(3 Hours) Total Marks: 80

Note:

1. **Question No. 1 is compulsory**.
2. Attempt any **THREE** out of the remaining **FIVE** questions.
3. Assume suitable data if necessary.

Q. 1.	Answer **any FOUR** of the following:	**(20)**
(a)	What are the four factors to Design for Manufacturing? Give an example of Design for Manufacturing.	
(b)	What is Tolerance stack-up? Why is it important?	
(c)	What is Design for Assembly? Explain with an example.	
(d)	Give the differences between Value Engineering and Value analysis	
(e)	What are the limitations of Economic analysis?	
Q. 2. (a)	Explain Design for Assembly Guidelines.	**(10)**
(b)	What is the difference between failure rate and Hazard rate? Discuss on calculation of Hazard rate function.	**(10)**
Q. 3. (a)	Give differences between maintainability and reliability with example.	**(10)**
(b)	Explain self-dependent system with repair with example.	**(10)**
Q. 4. (a)	What are the different components of Reliability? Explain conditional Reliability.	**(10)**
(b)	Explain the steps of Functional Analysis.	**(10)**
Q. 5. (a)	With examples, explain how is value engineering beneficial in product design process?	**(10)**
(b)	What is assembly in manufacturing? How do you reduce costs in assembly process?	**(10)**
Q. 6.	**Explain the following:-**	**(20)**
(a)	BathTub Curve with neat labeled diagram	
(b)	Geometric Tolerances	
(c)	Mean-Time to Failure (MTTF)	
(d)	Uses of Reliability in Engineering.	

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