



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:III
Class:SY	Program:B.Tech
Branch Code:CHE	Pattern:2022
Name of Course:Engineering Materials	Course Code:CHE222004
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 _____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 method for welding with suitable diagram. (6) CO1

Question No. 2 Attempt following Question

- 2a) A hollow cylinder 2m long has an outside diameter of 50 mm and inside diameter of 30 mm. If cylinder is carrying a load of 25 KN. Find the stress in cylinder. Also find the deformation of the cylinder, if the values of modulus of elasticity of cylinder is $100 \times 10^3 \text{ N/mm}^2$. (6) CO2

Question No. 3 Attempt following Question

- 3a) What is Pilling-Bedworth rule in corrosion? (5) CO3

OR

- 3b) Describe carbon steel, classification and their types in detail. (5) CO3

- 3c) Describe Cast Iron their types in detail. (5) CO3

OR

- 3d) Explain in detail Electrochemical series. (5) CO3

- 3e) Describe Iron-Iron Carbide Diagram in detail and different reactions involved in it. (6) CO3

OR

- 3f) Draw and explain equilibrium diagram in detail for Brass. (6) CO3

Question No. 4 Attempt following Question

4a) Describe in details Buckyballs. (5) CO4

OR

4b) Write in detail about the application of nanomaterials in the chemical industry. (5) CO4

4c) Write in detail about fullerenes. (5) CO4

OR

4d) Describe various methods for synthesis of nano materials. (5) CO4

4e) Describe in detail Synthesis and Characterisation of carbon nano tubes. (6) CO4

OR

4f) Write about the Sol-Gel method of characterisation. (6) CO4

Question No. 5 Attempt following Question

5a) Describe the difference between Electron and light microscope. (5) CO5

OR

5b) Describe in details about the interaction of electrons with specimen. (5) CO5

5c) Write in detail about backscattered electrons. (5) CO5

OR

5d) Write down the advantages of SEM. (5) CO5

5e) Describe Scanning tunnelling microscopy in detail with suitable diagram. (6) CO5

OR

5f) Describe Scanning electron microscope in detail with suitable diagram. (6) CO5

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