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Internal Assessment Test 2 – June 2022

Sub:	PLCM					Sub Code:	17ME835	Branch:	ME	
Date:	04.06.2022	Duration:	90 min's	Max Marks:	50	Sem / Sec:	8th B			OBE

	Answer any FIVE FULL Questions	MARKS	CO	RBT
1a.	What do you understand by product development? Explain Various factors to be considered for new product development? Solution: In business and engineering, new product development (NPD) covers the complete process of bringing a new product to market. A central aspect of NPD is product design, along with various business considerations. New product development is described broadly as the transformation of a market opportunity into a product available for sale. The product can be tangible (something physical which one can touch) or intangible (like a service, experience, or belief), though sometimes services and other processes are distinguished from "products." NPD requires an understanding of customer needs and wants, the competitive environment, and the nature of the market. Cost, time and quality are the main variables that drive customer needs. Aiming at these three variables, innovative companies develop continuous practices and strategies to better satisfy customer requirements and to increase their own market share by a regular development of new products. There are many uncertainties and challenges which companies must face throughout the process. The use of best practices and the elimination of barriers to communication are the main concerns for the management of the NPD	(10)	CO3	L1
2a.	With a Schematic diagram explain the components in building decision support systems (DSS)? Solution: Decision support systems are now widely used in organizations and military across the world, helping decision makers apply analytical, statistical and scientific techniques to decision making. In recent years, there popularity has significantly increased because of their ability to execute, interpret, analyze and suggest. Decision support systems can be used in the areas of economic forecasting, risk Management, manufacturing automation, supply chain management, healthcare, data warehousing, demographic trends and forecasts, resource allocation, etc. The growing popularity of decision support systems is due to their capability to help decision makers balancing conflicting objectives and allocating scarce resources optimally. Though decision support systems are known to make the whole process of decision making easier and speedier, their own development is a complex and time consuming process. Building a DSS user interface requires a very high level of expertise intechnology, programming, decision making, project management, and user experience and user interface design. Plus, it requires a close and unswerving collaboration of the analysts, programmers, decision makers, finance specialists and end users. Building DSS User Interface each DSS has a different purpose, defining representations, operations, and memory and control aids are of absolute importance before beginning to develop a DSS user interface. The usefulness, validity and applicability of a DSS depend on the design elements of a user interface.	(10)	CO3	L2

	A good user interface design must ensure that: The screen design is aesthetically pleasing The layouts are symmetrical The arrangement of options/menus is appropriate The screen layout is easy to understand and use The design doesn't need to be artistic but it should certainly be visually pleasing Working on it is easy and enjoyable Therefore, a Decision Support System user interface developer must: Get started with all significant information in hand. As a DSS is customized to the needs of end users, it's not a previously defined package. This means that a DSS user interface developer must steer clear of assumptions and postulations. Rather he or she must rely on neat specifications. Be able to respond quickly to the needs of end users. A decision support system needs to be modified or evolved quickly as per the directions of the decision maker who is going to use the system. The designing of user interface should be such that it facilitates changes whenever required. Take into account the idiosyncrasies of the problems to be solved. Each DSS is developed to solve particular types of problems. Therefore, a user interface developer is expected to understand the peculiarity of the problems to be solved using DSS. And on the basis of this, he or she must be able to determine what kind of input a user must feed and how and what kind of output the system must product Pay attention to the order of priority while designing the software. This typically includes four steps. i) Design user interface, focusing on the dialogue that takes place between user and machine. ii) Design operations and commands that will be used to carry out the operations. iii) Define what happens when the user gives a command. iv) Work backward and create the program. While a DSS user interface developer works on building the software, the focus must constantly be on - who the user is; what the user will do with the system; what type of decisions the user makes; and what aid the user expects from a DSS. Comments on Design Elements As user interface development takes place, the developer must keep a tab on the way information will be presented to the end user. Design elements play a crucial role in forming user experience. Here are few tips that should be kept in mind: Visual presentation of data is important, as it helps users visualize the relationship between two or more elements. Graphs, charts, hierarchy, diagrams, flowcharts and maps should be used in reports, performance sheets, planning, designing and allocation. Augment the use of color in a way that it enhances the overall appearance of the system. Allow users to have some control of the functions, such as color adjustments, themes, home screen, wall papers, menu style, patterns, etc. Build guidance mechanisms, in order to make it easy for users to manipulate the system. Offer process guidance help, just in case the user feel The software system should be responsive enough to offer suggestions to the users, helping them optimally use the system. The bottom line is that a DSS user interface developer should make it a point that the system provides decision makers with enough discretion and prudence. The system must let them choose the way they want to use it.			
3a.	Explain various steps involved in implementing new product development? Solution:	(06)	CO3	L2

The product development process is articulated and broken down in many different ways, many of which often include the following phases/stages:
1. Fuzzy front-end (FFE) is the set of activities employed before the more formal and well defined requirements specification is completed. Requirements speak to what the product should do or have, at varying degrees of specificity, in order to meet the perceived market or business need.

2. Product design is the development of both the high-level and detailed-level design of the product: which turns the what of the requirements into a specific how this particular product will meet those requirements. This typically has the most overlap with the engineering design process, but can also include industrial design and even purely aesthetic aspects of design. On the marketing and planning side, this phase ends at pre-commercialization analysis stage.

3. Product implementation often refers to later stages of detailed engineering design (e.g. refining mechanical or electrical hardware, or software, or goods or other product forms), as well as test process that may be used to validate that the
prototype actually meets all design specifications that were established.
4. Fuzzy back-end or commercialization phase represent the action steps where the production and market launch occur. The front-end marketing phases have been very well researched, with valuable models proposed. Peter Koen et al. provides a five-step front-end activity called front-end innovation: opportunity identification, opportunity analysis, idea genesis, idea selection, and idea and technology development. He also includes an engine in the middle of the five front-end stages and the possible outside barriers that can influence the process outcome. The engine represents the management driving the activities described. The front end of the innovation is the greatest area of weakness in the NPD process. This is mainly because the FFE is often chaotic, unpredictable and unstructured. Engineering design is the process whereby a technical solution is developed iteratively to solve a given problem The design stage is very important because at this stage most of the product life cycle costs are engaged. Previous research shows that 70–80% of the final product quality and 70% of the product entire life-cycle cost are determined in the product design phase, therefore the design-manufacturing interface represent the greatest opportunity for cost reduction. Design projects last from a few weeks to three years with an average of one year. Design and Commercialization phases usually start a very early collaboration. When the concept design is finished it will be sent to manufacturing plant for prototyping, developing a Concurrent Engineering approach by implementing practices such as QFD, DFM/DFA and more.
The output of the design (engineering) is a set of product and process specifications –
mostly in the form of drawings, and the output of manufacturing is the product ready for sale. Basically, the design team will develop drawings with technical specifications representing the future product, and will send it to the manufacturing plant to be executed. Solving product/process fit problems is of high priority in information communication design because 90% of the development effort must be scrapped if any changes are made after the release to manufacturing.

3b.	Explain 4 Financial control techniques to be considered in introducing New Products? Solution: Budgetary control Return on investment Breakeven analysis Ratio analysis	(04)	CO3	L2
4a.	What do you understand by Technology Forecasting Why is it important explain? Solution: Technology forecasting is a group of techniques that predict the direction, character, rate, implication, and impact of technological advances -Vanston A prediction of the future characteristics of useful machines, procedures, or techniques –Martino Anticipation of the character, intensity, and timing of changes in technology - Porter It is Indispensable. It improves Quality of Decision making Scanning the technological environment Anticipating emerging technological changes identifying suitable technologies by evaluating various alternatives Planning for future technology needs	(10)	CO4	L1
5a	Explain various Technology forecasting techniques used? Solution: 1. Judgmental or intuitive methods, 2. Extrapolation and trend analysis, 3. Models, and Scenarios and simulations. Judgmental methods fundamentally rely on opinion to generate a forecast. Typically the opinion is from an expert or panel of experts having knowledge in fields that are relevant to the forecast. In its simplest form, the method asks a single expert to generate a forecast based on his or her own intuition. Sometimes called a “genius forecast,” it is largely dependent on the individual and is particularly vulnerable to bias. The potential for bias may be reduced by incorporating the opinions of multiple experts in a forecast, which also has the benefit of improving balance. Forecasts produced by groups have several drawbacks. First, the outcome of the process may be adversely influenced by a dominant individual, who through force of personality, outspokenness, or coercion would cause other group members to adjust their own opinions. Second, group discussions may touch on much information that is not relevant to the forecast but that nonetheless affects the outcome. Lastly, can occur when forecasts are generated by groups that interact openly. The shortcomings of group forecasts led to the development of more structured approaches. Among these is the Delphi method, developed by the RAND Corporation in the late 1940s. The Delphi Method The Delphi method is a structured approach to eliciting forecasts from groups of	(10)	CO4	L2

	experts, with an emphasis on producing an informed consensus view of the most probable future. The Delphi method has three attributes—anonymity, controlled feedback, and statistical group response5—that are designed to minimize any detrimental effects of group interaction.			
6a	Write short Notes on : A. Mission flow Diagrams B. Morphological Analysis C. Design Thinking D. TRIZ-Theory of inventive problem solving An understanding of how technologies evolve over time can be used to project future developments. One technique, called TRIZ (from the Russian teoriya resheniya izobretatelskikh zadatch, or the "inventor's problem-solving theory"), uses the Laws of Technological Evolution, which describe how technologies change throughout their lifetimes because of innovation and other factors, leading to new products, applications, and technologies. The technique lends itself to forecasting in that it provides a structured process for projecting the future attributes of a present-day technology by assuming that the technology will change in accordance with the Laws of Technological Evolution.	(10)	CO4	L2

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