

Register No : _____

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV /DEC 2024

Third Semester

Product Design and Development

PD4004–Quality and Financial Concepts in Product Development

Regulations - 2021

Duration : 3 Hrs

Maximum : 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	What are the seven tools of quality?	RE	1	2
2.	Distinguish between histogram and bar graph.	AN	1	2
3.	Outline the principle of QFD.	UN	2	2
4.	Summarize how hazard rate is established.	UN	2	2
5.	Define DMAIC.	RE	3	2
6.	List out the methods of DFSS.	RE	3	2
7.	Identify the objectives of FMEA.	AP	4	2
8.	Compare robust design and reliability.	RE	4	2
9.	What are the role of finance in new product development?	RE	5	2
10.	Analyze the key aspects of working capital management.	AN	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*13 = 65)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Explain, the basic procedure for creating control charts.	UN	1	8
	ii Explain, the types of control charts.	UN	1	5
	Or			
b	Explain the following: (i) Affinity diagram (ii) Matrix diagram (iii) Tree diagram (iv) Arrow diagram	UN	1	13
12.	a Illustrate the various phases of QFD for the product development cycle.	UN	2	13
	Or			
b	Explain the causes and effect of hazard rate.	UN	2	13
13.	a Analyze the different tools used for six sigma implementation.	AN	3	13
	Or			
b	Classify the management roles and responsibilities with example for a six sigma project.	AN	3	13

14. a With the help of simple flow diagram, explain the methods of implementing robust design. AP 4 13
- Or
- b Explain, the procedural steps involved in conducting embodiment design with suitable example. AP 4 13
15. a Explain the importance and essential characteristics of financial planning. AP 5 13
- Or
- b Explain in details the classifications and the factors determining the working capitals. AP 5 13

*PART – C (Marks 1*15 = 15)*

<i>Q.No</i>		<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
16.	a	A machine is set to deliver packets of a given weight. Ten samples of size five each were recorded. Below are given relevant data :	AP	1	15

Sample Data	1	2	3	4	5	6	7	8	9	10
Mean X	15	17	15	18	17	14	18	15	17	16
Range R	7	7	4	9	8	7	12	4	11	5

Calculate the control limits for mean chart and the range chart and then comment on the state of control.

(Conversion chart for $n = 5$, $A_2 = 0.58$, $D_3 = 0$ and $D_4 = 2.115$)

Or

- b A system has 8 components viz, A, B, C, D, E, F, G and H. The module M has components A, B, C and D in parallel to each other. The module N has components E, F, G and H in parallel to each other. The module M and module N are in series. Construct a fault tree for this system and compute system reliability if all the components have reliability = 0.95. AP 3 15