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Question Paper Code	12849
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024**

Fifth Semester

**Mechanical Engineering**

**20MEPC501 - AUTOMOTIVE SYSTEMS**

Regulations - 2020

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

	Marks	K- Level	CO
1. Why are pistons and combustion chambers in cylindrical shape?	2	K2	CO1
2. Name and sketch the various types of sections for automobile frames.	2	K2	CO1
3. Draw the circuit of the common rail direct injection system.	2	K2	CO2
4. State the purpose of turbocharger.	2	K1	CO2
5. What is the purpose of the transfer gearbox?	2	K1	CO3
6. Distinguish fluid flywheel and torque converter.	2	K2	CO3
7. What do you mean by camber and castor?	2	K1	CO4
8. Differentiate traction and tractive effort.	2	K2	CO4
9. What are the main components of electric vehicles?	2	K1	CO5
10. What is the composition of Natural gas?	2	K1	CO5

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Draw the layout of conventional chassis with a neat sketch and explain about the various parts on it.	13	K2	CO1
<b>OR</b>			
b) Explain the construction and working of variable valve timing (VVT) in internal combustion engines.	13	K2	CO1
12. a) Explain the construction and working of an electronically controlled SI engine ignition system.	13	K2	CO2
<b>OR</b>			
b) Explain the construction and working of the wastegate turbocharger.	13	K2	CO2
13. a) Explain the working of the centrifugal clutch with a neat sketch.	13	K2	CO3
<b>OR</b>			
b) Explain the working principle of fluid flywheel with the help of a sketch.	13	K2	CO3

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

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14. a) Explain the construction and working of power steering with a neat sketch. 13 K2 CO4

**OR**

b) Explain the construction and working of an anti-lock braking system (ABS) with a neat sketch. 13 K2 CO4

15. a) What are the main components of hybrid system and explain. 13 K2 CO5

**OR**

b) Explain the working of the Fuel cell with a neat sketch. 13 K2 CO5

**PART - C (1 × 15 = 15 Marks)**

16. a) Explain SI and CI engines' performance, combustion, and Emission characteristics with alternate fuels. 15 K5 CO6

**OR**

b) Discuss the construction and working principle of 3-way Catalytic Controller and List the emissions controlled by using Catalytic controller. 15 K5 CO6