Reg. No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

| Question Paper Code | 13230 |

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024
Seventh Semester
Mechanical and Automation Engineering
20MEOE901 - PRODUCTION OF AUTOMOTIVE COMPONENTS
Regulations - 2020

Duration: 3 Hours   Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)
Answer ALL Questions

		Marks	K-Level	CO

1. Which of the following is correct for casting process?   — 1 K1 CO1
   (a) time required for casting is quite long   (b) large sizes can not be produced in casting
   (c) casting process is costly   (d) none of the above
2. Material used for piston ring   — 1 K1 CO1
   (a) cast iron   (b) steel   (c) alloy cast iron   (d) polymer
3. Hard shifting of gears is due to   — 1 K1 CO1
   (a) leakage of oil from gear box   (b) worn out splines on the main shaft
   (c) High speed   (d) Over loading
4. The pipe which connects the intake system to the inlet valve of the engine and through which air or air-fuel mixture is drawn into the cylinder is known as _____   — 1 K1 CO1
   (a) Spark Plug   (b) Connecting Rod   (c) Camshaft   (d) Inlet Manifold
5. Which of the following is not a part of the transmission system?   — 1 K1 CO2
   (a) clutch   (b) wheels   (c) axle   (d) gear box
6. An automobile chassis does not include the following   — 1 K1 CO2
   (a) shock absorber   (b) steering system   (c) differential   (d) brake
7. The first automobile was built in the year   — 1 K1 CO2
   (a) 1727   (b) 1736   (c) 1826   (d) 1769
8. Which material is used to make the connecting rod?   — 1 K1 CO2
   (a) cast iron   (b) mild steel   (c) aluminium alloy   (d) forged steel
9. Which of the following is the primary purpose of an automobile's catalytic converter?   — 1 K1 CO3
   (a) Increase fuel efficiency   (b) Reduce exhaust emissions
   (c) Improve engine performance   (d) Increase exhaust noise
10. Which of the following pollutants is converted into harmless gases by a catalytic converter?   — 1 K1 CO3
    (a) Nitrogen (N_2)   (b) Carbon dioxide (CO_2)
    (c) Carbon monoxide (CO)   (d) Water vapor (H_2O)
11. What type of sensor is used to measure the oxygen content in a vehicle's exhaust gas?   — 1 K1 CO3
    (a) Knock sensor (b) Oxygen sensor   (c) Temperature sensor   (d) Pressure sensor
12. Which type of welding is most commonly performed by robots in automotive body assembly?   — 1 K1 CO3
    (a) Arc welding   (b) Gas welding   (c) Spot welding   (d) Laser welding
13. What is the purpose of the reciprocating ball type steering gear?   — 1 K1 CO4
    (a) To reduce the operating cost   (b) To reduce the number of parts
    (c) To reduce the operating friction   (d) To reduce the toe-out during the turns
14. Generally which brakes are on the front wheels?   — 1 K1 CO4
    (a) Drum brake   (b) Disk brake   (c) Shoe brake   (d) Double shoe brake
15. The comparative strength of tyre is indicated by _____   — 1 K1 CO4
    (a) Ply rating   (b) Thickness   (c) Materials of construction   (d) Size and tyre width
16. In a disc brake, which component provides the pad-to-disc adjustment?   — 1 K1 CO4
    (a) Bleed screw   (b) Piston   (c) Caliper   (d) Piston seal

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create   **13230**

17. Full form of STL is _____. 1 K1 CO5
    (a) Standard Tessellation Language (b) Streto Tessellation Lithography
    (c) Stereo Tessellation Lithography (d) Straight Tessellation Language
18. For rapid prototyping 3D, CAD model should be converted into_____file. 1 K1 CO5
    (a) SGC (b) SLA (c) STL (d) SLS
19. Which technology is commonly used in 3D printing? 1 K1 CO5
    (a) Laser cutting (b) Injection molding (c) Additive manufacturing (d) CNC machining
20. Input of RP data is _____ 1 K1 CO5
    (a) CAM data (b) CAPP data (c) CAD data (d) PPC data

PART - B (10 × 2 = 20 Marks)
Answer ALL Questions

21. Draw the engine valve and name its parts. 2 K1 CO1
22. State the advantage of forging vs. casting. 2 K1 CO1
23. Name the machines that will produce gears. 2 K1 CO2
24. Why gears are preferred over other transmission components? 2 K1 CO2
25. Where is thermoforming necessary? 2 K1 CO3
26. Recall hydro forming. 2 K1 CO3
27. Discuss the various loads acting on chassis frame. 2 K2 CO4
28. What is an energy absorbing frame? 2 K1 CO4
29. Why is spray painting used in automobiles? 2 K1 CO5
30. Define powder coating. 2 K1 CO5

PART - C (6 × 10 = 60 Marks)
Answer ALL Questions

31. a) List the components of the engine that are heat treated and explain the reason for heat treatment. 10 K2 CO1
    OR
    b) Extend the process of material selection for engine components. 10 K2 CO1

32. a) Illustrate in detail the production of propeller shaft. 10 K2 CO2
    OR
    b) Explain the process of gear powder metallurgy. 10 K2 CO2

33. a) What is Bumper? Explain how it is manufactured in detail with sketches. 10 K2 CO3
    OR
    b) Demonstrate the 3D printing process for manufacturing of automotive components in detail with a diagram. 10 K2 CO3

34. a) Enumerate the process of manufacturing shock absorbers in detail. 10 K2 CO4
    OR
    b) Explain hydraulic brake with a neat sketch and write its advantages. 10 K2 CO4

35. a) Outline the process of production of sealants in detail. 10 K2 CO5
    OR
    b) Summarize the Chemical vapour deposition and physical vapour deposition. 10 K2 CO5

36. a) i) Explain the construction and working of mechanical brakes with a neat sketch. 5 K2 CO4
    ii) Interpret the process of Tyre and tube manufacturing. 5 K2 CO5
    OR
    b) i) Describe the construction and operation of power steering. 5 K2 CO4
    ii) Extend the various methods of producing sound proof material for automobile production. 5 K2 CO5

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create **13230**