Flow:** Are there gaps or flaws in the reasoning?
    - **Data Accuracy:** Is the data collected and interpreted correctly?
- **Judgmental Approach:**
    - Use boldness and critical thinking to form judgments.
    - Be flexible to correct any wrong conclusions.

Creative Reading

- **Purpose:** Explore possibilities and positive ideas beyond the author's work.
- **Focus Areas:**
    - Search for new applications of the concepts.
    - Extend ideas into broader generalizations or areas.
- **Key Considerations:**
    - **Innovative Thinking:** Can the ideas be applied in different contexts?
    - **Generalizations and Extensions:** What additional work or insights can be drawn?
    - **Practical Challenges:** Are there challenges or modifications to improve usability?
- **Future Research Opportunities:**
    - Look for gaps where further research is needed.
    - Suggest areas for innovation and new studies.

Steps Involved in Critical and Creative Reading Process

Steps in Critical Reading:

1. **Understand the Purpose:**
   - Identify the primary research question or argument.
2. **Evaluate Problem Solving:**
   - Assess if the right problem has been addressed and if there are simpler solutions.
3. **Identify Limitations:**
   - Look for stated and unstated limitations and missing links.
4. **Check Assumptions:**
   - Analyze the assumptions made and their reasonableness.
5. **Assess Logical Flow:**
   - Verify if the arguments and data presented follow a logical progression.
6. **Data Accuracy:**
   - Confirm if the data supports the claims and was collected correctly.

Steps in Creative Reading:

1. **Explore New Applications:**
   - Actively seek applications beyond what the paper discusses.
2. **Generalize Concepts:**
   - Look for opportunities to extend ideas to broader contexts.
3. **Address Practical Challenges:**
   - Identify modifications or challenges that can improve practical usability.
4. **Extend Research Horizons:**
   - Determine areas where further research can be conducted.
5. **Innovate Solutions:**
   - Think of new ways to solve limitations or enhance the presented work.

By combining critical and creative reading, researchers can both critique existing work and build upon it to create innovative solutions and advancements in their fields.

Summary of Critical Reading vs. Creative Reading

Aspect	Critical Reading	Creative Reading
Difficulty	Easier	Harder
Approach	Judgmental	Exploratory
Focus	Identifying flaws and weaknesses	Exploring new ideas and applications
Purpose	Evaluate validity and logic	Extend research and innovate
Outcome	Ensures accuracy and clarity	Opens paths for future research

4b. Explain the term citation? Describe the functions of citation?

Ans:

Definition of Citation

Citation: A citation is a reference to a source that credits the original author or creator of a work, allowing readers to trace the source material. It serves as a formal acknowledgment of the contributions made by others, ensuring that proper credit is given and helping to prevent plagiarism.

Functions of Citation

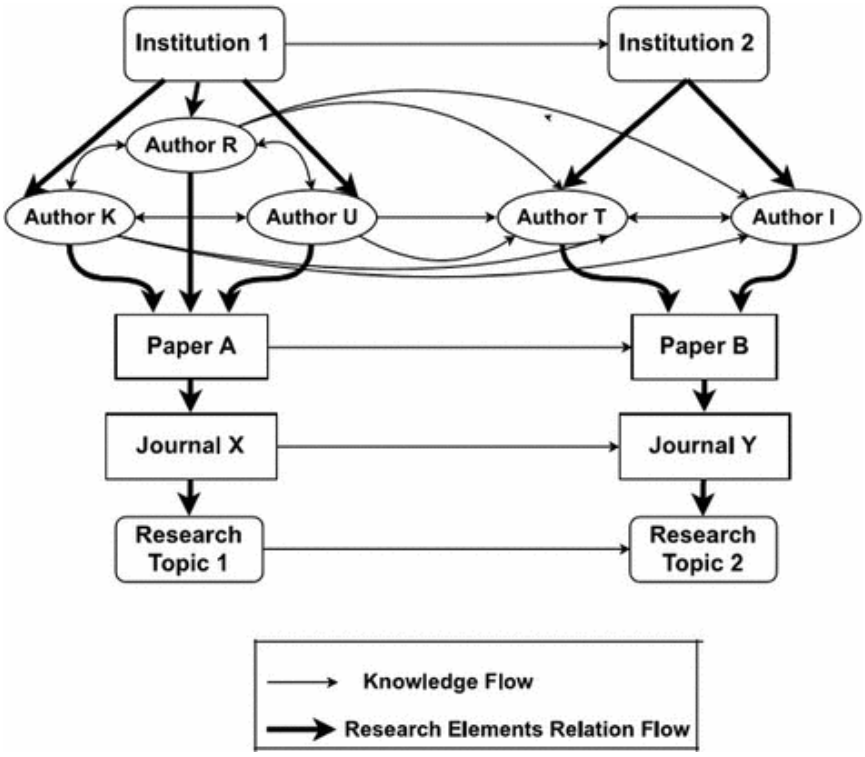
1. **Verification Function:**
    - Citations allow readers to check the accuracy of information presented in a work.
    - They provide a way for readers to determine if the original source is reliable and whether the claims made are justified.
2. **Acknowledgment Function:**
    - Citations give credit to researchers for their original work, enhancing their academic reputation.
    - They are crucial for career advancement, as funding and employment opportunities often depend on the visibility and recognition of researchers through their citations.
3. **Documentation Function:**
    - Citations serve to document scientific concepts and track the historical development of technologies.
    - They create a record of how knowledge has evolved over time, allowing researchers to understand the context and progression of their field.

4c. Explain the knowledge flow process through a citation network?

Ans:

Knowledge Flow Through Citation Network

1. Knowledge Flow



- **Communication Channels**: Knowledge flows through verbal communication, books, documents, videos, and images.
- **Research Flow**: In academic research, knowledge is primarily transmitted through books, theses, articles, patents, and reports.

2. Role of Citations

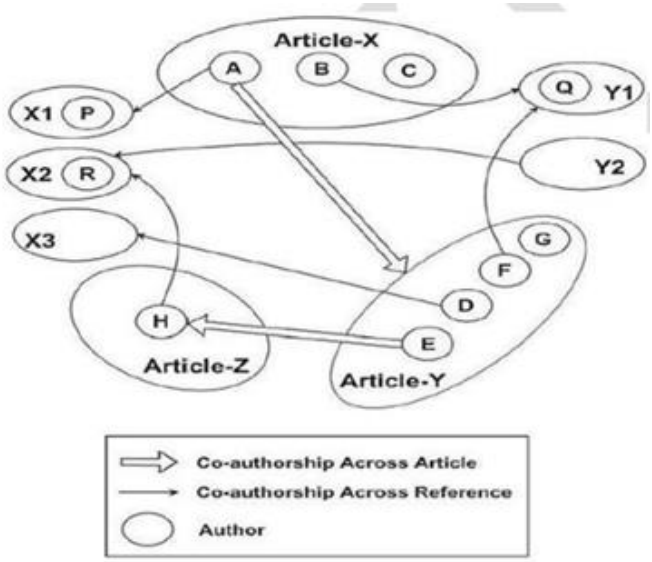
- **Transmitting Knowledge**: Citations play a key role in transmitting knowledge from previous work to new innovations.

- **Flow Mechanism**: When Paper A cites Paper B, knowledge flows from Paper B to Paper A through the citation network.

3. How Knowledge Flows

- **Between Co-Authors**: During research collaborations, knowledge flows between co-authors, enriching the work.
- **Across Institutions**: Research is shared across institutions, and knowledge flows through citations between them.
- **Between Research Fields**: Knowledge flows between different research fields, especially in interdisciplinary research, which encourages broad collaboration.

4. Example Diagram



- **Paper X**: Authored by A, B, C, and cites references X1, X2, X3.
- **Paper Y**: Authored by D, E, F, G, A, and cites references Y1, Y2.
- **Paper Z**: Authored by H, E, and connects to Paper Y.
- This example demonstrates how knowledge flows through co-authorship and citations across institutions and research topics.

5. Benefits of Knowledge Flow

- **Collaboration**: Encourages collaboration among researchers and institutions.
- **Research Quality**: Improves the quality of research by building on existing knowledge.
- **Interdisciplinary Innovation**: Promotes interdisciplinary research, leading to innovations across different fields.

MQP 2

3a. How does the new and existing knowledge can contribute to the research process? Explain with relevant points.

Ans: (same as 3b from MQP 1)

3b. How can researchers effectively use search engines to find relevant literatures in their field?

Ans:

1. **Choose the Right Search Engines**
    - Use academic search engines like Google Scholar, PubMed, IEEE Xplore, or Web of Science.
    - These platforms are tailored for scholarly articles, journals, and research papers.

2. **Use Specific Keywords**
    - Identify key terms related to your research topic.
    - Combine keywords using Boolean operators (AND, OR, NOT) for precise results.
        - Example: "machine learning AND healthcare NOT agriculture".
3. **Advanced Search Features**
    - Use filters to narrow down results by year, author, journal, or subject area.
        - Example: Filter results to show only articles published in the last 5 years.
4. **Citation Tracking**
    - Look for highly cited papers in your field.
    - Use the "Cited by" feature in Google Scholar to find newer research that references a key paper.
5. **Explore Related Articles**
    - Use the "Related articles" or "Similar works" feature to find papers on similar topics.
    - This helps in discovering relevant literature you might have missed.
6. **Set Up Alerts**
    - Create email alerts for specific keywords or authors.
    - This ensures you stay updated with the latest research in your field.
7. **Access Institutional Resources**
    - Use your university or institution's library portal to access paywalled articles for free.
    - Many institutions provide access to databases like JSTOR, Springer, or Elsevier.
8. **Evaluate Sources**
    - Check the credibility of the source (e.g., peer-reviewed journals, reputable publishers).
    - Avoid predatory journals or low-quality sources.
9. **Organize and Manage References**
    - Use reference management tools like Zotero, Mendeley, or EndNote to save and organize articles.
    - These tools also help in generating citations and bibliographies.
10. **Read Abstracts and Skim Papers**
    - Start by reading abstracts to determine relevance.
    - Skim through the introduction and conclusion to understand the paper's focus and findings.

4a. Explain how knowledge flows through a citation network using a flow diagram.

Ans: (same as 4c from MQP 1)

4b. What is impact of Title and Keywords on citations? Explain Citation based Knowledge flow

Ans: **Role of Title**

- **First Impression**: The title is the first element readers notice and indicates the research area.
- **Attractiveness**: A good title should be clear, informative, and appealing to the target audience.

Factors Affecting Citation Rates

1. **Type of Title**:
    - Titles with question marks, colons, or geographical references generally have lower citation rates.
    - Titles describing results (e.g., "Impact of X on Y") get more citations than those describing methods (e.g., "A Study of X using Y").
2. **Length of Title**:
    - Shorter titles are more effective in capturing attention and increasing citation rates.

3. **Keywords in Title**:
    - Including at least two keywords in the title improves visibility and citation chances.

Role of Keywords

- **Content Representation**: Keywords summarize the main topics of the article.
- **Search Engine Optimization**: Journals, indexing services, and search engines use keywords to categorize and display research.

Impact on Citations

1. **Increased Visibility**:
    - Using the maximum allowable keywords enhances the likelihood of the article being found and cited.
2. **Avoiding New Keywords**:
    - Using uncommon or new keywords can reduce visibility as they are less familiar to researchers.

Citation-Based Knowledge Flow

1. **Citation-Based Knowledge Flow**
    - Knowledge flows through citations when one research paper references another.
    - This process helps in building on existing knowledge and promoting innovation.
2. **Knowledge Flows Through Citations**
    - **Between Researchers:**
        - When Paper A cites Paper B, knowledge flows from B to A.
    - **Across Institutions:**
        - Citations connect researchers from different institutions, fostering collaboration.
    - **Between Research Fields:**
        - Interdisciplinary research encourages knowledge flow across diverse fields.
3. **Benefits of Citation-Based Knowledge Flow**
    - **Encourages Collaboration:**
        - Researchers build on each other's work, leading to better-quality research.
    - **Improves Visibility:**
        - Highly cited papers gain more visibility and influence in the research community.
    - **Promotes Innovation:**
        - Knowledge flow through citations drives new discoveries and advancements.
4. **Example of Knowledge Flow**
    - If Paper X cites Paper Y, knowledge flows from Y to X.
    - This creates a network of knowledge that connects researchers, institutions, and fields.

Summary in Points:

1. **Impact of Title and Keywords**
    - Titles should be informative, attractive, and include keywords.
    - Keywords help in categorization and increase visibility.
2. **Citation-Based Knowledge Flow**
    - Knowledge flows through citations, connecting researchers and institutions.
    - Promotes collaboration, visibility, and innovation.

MQP 3

3a. Explain the various steps involved in the critical and creative reading process
Ans: (same as 4a from MQP 1)

3b. What are the key features of the bibliographic database of the Web of Science (WoS), and how is it commonly used in research?
Ans:

Bibliographic databases are referred to as "abstracting and indexing services."

- **Purpose:** They play a crucial role in collecting citation-related information and abstracts of research articles from scholarly literature.
- **Accessibility:** The gathered information is made available through search functionalities, enabling researchers to retrieve relevant literature efficiently.

Example Databases: IEEE Xplore, Engineering Village, Scopus, etc.

Key Features of the Web of Science (WoS) Bibliographic Database

1. **Comprehensive Database:**
   - WoS includes multiple specialized databases, offering access to a vast range of scholarly materials across various disciplines.
2. **Search and Filtering Tools:**
   - **Advanced Search Options:** Search by title, topic, author, address, etc., using drop-down menus.
   - **Sorting Capabilities:** Results can be sorted by the number of citations (highest to lowest) or publication date.
   - **Refine Results Panel:** Narrow searches by keyword, phrase, material type (e.g., peer-reviewed articles), date, language, etc.
3. **Citation Tracking:**
   - The **Cited Reference Search** allows researchers to trace articles that have cited previously published work, helping to understand how ideas have evolved over time.
4. **Search Expansion and Refinement:**
   - Use alternate word endings, synonyms, or scientific names connected with logical operators like **OR**.
   - Features for discovering additional references make it easier to broaden or narrow the scope of research.
5. **Rich Metadata Display:**
   - Clicking on a search result provides detailed information like the paper's title, authors, journal type, volume, issue, year, abstract, and keywords, enabling informed decisions about acquiring full-text papers.
6. **Relevance and Structured Searching:**
   - The structured search functionality helps ensure relevant results and reduces wasted effort on irrelevant sources.

Common Uses of Web of Science in Research

1. **Literature Review:**
   - Efficient retrieval of scholarly articles for conducting in-depth literature reviews on specific research topics.

2. **Citation Analysis:**
    - Tracking citations to measure research impact, identify influential works, and analyze trends in specific fields.
3. **Identifying Research Trends:**
    - Helps researchers identify popular or emerging topics in their areas of interest.
4. **Collaborative Opportunities:**
    - Discovering researchers and institutions working on similar topics for potential collaborations.
5. **Journal and Publication Insights:**
    - Provides insights into high-impact journals and citation counts to guide where to publish research.
6. **Academic Networking:**
    - Assists researchers in understanding networks of citations, which can lead to new academic connections and opportunities.
7. **Monitoring Progress:**
    - Tracks the evolution of specific ideas, theories, or methodologies through cited reference searches.

By offering comprehensive indexing, citation tracking, and advanced search tools, WoS significantly aids in quality research and effective knowledge discovery.

4a. What types of citations fail to achieve their goal and do not benefit the reader? Explain.

Ans:

Types of Citations That Fail to Achieve Their Goal and Do Not Benefit the Reader

Failure to cite appropriately infringes on the rights of the original researcher and misleads readers. There are certain cases where citations fail to fulfill their purpose, diminishing their value to the reader.

1. **Spurious Citations**
    - **Definition:** These occur when citations are added unnecessarily or when an appropriate citation is unavailable but one is still included.
    - **Impact:**
        - Adds no value to the understanding of the paper.
        - Wastes the reader's or reviewer's time by referencing irrelevant material.
        - Harms the credibility of the research work and the publishing journal or conference.
2. **Biased Citations**
    - **Definition:** These occur when authors favor citing the work of friends, colleagues, or specific individuals, or omit citations for significant prior work for personal reasons.
    - **Impact:**
        - Neglects important prior work, especially if it contradicts the current research.
        - Skews the research narrative, misleading readers about the significance of certain studies.
        - Compromises ethical standards in research.
3. **Self-Citations**
    - **Definition:** Citing one's prior work when relevant is ethical, but irrelevant or excessive self-citation can be problematic.
    - **Impact:**
        - Helps readers only if the citations are genuinely relevant.
        - Irrelevant self-citations waste readers' time and distort research credibility.

        - Negative effects include altering the journal's impact factor unfairly and misleading readers about the importance of the cited work.

4. **Coercive Citations**
    - **Definition:** When journal editors pressure authors to add citations to the journal itself, even when irrelevant, to inflate the journal's impact factor.
    - **Impact:**
        - Diminishes the journal's reputation.
        - Undermines the quality and ethical standards of academic publishing.
        - Creates a conflict of interest that benefits the journal at the cost of academic integrity.

Key Insights

- Citations should be balanced—neither too few nor excessive.
- Giving due credit, even to one's own work, is ethical and necessary for maintaining research integrity.
- Avoiding these citation issues ensures that the references serve their purpose: aiding readers in understanding the research and tracing its foundations.

4b. Explain the most common styles for citation used by engineers during research, and provide an example.

Ans:

Most Common Citation Styles Used by Engineers in Research

Citation styles organize references in a standardized format, prioritizing conciseness, readability, and key information such as dates, authors, and publications. Below are the most commonly used citation styles by engineers:

1. ASCE Style (American Society of Civil Engineers)

- **Reference Organization:**
    - Clearly separates references based on source type (books, websites, journals).
    - Provides all necessary publication details, including city and pages used.
- **In-Text Citations:**
    - Simple format using the author's surname or website URL and publication year.
    - Helps integrate citations seamlessly into the text for context.
- **Usage Context:**
    - Primarily used in civil engineering and related disciplines for academic reports and professional publications.

Examples:

- For Books:

  Template:

  ```
  Author Surname, Author Initial. (Year). Title: Publisher, City, Pages Used.
  ```

  Example:

  ```
  Wearstler, K., and Bogart, J. (2004). Modern glamour. Regan Books, NY.
  ```

- For Websites:

  Template:

  ```
  Author Credentials and Company Name (Year). 'Title.' [Website URL (Accessed: Date)]
  ```

  Example:

  ```
  Blade cleaning services (2015): [Website URL (Accessed: Oct. 29, 2016)]
  ```

- For Journal Publications:

  Template:

  ```
  Author Surname, Author Initial. (Year). 'Title.' Publication Title, Volume (issue), Pages.
  ```

  Example:

  ```
  Johnston, L. (2014). “Inconvenient Truth Expanded The Climate Change Dialogue.” 1-160.
  ```

2. IEEE Style (Institute of Electrical and Electronics Engineers)

- **Numerical Referencing:**
  - Uses numbered citations in the order they appear in the document.
  - Ensures clarity and conciseness in technical papers.
- **Detailed Endnotes:**
  - Includes all publication details in a compact format.
  - Ensures traceability of references for further exploration by the reader.
- **Usage Context:**
  - Widely adopted in electrical engineering and computer science research for conference papers and journal articles.

Example:

- Example for Chapter in Edited Book:

  ```
  [1] A. Rezi and M. Allam, “Techniques in array processing by means of transformations,” in Control and Dynamic Systems, Vol. 69, Multidimensional Systems, C. T. Leondes, Ed. San Diego: Academic Press, 1995, pp. 133-180.
  ```

3. ASME Style (American Society of Mechanical Engineers)

- **Bracketed Citations:**
  - Uses numerical brackets ([1], [2]) for simplicity and easy cross-referencing.
  - Ensures uniformity in presenting references within the text.
- **Compact Referencing:**
  - Prioritizes brevity without compromising on the essential details of the source.
  - Efficiently presents technical data for quick comprehension.
- **Usage Context:**
  - Common in mechanical engineering research and technical documentation.

Example: Citation: [1]

Summary

- Engineers widely use **ASCE**, **IEEE**, and **ASME** styles based on their fields.
- These styles ensure proper citation of references in technical writing, helping readers identify and locate sources easily.

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MODULE 3

MQP 1

5a. Define the term patent?

Ans:

Patent:

1. **Definition of Patent:**
   - A **patent** is a legal right granted to an inventor by a government, providing exclusive rights to use, manufacture, and sell their invention for a specific period.
   - It ensures that no one can use, produce, or distribute the invention without the patent holder's consent.
2. **Purpose of Patents:**
   - Encourages innovation by rewarding inventors with exclusive rights.
   - Promotes public disclosure of inventions to advance knowledge and development.
3. **Key Features of a Patent:**
   - **Originality:** The invention must be new and not previously known.
   - **Usefulness:** It must have industrial or practical application.
   - **Non-Obviousness:** It should not be an obvious improvement to existing inventions.
4. **Scope and Duration:**
   - A patent is generally valid for **20 years** from the date of application, after which the invention becomes public property.
5. **Types of Patents:**
   - Product Patents: Protect specific products (e.g., a drug).
   - Process Patents: Protect methods or processes of creating a product.
6. **Example:**
   - An inventor patents a unique drug formulation that cures a rare disease, ensuring exclusive rights to its production and sale.

5b. Write a brief history of Patent

Ans:

History of Patents

1. **Pre-Independence Era in India**
   - The first patent legislation in India was **Act VI of 1856**, inspired by the **British Patent Law of 1852**.
   - Aim: Encouraged new inventions in manufacturing.
2. **The Indian Patents and Designs Act, 1911**
   - Replaced earlier laws, placing the governance of patents under the **Controller of Patents**.
   - Key Amendments:
     - Introduced "Patent of Addition" and extended the patent duration to 16 years.
     - Allowed provisional applications with a 9-month window for completing submissions.
3. **Post-Independence Developments**
   - **1949 Recommendations:**
     - Prevent misuse of patent rights.

        - Ensure availability of essential goods (food, medicine) at affordable prices.
    - **1950 and 1952 Amendments:**
        - Introduced compulsory licensing for patents related to food, drugs, and chemicals.
4. **The Patents Act, 1970**
    - Replaced the 1911 Act, introducing significant changes:
        - Excluded product patents for food, drugs, and chemicals to focus on public welfare.
        - Encouraged innovation while balancing national interests.
5. **Recent Amendments**
    - **Patents (Amendment) Act, 1999:** Allowed product patents in pharmaceuticals and agrochemicals.
    - **Patents (Amendment) Act, 2002:** Introduced the **Patent Rules, 2003**, replacing the 1972 rules.
    - **Patents (Amendment) Act, 2005:**
        - Extended patent coverage to all fields of technology.
        - Added pre-grant and post-grant opposition mechanisms.
        - Simplified the process for filing patents internationally.

Importance of Patents

1. **Encourages Innovation:** Protects inventors' rights, motivating them to develop new technologies.
2. **Public Disclosure:** Shares technical knowledge with the public, fostering future research.
3. **Economic Impact:** Enhances industries by creating exclusive rights, increasing market competitiveness.

This systematic evolution highlights India's adaptation to global intellectual property standards, ensuring innovation and safeguarding inventors' rights.

5c. What are different patent applications and how are they commercialized

Ans: **Types of Patent Applications:**

1. **Provisional Application**
    - Filed when the invention is still in development.
    - Establishes a priority date but doesn't need full details.
    - Allows 12 months to finalize the invention before filing a complete application.
2. **Ordinary Application**
    - Filed with full details of the invention.
    - Does not claim a priority date, stands on its own.
3. **PCT Application**
    - A single application for international patent protection.
    - Can claim priority in all PCT member countries.
4. **Divisional Application**
    - Filed when the original application has multiple inventions.
    - Divides the application into separate ones for each invention.
5. **Patent of Addition**
    - For minor improvements to an existing patented invention.
    - Expires with the original patent and doesn't require extra renewal fees.
6. **Convention Application**
    - Filed to claim the same priority date in other countries (Paris Convention).
    - Must be filed within 12 months of the original application.

Commercialization of a Patent:

1. **Granting Licenses:**
    - The patent owner gives permission to others to use, make, or sell the patented invention.
    - Types of licenses:
        - **Exclusive License:** Only one person or organization gets the rights, and no one else (not even the owner) can use the patent during this time.
        - **Non-Exclusive License:** The patent can be licensed to many people or organizations at the same time.
2. **Direct Use by the Owner:**
    - The patent owner manufactures and sells the invention directly to customers.
3. **Selling Patent Rights:**
    - The patent owner transfers ownership to someone else for an agreed price or benefit. The new owner gets full rights to the patent.
4. **Compulsory Licensing:**
    - If the patent is not used within three years of being granted, others can request permission to use it.
    - Conditions for granting:
        - The public's need for the product is not met.
        - The product is too expensive.
        - The invention is not being made or used in India.
5. **Collaborations:**
    - The patent owner partners with companies to develop and sell the invention together.
6. **Annual Reporting:**
    - The owner must report the status of commercialization every year using **Form-27** to show how the patent is being used.

6a. What are the inventions eligible for patenting and which are the matters considered as non patentable?

Ans:

Types of Inventions Eligible for Patenting

To be eligible for patenting, an invention must meet the following criteria:

1. **Novelty**
    - The invention should be **new** and not disclosed anywhere in the public domain before the filing date.
    - Example: A new drug to treat a specific disease.
2. **Inventive Step** (Non-obviousness)
    - The invention must involve a creative step that is **not obvious** to a person skilled in the field.
    - Example: Developing a solar panel with enhanced efficiency through a unique material.
3. **Industrial Applicability**
    - The invention should be **useful** and capable of being produced or used in any industry.
    - Example: A machine for automated farming that increases productivity.
4. **Patentable Subject Matter**
    - The invention should fall under the categories recognized by patent law, such as a **process, machine, article of manufacture, or composition of matter**.

Non-Patentable Matters (As per the Patent Act, 1970)

Certain categories of inventions are excluded from patent protection:

1. **Inventions Contrary to Public Morality**
   - Inventions harmful to public order, health, or morality are excluded.
   - Example: Methods for **human cloning** or a device for **gambling**.
2. **Mere Discoveries**
   - Discoveries of natural phenomena or materials already existing in nature are not patentable.
   - Example: **Laws of gravity** or finding a naturally occurring microorganism.
3. **Frivolous Inventions**
   - Inventions without practical utility or improvement.
   - Example: A calendar for 100 years or an **umbrella with a fan**.
4. **Inventions Relating to Atomic Energy**
   - Inventions involving radioactive materials or related processes as per the Atomic Energy Act, 1962.
   - Example: Compounds of **Uranium** or **Plutonium**.
5. **Literary, Artistic, or Musical Works**
   - These are covered under copyright law, not patent law.
   - Example: **Books, paintings, sculptures, and software programs**.
6. **Plants and Animals**
   - Plants, animals, and biological processes for their propagation are excluded.
   - Example: A genetically modified seed or plant.
7. **Traditional Knowledge**
   - Knowledge passed through generations or aggregation of known properties of traditional components.
   - Example: Using **turmeric for wound healing**.
8. **Integrated Circuit Layouts**
   - Protection is granted under a separate act, not patent law.
   - Example: **Semiconductor layouts** under the Semiconductor Integrated Circuit Layout Designs Act, 2000.

6b. Explain through a flow chart the major steps involved in patenting

Ans:

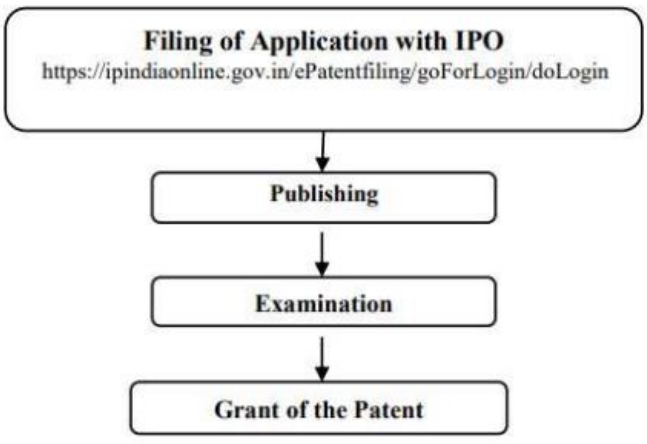


Figure: Flow chart of major steps involved in the grant of a patent

Process of Patenting

```
START
 ↓
Filing Application with IPO
 ↓
Publication (18 months after filing)
 ↓
Examination (Prior Art Search and Evaluation)
 ↓
Grant of Patent
 ↓
END
```

Major Steps in the Process of Filing Patent Applications

1. Filing of Application with IPO

- Submit the patent application to the Indian Patent Office (IPO).
- **Process:**
  - File online at https://ipindiaonline.gov.in/ePatentfiling
  - Include necessary documents:
    - Patent specification (description of the invention).
    - Claims (scope of protection sought).
    - Drawings (if applicable).
- **Importance:**
  - Establishes the priority date for the invention.
  - Marks the official start of the patent process.

2. Publication

- The application is published in the Official Journal of the Indian Patent Office.
- **Time Period:** 18 months after the filing date or priority date.
- **Purpose:**
  - Makes the invention publicly available.
  - Allows third parties to oppose the patent if they believe it is not novel or inventive.

3. Examination

- A detailed examination of the application is conducted by an IPO examiner.
- **Steps:**
  - **Prior Art Search:** The examiner searches existing patents and publications to check:
    - **Novelty:** Is the invention new?
    - **Inventive Step:** Is the invention non-obvious?
    - **Industrial Applicability:** Can the invention be used in industry?
  - **Objections:** If the examiner finds issues, the applicant must respond and address them.
- **Importance:**
  - Ensures the invention meets patentability criteria.

4. Grant of Patent

- If the invention is found patentable and all objections are resolved, the IPO grants the patent.
- **Validity:**
  - The patent is valid for 20 years from the filing date.
- **Importance:**
  - Grants the inventor exclusive rights to the invention.
  - Allows the inventor to prevent others from making, using, or selling the invention without permission.

Summary:

1. **Filing of Application:**
   - Submit application online with necessary documents.
   - Establishes priority date.
2. **Publication:**
   - Published 18 months after filing.
   - Allows public scrutiny and opposition.
3. **Examination:**
   - Examiner checks novelty, inventive step, and industrial applicability.
   - Applicant responds to objections.
4. **Grant of Patent:**
   - Patent granted if all criteria are met. Valid for 20 years from filing date.

MQP 2

5a. Describe Intellectual Property Rights and List its types?

Ans: Intellectual Property Rights (IPR)

- **Definition**: IPR refers to the legal rights granted to creators or inventors to protect their creations, inventions, or works from unauthorized use or duplication.
- **Purpose**: Encourages innovation, creativity, and economic growth by providing exclusive rights to the creators.

1. **Definition of Intellectual Property (IP)**
   - IP refers to **intangible assets** derived from human intelligence, creativity, and imagination, which have **commercial value**.
   - Unlike physical assets, IP includes creations like inventions, art, literature, and symbols.
2. **Intellectual Property Rights (IPR)**
   - IPR grants **exclusive privileges** to creators or inventors under legal frameworks.
   - These rights allow the creator to **use, sell, distribute**, or restrict unauthorized use of their IP.
   - IPR is granted in exchange for **disclosure** of the invention or creation to the public.
3. **Branches of IP**

   IP is broadly divided into two categories:
   - **Copyrights and Related Rights**: Protects creative expressions like literature, art, music, films, and software.
   - **Industrial Property Rights**: Includes patents, trademarks, industrial designs, and geographical indications.

Types of Intellectual Property Rights (IPR)

1. **Copyright**
   - Protects **original creative works** such as books, music, films, software, and paintings.
   - Provides rights to the creator for **publication, distribution, and reproduction**.
   - **Example**: Copyright for J.K. Rowling's *Harry Potter* series protects the books and movies from unauthorized duplication.
2. **Patents**
   - Grants exclusive rights to an inventor for a **novel, useful, and non-obvious invention** or process.
   - Prevents others from manufacturing, selling, or using the invention without permission.
   - **Example**: Patent for a new COVID-19 vaccine formula.
3. **Trademarks**
   - Protects **distinctive signs, logos, or symbols** that differentiate a brand's goods or services.
   - Helps consumers identify the source of products and maintain brand reputation.
   - **Example**: The Apple logo for Apple Inc.
4. **Industrial Designs**
   - Protects the **ornamental or aesthetic features** of a product, such as shape, pattern, or design.
   - Ensures exclusivity in the market for unique designs.
   - **Example**: The design of the Coca-Cola bottle.
5. **Geographical Indications (GI)**
   - Identifies products with a **specific geographical origin** and unique quality associated with that location.
   - Ensures authenticity and boosts regional economies.
   - **Example**: Darjeeling Tea from India or Champagne from France.

5b. Explain the following major steps involved in the process of Patent Registration:
i)Prior Art Search
ii)Choice of application to be filed
iii)Pre grant opposition
Ans:

Major Steps in the Process of Patent Registration

i) Prior Art Search

- Prior art search is conducted to ensure that the invention is novel and does not already exist in the public domain.
- **Importance:** It helps determine if the invention is patentable by checking if similar inventions already exist.
- **Process:**
  - Search through patent databases like InPASS, Patentscope, and Espacenet.
  - Explore Non-Patent Literature (NPL) such as journals, technical reports, and industry publications.
- **Advantages:**
  - Avoids infringement issues.
  - Provides detailed information on existing inventions, aiding in the development of a stronger application.

ii) Choice of Application to be Filed

- After the prior art search, the inventor must decide which type of patent application to file: provisional or complete.
- **Importance:**
  - A provisional application is quicker, cheaper, and can be filed with incomplete data.
  - It allows improvements to be added later and secures a priority date for the invention.
  - The complete application must have all the necessary details, including claims and a complete description of the invention.
- **When to file provisional vs. complete?**
  - If further development or experiments are needed, file a provisional application.
  - If the invention is fully developed, file a complete application.

iii) Pre-grant Opposition

- Pre-grant opposition allows third parties to challenge a patent application before it is granted.
- **Time Period:**
  It must be filed within 6 months from the date of publication of the patent application.
- **Process:**
  - A third party can file a challenge to the application if they believe it does not meet the patentability requirements (novelty, inventive step, etc.).
  - The opposition is examined by the Controller of Patents, and the application may either be rejected or proceed to the examination stage.
- **Significance:**
  It ensures that patents granted are valid and meet the legal standards for patentability.

6a. In which circumstances Indian residents are not required to file a patent application first in India to get patent protection in another country? Explain.

Ans:

General Rule:

- Normally, **Indian residents must file their patent application first in India** before seeking patent protection in other countries. However, there are some situations where this rule does not apply.

Conditions When Filing in India is Not Required:

- **If the applicant is not an Indian resident:**
  - If the person applying for the patent is **not an Indian resident**, they are **not required** to file the patent in India first.
- **If 6 weeks have passed after filing in India:**
  - If the patent has been filed in India and **6 weeks have passed**, the applicant does not need permission to file in other countries.
- **If the invention has no market in India:**
  - If **two or more inventors** are working on an invention in a **foreign country** and one of the inventors is an Indian resident, and if the invention **does not have a market in India**, the Indian resident inventor can apply for a patent outside India without filing in India first.
  - In such cases, the Indian resident needs to **seek Foreign Filing Permission (FFP)** from the Indian Patent Office.
- **If the invention is part of international collaboration:**
  - If the invention is part of **international collaboration** and originated in India, and the inventor is an Indian resident, the inventor **needs permission** from the Indian Patent Office before applying for a patent outside India.
- **For inventions related to defense or atomic energy:**
  - If the invention is related to **defense**, **atomic energy**, or **utility models**, the inventor must get **prior approval** from the Indian Patent Office before filing the patent outside India, as such inventions are not patentable in India.

Key Points to Remember:

- In most cases, Indian residents must **file in India first**, but if certain conditions are met, they can apply outside India without prior filing.
- The most common exceptions are when the **inventor is not an Indian resident**, when there's no market for the invention in India, or when the invention is related to **defense or atomic energy**.

6b. Explain step by step process of obtaining the patent from the initial idea to the grant of patent.

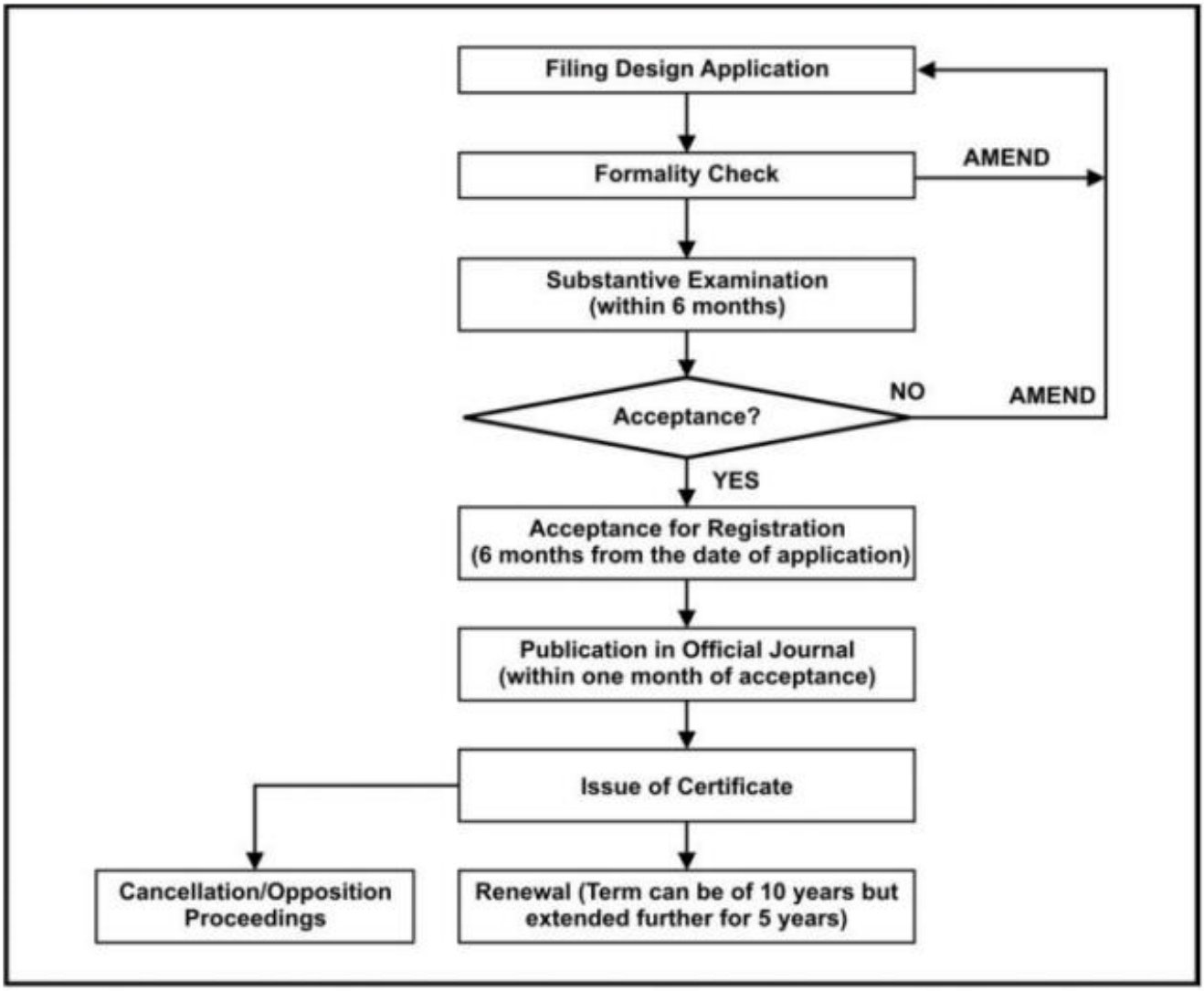
Ans: (same as 6b from MQP 1)

MQP 3

5a. Discuss the Design registration procedure of patent by using a flowchart.

Ans:

Figure 2.10: Flowchart for the process of Design registration.



Design Registration Procedure

1. **Prior Art Search**
   - Before filing, ensure the design is novel and not already registered.
   - Use search engines like Design Search Utility (CGPDTM), Global Design Database (WIPO), Hague Express Database (WIPO), and DesignView (EUIPO).
2. **Filing Design Application**
   - Individuals, small entities, institutions, or industries can file the application.
   - Process: File through a professional patent agent or legal practitioner. Non-residents must appoint an agent in India.
   - Location: Submit at the Design Office, Deputy Controller of Patents & Designs, Kolkata.
   - Include design representation and necessary forms.
3. **Formality Check**
   - The examiner checks if the application meets eligibility criteria.
   - If issues are found, the applicant must amend the application within 6 months.

4. **Substantive Examination**
    - The examiner evaluates the design for novelty and originality.
    - If accepted, the design proceeds to registration. If rejected, the applicant can amend and resubmit.
5. **Acceptance for Registration**
    - If the design meets all criteria, it is accepted for registration.
    - The design is published in the Official Journal of the Patent Office.
    - The public can oppose the design within a specified period.
6. **Issue of Certificate**
    - If no opposition is received, the design is registered, and a certificate is issued.
    - The applicant becomes the proprietor and gains exclusive rights to use the design.
7. **Duration of Registration**
    - Initial Term: 10 years from the date of registration (or priority date).
    - Extension: Can be renewed for an additional 5 years by filing Form-3 with fees.
8. **Importance of Design Registration**
    - Provides exclusive rights to prevent others from copying or imitating the design.
    - Boosts sales and establishes goodwill in the market.
9. **Cancellation of Registered Design**
    - Grounds for Cancellation:
        - Design already registered.
        - Design published before registration.
        - Design is not novel or original.
    - Process: File Form-8 with the prescribed fee to the Controller of Designs.

Summary:

1. **Prior Art Search:** Ensure the design is novel using search engines.
2. **Filing Application:** Submit at the Design Office with necessary documents.
3. **Formality Check:** Examiner checks eligibility; amend if required.
4. **Substantive Examination:** Evaluates novelty and originality.
5. **Acceptance for Registration:** Published in the Official Journal.
6. **Issue of Certificate:** Granted if no opposition is received.
7. **Duration:** Valid for 10 years, extendable for 5 more years.
8. **Importance:** Provides exclusive rights and market advantage.
9. **Cancellation:** Can be cancelled on grounds like lack of novelty.

5b. Discuss the history of Intellectual Property Rights in India

Ans:

History of IP in India

1. Patents

- **Pre-Independence:** The Indian patent system started with **Act VI of 1856**, based on British Patent Law, to promote inventions.
- **1911:** The Indian Patents and Designs Act (Act II of 1911) replaced earlier laws and placed patent governance under the Controller of Patents. Key features included:
    - Government use of inventions.
    - Extension of the patent term from 14 to 16 years.
    - Filing of provisional applications.
- **Post-Independence (1950):** The Indian Patents Act was modified to ensure accessibility to medicines and food.

- **1970:** The **Patents Act** was introduced, focusing on India's development needs and prohibiting patents on food/medicine processes.
- **1999-2005 Amendments:** Introduced product patents for pharmaceuticals and agrochemicals, rationalized opposition procedures, and extended grace periods.

2. Copyrights and Related Rights

- **Pre-Independence:** Copyright law in India dates back to 1847 under the British East India Company.
- **1914:** The Indian Copyright Act aligned with UK law, introducing criminal penalties for infringement.
- **1957:** The Indian Copyright Act superseded earlier laws and aligned with the **Berne Convention**.
- **Amendments (1983-2012):** Adjustments made to comply with global treaties like **WCT, WPPT, and TRIPS**.

3. Trademarks

- **Early Legislation:** The Trade Marks Act, 1940, was based on the UK's 1938 Act and was replaced by the **Trade and Merchandise Marks Act, 1958**.
- **1999:** The **Trade Marks Act** aligned India's trademark system with international standards, especially **TRIPS**.

4. Geographical Indications (GI)

- **1999:** India introduced the **Geographical Indications of Goods Act**, complying with **WTO TRIPS**.

5. Industrial Designs

- **1872:** The first law for industrial designs, the **Patterns and Designs Act**, was passed.
- **2000:** The **Designs Act** came into force to protect industrial designs, replacing previous laws.

6. Semiconductor Integrated Circuits and Layout Designs (SICLD)

- **2000:** The **SICLD Act** was introduced to protect semiconductor circuit designs, in line with **TRIPS**.

7. Plant Varieties

- **Pre-1970s:** Biological materials like plants were not patentable.
- **2001:** India enacted the **Protection of Plant Varieties and Farmers' Rights Act** to protect plant varieties and farmers' rights.

8. Biodiversity Conservation

- **1927-1972:** The **Indian Forest Act** and **Wildlife Protection Act** laid the foundation for biodiversity protection.
- **2002:** The **Biological Diversity Act** was enacted to conserve biodiversity, along with policies like the **National Biodiversity Action Plan** (2009).

6a. What strategies are involved in the commercialization of a patent?
Ans: (same as 5c from MQP 1)

6b. What are utility models, and how do they differ from patents?
Ans:
Utility Models
Utility models, also known as **Petty Patents** or **Innovation Patents**, protect small, practical inventions that improve existing products or processes but don't meet the strict standards for regular patents.

Key Features of Utility Models

Incremental Innovations

- Protects **small changes** or improvements, which may not meet the **novelty** or **non-obviousness** standards for patents.
- Example: **Improving the design** of a bottle cap to make it seal better.

Simplified Criteria

- The rules for **novelty** and **non-obviousness** are **relaxed** or removed.
- The invention must still have **industrial use** (practical value).

Cost-Effective for MSMEs

- Ideal for **Micro, Small, and Medium Enterprises (MSMEs)**, as the process is **cheaper**, **faster**, and **simpler** than getting a patent.

Shorter Duration

- The protection lasts between **7-15 years**, depending on the country.

Countries Offering Utility Models

- Recognized in countries like **France, Germany, Japan, South Korea, China, and Russia**.
- **India** does not currently offer protection for utility models.

Difference Between Patents and Utility Models

Feature	Patents	Utility Models
Criteria	Strict rules for novelty and uniqueness.	Relaxed rules for novelty and uniqueness.
Innovation Level	Big, significant inventions.	Small, practical improvements.
Cost & Time	Expensive and takes time to grant.	Cheaper and quicker process.
Duration	Valid for 20 years.	Valid for 7-15 years.
Example	New medicine.	Better grip for a pen.

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MODULE 4

MQP 1

7a. What is a copyright and write its classes

Ans:

Copyright and Its Classes

Copyright refers to the legal rights granted to the original creator of a work in fields like literature and computer software. These rights protect the creator's work from unauthorized reproduction, adaptation, and distribution.

- **Related Rights** cover works in areas such as drama, sound recordings, films, paintings, and architecture, among others.
- Copyrights and Related Rights are governed by the **Copyright Act, 1957** of India, which provides creators with rights of reproduction, communication, adaptation, and translation.

Classes of Copyrights

1. **Literature**
   - Books, essays, research articles, lectures, computer programs, software, and databases.
2. **Dramatics**
   - Screenplays, dramas, and theatrical works.
3. **Sound Recordings**
   - Recordings of sounds (e.g., phonograms, CDs, etc.).

4. **Artistic**
   - Drawings, paintings, logos, maps, charts, photographs, architecture works, engravings, and crafts.
5. **Musical**
   - Musical notations (excluding any words or actions meant to be sung or spoken with the music). Protection applies even if not written down.
6. **Cinematograph Film**
   - Visual recordings created through any medium, including motion pictures, TV programs, and visual recordings with sound.

7b. Explain what are the two exclusive rights owned by copyright owners ?

Ans:

Exclusive Rights of Copyright Owners: Economic and Moral Rights

1. **Economic Rights (Proprietary Rights):**
   - Copyright gives the owner **control over the financial benefits** of their work. This means the author can **earn from their creations** by controlling how the work is used.
   - The owner can decide who can:
     - **Reproduce** the work in different forms (e.g., printing the book, making copies, or creating digital versions).
     - **Distribute** copies of the work to the public (e.g., selling or licensing copies of books, films, or music).
     - **Publicly perform** the work (e.g., plays, concerts, movies).
     - **Broadcast** or communicate the work through TV, radio, or digital platforms.
     - **Translate** the work into different languages (e.g., translating a book into Spanish or French).
     - **Adapt** the work into new forms (e.g., converting a book into a movie, or turning a novel into a screenplay).
   - These rights allow the copyright holder to decide who profits from the use of their work and to protect the commercial value of their creation.

2. **Moral Rights (Personal Rights):**
   - These rights focus on protecting the author's **personal connection** to the work, ensuring that the author's reputation and integrity are maintained.
   - They include:
     - **Right of Paternity:** The author has the right to be recognized as the creator of the work, even if it is sold or licensed to another party. For example, the author's name remains on the book or film even after it's published or adapted by others.
     - **Right of Integrity:** The author can stop others from altering the work in a way that could harm their reputation. For example, the author can prevent changes that distort the original meaning or message of the work (e.g., changes that misrepresent the author's intent).

3. **Multiple Rights Holders:**
   - A single work can have multiple **rights holders**. For instance:
     - A **musical sound recording** may have:
       - The **lyricist**.
       - The **composer**.
       - The **performing artist (singer)**.
       - The **musicians**.
       - The **sound engineer/recording company**.
   - Each can have specific rights related to their role in the work, and they may share the profits or control over the use of the work.

4. **Transfer of Rights:**
   - The **Economic Rights** (such as reproduction or distribution) can be **transferred or licensed** to others, such as publishers, production companies, or broadcasters.
   - However, **Moral Rights** (Right of Paternity and Integrity) **cannot be transferred**. The author always retains these rights, even if they sell or license the work.

7c. What is the role of Register of copyrights and the powers given to the Board of Copyrights?

Ans:

Role of the Register of Copyrights:

- **Automatic Copyright Protection**: Copyright is automatically given to a work as soon as it's created. No registration is needed to claim it.
- **Proof of Ownership**: Registration isn't required, but it helps prove who owns the copyright if there's a dispute.
- **Legal Protection**: While registration doesn't create copyright, it strengthens legal protection in case of disputes over ownership or rights.

Powers of the Copyright Board:

- **Constitution and Functioning**: The Copyright Board is a government body for handling copyright disputes. It has a Chairman (like a High Court judge) and 2-14 members.
- **Powers Granted by the Copyright Act**:
  - **Appeals Handling**: The Board can review decisions made by the Registrar of Copyrights.
  - **Rectification of Entries**: The Board can correct any errors in the Copyright Register.
  - **Dispute Resolution**: The Board resolves issues about transferring copyrights.
  - **Compulsory Licenses**: The Board can allow:
    - Publication or republication of works under certain conditions.
    - Translation of works into other languages after 7 years from the first publication.
  - **International Disputes**: The Board handles issues like confirming publication dates and copyright terms in other countries.
  - **Royalty Rates**: The Board sets royalty rates for sound recordings in some cases.
  - **Resale Rights**: The Board decides on resale rights for original artworks, like paintings or sculptures.

Summary:

- Copyright registration is not mandatory, but it helps in legal matters.
- The Copyright Board resolves disputes, hears appeals, and handles licensing issues.

8a. What is a trademark? List the advantages a owner of the trademark gain through its registration

Ans:

Trademark:

A **Trademark** is a unique symbol, word, name, logo, design, or combination of these that is used to distinguish and identify the goods or services of one organization from another. Trademarks help customers recognize the origin of products or services and are essential in branding.

- **Mark** refers to any distinctive sign, such as a logo, name, symbol, phrase, or combination, that can identify a brand.
- Trademarks play a crucial role in the marketplace by differentiating a company's goods or services from others.

Designation of Trademark Symbols:

Represents that the Trademark is unregistered. This mark can be used for promoting the goods of the company.

Represents that the Trademark is unregistered. This mark can be used for promoting brand services.

Represents a registered Trademark/Service. The applicant of the registered Trademark is its legal owner.

Advantages of Trademark Registration

1. **Legal Protection:**
   - Stops others from using the trademark without permission.
2. **Exclusive Right:**
   - Gives the owner the sole right to use the trademark.
3. **Brand Recognition:**
   - Helps customers easily recognize and trust the brand.
4. **Asset Creation:**
   - A trademark is an asset that can increase business value.
5. **Global Protection:**
   - Makes it easier to protect the trademark in other countries.
6. **Deters Infringement:**
   - Prevents others from copying the trademark.
7. **Right to Use ® Symbol:**
   - The owner can use the ® symbol to show the trademark is legally protected.
8. **Helps in Business Expansion:**
   - Supports business growth by building brand recognition.
9. **Protection of Unique Identity:**
   - Protects the unique image and identity of the brand.
10. **Increased Market Value:**
    - Makes the business more valuable to investors and partners.

8b. Explain the steps involved in Trademark Registrations using a flowchart

Ans: Steps Involved in Trademark Registration:

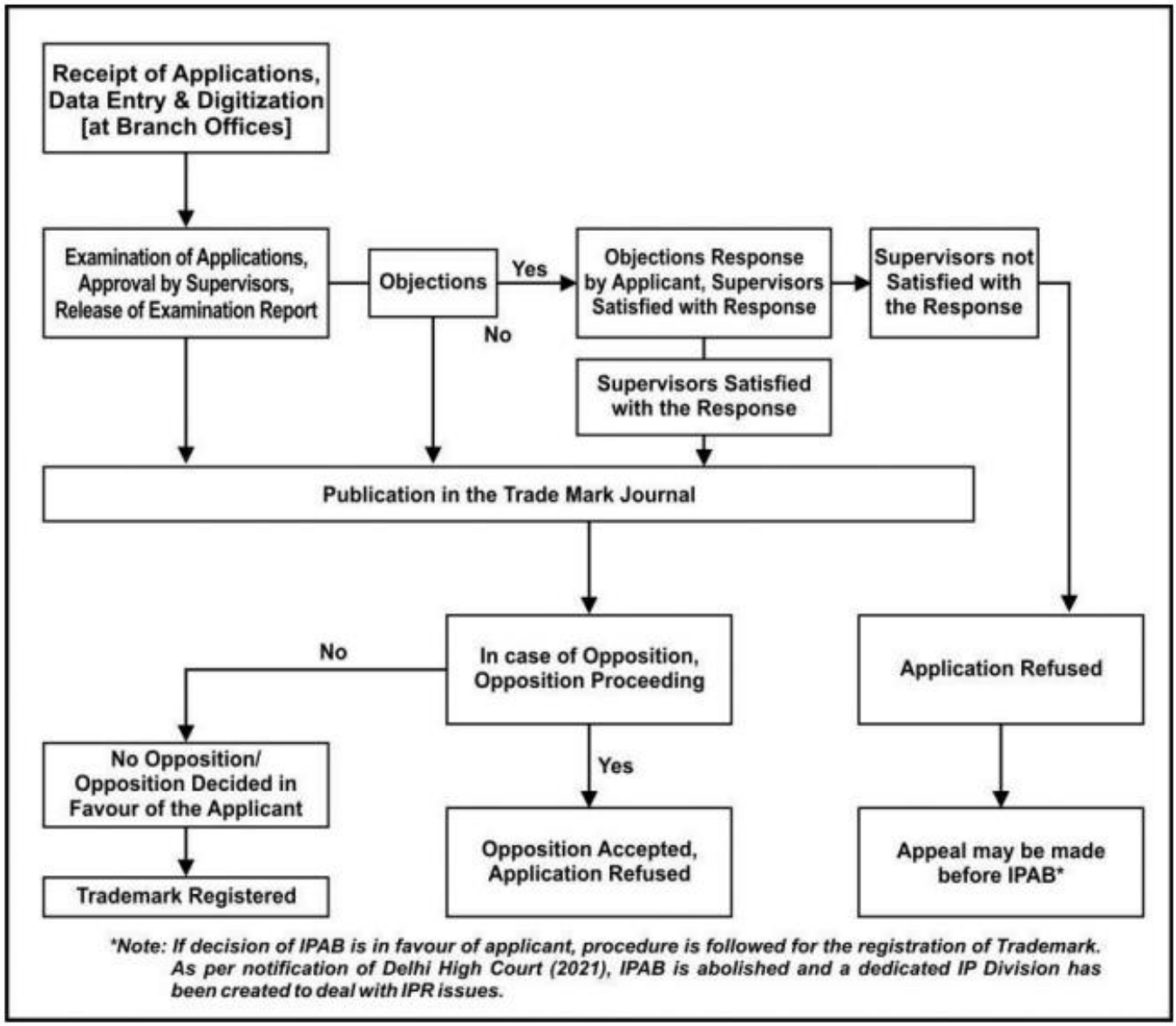

Fig: Process for Trademark registration

1. **Prior Art Search**
   - Conduct a prior art search to ensure the Trademark is unique and not already registered.
   - Use search portals like:
     - Public Search for Trademarks by CGPDTM
     - Trademark Electronic Search System (TESS)
     - WIPO's Global Brand Database
2. **Filing the Application**
   - The proprietor or their agent files the Trademark application.
   - The application is assigned an application number, which can be tracked online.
3. **Examination of Application**
   - A professional examiner scrutinizes the application.
   - If everything is in order, the application is published in the Official Trademark Journal.
   - If objections arise, the applicant must rectify them.
   - If rejected, the applicant can appeal to the Intellectual Property Division.

4. **Publication in Trademark Journal**
    - The application is published, and the public has 90 days to file objections.
    - If objections are raised, both parties are heard, and a decision is made on granting or disallowing the Trademark.
5. **Issuance of Trademark Certificate**
    - If no objections are raised or resolved, a Trademark Registration Certificate is issued to the applicant.
6. **Appeal Process (if applicable)**
    - If the application is rejected, the applicant can appeal to the Intellectual Property Division (formerly IPAB).
    - If the decision is in favor of the applicant, the Trademark proceeds to registration.

Summary:

- **Prior Art Search:** Ensure the Trademark is unique using search portals.
- **Filing Application:** Submit the application online or through an agent.
- **Examination:** Examiner checks for compliance; rectify objections if any.
- **Publication:** Published in the Official Trademark Journal for public scrutiny.
- **Public Objections:** Public can file objections within 90 days.
- **Issuance of Certificate:** If no objections, a Trademark Certificate is issued.
- **Appeal Process:** If rejected, appeal to the Intellectual Property Division.

MQP 2

7a. Using a flowchart, explain the steps involved in the process of Trademarks Registration.
Ans: (same as 8b from MQP 1)

7b. Define the term Copyright and write its classes. What are the two exclusive rights owned by the copyright owner? Explain briefly.
Ans: (same as 7a & 7b from MQP 1)

8a. Using a flowchart, explain the steps involved in the process of Copyright Registration.

Ans:

Steps Involved in Copyright Registration:

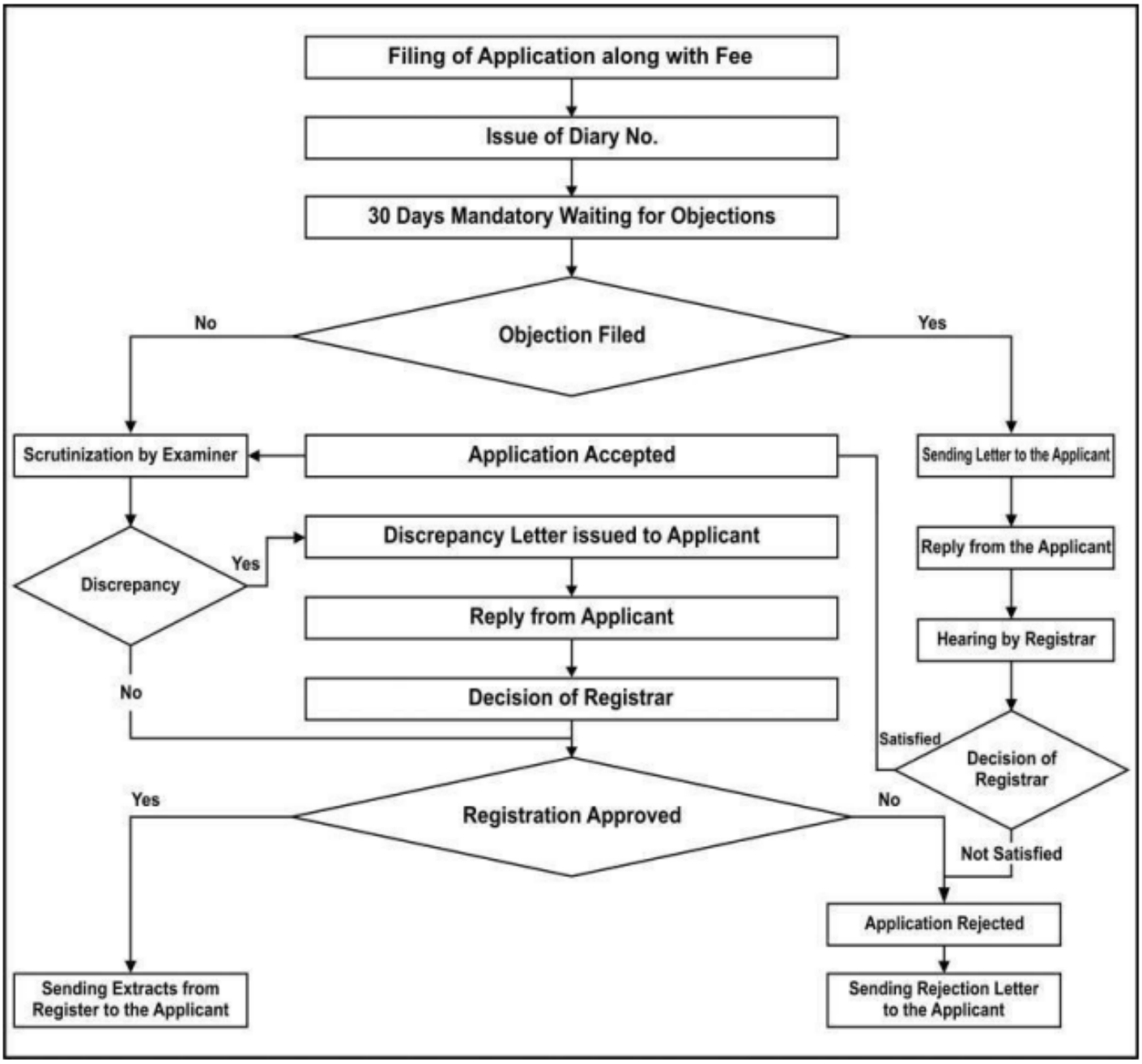

Fig: Flow chart for the process of Copyright registration

1. **Filing of Application**
   - The applicant submits the Copyright application along with the required fee.
   - A Diary Number is issued upon receipt of the application.
2. **Mandatory 30-Day Waiting Period**
   - The application is kept open for 30 days to allow for any objections from the public.
   - If no objections are filed, the process moves to the next step.
3. **Scrutinization by Examiner**
   - The Copyright Office examiner scrutinizes the application.
   - If the application is complete and correct, it is accepted.
   - If there are discrepancies, a discrepancy letter is sent to the applicant for rectification.

4. **Reply from Applicant**
    - The applicant must respond to the discrepancy letter within the given time (usually 45 days).
    - If the response is satisfactory, the application proceeds. If not, it may be rejected.
5. **Hearing and Decision by Registrar**
    - If objections are raised during the 30-day waiting period, a hearing is conducted.
    - The Registrar of Copyrights hears both parties and makes a decision:
        - If satisfied, the application is approved for registration.
        - If not satisfied, the application is rejected, and a rejection letter is sent to the applicant.
6. **Registration Approved**
    - If the application is approved, the Copyright is registered, and extracts from the Register are sent to the applicant.
    - A Copyright Registration Certificate is issued, which serves as prima facie evidence in legal disputes.

Summary:

- **Filing of Application:** Submit the application with the required fee; a Diary Number is issued.
- **30-Day Waiting Period:** The application is open for public objections.
- **Scrutinization by Examiner:** The examiner checks for completeness and correctness.
- **Reply from Applicant:** Respond to discrepancy letters within 45 days.
- **Hearing and Decision:** If objections are raised, a hearing is conducted, and the Registrar makes a decision.
- **Registration Approved:** If approved, a Copyright Registration Certificate is issued.

Key Points to Remember:

- Copyright registration is not mandatory but provides legal protection.
- The process takes 2-3 months, including the 30-day waiting period.
- The Registrar of Copyrights has judicial powers similar to a civil court.

8b. Copyright Infringements, Copyright Infringement is a Criminal Offence. Copyright Infringement is a Cognizable Offence Explain.

Ans:

Copyright Infringement as a Criminal Offence

Definition of Copyright Infringement

- Copyright infringement occurs when someone uses, reproduces, or distributes a copyrighted work without the permission of the owner.
- **Examples of infringement include:**
    - Making copies for sale or hire without permission.
    - Publicly performing or exhibiting infringing copies.
    - Importing or distributing infringing copies for trade.
    - Translating a work without the owner's consent.

Legal Provisions

- As per **Section 63** of the **Copyright Act, 1957**, knowingly infringing copyright is a **criminal offence**.
- **Punishment:**
    - First-time offenders face **imprisonment for at least 6 months** and a minimum fine of **₹50,000**.

- For second or subsequent convictions, the punishment increases to **imprisonment for at least 1 year** and a minimum fine of **₹1,00,000**.

Enforcement

- A dedicated **IP Division** handles copyright cases.
- The **Copyright Board**, established in **1958**, adjudicates disputes related to copyright.

Copyright Infringement as a Cognizable Offence

Definition of Cognizable Offence

- A cognizable offence is one where a police officer can arrest the offender **without a warrant** and confiscate infringing materials **without prior court approval**.

Legal Provisions

- Copyright infringement is classified as a **cognizable offence** under the **Copyright Act, 1957**.
- A **police officer** of the rank of **Sub-Inspector or higher** can:
  - Seize infringing materials **without a warrant**.
  - Produce the confiscated materials in court as evidence.

Implications

- This provision ensures **quick action** against copyright violators, ensuring **effective enforcement** of copyright laws.

#EXTRA - Fair Use Doctrine

The **Fair Use Doctrine** allows limited use of copyrighted materials without the owner's permission for certain purposes like education, research, and commentary. It follows a four-part test to determine if the use is fair:

1. **Character of Use**: The work must be used for non-commercial, educational, or personal purposes.
   - *Example*: A teacher using a book excerpt in class without profit.
2. **Nature of the Work**: The use of factual works is more likely to be considered fair than creative or artistic works.
   - *Example*: Using an educational article or scientific data for research purposes.
3. **Amount of Portion Used**: Only a small portion of the copyrighted material should be used.
   - *Example*: Quoting a short passage from a novel in a research paper.
4. **Impact on the Market**: The use should not harm the market value of the original work.
   - *Example*: Using a book excerpt in a classroom setting, without affecting its sales or demand.

Examples of Fair Use:

- Quoting portions of copyrighted text.
- Reporting current events through media.
- Reproducing content for teaching or research purposes.
- Using works prepared by legislative bodies.

Summary :

- **Copyright Infringement:** Unauthorized use, reproduction, or distribution of copyrighted work.
  - **Examples:** Copying, public performance, importing infringing copies.
- **Criminal Offence:**
  - **Punishable** under **Section 63** of the **Copyright Act, 1957**.
  - **Penalties:** 6 months to 1 year imprisonment and fines up to ₹1,00,000.
- **Cognizable Offence:**
  - Police can seize infringing materials **without a warrant**.

- Ensures **quick enforcement** of copyright laws.
- **Fair Use Doctrine:**
  - Allows limited use for **education**, **research**, or **reporting**.
  - Governed by a **four-part test** to ensure fairness.

MQP 3

7a. Explain the process of copyright registration? What are the benefits for the copyright holders?

Ans: **Copyright Registration** (same as 8a from MQP 2)

Benefits for Copyright Holders

1. **Exclusive Rights:**
   - Only the copyright holder has the right to reproduce, distribute, and perform the work.
   - They can authorize others to use the work for a fee or restrict its use.
2. **Economic Rights:**
   - **Reproduction:** Control over how the work is reproduced in any form (e.g., printed publications, digital formats).
   - **Distribution:** Exclusive rights to distribute copies of the work.
   - **Public Performance:** Control over performances in public, such as concerts or screenings.
   - **Broadcasting:** Authority to allow or prohibit the broadcasting of the work.
   - **Translation & Adaptation:** Ability to control adaptations (e.g., turning a novel into a movie) and translations of the work.
3. **Moral Rights:**
   - **Right of Paternity:** Right to be recognized as the author of the work, even if the copyright is transferred to others.
   - **Right of Integrity:** Right to prevent alterations that would harm the work or misrepresent the author's original intentions.
4. **Financial Benefits:**
   - The copyright holder can generate revenue through licensing agreements, sales, or royalties.
5. **Legal Protection:**
   - Copyright holders are legally protected against unauthorized use of their work and can take legal action if their rights are violated.
6. **Reputation and Recognition:**
   - The author can maintain recognition and respect for their work through moral rights, especially in cases of public performance or use by others.

7b. Explain by using flowchart, steps involved in trademark registration?

Ans: (same as 8b from MQP 1)

8a. Explain the criteria that an original work must meet to quality for copy right protection?

Ans:

Criteria for Copyright Protection

1. **Existence in a Tangible Form:**
   - The work must be fixed in a physical medium, such as paper, canvas, or digital form.
   - It should exist in a form that can be perceived, reproduced, or communicated.

2. **Originality:**
    - The work must be created by the author through independent thinking and not copied from another source.
    - Even if the work is similar to an existing one, it must be distinct in its expression and not identical.
3. **Creative Effort:**
    - The work must show a degree of creativity, though it doesn't have to be highly sophisticated.
    - The minimal level of creativity required is determined by subjective judgment, usually evaluated by the Copyright Registrar.
4. **No Minimum Quality or Quantity:**
    - A work can qualify for copyright protection regardless of its quality or size.
    - Even works with low aesthetic or artistic merit can be protected if they meet the originality and creativity criteria.
5. **Not Commonplace or Routine:**
    - Works like a simple alphabetical list (e.g., a phonebook) or mere changes in dimensions (e.g., resizing a book) do not qualify.
    - The work should involve some creative selection, arrangement, or original thought.
6. **Subjectivity of Creativity:**
    - The level of creativity required for copyright protection is subjective and based on the specific case.
    - Works that display minimal creative input but are independently created may still qualify for protection.
7. **Not a Mere Idea:**
    - Copyright protects the expression of an idea, not the idea itself.
    - The expression must be a unique representation, while the underlying concept can be used freely by others.
8. **Types of Work Eligible:**
    - Almost any form of expression can be protected, such as literary works, music, visual arts, films, software, architecture, etc.
9. **No Requirement for Commercial Success:**
    - A work does not need to be commercially successful to qualify for copyright.
    - The work simply needs to meet the originality and creativity requirements.
10. **Work Not Public Domain:**
    - The work should not be in the public domain or too similar to already existing works without significant transformation or new expression.

8b. What are the roles and functions of the copyright board and the copyright Society in administering copyright laws and regulations?

Ans:

Copyright Society

A Copyright Society is a collective administration body formed by authors and copyright owners to manage and protect their rights. It is registered under Section 33 of the Copyright Act, 1957.

Purpose:

- It helps authors and copyright holders track the use of their work, manage royalties, and address infringement issues.

Functions:

1. **Rights Management:**
    - Tracks and monitors the use of copyrighted works, ensuring that all rights are being respected and infringements are identified.
2. **License Issuance:**
    - Issues licenses for the use of works under its management, allowing others to use the works legally while collecting the necessary fees.
3. **Fee Collection and Distribution:**
    - Collects licensing fees and distributes them to copyright holders, after deducting administrative expenses.
4. **Collective Representation:**
    - Formed by seven or more copyright holders, a society represents a group of authors or copyright owners in managing and enforcing their rights.
5. **Examples of Societies:**
    - **SCRIPT**: For cinematograph and television films.
    - **IPRSL**: For musical works.
    - **PPL**: For sound recordings.

Copyright Board

The Copyright Board is a judicial body constituted by the government to adjudicate copyright-related disputes and perform other judicial functions under the Copyright Act of India.

Purpose:

- It ensures that copyright laws are correctly applied, resolves disputes, and ensures fair practices in the administration of copyright laws.

Functions:

1. **Appeals and Rectifications:**
    - Hears appeals against decisions made by the Registrar of Copyrights and handles requests for correcting entries in the Register of Copyrights.
2. **Dispute Resolution:**
    - Resolves disputes related to the assignment of copyrights, ensuring that copyright ownership and rights are clearly defined.
3. **Granting Compulsory Licenses:**
    - The Board can grant compulsory licenses to publish or republish works in certain situations, such as after a work has been published for seven years.
4. **Translation Licenses:**
    - Issues compulsory licenses for translating literary or dramatic works into other languages after seven years from the first publication.
5. **Royalty and Resale Rights:**
    - Fixes royalty rates for sound recordings and establishes resale rights for original works like paintings, sculptures, and manuscripts.

#EXTRA - Explain Famous case law of Coca-Cola Company vs. Bisleri International Pvt. Ltd.
Ans:

Famous Case Law: Coca-Cola Company vs. Bisleri International Pvt. Ltd.

- **Background**: Bisleri International Pvt. Ltd. owned the trademark "MAAZA" for its popular mango drink in India. The company transferred the rights, including the formulation, intellectual property rights (IPR), and goodwill, to Coca-Cola for the Indian territory.
- **Issue**: In 2008, Bisleri applied to register the trademark "Maaza" in Turkey and started exporting the product under the same name. Coca-Cola objected, claiming that the rights to "Maaza" for the Indian market were transferred to them, and using the trademark in India and for exports violated these rights.
- **Legal Action**: Coca-Cola filed a petition for a permanent injunction and damages, arguing that Bisleri's use of the trademark "Maaza" in India and for export was an infringement, as the rights had been transferred to Coca-Cola.
- **Court's Decision**: The court ruled in favor of Coca-Cola and granted an interim injunction against Bisleri, prohibiting them from using the trademark "MAAZA" in India and for export. The court considered the trademark infringement due to the transfer of rights to Coca-Cola.

This case highlights the importance of clear trademark assignment and the legal consequences of infringing on assigned trademark rights.

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MODULE 5

MQP 1

9a. Explain in detail what is Industrial Design (ID)

Ans:

Industrial Designs (ID)

- **Definition:**
  - Industrial design refers to the aesthetic features of an object, such as its shape, pattern, color, or a combination of these. The design must be judged by the eye and can be two-dimensional or three-dimensional.
  - It can be one-dimensional, two-dimensional, or three-dimensional or a mix of these dimensions.
  - The design must appeal visually and is judged based on how it appears to the eye, without considering its technical or mechanical aspects.
- **Purpose:** The goal is to protect the originality of the creator's design and promote further creativity in the industry.

Eligibility Criteria

- **Novelty:** The design must be original, meaning it hasn't been made public before through any publication or use.
- **Distinctiveness:** It should stand out from existing designs to ensure it is not similar to prior designs.

Legal Framework

- **Governing Acts:** Industrial designs in India are regulated by The Designs Act of 2000 and the Designs Rules of 2001, amended in subsequent years.

Example

- **Example of Industrial Design:** The unique shape and design of an Apple iPhone are protected as industrial design. The sleek curves and distinctive appearance distinguish it from other smartphones.

This protection encourages the creators to innovate while preventing others from copying their creative designs.

9b. Summarize the Non Protectable Industrial Designs in India

Ans:

Non-Protectable Industrial Designs in India

1. **Against Public Moral Values:**
   - Designs that violate moral standards or social values cannot be protected.
   - **Example:** A design that promotes offensive or harmful messages, such as designs related to hate speech or violence.
2. **National Symbols:**
   - Designs that feature national flags, emblems, or symbols of any country are not eligible for protection.
   - **Example:** A design using India's national flag or its emblem as part of a product's design.
3. **Integrated Circuits:**
   - Designs related to the internal structure or layout of integrated circuits are not considered industrial designs.
   - **Example:** The specific wiring or configuration of a microchip that forms part of a circuit.
4. **Process-Related Designs:**
   - Designs that focus on the functional process of making an item, rather than the visual or aesthetic appearance, cannot be protected.
   - **Example:** A design that illustrates how to manufacture a chair but does not focus on its visual shape or look.
5. **Documents and Stationery:**
   - Items like books, calendars, greeting cards, or postcards do not qualify as industrial designs since they are primarily literary or artistic works.
   - **Example:** A greeting card design, which is more of an artistic creation, not a product's industrial design.
6. **Artistic Works:**
   - Works like paintings, sculptures, and photographs are considered artistic works and are protected by copyright law, not industrial design.
   - **Example:** A famous painting by an artist cannot be registered as an industrial design.
7. **Trademarks:**
   - Designs that form part of a trademark (such as logos) cannot be protected under industrial design law.
   - **Example:** The design of the Nike Swoosh logo cannot be registered as an industrial design, as it is a trademark.

Each of these categories reflects limitations on the scope of industrial design protection, ensuring it applies only to designs related to the aesthetic or functional appearance of products and not other forms of intellectual property.

9c. Describe the Registration process for Industrial Design with a flow chart

Ans:

Registration Process for Industrial Design

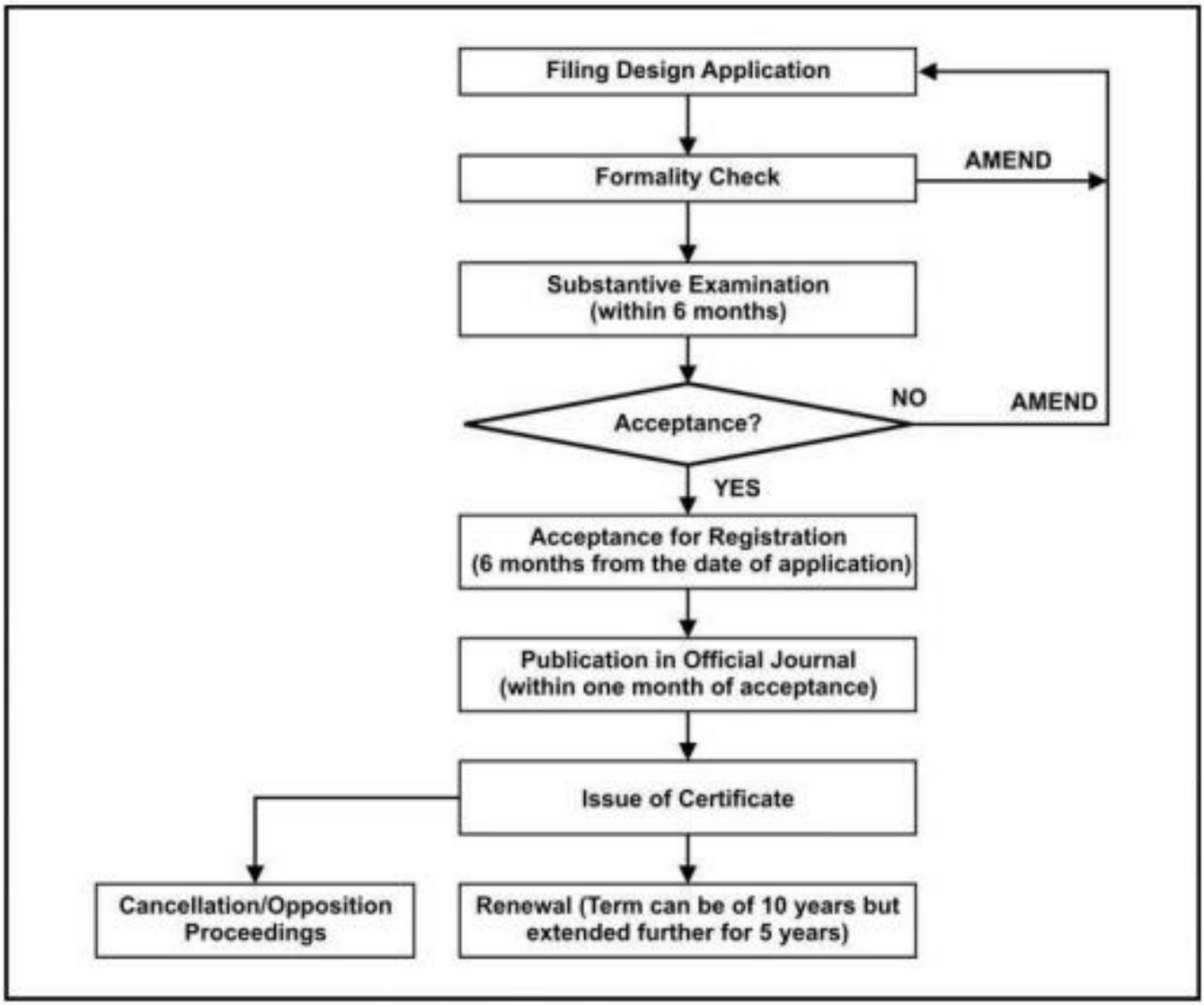

Fig: Process of Design registration

1. **Prior Art Search**
   Before filing, conduct a prior art search to ensure the design is novel and not already registered.
   - Use search engines like:
     - **Design Search Utility (CGPDTM)**
     - **Global Design Database (WIPO)**
2. **Filing Design Application**
   The applicant (individual, small entity, institution, or industry) files the application.
   - **Process:**
     - Submit the application at the Design Office, Deputy Controller of Patents & Designs, Kolkata.
     - Non-residents must appoint an agent in India.
     - Include necessary documents like design representation and forms.
3. **Formality Check**
   The examiner checks if the application meets eligibility criteria.
   - If there are discrepancies, the applicant must rectify them within 6 months.

4. **Substantive Examination**
   The examiner evaluates the design for:
   - **Novelty:** Is the design new?
   - **Originality:** Is the design significantly distinguishable?
   - If accepted, the design proceeds to registration. If rejected, the applicant can amend and resubmit.
5. **Acceptance for Registration**
   If the design meets all criteria, it is accepted for registration.
   - The design is published in the Official Journal of the Patent Office.
6. **Issue of Certificate**
   If no objections are raised within 1 month of publication, a Design Registration Certificate is issued.
7. **Duration of Registration**
   - **Initial Term:** 10 years from the date of registration (or priority date).
   - **Extension:** Can be renewed for an additional 5 years by filing Form-3 with fees.
8. **Importance of Design Registration**
   - Provides exclusive rights to the owner.
   - Prevents piracy and imitation of the design.
   - Boosts sales and establishes goodwill in the market.
9. **Cancellation of Registered Design**
   The design can be cancelled by filing Form-8 with the prescribed fee.
   - **Grounds for Cancellation:**
     - Design already registered.
     - Design published before registration.
     - Design is not novel or original.

Summary:

1. **Prior Art Search:** Ensure the design is novel using search engines.
2. **Filing Application:** Submit at the Design Office with necessary documents.
3. **Formality Check:** Examiner checks eligibility; amend if required.
4. **Substantive Examination:** Evaluates novelty and originality.
5. **Acceptance for Registration:** Published in the Official Journal.
6. **Issue of Certificate:** Granted if no objections are raised.
7. **Duration:** Valid for 10 years, extendable for 5 more years.
8. **Importance:** Provides exclusive rights and prevents piracy.
9. **Cancellation:** Can be cancelled on grounds like lack of novelty.

10a. Define the term Geographical Indicators (GI)? What are the rights given to GI holders

Ans:

Geographical Indications (GI)

Definition:

- A Geographical Indication (GI) is a sign or label used on products that come from a specific geographical location and possess qualities, reputation, or characteristics that are inherent to that region. The key link is the strong connection between the product and its original place of production, often highlighting local traditions, craftsmanship, or natural resources.
- For example, "Darjeeling Tea" is a GI because it is grown in the Darjeeling region and possesses specific qualities that are unique to that region's climate and soil.

Acts, Laws, and Rules Pertaining to GI

- In India, GIs are governed under the **Geographical Indications of Goods (Registration & Protection) Act, 1999**, and the **Geographical Indications of Goods (Registration & Protection) Rules, 2002**.
- These laws aim to provide protection and prevent misuse or imitation of GIs to preserve the authenticity and reputation of the products.

Ownership of GI

- The ownership of a GI is typically held by a group of producers or an association such as a cooperative society. In some cases, the government may also hold the ownership rights to certain GIs.

Rights Granted to GI Holders

1. **Right to Grant License:**
    - The holder of a GI has the exclusive right to license others to use the GI.
    - This includes the right to sell, transfer, mortgage, or enter into other arrangements for consideration.
    - Any license or assignment of GI rights must be in writing and registered with the **Registrar of GI** to be legally valid.
2. **Right to Sue:**
    - The holder has the right to take legal action against individuals or entities that use the GI product without permission or consent.
    - This helps in protecting the product from unauthorized exploitation and ensures the preservation of its reputation.
3. **Right to Exploit:**
    - The GI holder can authorize exclusive users to use the GI, thereby granting them the right to exploit the product in the market.
    - This right also helps in generating revenue through licensing while maintaining the integrity of the geographical identity.
4. **Right to Obtain Relief:**
    - Registered proprietors and authorized users of a GI have the right to seek relief in case of infringement.
    - This includes the right to claim damages or other remedies in case someone unlawfully uses the GI product.

Example of GI Protection in India:

- **Darjeeling Tea** – Known worldwide for its unique flavor, it has been granted GI status, protecting it from being produced outside the region under the same name.
- **Kancheepuram Silk Sarees** – This traditional saree from Tamil Nadu has a GI tag, ensuring that only products made in Kancheepuram can be marketed as "Kancheepuram Silk".

10b. Discuss the case study of Apple Vs Samsung

Ans:

Case Study: Apple Inc. vs. Samsung Electronics Co.

1. Lawsuit Initiation (2011)

- **Apple's Lawsuit:** Apple sued Samsung for design and utility patent infringement (screen grid layout, tap-to-zoom features).
- **Evidence:** Apple presented side-by-side images comparing iPhone 3GS and Samsung Galaxy S, alleging design similarities.

2. Discovery of False Evidence

- **Image Tampering:** Apple was found to have altered the images to exaggerate the design similarities between the two phones.
- **Accusation:** Samsung accused Apple of submitting misleading evidence in court.

3. Counter-Suit and Global Proceedings

- **Samsung's Response:** Samsung countersued Apple in multiple countries: South Korea, Japan, Germany, the USA, and with the International Trade Commission (ITC).
- **Seven-Year Legal Battle:** Legal proceedings lasted for seven years across multiple jurisdictions.

4. Settlement and Outcome (2018)

- **Settlement Reached:** In 2018, both companies reached a settlement agreement.
- **Payment:** Samsung was ordered to pay $539 million to Apple for patent infringement.

Key Takeaways

1. Patent Infringement in the Tech Industry:

- Highlighted the importance of protecting intellectual property in the competitive smartphone market.

2. Integrity of Evidence:

- Emphasized the need for presenting truthful and accurate evidence in legal cases, as misleading evidence can affect credibility.

3. Global Impact:

- Showed how patent disputes can have worldwide consequences, affecting market competition and company reputations.

4. Financial and Market Impact:

- The settlement had a financial impact on Samsung, but allowed both companies to focus on innovation and business growth after years of litigation.

10c. Discus the case study of Basmati Patent

Ans:

Case Study: Basmati Patent

1. The Basmati Patent Controversy

- **Patent Awarded:** In 1997, RiceTec, a US company, was granted a patent for a strain of Basmati rice, which has been traditionally grown in India and Pakistan for centuries.
- **Basmati Rice:** Known for its distinct aroma and long grains, it has been cultivated by farmers in the region for centuries.

2. RiceTec's Claims

- **Acknowledgment of Tradition:** RiceTec admitted that good-quality Basmati traditionally comes from India and Pakistan.
- **Claim of Innovation:** However, RiceTec claimed it had developed "novel" strains of Basmati rice, which were higher yielding and could be produced globally.

3. Indian Government's Response

- **Legal Action:** India challenged the patent, questioning the validity of RiceTec's claims, specifically regarding starch index, aroma, and grain dimensions.
- **WTO Involvement:** India considered taking the issue to the World Trade Organization (WTO), claiming violation of the TRIPS agreement.

4. Patent Law Issues

- **TRIPS Agreement:** TRIPS does not require patent protection for plant varieties but insists on some form of protection for them. The US allows plant variety patents, which is how RiceTec gained the patent.
- **Misappropriation of Knowledge:** The patent was seen as an attempt by RiceTec to claim traditional knowledge as their invention.

5. Settlement and Outcome

- **Patent Withdrawn:** After prolonged disputes, RiceTec withdrew some of its claims, but it had already patented certain strains of Basmati rice.
- **Protection of Traditional Knowledge:** The case emphasized the need for better protection of traditional agricultural knowledge and resources.

6. Key Takeaways

- **Misappropriation Issue:** The case highlighted how traditional knowledge can be wrongly patented by entities outside the region of origin.
- **Importance of Protection:** It stresses the need for laws that protect traditional knowledge and prevent exploitation through patents.

MQP 2

9a. Explain the process of industrial design registration.

Ans: (same as 9c from MQP 1)

9b. Define Geographical Indications (GI) with an example. What are the rights granted to GI holders?

Ans: (same as 10a from MQP 1)

10a. Explain Case study of Curcuma (Turmeric) Patent, Case study of Neem Patent.

Ans:

Case Study: Curcuma (Turmeric) Patent & Neem Patent

Turmeric Patent Case

- **Background:**
  - Turmeric (Curcuma longa) is a tropical herb widely used in India for cooking, medicinal, and cosmetic purposes, particularly known for its wound-healing and anti-parasitic properties.
- **Patent Grant:**
  - In 1995, the University of Mississippi Medical Center was granted a patent by the US for using turmeric powder for wound healing, both orally and topically.
- **Objection from India:**
  - India's Council for Scientific and Industrial Research (CSIR) objected, providing evidence of the long history of turmeric use in Ayurvedic medicine.
- **Evidence and Revocation:**
  - CSIR found references to turmeric's medicinal use in Sanskrit, Urdu, and Hindi texts, dating back centuries.
  - The USPTO revoked the patent in 1997, agreeing that the use of turmeric for healing was not novel and had been known for ages.
- **Key Outcome:**
  - The case emphasized the need for safeguarding traditional knowledge, with India successfully defending its cultural heritage against patent misappropriation.

Neem Patent Case

- **Background:**
  - Neem (Azadirachta indica) is an ancient tree from India, known for its medicinal uses, especially in treating diseases like leprosy and diabetes. It is also used in agriculture for pest control.
- **Patent Grant:**
  - In 1994, the European Patent Office (EPO) granted a patent to W.R. Grace Company (USA) for using neem oil to control fungi on plants.
- **Opposition from India:**
  - India, supported by the Research Foundation for Science, Technology and Ecology (RFSTE), opposed the patent, presenting evidence from ancient Ayurvedic texts that neem oil had been used for fungal control and medicinal purposes for centuries.
- **Revocation:**
  - In 2000, the EPO revoked the patent, stating it lacked novelty and inventive steps, as neem's uses had been known in India for centuries.
- **Key Outcome:**
  - The case highlighted the importance of protecting indigenous knowledge and preventing the misappropriation of traditional plant-based remedies.

Summary: Turmeric & Neem Patent Cases

1. **Turmeric Patent Case:**
   - In 1995, the University of Mississippi Medical Center was granted a US patent for using turmeric for wound healing.
   - India's CSIR challenged this, citing turmeric's centuries-old use in Ayurvedic medicine.
   - The USPTO revoked the patent in 1997, recognizing the use of turmeric as ancient knowledge.
2. **Neem Patent Case:**
   - In 1994, the European Patent Office granted a patent for using neem oil to control plant fungi.
   - India opposed this, providing evidence of neem's traditional use.
   - The patent was revoked in 2000, as neem's properties were well-known in India long before the patent was filed.

Both cases highlight the importance of protecting traditional knowledge from patent misappropriation.

10b. Using a flow chart, explain the process of GI registration

Ans: Process of GI Registration

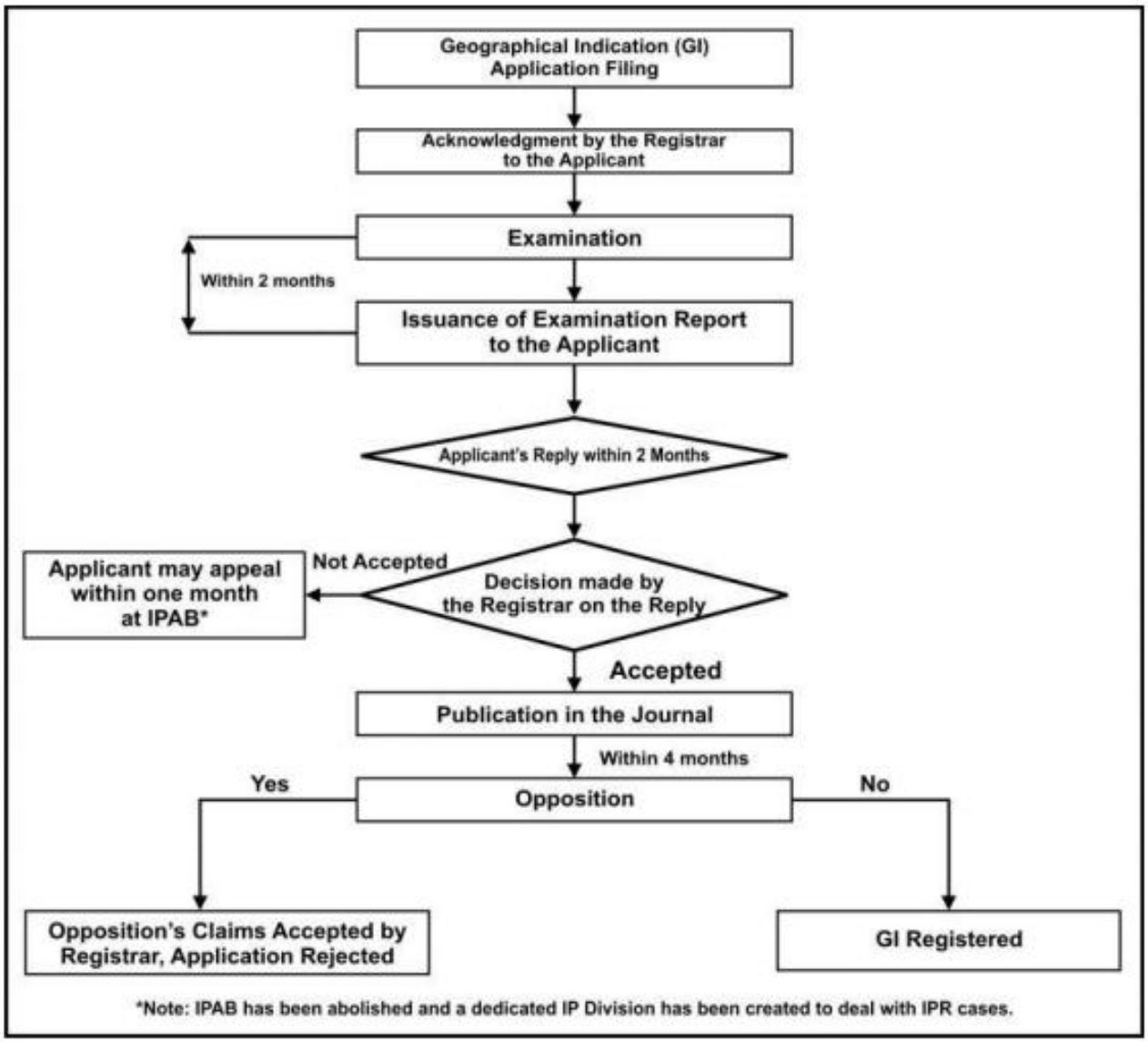

Fig: Procedure for GI registration

1. **Prior Art Search:**
    - Before filing, conduct a prior art search to ensure the GI is not already registered.
    - Use search engines like WIPO's Global Brand Database or the GI Registry website.
2. **Filing the Application:**
    - The applicant (individual, organization, or authority) files the GI application.
    - **Process:**
        - Submit the application in the prescribed format to the Registrar of Geographical Indications, Chennai.
        - Include details about the producers' interest and standards for maintaining the GI.
        - Attach three certified copies of the map of the region where the GI belongs.
3. **Examination of Application:**
    - The examiner scrutinizes the application for deficiencies or similarities with existing GIs.
    - If discrepancies are found, the applicant must respond within 1 month.
4. **Publication in GI Journal:**
    - If the examiner is satisfied, the application is published in the Geographical Indication Journal.
    - The public has 4 months to file objections.
5. **Objection Handling:**
    - If objections are raised, the applicant must address them within 2 months.
    - If no objections are filed, the GI proceeds to registration.
6. **Registration of GI:**
    - If no objections are resolved, the GI is registered, and the filing date becomes the registration date.
    - The GI is initially valid for 10 years and can be renewed by paying the prescribed fee.
7. **Issue of GI Tag:**
    - The registered GI product is granted a GI tag, which confirms its authenticity and geographical origin.

Summary in Points:

1. **Prior Art Search:** Ensure the GI is not already registered.
2. **Filing Application:** Submit the application with details about producers and standards.
3. **Examination:** Examiner checks for deficiencies; respond to discrepancies within 1 month.
4. **Publication:** Application is published in the GI Journal for public objections.
5. **Objection Handling:** Address objections within 2 months.
6. **Registration:** If no objections, the GI is registered for 10 years.
7. **GI Tag:** The registered product is granted a GI tag for authenticity.

Key Points to Remember:

- GI registration ensures authenticity and geographical origin of products.
- The process involves prior art search, application filing, examination, publication, and registration.
- The GI tag is valid for 10 years and can be renewed.

MQP 3

9a. Explain the classification of Industrial Designs and design registration trends in India

Ans:

Classification of Industrial Designs

Explanation:

Industrial designs are categorized into specific classes and subclasses to streamline the registration process and ensure uniformity across countries. This classification is governed by the **Locarno Agreement, 1968**, which provides a standardized system for design registration and searches.

Key Points:

- Designs are classified into **32 classes** and **237 subclasses**.
- **Examples:**
  - **Class 1:** Foodstuffs for humans and animals (excluding packaging).
  - **Class 9:** Bottles, flasks, pots, and pressurized containers.
  - **Class 32:** Graphic symbols, logos, surface patterns, and ornamentation.
- The classification helps in categorizing goods for design registration and ensures consistency in official documents.

Design Registration Trends in India (2010-2020)

Explanation:

The design registration process in India has seen significant growth over the decade, reflecting increased awareness and importance of protecting industrial designs. The trends are analyzed based on three key parameters: **designs filed**, **designs examined**, and **designs registered**.

Key Points:

- **Overall Growth:**
  - **Designs Filed:** 88% increase.
  - **Designs Examined:** 117% increase.
  - **Designs Registered:** 33% increase.
- **Highest Numbers in 2019-20:**
  - **Designs Filed:** 12,268.
  - **Designs Examined:** 13,644.
  - **Designs Registered:** 14,272.
- **Trend Analysis:**

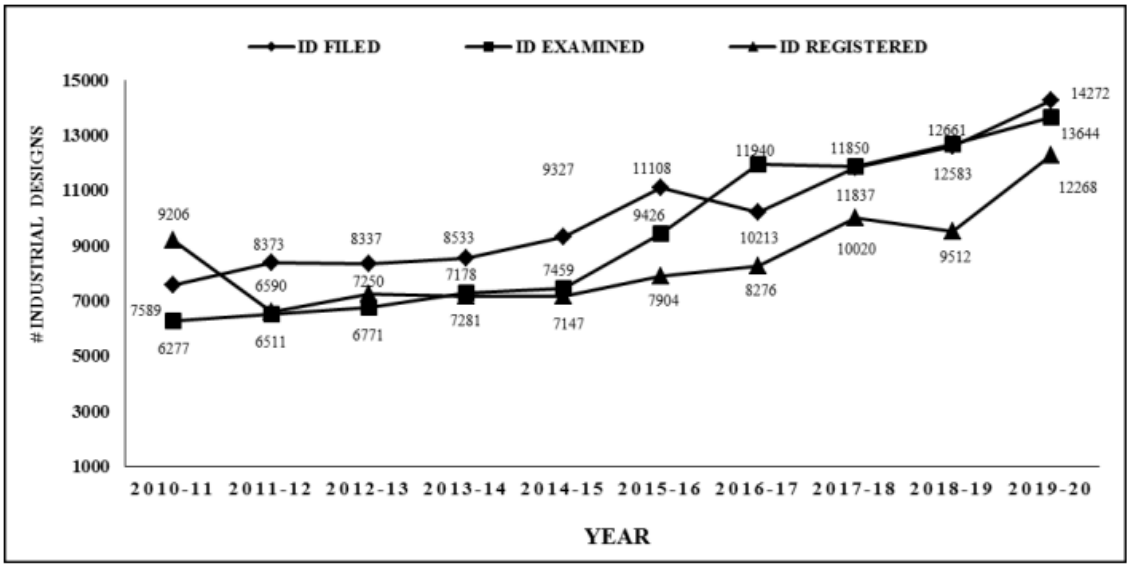

Fig: Industrial Designs Profile in India

- The graph shows a similar pattern for all three parameters.
- The highest numbers were observed in **2019-20**, indicating a growing interest in design registration.

Summary:

1. **Classification of Industrial Designs:**
   - Governed by the **Locarno Agreement, 1968**.
   - **32 classes** and **237 subclasses** for categorizing goods.
   - **Examples:**
     - Class 1 (foodstuffs),
     - Class 9 (packaging),
     - Class 32 (graphic symbols).
2. **Design Registration Trends in India (2010-2020):**
   - Significant growth in **designs filed (88%)**, **examined (117%)**, and **registered (33%)**.
   - **Highest numbers in 2019-20:**
     - **12,268 filed**, **13,644 examined**, **14,272 registered**.
   - Reflects increased awareness and importance of design protection.

9b. Explain the famous case law between Apple Inc Vs Samsung Electronics Co. related with Industrial Design Rights.

Ans: (same as 10b from MQP 1)

10a. How would you describe the overall ecosystem and significance of geographical indications in India?

Ans:

1. GI Ecosystem in India

Explanation:

India's geographical and cultural diversity provides immense potential for GI products, tied to specific regions and traditions, contributing to economic and cultural growth.

Key Points:

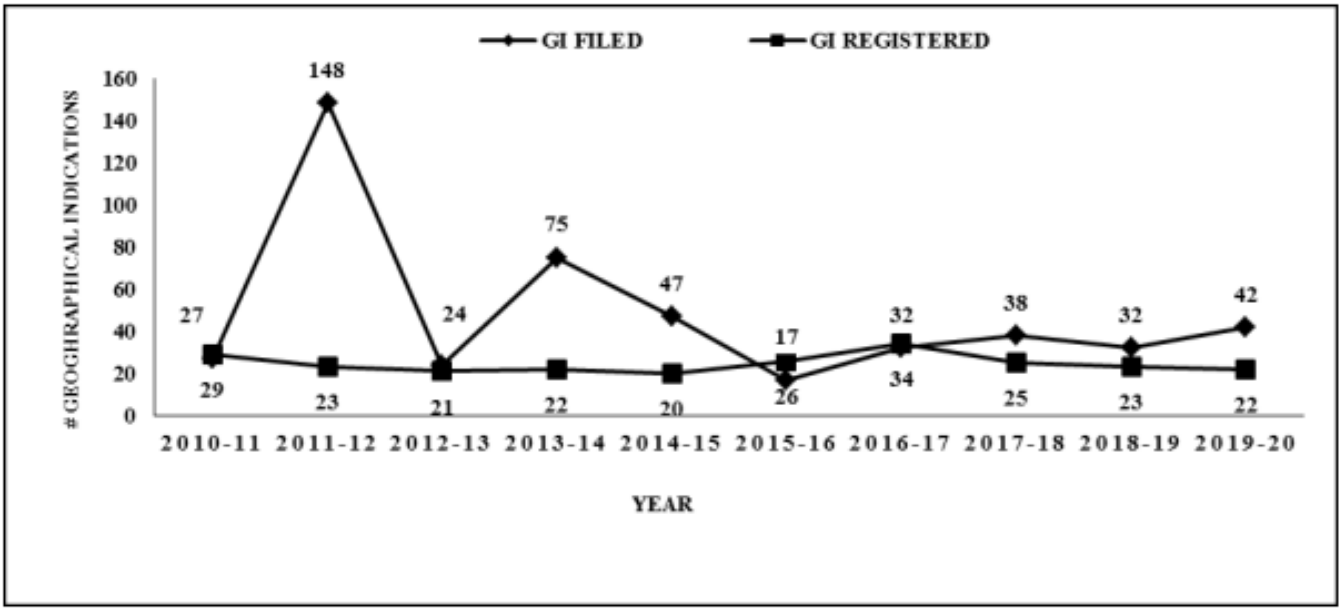

Fig: GI Profile (India) for the period 2010-2020

- **Total GIs Registered:** As of June 2021, 370 GIs have been registered in India.
- **Scope:** India has vast potential for GI products, but the number of registrations is much below its capacity.
- **Trends (2010-2020):**
  - **Maximum GIs Filed:** 148 in 2011-12.
  - **Minimum GIs Filed:** 17 in 2015-16.
  - **Registrations:** Around 20-30 per year, with a peak of 34 in 2016-17.

2. Significance of GI in India

Explanation:
GI tags protect the authenticity and origin of products, ensuring they meet specific standards and originate from designated locations. This preserves cultural heritage and supports local economies.

Key Points:

- **GI Tags:**
  - Confirm the genuineness of products in terms of production standards and geographical origin.
  - **Examples:** Darjeeling Tea, Mysore Silk, Tirupathi Laddu.
- **Economic Impact:**
  - Contribute to the economic development of regions.
  - Help local producers gain market recognition and premium pricing.
- **Cultural Identity:**
  - Preserve the cultural and historical identity of regions.
  - Prevent misuse of traditional knowledge and products.
- **Legal Protection:**
  - Prevent non-registered products from using the GI tag.
  - Restrict labeling of products not produced in designated locations as GI.

3. GI Registry in India - #EXTRA

Explanation:
The **Geographical Indications Registry** (under the Department for Promotion of Industry and Internal Trade) manages GI registrations in India.

Key Points:

- **Head Office:** Located in Chennai.
- **Functions:**
  - Issues GI tags to registered products.
  - Ensures compliance with production standards and geographical origin.
- **Example:**
  - **Darjeeling Tea** can only be labeled as such if grown in the Darjeeling region, even though it can be produced elsewhere.

Summary in Points:

1. **GI Ecosystem in India:**
   - 370 GIs registered as of June 2021.
   - Trends show fluctuations, with a peak of 148 filings in 2011-12 and 34 registrations in 2016-17.

2. **Significance of GI:**
    - Protects authenticity and geographical origin.
    - Boosts local economies and preserves cultural heritage.
    - **Examples:** Darjeeling Tea, Mysore Silk, Tirupathi Laddu.
3. **GI Registry:**
    - Headquartered in Chennai.
    - Ensures compliance with production standards and geographical origin.

10b. Using a flowchart, Explain the process of GI registration.

Ans: (same as 10b from MQP 2)

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