

NETTUR TECHNICAL TRAINING FOUNDATION
DIPLOMA IN MECHATRONICS ENGINEERING & SMART FACTORY-CP15
V SEMESTER REGULAR & SUPPLEMENTARY EXAMINATION-JAN 2023

Subject: Product Design & Development
Subject Code: CP15505T

Total Time: 2 Hr.
Total Marks: 50 Marks

PART B

1.0 ANSWER ANY EIGHT OF THE FOLLOWING **2*8=16**

- 1.1 What are the basic key elements for mechatronics system design?
- 1.2 What is sensor and give some examples?
- 1.3 List out the 5 ideation techniques in design-thinking process
- 1.4 What is the 5W Tool in design thinking?
- 1.5 Define- High fidelity Prototype with one example
- 1.6 What are the outputs taken from Plan and define program in APQP?
- 1.7 What is Production validation testing?
- 1.8 List out the APQP shipment review
- 1.9 What is the X,L,C representation means in characteristics matrix?
- 1.10 What are Consumer Goods? List out the types of Consumer goods

2.0 ANSWER ANY SIX OF THE FOLLOWING **3*6=18**

- 2.1 Why design thinking is important in product design?
- 2.2 What is the difference between Mechatronics systems and Conventional systems?
- 2.3 List the steps in the process of design thinking in 5 phases.
- 2.4 List out the 5 Phases of APQP
- 2.5 Give a short note on Voice of customer with example statements
- 2.6 Tabulate the checklist of DFMEA
- 2.7 When we called it as significant production run?
- 2.8 Draw production - Consumption cycle

3.0 ANSWER ANY FOUR OF THE FOLLOWING **4*4=16**

- 3.1 What are the 12 steps in design process?
- 3.2 Write a short note on TTM with examples and also state the importance of TTM With neat sketch
- 3.3 Write a short note on Benchmarking and 6 - Step approach in benchmarking
- 3.4 Explain the types of design thinking process in product design
- 3.5 What are the benefits of simulation? Explain the process of simulation
- 3.6 Write a short note on : i) Characteristics of successful ideation ii)define ideate

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DIPLOMA IN MECHATRONICS - CP15
V SEMESTER SUPPLEMENTARY EXAMINATION – JAN 2023

Subject: Mechatronics System design
Subject Code: CP15 05 03

Total Marks : 50
Total Time : 2H

PART B

- 1.0 ANSWER ANY EIGHT OF THE FOLLOWING** **2*8=16**
1. 1 List the basic building blocks of mechanical system.
 1. 2 Define Knowledge acquisition.
 1. 3 Write about soft automation?
 1. 4 Explain the term Mathematical Model.
 1. 5 Brief about Mechatronics.
 1. 6 Brief the term On- line Quality monitoring.
 1. 7 Give two examples for electromechanical systems.
 1. 8 List out the model categories.
 1. 9 Define block diagram.
 1. 10 List two advantages of micro sensors.
- 2.0 ANSWER ANY SIX OF THE FOLLOWING** **3*6=18**
2. 1 Explain about the advantages of Top down design approach.
 2. 2 Explain Model – Based System in Mechatronic control in Automated Manufacturing.
 2. 3 List the challenges before R & D in mechatronics.
 2. 4 Define block diagram moulding.
 2. 5 List the life cycle aspects of a product and explain any two of them.
 2. 6 Explain simulation process in detail.
 2. 7 Brief Friction and also explain static friction, Coulomb friction & Viscous friction.
 2. 8 Give short note on mechanical translational system.
- 3.0 ANSWER ANY FOUR OF THE FOLLOWING** **4*4=16**
3. 1 Explain structural modelling and behavioral modelling in detail.
 3. 2 Define: a) Logic b) Multi body c) Block diagram d) Circuit.
 3. 3 Build a mathematical model of Hydraulic system with an example.
 3. 4 Write about ANN, how we can implement ANN?
 3. 5 Write a note on Micro sensors and its importance in Mechatronics. Also explain its fabrication process.
 3. 6 Briefly explain the mechatronics design process.