

JEPPIAAR ENGINEERING COLLEGE

DEPARTMENT OF BIOTECHNOLOGY

B.TECH /BATCH (2015-2019): IV YEAR /VII SEM



QUESTION BANK

**BT6703 – CREATIVITY, INNOVATION AND NEW PRODUCT
DEVELOPMENT (R-2013)**

Compiled By

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BT6703 CREATIVITY, INNOVATION AND NEW PRODUCT DEVELOPMENT

OBJECTIVE:

To impart the knowledge of various aspects of Creativity, Innovation and New Product Development

UNIT I INTRODUCTION 9

The process of technological innovation - factors contributing to successful technological innovation - the need for creativity and innovation - creativity and problem solving - brainstorming - different techniques

UNIT II PROJECT SELECTION AND EVALUATION 9

Collection of ideas and purpose of project - Selection criteria - screening ideas for new products evaluation techniques)

UNIT III NEW PRODUCT DEVELOPMENT 9

Research and new product development - Patents - Patent search - Patent laws-International code for patents - Intellectual property rights (IPR).

UNIT IV NEW PRODUCT PLANNING 9

Design of proto type - testing - quality standards - marketing research introducing new Products

UNIT V MODEL PREPARATION & EVALUATION 9

Creative design - Model Preparation - Testing - Cost evaluation – Patent application

TOTAL: 45 PERIODS

COURSE OUTCOME:

On completion of the course, students will have gained knowledge on various issues related to Patents, Quality, Creativity, Innovation, New Product Development, Planning and Evaluation.

TEXT BOOKS:

1. Twiss, Brian. "Managing Technological Innovation", Pitman Publishing Ltd., 1992.
2. Watton, Harry B. "New Product Planning", Prentice Hall Inc., 1992.

REFERENCES:

1. Nystrom, Harry "Creativity and Innovation", John Wiley & Sons, 1979.
2. Khandwalla, N. – "Fourth Eye (Excellence through Creativity) - Wheeler Publishing", 1992.
3. I.P.R. Bulletins, TIFAC, New Delhi, 1997.

LESSON PLAN

S. No.	Title	Reference Book	Page No.
UNIT I INTRODUCTION (9)			
1.	The process of technological innovation (2)	Twiss, Brian. “Managing Technological Innovation”, Pitman Publishing Ltd., 1992.	Pg No
2.	Factors contributing to successful technological innovation(2)		1-25
3.	The need for creativity and innovation (2)		
4.	Brainstorming (2)		
5.	Brainstorming Different techniques (1)		
UNIT II PROJECT SELECTION AND EVALUATION (9)			
1.	Collection of ideas and purpose of project (4)	Twiss, Brian. “Managing Technological Innovation”, Pitman Publishing Ltd., 1992.	Pg No
2.	Selection criteria (3)		89-118
3.	Screening ideas for new products (evaluation techniques) (2)		
UNIT III NEW PRODUCT DEVELOPMENT (9)			
1.	Research and new product development	Twiss, Brian. “Managing Technological Innovation”, Pitman Publishing Ltd., 1992.	Pg No
2.	Patents, Patent search, International code for patents, Intellectual property rights (IPR).		119-145

UNIT IV NEW PRODUCT PLANNING (9)

1.	Design of proto type, Testing, (3)	Twiss, Brian. “Managing Technological Innovation”, Pitman Publishing Ltd., 1992.	Pg No 145-172
2.	Quality standards, Marketing research introducing new Products (6)		

UNIT V MODEL PREPARATION & EVALUATION (9)

1.	Creative design (2)	Twiss, Brian. “Managing Technological Innovation”, Pitman Publishing Ltd., 1992.	Pg No 202-234
2.	Model Preparation (2)		
3.	Testing (1)		
4.	Cost evaluation (2)		
5.	Patent application (2)		

PART A

UNIT I INTRODUCTION

The process of technological innovation - factors contributing to successful technological innovation - the need for creativity and innovation - creativity and problem solving - brainstorming - different techniques

1. Difference between creativity and Innovation Nov/Dec 2016, Nov/Dec 2017

Creativity is the capability or act of conceiving something original or unusual, Innovation is the implementation of something new. Invention is the creation of something that has never been made before and is recognized as the product of some unique insight.

2. What is meant by Brain storming Nov/Dec 2016, Nov/Dec 2017

Brainstorming is a group problem-solving method that involves the spontaneous contribution of creative ideas and solutions. This technique requires intensive, freewheeling discussion in which every member of the group is encouraged to think aloud and suggest as many ideas as possible based on their diverse knowledge. Brainstorming combines an informal approach to problem-solving with lateral thinking, which is a method for developing new concepts to solve problems by looking at them in innovative ways. Some of these ideas can be built into original, creative solutions to a problem, while others can generate additional ideas.

3. What is meant by a compelling case for innovation? Nov/Dec 2016

Unless people understand why innovation is necessary, it always loses to core business or the performance engine in the battle for resources. The performance engine is bigger, is the center of power, and can justify resources based on short term financial results. So the case for innovation has to be made, and it better be compelling.

4. Comment on Open-minded exploration of the marketplace drivers of innovation.

Organizational change is driven by marketplace factors: customers, competition, government regulation, and science and technology. Only by exploring these drivers of change can a company begin to recognize what it must do to be relevant in its envisioned future.

5. Difference between creativity and Innovation

Creativity is the capability or act of conceiving something original or unusual, Innovation is the implementation of something new. Invention is the creation of something that has never been made before and is recognized as the product of some unique insight.

6. Comment on creativity classification

Creativity techniques can be classified on the basis of two sets of principles:

1. Working principles contained in the techniques

2. Applied triggering principles

7. Comment on Management of Technology Issues

Management of Technology involves many issues such as
The process of innovation in the firm• The strategic management of R & D The reduction of new product development times• The effective use of information system and technologies• The effect of new technologies on strategies of the firm• Moving into new technologies timing and choice• Internal technology venturing• Strategic alliances for technology acquisition and product development• High tech marketing• Risk management of technological projects• Development of new competencies

8. Comment on Creativity and Innovation

There is a distinction between creativity and innovation. It can be said that creativity results in innovation. In other words, creativity is idea phase and innovation is action phase. “The underlying element in all innovation is creativity” According to American Heritage Dictionary (1994) “Innovation is the act of introducing something new”. In this definition, the word “new” relates to creativity and the term “act of introducing” relates to innovation. One author has noted:- $\text{Innovation} = \text{Creativity} \times \text{Risk Taking}$

9. Comment on the difference between Invention and Innovation

The distinction between invention and innovation is very similar to the distinction between creativity and innovation. While invention is a creation of new product or service or process, innovation is the introduction of new product or service or process into the market place.

Invention may have economic or non economic motives. Innovation has always economic motives. Invention precedes innovation or innovation follows invention. An invention is based on a new idea that is turned into some kind of conceptual model that demonstrates the feasibility of that idea. Innovation is concerned with the development and implementation of new systems, products or services and is typically based on invention.

10. What are the types of Innovation?

Depending upon the impact they make, innovations can be broadly classified as: i) Incremental Innovation ii) Modular Innovation iii) Architectural Innovation iv) Radical Innovation

11. Comment on the factors that affect disruptive innovation

The general belief is that outcomes of innovation efforts are impossible to predict. But Clayton Christensen thinks that it is not so. According to him, even an undesirable outcome has a cause. Outcomes appear random because all the variables that affect successful innovation are not known. If these variables are understood and managed, innovation will be less risky. Christensen classifies the variables into four sets: taking root in disruption, the necessary scope to succeed, leveraging the right capabilities, and disrupting competitors, not customers.

12. Comment on the blocks to creativity

- Mindset blocks to creativity
- Personal blocks to creativity
- Organizational blocks to creativity

13. Define Technological Innovation

The technological innovation system is a concept developed within the scientific field of innovation studies which serves to explain the nature and rate of technological change.

14. What are the roles of design in innovation process?

The role of design in the innovation process is as follows: Design research techniques can be used to help identify new product or market opportunities. The design process is used to both generate ideas and to implement solutions for useful, usable and delightful product, services and environments. Design techniques can be used to communicate innovation and new idea through prototyping and visualization.

15. What are the creative process features?

1. The work environment
2. Traits
3. The four step creative process
4. Brainstorming
5. Divergent thinking

16. What are the stages of creative process?

1) Preparation

The time for research, fact gathering, assembling materials, gathering needed information before the creative act.

2) Incubation

This is the period of gestation, of letting go so that the mind, the unconscious, intuition, and emotion can ponder over the information and put it into its own original perspective.

Dreaming may be a part of this period.

3) Inspiration

The Aha! when the solution, illumination, or discovery either emerges or forces itself through into a coalesced form.

4) Evaluation or confirmation

This is the time to ask, Will it work? Does it hold up next to other theories? Does it logically fit with the original stimulus?

17. Write the process of Innovation features?

- a) Idea generation (Making)
- b) Idea screening (test)
- c) Feasibility (Practically)
- d) and implementation (Completion)

18. What is Creativity?

Creativity is a phenomenon whereby something new and somehow valuable is formed. The created item may be intangible (such as an idea, a scientific theory, a musical composition or a joke) or a physical object (such as an invention, a literary work or a painting).

The dominant factors are usually identified as "the four Ps" — process, product, person and place (according to Mel Rhodes). A focus on *process* is shown in cognitive approaches that try to describe thought mechanisms and techniques for creative thinking. Theories invoking divergent rather than convergent thinking (such as Guilford), or those describing the staging of the creative process (such as Wallas) are primarily theories of creative process.

19. Write the difference between the 3 concepts

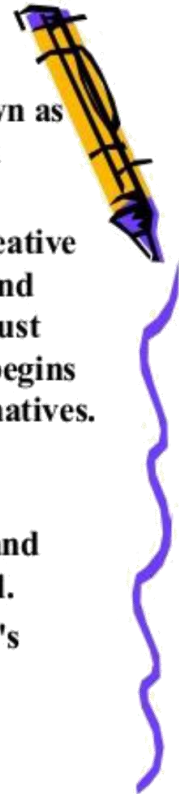
Creativity is the capability or act of conceiving something original or unusual.

Innovation is the implementation of something new.

Invention is the creation of something that has never been made before and is recognized as the product of some unique insight.

WHAT IS CREATIVE PROBLEM SOLVING Process

- The Creative Problem Solving Process (CPS), also known as the Osborn-Parnes CPS process, was developed by Alex Osborn and Dr. Sidney J. Parnes in the 1950s.
- Osborn-Parnes CPS process is different from other "creative problem solving" methods that it uses both divergent and convergent thinking during each process step, and not just when generating ideas to solve the problem. Each step begins with divergent thinking, a broad search for many alternatives. This is followed by convergent thinking, the process of evaluating and selecting.
- Thus CPS is a structured method for generating novel and useful solutions to problems. It is flexible process as well.
- CPS follows three process stages, which match a person's natural creative process, and six explicit steps.

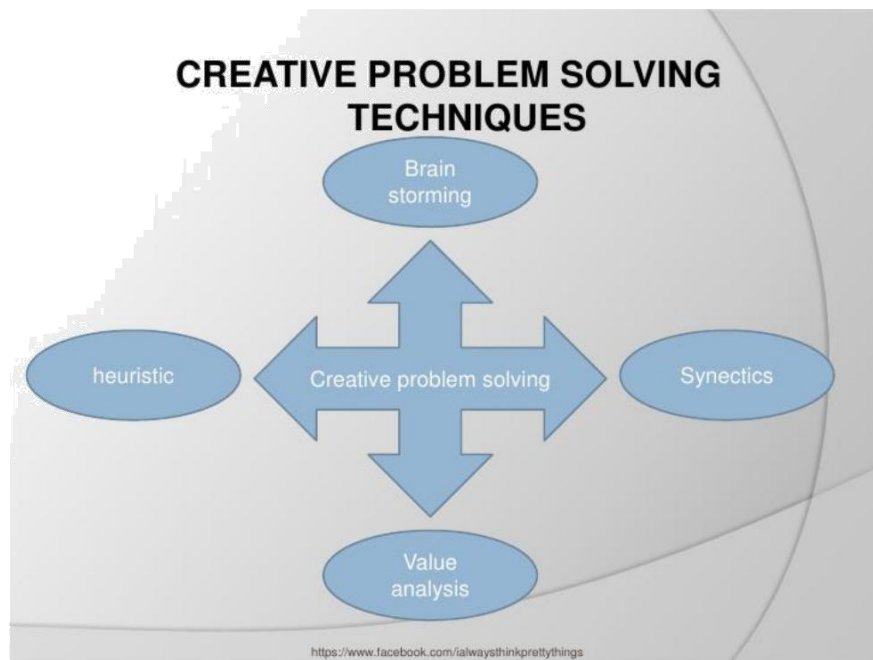


21. What are the characteristic of Brain storming?

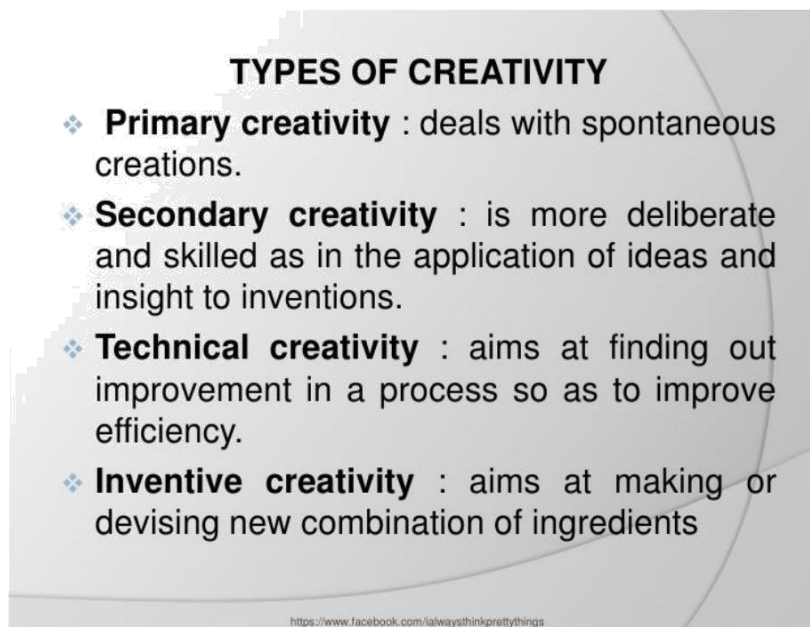
CHARACTERISTICS OF BRAIN STORMING

- ❖ This technique is not suitable where the problem has a unique solution which can be found through analysis or evaluation.
- ❖ brain storming can take place only when there is specific topic.
- ❖ Brain storming results in generation of numerous ideas out of which a few ideas are chosen for in depth investigation.
- ❖ Brain storming provides ample opportunities to participants to put forth various suggestions for solving specific problems.
- ❖ Brain storming enables participation to freely share different ideas.

22. Comment on the creative problem solving technique



23) What are the types of creativity?



24. Comment on Brain Storming

25. Comment on the six steps for CPS

- ❖ **Brain storming** : in this group members or individuals are encouraged to spell out maximum number of possible solutions of a specific or stated problem. Under brain storming more emphasis is laid on the number of possible solutions or ideas.



Creativity* Teamwork* Problem Solving

Six steps to Creative Problem Solving!

Explore the Challenge	1. Objective Finding (identify the goal, wish or challenge) 2. Fact Finding (gather the relevant data) 3. Problem Finding (clarify the problems that need to be solved in order to achieve the goal)
Generate Ideas	4. Idea Finding (generate ideas to solve the identified problem) 5. Solution Finding (move from idea to implementable solution)
Prepare for Action	6. Acceptance Finding (plan for action)

PART B

UNIT I INTRODUCTION

1. Discuss about the factors involved in successful technological innovation.
Nov/Dec 2017

Ans: Twiss, Brian.Pg No: 11-15

2. Write on the various aspects under Creativity and Innovation in a broader view. **Nov/Dec 2015, Nov/Dec 2016** . Ans: Twiss, Brian.Pg No: 36-42

3. Detailed note on techniques involved in Creative Problem Solving. **Nov/Dec 2015,Nov/Dec 2017**
Ans: Twiss, Brian.Pg No: 45-67

4. Give an elaborate note on the different techniques in brain storming and how problems are solved by this. **Nov/Dec 2016**. Ans: Twiss, Brian.Pg No: 55-65

5. Discuss the different techniques used for brain storming issues.
Ans: Twiss, Brian.Pg No: 67-73

UNIT II PROJECT SELECTION AND EVALUATION

Collection of ideas and purpose of project - Selection criteria - screening ideas for new products evaluation techniques

PART A

1. What is meant by Project and give methods for the evaluation of the same. Nov/Dec 2017

Many scholars have defined the term project in different ways. Below are some of the definitions:

- Any single activity that involves expenditure and yields returns and about which a decision must be made.
- A onetime set of activities involving the use of human, material and financial resources to achieve a given result in a specific period of time.
- A planned undertaking or set of activities, which an individual, group, organisation or country carries out within a given time frame work and budget.
- A set of activities, which aim at achieving specific objectives within a stipulated period of time and budget.

2. What are the principal factors to be considered during project evaluation? Nov/Dec 2017

- Specific objectives
- Planned undertaking
- Set of interrelated and coordinated activities
- Budget
- Time

3. What are the two main objectives for initiating a project? Nov/Dec 2016

1. What are the reasons for doing the project and the Benefits and Risks?

Scope: What is to be done and what will not be included?

2. When can the products be delivered?

Scope: How can it be ensured that quality will be achieved?

4. Mention any two evaluation techniques for selecting new products? Nov/Dec 2016

1. To evaluate design and its perceived use during the different stages of design process and to define operations of a product/system and identify users' needs.
2. To identify users' needs Mock-up evaluation and to evaluate a design, user's expertise level and understand users' concept of products.

5. Comment on Project Planning Assessment Nov/Dec 2015

Planning

- Step 1 Set the focus, refine the issue(s) and identify the stakeholder(s)
- Step 2 Establish the planning team
- Step 3 Draft a plan for carrying out the needs assessment
- Step 4 Use the TOP model to direct data collection efforts
- Step 5 Gauge the likelihood of project success through opportunity assessment
- Step 6 Define participants in the needs assessment
- Step 7 Design data collection strategies

Data Collection

- Step 8: Determine sampling scheme
- Step 9: Design and pilot data collection instrument(s)
- Step 10: Gather and record data

Data Analysis, Data Reporting, and Priority Setting

- Step 11: Perform data analysis
- Step 12: Determine priorities and identify potential solutions
- Step 13: Synthesize information and create a report

A project can now be defined as "A planned undertaking or set of interrelated or coordinated activities meant to achieve specific objectives within a stipulated period of time and budget."

6. Write notes on Project Identification Steps Nov/Dec 2015

Project identification is the basic phase of the project development cycle. It begins with the conceiving of ideas or intentions to set up a project. This phase involves collecting, processing and analyzing data on problem/needs of the areas/community/organization. The data/ information generated during this stage / phase provides a basis for the next or second stage of the project cycle.

The technical officers, will identify the problem statement and using the problem tree analysis, solutions to priority problems/needs are sought and it is from these solutions that a project may be identified to address the problems/needs.

7. Comment on Project Preparations

This is the second stage of the project cycle. It is also referred to as: Project Write-up/Project Design/Project formulation. It involves analyzing the information from the identification stage in details to formulate a project document. The economic, financial, social, ecological data are analyzed and the results documented. These dimensions are summarized under the project elements such as background and context, project description, objectives, outputs, activities, inputs, budget, organization and management etc.

The preparation stage results in designing project documents namely;

- The project proposal – for simple and small-scale projects.
- Business plan – for commercial projects.
- Feasibility study – for complex and large scale projects
- Pre-feasibility study – conducted to precede the feasibility study.

8. Comment on Project Presentation

Project presentation involves the forwarding or handing over the project document to the proposed financing agency. An introductory letter accompanies it designed by the implementing agency or organization seeking funds.

9. Write notes on Project Appraisal

After the project has been presented to the financing agency, arrangements are made by the financing agency to have the project appraised. This is the assessment or in depth analysis or examination of all the aspects of the project namely technical, financial, commercial, community participation, socio-economic benefits, organization and management, environmental impact, political risks, project sustainability and replicability.

In the process of appraisal, the appraisal team is to establish whether the project is possible (feasible) or worthwhile (viable). An appraisal report is then prepared and it serves as a basis for negotiation with the agency that requested for financing.

10. Comment on Project Selection, Negotiation and Approval

This involves reviewing of the appraisal report and selection of the most appropriate project. This goes with obtaining formal government approval of credit arrangements (where necessary), funding authorization and preparation of loan documents.

This also forms part of project negotiation. At this level, the implementing and financing agencies draw up a formal implementation or operation plan. Once all these are done and are acceptable to both parties then, the project is approved and funds and other resources are committed for the implementation of the project.

11. Write the steps for The Project Planning and Implementation Process

(Re) assess need and capability Step 1. Establish the project planning team Step 2. Develop project goals and objectives Step 3. Develop a logic model Step 4. Select and characterize the audience Step 5. Establish program format and delivery system Step 6. Ensure quality instructional staff Step 7. Ensure quality instructional materials and strategies Step 8. Assemble materials, resources, and facilities Step 9. Plan for emergencies Step 10. Promote, market, and disseminate project Step 11. Implement project Step

12. What is meant by Project Implementation / Management

Project implementation begins when resources are committed to the project. Implementation is the stage when the project proposal is transformed into the actual project or reality. It is in short, putting into practice the plans that had earlier on been appraised following the already laid down time table or work plan. It leads to the realization of project outputs and immediate objectives.

It involves 2 levels:

- a) Project activation
- b) Project operation

Project activation involves the coordination and allocation of resources to make the project operational.

13. Write note on Project activation Steps

- Establishment of Project Implementation Units (PIUs)
- Recruitment of project manager and other staff.
- Procurement of supplies
- Preparation of contingency plans
- Designation of the internal projects authorities for decision-making and establishment of communication channels.
- Putting in place staff training and development programmes.
- Establishment of linkages with the target group.
- Formulation of evaluation plans.

Project operation is the level when the actual implementation takes place i.e. when the project reaches its full development and normal life. At this level, the inputs are transformed into outputs via activities.

14. What is meant by Project Monitoring and Supervision?

Project Monitoring is carried out during the implementation stage of the project cycle. It is a continuous assessment or review and surveillance by the project management at every level of the hierarchy of the implementation of the project to check on the progress of the project by ensuring that input and material deliveries, work schedules, targeted outputs and other required actions are proceeding according to plan.

In simple terms, “Keeping track of events in relation to **work plan** and **targets**. The basic purpose of project monitoring is to achieve efficient and effective project performance by providing a feed back to the project management at all levels. This enables the management to improve operational plans and take timely corrective action in case of constraints or short falls. Monitoring is part of the Management Information System (MIS) and an internal activity.

15. How is Project Monitoring carried out?

It is done on the basis of:

- Periodic reports
- Regular project management and staff meetings
- Observations
- Field visits and inspection

Outsiders like the donor/financing agency, relevant government departments, beneficiaries and other stakeholders on the other hand can simply refer to project supervision as external monitoring because it is the overseeing of project execution.

16. What is meant by Project Evaluation?

This is a process of determining systematically and objectively the relevance, efficiency, effectiveness and impact of the project in light of its objectives. The question to be asked is, “Has the project achieved its objectives?”

Evaluation is a more comprehensive review, assessment and critical analysis not only of the project results, but also the initial assumptions underlying the project elements including the relevance of the problem statement.

17. Comment on the characteristics of projects

While projects may have much in common, they may still differ from each other in significant ways;

I. Duration

Some projects may take just months to implement while others may take many years to implement. A broiler chicken project may take two months to accomplish while a mahogany tree growing project may take up to 30 years.

II. Financial Requirements

Some projects need limited initial capital while others require a heavy initial investment e.g. a hydroelectric dam. Some projects are implemented using money generated from their parent organizations while others require external assistance in form of loans, donations/grants, and credit. With some projects there is a onetime initial investment while others the investment may be spread over the life period of the project in form of working capital.

III. Geographical Scope

While some projects are located in one spot, others may have many offices over a wide area e.g. poverty alleviation project (PAP) which has offices in every district.

IV. Repetition/Replication

Some projects are implemented once and are not duplicated. Others are repeated in the same place or for the same beneficiaries (project duplication) while others are implemented elsewhere for different beneficiaries (project replication).

V. Breadth of Purpose

Not all projects focus on a single objective. Some are multi-purpose and involve many agencies and target groups such as settlement schemes or integrated rural development projects.

VI. Urgency of Need

For some project there is no time to go through all the steps of planning before implementing the project e.g. relief projects which are meant to address disasters such as famine, disease outbreaks like cholera, displacement due to war, floods earthquakes.

18. Comment on Project Planning:

Thinking and working out what to do about something before it happens.

To look ahead, to prepare now what to be done and accomplish in future.

It is a process of generating and organizing ideas for purposes of accomplishing desired objectives.

It is a four set process of STOP-THINK-DECIDE-AND ACT.

- It involves predicting and making a forecast into the future.
 - (i) Planning is a pre-requisite for development.
 - (ii) Planning aids decision-making and helps to take actions that give desired results.
 - (iii) Proper planning enables us to do things efficiently and effectively.

Project Planning

It is looked at as, “Arrangements for setting up and implementing project and it involves tracing the life history of the project right from the beginning to the end (project development cycle).”

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Evaluation is a more comprehensive review, assessment and critical analysis not only of the project results, but also the initial assumptions underlying the project elements including the relevance of the problem statement.

25. Comment on Project Evaluation

Project evaluation is a process of collecting, recording and organising information about project results and lessons learned for future projects which are captured during the Closure phase.

Project evaluation is important to answer the following questions:

- What progress has been made?
- Were the desired outcomes achieved?
- Do the project results justify the project inputs?
- How has the project improved patient and staff experience?

Project evaluation

Evaluation of Performance

- Evaluation of Management and process of project

Cost Overruns

- When actual cost exceeds budgeted cost.

Hindsight

- To discover instances where “right” decision was not made.

Evaluation of Results

- Whether the project achieved its objective. It might take many years to completely evaluate a project. Unless action can be taken based on analysis there is no point in evaluating a project

PART - B

UNIT II PROJECT SELECTION AND EVALUATION

1. Develop a model business plan of your own interest **Nov/Dec 2017** Ans: Twiss, Brian. Pg No: 156-167
2. Explain in detail the basic elements of a business plan **Nov/Dec 2017** Ans: Twiss, Brian. Pg No: 324-330
3. Write in detail on the various criteria and measures to be adopted in selection of project **Nov/Dec 2016** Ans: Twiss, Brian. Pg No: 56-78
4. In what ways are the collected ideas screened and scrutinized for proposing a project? **Nov/Dec 2016**
Ans: Twiss, Brian. Pg No: 112-123
5. Evaluate the selection criteria for selection of projects.
Ans: Twiss, Brian. Pg No: 125-135
6. Describe various screening ideas for new products evaluation.
Ans: Twiss, Brian. Pg No: 134-145
7. Comment on the various product evaluation techniques used for selection.
Ans: Twiss, Brian. Pg No: 154-165
8. Write an overall view about the criteria's involved for selection of projects.
Ans: Twiss, Brian. Pg No: 175-187

UNIT III NEW PRODUCT DEVELOPMENT

Research and new product development - Patents - Patent search - Patent laws-International code for patents - Intellectual property rights (IPR).

1. Define the terms a) research b) patent .Nov/Dec 2017

Research: Six steps to research process includes: 1. Generating the ideas: 2. Test the Concepts: 3. Size of Opportunity: 4. Prototype Testing: 5. Launch Plan: 6. Pricing Strategy:

Patent: A patent is a set of exclusive rights granted by a sovereign state or intergovernmental organization to an inventor or assignee for a limited period of time in exchange for detailed public disclosure of an invention. An invention is a solution to a specific technological problem and is a product or a process. Patents are a form of intellectual property.

2. Define Intellectual Property. Nov/Dec 2107

Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works, designs, and symbols, names and images used in commerce. IP is protected in law by, for example, patents, copyright and trademarks, which enable people to earn recognition or financial benefit from what they invent or create.

3. Define the term Patent. Nov/Dec 2016

A form of protection that provides a person or legal entity with exclusive rights for making, using or selling a concept or invention and excludes others from doing the same for the duration of the patent

4. Expand IPR and what do you mean by that term .Nov/Dec 2016

Intellectual Property Rights (IPR) is a category of property that includes intangible creations of the human intellect, and primarily encompasses copyrights, patents, and trademarks. It also includes other types of rights, such as trade secrets, publicity rights, moral rights, and rights against unfair competition.

5. Comment on New product Development (NPD) Nov/Dec 2015

A company can develop a new product by two ways (1) Acquisition and (2) NPD

Acquisition: To buy a patent or license to produce other's product

New product Development (NPD): A new product means original products, product improvements and modification and new brand that a firm develops through his own efforts and research. There are 6 stages of NPD: Idea generation, Idea Screening, Business Analysis, Product Development, Testing Market and Commercialization.

6. What are the attributes for a new product to succeed? Nov/Dec 2015

For a new product to succeed it must have:

- desirable attributes
- be unique
- have its features communicated to the consumer (mkt support necessary)
- Developing new products is expensive and risky. Failure not to introduce new products is also risky.

7. Developing New Products is classified into which stream?

A new product can be:

- Continuous Innovation...No new buyer behavior to learn, i.e. -products not previously marketed by the firm, but by others
- Dynamic Continuous Innovation...minor education needed for consumers to adopt product
- Discontinuous Innovation...entirely new consumption patterns

8. Why New Products Fail

- Lack of differentiating advantage
- Poor marketing plan
- Poor timing
- Target market too small
- Poor product quality
- No access to market

9. What are the conditions to be considered for NPD?

Need to consider:

the speed of acceptance among consumers and channel members;
intensity of distribution,
production capabilities,
promotional capabilities
prices, competition,
time period to profitability and commercialization costs.

10. Comment on Buyers' Product Adoption Process

1. *Awareness*

Buyers become aware of the product

2. *Interest*

Buyers seek information and are receptive to learning about product

3. *Evaluation*

Buyers consider product benefits and determine whether to try it

4. *Trial*

Buyers examine, test or try the product to determine usefulness relative to needs

5. *Adoption*

Buyers purchase the product and can be expected to use it when the need for the general type of product arises.

11. Comment on Copyrights.

A copyright gives the creator his/her original work exclusive rights to it, usually for a limited time. Copyright may apply to a wide range of creative, intellectual, or artistic forms, or "works". Copyright does not cover ideas and information themselves, only the form or manner in which they are expressed.

12. Write notes on Industrial design rights.

An industrial design right (sometimes called "design right" or *design patent*) protects the visual design of objects that are not purely utilitarian. An industrial design consists of the creation of a

shape, configuration or composition of pattern or color, or combination of pattern and color in three-dimensional form containing aesthetic value. An industrial design can be a two- or three-dimensional pattern used to produce a product, industrial commodity or handicraft. Generally speaking, it is what makes a product look appealing, and as such, it increases the commercial value of goods.

13. Comment on Plant breeder's right varieties.

Plant breeders' rights or plant variety rights are the rights to commercially use a new variety of a plant. The variety must amongst others be novel and distinct and for registration the evaluation of propagating material of the variety is considered.

14. Write notes on Trademarks?

A trademark is a recognizable sign, design or expression which distinguishes products or services of a particular trader from the similar products or services of other traders.

15. What is meant by Trade dress?

Trade dress is a legal term of art that generally refers to characteristics of the visual and aesthetic appearance of a product or its packaging (or even the design of a building) that signify the source of the product to consumers.

16. What are Trade Secrets?

A trade secret is a formula, practice, process, design, instrument, pattern, or compilation of information which is not generally known or reasonably ascertainable, by which a business can obtain an economic advantage over competitors and customers. There is no formal government protection granted; each business must take measures to guard its own trade secrets (e.g., Formula of its soft drinks is a trade secret for Coca-Cola.)

17. Comment on Patent Infringement

Patent infringement typically is caused by using or selling a patented invention without permission from the patent holder. The scope of the patented invention or the extent of protection is defined in the claims of the granted patent. There is safe harbor in many jurisdictions to use a patented invention for research. This safe harbor does not exist in the US unless the research is done for purely philosophical purposes, or in order to gather data in order to prepare an application for regulatory approval of a drug.

18. Write note on Copyright Infringement

Copyright infringement is reproducing, distributing, displaying or performing a work, or to make derivative works, without permission from the copyright holder, which is typically a publisher or other business representing or assigned by the work's creator. It is often called "piracy". While copyright is created the instant a work is fixed, generally the copyright holder can only get money damages if the owner registers the copyright. Enforcement of copyright is

generally the responsibility of the copyright holder. The ACTA trade agreement, signed in May 2011 by the United States, Japan, Switzerland, and the EU, and which has not entered into force, requires that its parties add criminal penalties, including incarceration and fines, for copyright and trademark infringement, and obligated the parties to active police for infringement. There are limitations and exceptions to copyright, allowing limited use of copyrighted works, which does not constitute infringement. Examples of such doctrines are the fair use and fair dealing doctrine.

19. What is meant by Trademark Infringement?

Trademark infringement occurs when one party uses a trademark that is identical or confusingly similar to a trademark owned by another party, in relation to products or services which are identical or similar to the products or services of the other party. In many countries, a trademark receives protection without registration, but registering a trademark provides legal advantages for enforcement. Infringement can be addressed by civil litigation and, in several jurisdictions, under criminal law.

20. What is meant by Trade Secret Misappropriation?

Trade secret misappropriation is different from violations of other intellectual property laws, since by definition trade secrets are secret, while patents and registered copyrights and trademarks are publicly available. In the United States, trade secrets are protected under state law, and states have nearly universally adopted the Uniform Trade Secrets Act.

21) What is meant by IPC?

The International Patent Classification (IPC), established by the Strasbourg Agreement 1971, provides for a hierarchical system of language independent symbols for the classification of patents and utility models according to the different areas of technology to which they pertain.

22) What is Espacenet?

Espacenet (formerly often written as *esp@cenet*) is a free online service for searching patents and patent applications. Espacenet was developed by the European Patent Office (EPO) together with the member states of the European Patent Organization. Most member states have an Espacenet service in their national language, and access to the EPO's worldwide database, most of which is in English. In 2015, the Espacenet worldwide service claimed to have records on more than 90 million patent publications.

23) What is meant by Patent Classification?

A **patent classification** is a system for examiners of patent offices or other people to categorize (code) documents, such as published patent applications, according to the technical features of their content. Patent classifications make it feasible to search quickly for documents about earlier disclosures similar to or related to the invention for which a patent is applied for, and to track technological trends in patent applications.

24) What is patent classification?

Searches based on patent classifications can identify documents of different languages by using the codes (classes) of the system, rather than words. Patent classification systems were originally developed for sorting paper documents, but are nowadays used for searching patent databases.

25) What is meant Prior Art?

Prior art is any evidence that your invention is already known. **Prior art** does not need to exist physically or be commercially available. It is enough that someone, somewhere, sometime previously has described or shown or made something that contains a use of technology that is very similar to your invention.

PART B

1. Discuss about developing a marketing strategy for a business **Nov/Dec 2017**.
Ans: Twiss, Brian. Pg No: 234-238
2. Explain in detail about staffing needs, recruiting and hiring employees. **Nov/Dec 2017**. Ans: Twiss, Brian. Pg No: 345-349
3. Explain the role and significance of IPR in newer product development **Nov/Dec 2016**
Ans: Twiss, Brian. Pg No: 456-459
4. Discuss in detail on International Code of Patents. **Nov/Dec 2016**
Ans: Twiss, Brian. Pg No: 678-680
5. Comment on research and new product development. **Nov/Dec 2015**
Ans: Twiss, Brian. Pg No: 165-178
6. Describe the patents and patent search. **Nov/Dec 2015**.
Ans: Twiss, Brian. Pg No: 145-155
7. Explain patent laws and product development. Ans: Twiss, Brian.
Pg No: 178-187
8. Describe International code for patents.
Ans: Twiss, Brian. Pg No: 168-195

UNIT IV NEW PRODUCT PLANNING

Design of Prototype - Testing - Quality Standards - Marketing research introducing new Products.

PART A

1. Define Prototype. What are the characteristic features required for designing prototype product? Nov/Dec 2017

A prototype is an example that serves as a basis for future models. Prototyping gives designers an opportunity to research new alternatives and test the existing design to confirm a product's functionality prior to production.

A prototype has many benefits, such as the developer and the implementer getting valuable feedback from the user even before the actual project is started. The actual process of creating prototype involves the following steps:

- Identify Basic Requirements: Basic requirements are determined, including input and output data needed.
- Initial Prototype Creation: The initial prototype is created.
- Review: The clients and the end-users verify the prototype and provide valuable feedback on additions or deletions. Also necessary changes are made to the final product.
- Revise and Improve the Prototype: Using the feedback from the client and end user, both the specifications and the prototype can be changed accordingly and improved. If changes are incorporated, a repeat of steps #3 and #4 may be required.

2. Define new product development with suitable examples Nov/Dec 2017

- **Internal sources** – many companies give incentives to their employees to come up with workable ideas.
- **SWOT analysis** – Company may review its strength, weakness, opportunities and threats and come up with a good feasible idea.
- **Market research** – Companies constantly reviews the changing needs, wants, and trends in the market.
- **Customers** – Sometimes reviews and feedbacks from the customers or even their ideas can help companies generate new product ideas.
- **Competition** – Competitors SWOT analysis can help the company generate ideas.

3. What do you mean by Prototype? Nov/Dec 2106

A **prototype** is an early sample, model, or release of a product built to test a concept or process or to act as a thing to be replicated or learned from. It is a term used in a variety of contexts, including semantics, design, electronics, and software programming. A prototype is generally used to evaluate a new design to enhance precision by system analysts and users. Prototyping serves to provide specifications for a real, working system rather than a theoretical one.

4. What major steps have to be implemented for market research? Nov/De 2106

Five step marketing research processes includes

Define the Problem. ...
Develop Your Research Plan. ...
Collect Relevant Data and Information. ...
Analyze Data and Report Findings. ...
Take Action.

5. Comment on Prototype Categorization?

Prototype Categorization: There are several different ways to categorize prototypes.

- Features: How many features of the final product does the prototype include?
- Functionality: How much of the functionality of the final product is included in the prototype (for each feature)?
- Interaction: How similar is the interaction with the prototype to the interaction with the final product?
- Design: How similar is the prototype in design to the final product? (color, graphic design,.)

6. Why Prototype?

Why prototype?

- Evaluation and feedback are central to interaction design
- Stakeholders can see, hold, interact with a prototype more easily than a document or a drawing
- Team members can communicate effectively
- You can test out ideas for yourself
- It encourages reflection: very important aspect of design
- Prototypes answer questions, and support designers in choosing between alternatives

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7. Comment on the order of NPD Process



8. Write notes on Low Common Fidelity?

Low-fidelity prototypes often have limited functionality, features and interaction. They are built mostly to depict concepts, design alternatives, or screen layouts. Typical examples of low-fidelity prototypes include storyboards, drawings, paper mockups, etc. There is no clear separation between low-fidelity and high-fidelity prototypes, several different techniques can also be classified as medium-fidelity prototypes.

9. Write notes on High Common Fidelity?

High-fidelity prototypes, in contrast, are typically fully interactive, represent the product's core functionality and are often built with prototyping systems (e. g. Smalltalk, Visual Basic). They are used mostly for exploration and tests of the look and feel of the final product (RSI96). There is no clear separation between low-fidelity and high-fidelity prototypes, several different techniques can also be classified as medium-fidelity prototypes.

10. Write notes on Horizontal prototypes?

It includes the full set of features that will be integrated in the final product but with limited functionality. This prototype is often involved in a simulation of the interface.

11. Write notes on Vertical Prototypes?

A vertical prototype covers only a small set of features but those with full functionality. This prototype is used to evaluate parts of the system in depth, often under real circumstances with real tasks. Scenarios are a mixture of vertical and horizontal prototypes. In a scenario a user is led through the system along one or just a few paths. It only covers as much functionality as is currently needed.

12. What is the pit fall of prototyping?

- Attempt to use prototyping techniques before securing cooperation from all parties involved in the procedure.
- Established management procedures might not involve prototyping.
- Reduction in programming discipline.
- Pressure to later use the prototype as the real-thing (from client or management).
- Overpromising or misleading with the prototype (prototyping something that cannot be included with the available resources).
- Trap of overdesign (too much time is spent on the prototype).
- Depending how the prototype was designed it might be hard to extend.

13. What are the dimensions to be analyzed for prototyping techniques?

Prototyping techniques can be analyzed along four dimensions:

- Representation describes the form of the prototype (e.g., sets of paper sketches or computer simulations).
- Precision describes the level of detail at which the prototype is to be evaluated (e.g., informal and rough or highly polished).
- Interactivity describes the extent to which the user can actually interact with the prototype (e.g., watch only or fully interactive).

Evolution describes the expected life cycle of the prototype (e.g., throw away or iterative).

14. Comment on the 5 steps of Prototype evaluation

5 steps to the evaluation of prototypes: 1. Confirm the Prototype 2. Develop Questions 3. Design Methods 4. Implement & Adapt 5. Make Decisions

15. What Makes Prototype Testing Valuable?

Improve usability early on

Conducting task-based testing helps you understand why users do what they do on your prototype. The longer you wait to test and find how effective your design is the more costly it becomes to make changes to it.

Measure first impressions

Measure and understand users' first impressions of your prototype with Screenshot Click Testing and Screenshot Timeout Testing.

Get your navigation right

Tree Testing and Card Sorting studies ensure your prototype is customized for your target audience. Get your information architecture right the first time!

Validate & improve design decisions

Quantify your prototype experience to validate or improve your design decisions.

Measure your prototype's ease of use or if customers would recommend it to others.

15. Comment on Rapid Prototyping

The goal of rapid prototyping is to develop prototypes quickly, in a fraction of the time it would take to develop a working system. By shortening the prototype-evaluation cycle, the design team can evaluate more alternatives and iterate the design several times, improving the likelihood of finding a solution that successfully meets the user's needs.

16. How rapid is Rapid Prototyping?

How rapid is rapid depends on the context of the particular project and the stage in the design process. Early prototypes (e.g., sketches) can be created in a few minutes. Later in the design cycle, a prototype produced in less than a week may still be considered "rapid" if the final system is expected to take months or years to build. Precision, interactivity, and evolution all affect the time it takes to create a prototype.

17. Comment on Field Prototypes?

Field Prototypes As the investment, risks and stakes of the innovation increase, so does the need to complement user feedback with more structured research on key questions. While direct user feedback is still central in prototypes, the questions and methods tend to be more robust and intensive.

18. What is the goal of Prototype Testing?

The goal of Prototype Testing is to evaluate new designs prior to launch to ensure the designs are clear, easy to use and meet users' expectations. Prototype Testing is best when iterative testing is built into the development process, so changes can be easily made early and often to ensure major issues do not arise just before launch. Prototype Testing also provides confirmation that new design direction, branding and messaging are going in the right direction.

19. Write note on the insights of Prototype Testing.

Prototype Testing can offer insights into multiple UI design, navigation and content areas prior to launch. The content, imagery, look, and feel of a design can be evaluated, as well as the labeling, navigation, and information architecture. Prototype Testing gives clients confidence that the new site or redesign will significantly outperform the current site across key success metrics.

20. Why to evaluate a Prototype?

Evaluating a prototype allows the production costs to be assessed and finalized. Every stage of manufacturing can be scrutinized for potential costs. If the client has set financial limits / restrictions, then alterations to the design or manufacturing processes may have to be made. This may lead to alternative and cheaper manufacturing processes being selected, for future production.

21. Comment on Product Development Phases:

This is a sequence of phases that are designed to deliver the best product in a define-able time.

One hypothetical, generic model for such a launch process might look like the following:

- Concept.
- System level.
- Preliminary design.
- Critical design.
- Test readiness.
- Production readiness.
- Launch.

22. What are the things to inspect during the process of Inspecting?

TIEMPO expands the concept of a Test and Evaluation Master Plan by focusing on staged deliveries of which each product/process release is a superset of the previous release and the test and inspection iterations are coordinated with releases. This can be especially important with systems development or with a multiple of suppliers. Under this plan, we can handle inspections as:

- Code reviews.
- Code releases.
- Design reviews.
- Schematic reviews.

23. What are the two automotive tools?

There are two automotive tools that illustrate the connection between inspection and testing. Those are the Design Failure mode Effects Analysis (DFMEA) and the Process Failure Mode Effects Analysis (PFMEA). These tools facilitate critical reviews of either the design or the processes that produces the designed product (production processes). This tool critiques a particular design or process function using failure modes, causes, effects, and some estimated values.

24. Comment on RPN?

The Risk Priority Number is the product of estimation of the Severity, Probability and Detection of a particular failure. The higher the RPN, the greater the risk to the product design or process. Recommended actions are often testing actions to determine if the estimates of severity, probability and detection are valid or to determine another way to achieve the function. In any case, the results of the DFMEA or PFMEA have an impact on the Design Verification Testing and Production Validation Testing.

25. What is meant by Design Verification Testing (DVT)

In the automotive world, DVT means we use prototype parts, prototype tooling, an unfinished production process, and maybe even hand-made parts. The purpose of DVT is to test out and verify design ideas before proceeding with development.

PART B

1. Describe in detail the various ways to finance your business. Ans: Twiss, Brian. Pg No: 257-187, **Nov/Dec 2017**
2. State how record keeping and accounting could be done to monitor the progress of your business establishment. Ans: Twiss, Brian. Pg No: 157-167, **Nov/Dec 2017**
3. Give a detailed note on the numerous quality standards to be encountered in planning a newer product. Ans: Twiss, Brian. Pg No: 345-350, **Nov/Dec 2016**
4. How the newer products are finally introduced in the market? Explain
Ans: Twiss, Brian. Pg No: 867-870, **Nov/Dec 2016**

5. Elaborate the designing of prototypes with regard to new product planning. Ans: Twiss, Brian. Pg No: 157-187
6. Comment on the different views with regard to testing of new product. Ans: Twiss, Brian. Pg No: 167-177
7. Explain the hypothesis of various quality standards for product planning. Ans: Twiss, Brian. Pg No: 187-195
8. Comment on marketing research in new product planning. Ans: Twiss, Brian. Pg No: 135-145

UNIT V MODEL PREPARATION AND EVALUATION

Creative design - Model Preparation - Testing - Cost evaluation – Patent application

PART A

1. Write any two challenges in patent application process. Nov/Dec 2017

First Challenge: while technology has facilitated online filing, patent application costs remain prohibitive.

Second Challenge: Pre-issuance submissions, post-grant review, and inter-parties review all encompass newly enacted methods under the AIA for a savvy competitor to attack an adversary's patent or patent application, but the options available to a challenger narrow in scope and increase in risk over time.

2. Define NPD and name the five elements used for NPD. Nov/De 2107

The creation of **products** with new or different characteristics offers new or additional benefits to the customer. **Product development** may involve modification of an existing **product** or its presentation, or formulation of an entirely new **product** that satisfies a newly defined customer want or market niche. Five elements include Strategy, organization, concept generation, marketing plan creation, evaluation, and commercialization of a new **product**.

3. What is normal design and creative design? Nov/Dec 2016

Normal design is not based on accurate calculation and it will not satisfy any theory. It could be more simple design whereas the creative design is based on the imagination and it would be more unconventional approach towards design. After imagination, one will approach to satisfy theory and calculations.

4. In what manner are the novel products denoted in a patent application. .Nov/Dec 2016

Novelty: An invention will be considered novel if it does not form a part of the global state of the art. Information appearing in magazines, technical journals, books, newspapers etc, constitutes the state of the art. Oral description of the invention in a seminar/conference can also spoil novelty. Novelty is assessed in a global context. An invention will cease to be novel if it has been disclosed in the public through any type of publications anywhere in the world before filing a patent application in respect of the invention.

5. Write notes on Idea Screening.

Ideas can be many, but good ideas are few. This second step of new product development involves finding those good and feasible ideas and discarding those which aren't. Many factors play a part here, these include –Company's strength, Company's weakness, Customer needs, Ongoing trends, Expected ROI, Affordability, etc.

6. Comment on Product Development

Once all the strategies are approved, the product concept is transformed into an actual tangible product. This development stage of New Product Development results in building up of a prototype or a limited production model. All the branding and other strategies decided previously are tested and applied in this stage.

7. What is meant by Test Marketing?

Unlike concept testing, here the actual prototype is introduced for research and feedback. Actual customer's feedbacks are taken and further changes, if required, are made to the product. This process is of utmost importance as it validates the whole concept and makes the company ready for the launch.

8. Write detailed notes on Commercialization.

The product is ready, so should be the marketing strategies. The marketing mix is now put to use. The final decisions are to be made. Markets are decided for the product to launch in. This stage involves briefing different departments about the duties and targets. Every minor and major decision is made before the final introduction stage of the New Product Development.

9. Comment on Market Evaluation

Seek feedback from customers, employees and partners on which idea is most appealing. Ask customers for feedback via email or phone calls. Send an email to partners and employees and ask which of the products seems most useful or valuable. Whittle the list to just one or two product ideas.

10. Comment on a Creative person

Creativity is a quality that is highly valued, but not always well understood. Those who have studied and written about it stress the importance of a kind of flexibility of mind. Studies have shown that creative individuals are more spontaneous, expressive, and less controlled or inhibited. They also tend to trust their own judgment and ideas--they are not afraid of trying something new.

11 . What is the creative design?

A **Creative Designer** works in areas of marketing and advertising to create various materials, such as product labels or brochures that provide information about a company's offerings. They **design** these materials using paper sketches and digital illustration software.

12. Is there a relationship between creativity and intelligence?

Yes In testing circumstances, an **Intelligence Quotient (IQ)** is gauged by one's ability to utilize information gained historically. **Creativity** is the ability to come up with new ideas through a mental process of connecting existing concepts

13. Comment on the Creative Process in 7 Steps

- **Step 1:** The **Design Brief**. The first **step** in the **creative** portion of the logo **design process** is called the **design brief**. ...
- **Step 2:** Research. ...
- **Step 3:** Brainstorming and Conceptualization. ...
- **Step 4:** Draft Production. ...
- **Step 5:** **Step Back**. ...
- **Step 6:** Client Feedback. ...
- **Step 7:** Delivery.

14. What are the steps in the engineering design process?

The steps of the engineering design process are to:

- Define the Problem.
- Do Background Research.
- Specify Requirements.
- Brainstorm Solutions.
- Choose the Best Solution.
- Do Development Work.
- Build a Prototype.
- Test and Redesign.

15. What is meant by Patent application?

A **patent application** is a request pending at a **patent** office for the grant of a **patent** for the invention described and claimed by that **application**. An **application** consists of a description of the invention (the **patent** specification), together with official forms and correspondence relating to the **application**.

16. How to file a patent application?

Steps to Filing a Patent Application

1. Keep a Careful Record of Your Invention. Record every step of the invention process in a notebook. ...
2. Make Sure Your Invention Qualifies for Patent Protection. ...
3. Assess the Commercial Potential of Your Invention. ...
4. Do a Thorough Patent Search. ...
5. Prepare and File an Application With the USPTO.

17. What types of inventions can be patented?

Biological inventions

carpet designs
clothing accessories and designs
computer software
cosmetics

Business methods

chemical formulas or processes
computer hardware and peripherals
containers
decorative hardware

19. What cannot be patented?

Many things are not open to **patent** protection. The laws of nature, physical phenomena, and abstract ideas are not patentable subject matter. A new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter.

20. How long is a patent protection good for?

A U.S. utility patent, explained above, is generally granted for **20 years** from the date the patent application is filed; however, periodic fees are required to maintain the enforceability of the patent. A design patent is generally granted protection for **14 years** measured from the date the design patent is granted.

21. How are scientific models developed?

Scientific modeling. In **science**, a **model** is a representation of an idea, an object or even a process or a system that is used to describe and explain phenomena that cannot be experienced directly. **Models** are central to what **scientists** do, both in their research as well as when communicating their explanations.

22. What are the three main types of models?

Three main types of models are physical, mathematical, and conceptual. **Models** have limitations but are useful and can be changed based on new evidence. Scientific knowledge is built as scientists form and revise scientific hypotheses, **models**, theories, and laws.

23. What are the types of software testing models?

6 Types of Software Testing Models

- **Waterfall Model.** This is the most basic software development life cycle process which is followed broadly in the industry. ...
- **V Model.** This **model** is widely recognized as superior to waterfall **model**. ...
- **Agile model.** ...
- **Spiral model.** ...
- **Rational Unified Process.** ...
- **Rapid application development.**

24. What are the different methods of testing?

A **software testing** method in which the internal structure/design/implementation of the item being tested is not known to the **tester**. These **tests** can be functional or non-functional, though usually functional. Test design **techniques** include Equivalence partitioning, Boundary Value Analysis, Cause-Effect Graphing.

25. How many years does it take to be a model?

An associate's degree in fashion design or merchandising usually takes **two years** to earn, and a bachelor's degree would typically take **four years** to complete

PART B

UNIT V MODEL PREPARATION & EVALUATION

1. Present a case study to show the growth of any business in today's market place. **Nov/Dec 2017**
2. Discuss about the intellectual property rights of Entrepreneurs **Nov/Dec 2017**
3. What are the different ways by which a final model is prepared and give a note on the creative designs proposed? **Nov/Dec 2016**
4. Write an elaborate note on each and every aspect to be followed in filing a patent application. **Nov/Dec 2016**
5. Explain in detail about creative designing for new model preparation Ans: Twiss, Brian. Pg No: 198-212
6. Elaborate Model preparation. **Nov/Dec 2015**
Ans: Twiss, Brian. Pg No: 187-192