Modified

CBCS SCHEME

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BRMK557

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Research Methodology and IPR

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Identify the meaning of Research and brief out the objective and motivation in engineering research.	10	L1	CO1
	b.	Explain brief about research cycle and verify with the research flow diagram.	10	L1	CO1
		OR			
Q.2	a.	Identify the types of engineering research and briefly explain them.	10	L1	CO1
	b.	Explain about the different types of research misconduct.	10	L1	CO1
		Module – 2			
Q.3	a.	Explain about the importance of literature review and technical reading.	10	L2	CO2
	b.	Mention the various benefits of bibliographic databases.	10	L1	CO2
		OR			
Q.4	a.	Indentify the impact of technical reaction and brief about it.	10	L1	CO2
	b.	Enumerate the impact of title and keywords on citation with example.	10	L2	CO2
		Module – 3			
Q.5	a.	Define Intellectual properties and explain about its types.	10	L1	CO3
	b.	Explain about the key aspect of patent law.	10	L2	CO3
		OR			
Q.6	a.	Explain about the assessment of novelty.	10	L1	CO3
	b.	Brief about the patent procedure in India.	10	L1	CO4
		Module – 4			
Q.7	a.	Mention and brief about the justification for copyright law.	10	L2	CO4
	b.	Explain about the basic concepts of under lying copyright law.	10	L1	CO4
		OR			
Q.8	a.	Brief about the various representations of sound recordings.	10	L2	CO5
	b.	Explain about TRIPS agreement in detail.	10	L1	CO5

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Module – 5					
Q.9	**a.**	Explain about the justification of protection designs.	**10**	**L2**	**CO5**
	b.	Brief about the excluded subjected matter in the context of design protection.	**10**	**L1**	**CO5**
OR					
Q.10	**a.**	What are the rights of the owner of designs? Explain.	**10**	**L1**	**CO5**
	b.	Brief about the Assignment of Design Rights.	**10**	**L1**	**CO5**

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Scheme of BRMK557

"Ramanarasimha K"
<k.ramanarasimha@gmail.com>

February 5, 2025 7:35 PM

To: boe@vtu.ac.in

Dear Sir,

Please find attached the completely modified scheme of BRMK557. The following instructions are to be noted during the valuation:

1. Since it is not completely clear whether question number 8(a) is out of syllabus, half the marks (5 Marks) are to be awarded if the student has attempted the question.
2. Since it is not completely clear whether question number 8(b) is out of syllabus, half the marks (5 Marks) are to be awarded if the student has attempted the question.
3. Since it is not completely clear whether question number 10(b) is out of syllabus, half the marks (5 Marks) are to be awarded if the student has attempted the question.

With Best Regards
Dr. K. Rama Narasimha
Chairman, BOE
Mechanical & Composite Board
Principal / Director
K.S. School of Engineering & Management
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Visvesvaraya Technological University
BELAGAVI - 590018
6/2/25

Detail Scheme for BRMK557 Jan 2025 Odd Semester Exams

Sl No.	Solution	Marks
Q1 a	Identify the meaning of Research and brief out the objective and motivation in Engineering research. Ans) **Meaning of Research: (2 marks)** Research refers to a careful, well-defined (or redefined), objective, and systematic method of search for knowledge, or formulation of a theory that is driven by inquisitiveness for that which is unknown and useful on a particular aspect so as to make an original contribution to expand the existing knowledge base. **Objective of Engineering research: (4 marks)** • The objective of engineering research is to solve new and important problems, • To develop new theoretical or applied knowledge and not necessarily limited to obtaining abilities to obtain the desired result. • To achieve the desired result that is being sought, one can fall back to understanding why it is not possible, because that is also a contribution toward ongoing research in solving that problem. **Motivation in Engineering research: (4 marks)** • Intrinsic motivations like interest, challenge, learning, meaning, purpose, are linked to strong creative performance. • Extrinsic motivating factors like rewards for good work include money, fame, awards, praise, and status are very strong motivators, but may block creativity. • Influences from others like competition, collaboration, commitment, and encouragement are also motivating factors in research. • Personal motivation in solving unsolved problems, intellectual joy, service to community, and respectability are all driving factors.	2+4+4 = 10
Q1 b	Explain brief about research cycle and verify with the research flow diagram. **Ans)** • The research cycle starts with basically a practical problem: one must be clear what the problem being attempted to solve is and why it is important. • This problem motivates a research question without which one can tend to get lost in a giant swamp of information. • The question helps one zero in onto manageable volume of information, and in turn defines a research project which is an activity or set of activities that ultimately leads to result or answer, which in turn helps to solve the practical problem that one started with in the first place as shown in Fig. Q1b. **(6 marks)**	6+4=10

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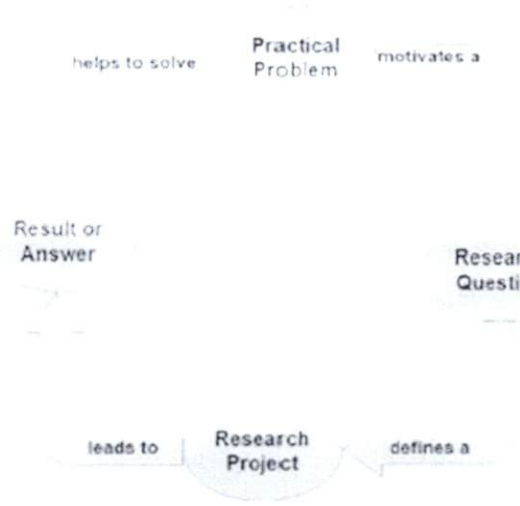

Fig Q1b: Research flow diagram

(Figure 4 marks)

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Q2 a	Identify the types of engineering research and briefly explain them. **Ans)** The different types of engineering research are: **(2 marks)** i. Descriptive ii. Analytical iii. Applied iv. Fundamental v. Quantitative vi. Qualitative **(Total marks for explanation = 8 marks)** o ***Descriptive research:*** It is a fact-finding research.	2+8=10

- It uses surveys and fact-finding enquiries.
- It adopts comparative and correlational methods.
- It effectively describes the present state of the art.
- The researcher holds no control over the variables; rather can only report what has happened and what is happening.

- *Analytical research:*

  - Has to use facts/information that is already available.
  - Analysis of these to make a critical evaluation of the materials.

- ***Applied Research***

  - Applied research seeks to solve an immediate problem facing the organization.
  - Research to identify social or economic trends, or those that find out whether certain communications will be read and understood are examples of applied research.
  - The primary objective of applied research is to determine a solution for compelling problems in actual practice

- *Fundamental Research*

  - Fundamental research is concerned with generalizations and formulation of a theory.
  - Research concerning natural phenomena or relating to pure mathematics are examples of fundamental research.
  - Fundamental research is aimed at seeking information which could have a broad base of applications in the medium to long term.

- ***Quantitative Research***
  - Quantitative research uses statistical observations of a sufficiently large number of representative cases to draw any conclusions.
- ***Qualitative Research***
  - Qualitative researchers rely on a few nonrepresentative cases or verbal narrative in behavioral studies

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	such as clustering effect in intersections in Transportation engineering to make a proposition.	
Q2 b	Explain about the different types of research misconduct. **Ans)** There may be different types of research misconduct, which can be summarised as follows: **(2 marks)** a) *Fabrication* b) *Falsification* c) *Plagiarism* d) *Other Aspects of Research Misconduct* **(Explanation of each 2x4 = 8 marks)** ***(i) Fabrication (Illegitimate creation of data)*** – *Fabrication* refers to the act of making up or falsifying data or results. – Creating a data set for an experiment that was never actually conducted. – Adding fictitious data to a real data set collected during an actual experiment to provide additional statistical validity. – Fabrication is the intentional misrepresentation of research results. This is due to the researcher cannot wait for the results possibly due to timeline pressures from supervisors or customers. – It is a serious ethical violation and is considered research misconduct. ***(ii) Falsification (Inappropriate alteration of data)*** – *Falsification* is "manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record." – It is a misrepresentation, or misinterpretation, or illegitimate alteration of data or experiments. – Misleading data can also crop up due to poor design of experiments or incorrect measurement practices. ***(iii) Plagiarism (Taking other's work sans attribution)*** – *Plagiarism* takes place when someone uses or reuses the work (including portions) of others (text, data,	2+8=10

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	tables, figures, illustrations or concepts) as if it were his/her own without explicit acknowledgement. - Copying or reusing one's own published work is termed self-plagiarism and is also an unacceptable practice in scientific literature. - The increasing availability of scientific content on the internet seems to encourage plagiarism in certain cases but also enables detection of such practices through automated software packages. *(iv) Other Aspects of Research Misconduct* - Submission of the same article to two different journals also violates publication policies. When mistakes are found in any published content, they are generally not reported for public access. - Research misconduct includes serious deviations from accepted conduct and fraud is the result of deception and damage. - Fraudulent activities in research can have severe consequences, not only for the individuals involved but also for the broader scientific community.	
Q3 a	Explain about the importance of literature review and technical reading. **Ans)** Importance of literature review: **(5 marks)** • The primary goal of literature review is to know the use of content/ideas/approaches in the literature to correctly identify the problem that is vaguely known beforehand, to advocate a specific approach adopted to understanding the problem, and to access the choice of methods used. • It also helps the researcher understand clearly that the research to be undertaken would contribute something new and innovative. • The quality of such review can be determined by evaluating if it includes appropriate breadth and depth of the area under study, clarity, rigor, consistency, effective analysis. Importance of technical reading: **(5 marks)** • Technical reading is the process of comprehending and extracting information from highly specialized documents, such as scientific papers, technical manuals, engineering specifications, computer code, or other materials that demand a certain level of expertise in a particular field. • Given the abundance of journal articles, it is useful to adopt a quick, purposeful, and useful way of reading these manuscripts. • A strategic and efficient approach to reading research papers is essential for effective research.	5+5=10

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Q3 b	Mention the various benefits of bibliographic databases. **Ans) (10 marks)** • "Bibliographic databases" refer to "abstracting and indexing services" useful for collecting citation-related information and possibly abstracts of research articles from scholarly literature and making them available through search. • Bibliographic databases are organized collections of references to published literature, including books, articles, conference proceedings, and other types of documents. • Performing simultaneous searches through such large databases may allow researchers to overtly rely on any one database and be limited by the intrinsic shortcoming of any one of them for quality research. • A researcher should be able to quickly identify the databases that are of use in the idea or problem that one wishes to explore.	10 marks
Q4 a	Identify the impact of technical reaction and brief about it. **Ans)** **Out of syllabus: The word reaction or reading. Conveys different meaning to the students.** Some of the strategies for Technical Reading (Research Papers) are as follows. 1. Selective Reading: - Not all papers are worth reading in-depth. An initial skimming helps decide whether a paper is worth further exploration. 2. Skimming Process: - Read the title and keywords: Determine if the paper is interesting and relevant. - Read the abstract: Gain an overview of the paper's content and relevance. - Jump to conclusions: Assess if the paper aligns with your research goals. - Review figures, tables, and captions: Quickly understand the key results. 3. In-Depth Reading: - Introduction: Understand the background and purpose of the study. - Results and Discussion: Focus on the core findings and their interpretation. - Experimental Setup/Modeling: Read if interested in detailed methodology. 4. Consider Author Reputation: - Evaluate not only the content but also the reputation of the authors who produced the knowledge. 5. Staying Updated: - Continuously search for relevant literature and remain up-to-date with developments in the field.	2x5=10
Q4 b	Enumerate the impact of title and keywords on citation with example. **Ans)**	5+5=10

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	Impact of title: (5 marks) • Title is the most important attribute of any research paper. • It is the main indication of the research area or subject and is used by researcher as a source of information during literature survey. • Title plays important role in marketing and makes research papers traceable. • A good title is informative, represents a paper effectively to readers, and gains their attention. • Some titles are informative but do not capture attention of readers, some titles are attractive but not informative or related to the readers' research area. • The download count and citation of a research paper might be influenced by title. • There are three different aspects which provide a particular behavior to the title: (i) types of the title, (ii) length of the title, and (iii) presence of specific markers. • Examples: ➢ Study by Stremersch concluded that length of the title has positive affects the number of citations. ➢ Study by Sagi and Yechniam has found that highly amusing titles have fewer citations and pleasant titles have no significant relation with citations. ➢ Jamali and Nikzad analyzed several open access papers and found that articles with question-type titles are downloaded more but poorly cited compared to the descriptive or declarative titles. Declarative titles are downloaded and cited less than descriptive titles but difference is not much. **Impact of title: (5 marks)** • Keywords represent essential information as well as main content of the article, which are relevant to the area of research. • Search engines, journal, digital libraries, and indexing services use keywords for categorization of the research topic and to direct thework to the relevant audience.Keywords are important to ensure that readers are aware about research articles and their content. • If maximum number of allowable keywords are used, then the chance of the article being found increases and so does the probability of citation count of the article. • Usage of new keywords should be minimal as such keywords may not be well known to the research community and so may lead to low visibility of the article.	
Q5 a	Define Intellectual properties and explain about its types. **Ans)** **Definition of Intellectual Property: (2 marks)** Intellectual Property (IP) is a special category of property created by human intellect (mind) in the fields of arts, literature, science, trade, etc.	2+8=10

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	(Explanation about its types 8 marks) • Broadly, IP comprises of two branches ➢ Copyrights and Related Rights ➢ Industrial Property Rights. • The "Copyrights and Related Rights" refer to the creative expressions in the fields of literature and art, such as books, publications, architecture, music, wood/stone carvings, pictures, portrays, sculptures, films and computer-based softwares/databases. • The "Industrial Property Rights" refer to the Patents, Trademarks, Trade Services, Industrial Designs and Geographical Indications. • **Patents:** A patent is an exclusive right granted for an innovation that generally provides a new way of doing something or offers a new technical solution to a problem. The exclusive right legally protects the invention from being copied or reproduced by others. • **Trademarks:** Trademark (or Trade Mark) is a unique symbol which is capable of identifying as well as differentiating products or services of one organization from those of others. • Industrial Designs: The word "Design" is defined as the features of shape, configuration, pattern, ornament or composition of lines or colours applied to any article. The main object of registration of industrial Designs is to protect and incentivize the original creativity of the originator and encourage others to work towards the art of creativity. • Geographical indications: A GI is defined as a sign which can be used on products belonging to a particular geographical location/region and possesses qualities or a reputation associated with that region. In GI, there is a strong link between the product and its original place of production.	
Q5 b	Explain about the key aspect of patent law. **Ans)** The key aspect of patent law is the rights associated with the patentee and its enforcement. Right associated with the patenetee: **(6 marks)** As per the Court of Law, a patent owner has the right to decide who may or may not use the patented invention. In other words, the patent protection provided by the law states that the invention cannot be commercially made, used, distributed, imported, or sold by others without the patent owner's consent. The patent owner may permit other parties to use the invention on mutually agreed terms. As a matter of fact, the patent rights are negative rights as the owner is restricting others from using the patent in any manner without his prior permission. The patent holder may choose to sue the infringing party to stop illegal use of the patent and also ask for compensation for the unauthorized use. **Enforcement of patent rights: (4 marks)** Enforcement is the process of ensuring compliance with laws, regulations, rules, standards and social norms. Patent	6+4=10

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	rights are usually enforced by the judicial courts. The Court of Law has the authority to stop patent infringement. However, the main responsibility for monitoring, identifying and taking action against infringers of a patent lies with the patent owner.	
Q6 a	Explain about the assessment of novelty. Ans) **(10 marks)** Not part of 'State of the Art'. The innovation claimed in the patent application is new and not known to anybody in Invention is the creation of a new idea or concept. Innovation is the process of translating an invention into commercial entity or widespread use the world. In other words, the innovation is a) not in the knowledge of the public, b) not published anywhere through any means of publication and c) not be claimed in any other specification by any other applicant.	10
Q6 b	Brief about the patent procedure in India. **Ans)** **(Flowchart – 6 marks)**	6+4=10

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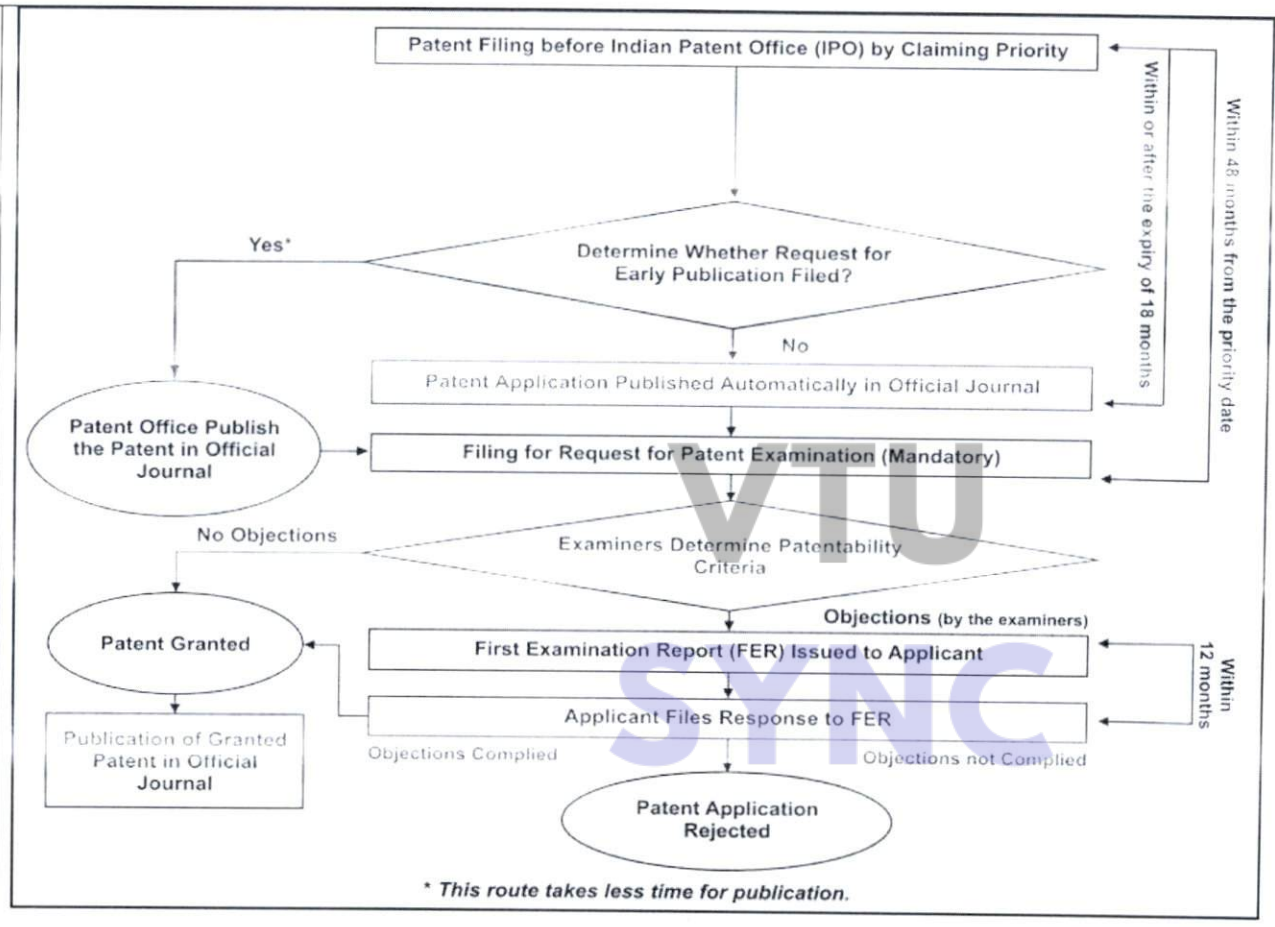

The process of granting a patent involves several steps. These steps are as follows: (4 marks)

i. Prior Art Search
ii. Choice of Application to be Filed
iii. Patent Application Forms
iv. Jurisdiction of Filing Patent Application
v. Publication
vi. Pre-grant Opposition
vii. Examination
viii. Grant of a Patent

	ix. Validity of Patent Protection x. Post-grant Opposition	
Q7 a	Mention and brief about the justification of copyright law. **Ans) (10 marks)** Copyright is a right given by the law to creators of literary, dramatic, musical and artistic works and producers of cinematograph films and sound recordings. In fact, it is a bundle of rights including, inter alia, rights of reproduction, communication to the public, adaptation and translation of the work. There could be slight variations in the composition of the rights depending on the work. Copyright ensures certain minimum safeguards of the rights of authors over their creations, thereby protecting and rewarding creativity. Creativity being the keystone of progress, no civilized society can afford to ignore the basic requirement of encouraging the same. Economic and social development of a society is dependent on creativity. The protection provided by copyright to the efforts of writers, artists, designers, dramatists, musicians, architects and producers of sound recordings, cinematograph films and computer software, creates an atmosphere conducive to creativity, which induces them to create more and motivates others to create.	10
Q7 b	Explain about the basic concepts of under lying copyright law. **Ans) (10 marks)** "Copyrights" refer to the legal rights provided by law to the original creator of the work in the fields of literature and computer software. The "Related Rights" encompass the author's work in the fields of dramatics, sound recording, film/video recordings, paintings, architecture, etc. Copyrights and Related Rights are one of the categories of IP and governed by the Copyright Act, 1957 of India. This Act provides rights of reproduction, communication to the masses, adaptation and translation of the work.	10
Q8 a	Brief about the various representation of sound recordings. **Ans)** Out of syllabus	
Q8 b	Explain about TRIPS agreement in detail. **Ans) Out of syllabus**	
Q9 a	Explain about the justification of protection designs. **Ans)** o The word "design" is defined as the features of shape, configuration, pattern, ornament, or composition of lines or colors applied to any article. o The Design may be of any dimension i.e. one or two or three dimensional or a combination of these.	2x5=10

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	o An industrial design right protects only the appearance or aesthetic features of a product, it does not protect the technical or functional features of a product. o In addition, it may be created by any industrial process or any means, that appeals to and is judged solely by the eye in the finished article. o The main object of the registration of industrial Designs is to protect and incentivize the original creativity of the originator and encourage others to work towards the art of creativity.	
Q9 b	Brief about the excluded subjected matter in the context of design protection. **Ans)** ➢ Any Industrial Design which is against public moral values. **(1 mark)** ➢ Industrial Designs including flags, emblems or signs of any country. **(1 mark)** ➢ Industrial Designs of integrated circuits. **(1 mark)** ➢ Any Design describing the "process of making of an article". Industrial Designs of – books, calendars, certificates, forms and other documents, dressmaking patterns, greeting cards, leaflets, maps and plan cards, postcards, stamps, medals. **(3 marks)** ➢ The artistic work defined under Section 2(c) of the Copyright Act, 1957 is not a subject matter for registration for Industrial Designs, such as: **(3 marks)** • Paintings, sculptures, drawings including a diagram, map, chart or plan. • Photographs and work of architecture. • Any other work related to artistic craftsmanship. ➢ Industrial Designs does not include any Trademark (The Designs Act, 2000). **(1 mark)**	1+1+1+3 +3+1=10
Q 10a	What are the rights of the owner of designs? Explain. **Ans)** The Design registration also confers a monopolistic right to the Proprietor by which he can legally exclude others from reproducing, manufacturing, selling, or dealing in the said registered Design without his prior consent. The Design registration is particularly useful for entities where the shape of the product has aesthetic value and the entity wishes to have exclusivity over the said novel and original Design applied to its product(s) or article(s). (4 marks) Once the applicant has been conferred with the rights over a specific Design, he has the right to sue the person (natural/entity) if the pirated products of his registered design are being used. He can file the infringement case in the court (not lower than District Court) in order to stop such exploitation and for claiming any damage to which the registered proprietor is legally entitled. The court will ensure first that the Design of the said product is registered under the Designs Act, 2000. If the Design is found not registered under the Act, there will not be legal action against the	4+6=10

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	infringer. If the infringer is found guilty of piracy or infringement, the court can ask him to pay the damage (₹ 50,000/-) in respect of infringement of one registered Design. **(6 marks)**	
Q 10b	Brief about the Assignment of Design rights. **Ans)** Out of syllabus	

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