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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2025 - 2026)

Subject: Automotive Manufacturing & Materials

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- | | | |
|-------|--|---|
| (1.1) | The automobile industry primarily manufactures: (CO1, K1) | 1 |
| | (a) Household items | |
| | (b) Vehicles for transportation | |
| | (c) Medical equipment | |
| | (d) Agricultural tools | |
| (1.2) | The most commonly used material in car bodies is: (CO1, K1) | 1 |
| | (a) Wood | |
| | (b) Steel | |
| | (c) Glass | |
| | (d) Rubber | |
| (1.3) | The main function of a chassis is to: (CO2, K1) | 1 |
| | (a) Increase speed | |
| | (b) Support vehicle components | |
| | (c) Reduce fuel consumption | |
| | (d) Increase engine power | |
| (1.4) | Hydroforming is mainly used for: (CO2, K1) | 1 |
| | (a) Welding sheets | |
| | (b) Machining shafts | |
| | (c) Forming tubular metal parts | |
| | (d) Cutting gears | |
| (1.5) | The main function of a fuel system in an automobile is to: (CO3, K1) | 1 |

- (a) Cool the engine
 - (b) Supply fuel to the engine
 - (c) Increase braking
 - (d) Control steering
- (1.6) Ceramic materials in exhaust systems are mainly used in: (CO3, K1) 1
- (a) Fuel pumps
 - (b) Fuel filters
 - (c) Catalytic converters
 - (d) Mufflers
- (1.7) The first stage in vehicle assembly is: (CO4, K1) 1
- (a) Final assembly
 - (b) Paint shop
 - (c) Body-in-White (BIW)
 - (d) Trim assembly
- (1.8) Chassis assembly includes installation of: (CO4, K1) 1
- (a) Seats
 - (b) Dashboard
 - (c) Suspension and wheels
 - (d) Mirrors
- (1.9) Automation in manufacturing mainly aims to (CO5, K1) 1
- (a) Increase manual work
 - (b) Reduce production
 - (c) Increase productivity and efficiency
 - (d) Increase defects
- (1.10) Industry 4.0 mainly focuses on (CO5, K1) 1
- (a) Manual production
 - (b) Traditional machining
 - (c) Smart connected manufacturing systems
 - (d) Paper documentation

2. Attempt all parts:-

- (2.1) Define automotive manufacturing. (CO1, K2) 2
- (2.2) List two materials used in chassis manufacturing. (CO2, K2) 2
- (2.3) What is the role of exhaust system? (CO3, K2) 2
- (2.4) How riveting is different from welding process. (CO4, K2) 2
- (2.5) What is role of IoT in manufacturing? (CO5, K2) 2

SECTION-B

30

Answer any one of the following:-

- (3.1) Explain the concept of automotive manufacturing. (CO1, K2) 6
- (3.2) Explain the importance of materials in automobile manufacturing. (CO1, K2) 6

Answer any one of the following:-

(3.3)	What is the role of heat treatment? Explain the different heat treatment processes used in automotive parts. (CO2, K2)	6
(3.4)	Describe coating processes used in automotive chassis.(CO2, K2)	6
Answer any one of the following:-		
(3.5)	Discuss the different materials used in vehicle exterior panels. (CO3, K2)	6
(3.6)	Describe the different manufacturing processes used in developing the interior of modern vehicle . (CO3, K2)	6
Answer any one of the following:-		
(3.7)	Explain the different stages of vehicle assembly. (CO4, K2)	6
(3.8)	How material handling systems help in automating the assembly process. .(CO4, K2)	6
Answer any one of the following:-		
(3.9)	Explain the role of robotics in automotive assembly. (CO5, K2)	6
(3.10)	Describe he role of real-time data monitoring in manufacturing. (CO5, K2)	6
<u>SECTION-C</u>		50
4. Answer any <u>one</u> of the following:-		
(4.1)	Describe the evolution of automotive manufacturing technologies from early production to modern automation. (CO1, K2)	10
(4.2)	Discuss different forming processes used in automotive manufacturing. (CO1, K2)	10
5. Answer any <u>one</u> of the following:-		
(5.1)	Explain brake system components and manufacturing processes. (CO2, K2)	10
(5.2)	Discuss differences between casting, forging and machining in automotive production. (CO2, K2)	10
6. Answer any <u>one</u> of the following:-		
(6.1)	Explain different materials and manufacturing processes used in automotive fuel systems.(CO3, K2)	10
(6.2)	How ceramics are different from other materials? Discuss role of ceramic materials in automotive exhaust systems.(CO3, K2)	10
7. Answer any <u>one</u> of the following:-		
(7.1)	Describe electrical system assembly in automobiles. (CO4, K2)	10
(7.2)	Explain role of jigs and fixtures in improving assembly accuracy. (CO4, K2)	10
8. Answer any <u>one</u> of the following:-		
(8.1)	Explain the working and applications of AGVs in smart factories. (CO5, K2)	10
(8.2)	Explain the concept of smart factories. How smart factory support the concept of sustainability? (CO5, K2)	10