



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:II
Class: FY	Program:M.Tech
Branch Code:ETC	Pattern:2022
Name of Course:ML in Chip Design	Course Code:ETC225108
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Question No. 1 Attempt following Question

- 1a) Explain the basic concepts of machine learning and its relevance to chip design processes (6) CO1

Question No. 2 Attempt following Question

- 2a) What are different algorithmic pathways? Explain one dominant algorithmic pathway and its application. (6) CO2

Question No. 3 Attempt following Question

- 3a) Along with applications explain how CPMs (Compact Lithographic Process Models) are used to estimate the outcomes of patterning processes for IC designs. Also draw a diagram of it. (8) CO3

OR

- 3b) Draw and explain Mask Synthesis Flow (8) CO3

- 3c) What is hotspot detection? Explain along with a diagram what are different challenges of hotspot detection? (8) CO3

OR

- 3d) Explain different approaches of machine learning in physical design. (8) CO3

Question No. 4 Attempt following Question

- 4a) How machine learning is used in process control and process improvements (8) CO4

OR

- 4b) How process variation characterization by virtual probe? (8) CO4

4c) What is aging analysis in VLSI design and how ML is used in it? (8) CO4

OR

4d) Explain Gaussian process-based wafer-level correlation modeling and its applications (8) CO4

Question No. 5 Attempt following Question

5a) Write short note on extreme statistics in memories. (8) CO5

OR

5b) Elaborate concept of learning from limited data in VLSICAD (8) CO5

5c) Explain concept of fast statistical analysis of rare circuit failure events (8) CO5

OR

5d) Why failure modeling is required? How ML is employed in failure modeling? (8) CO5

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