Reg. No.															

Question Paper Code	13620

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Fifth Semester

Mechanical Engineering

20MEPC501 - AUTOMOTIVE SYSTEMS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which of the following automobile has two/four doors? (a) Convertible (b) Special purpose vehicles (c) Pickups (d) Sedan	1	K1	CO1
2.	Which of the following is not an arrangement of IC engine cylinders? (a) Circular (b) Opposed cylinder engine (c) Radial (d) V type engine	1	K1	CO1
3.	Which of the following is not the part of the injector assembly? (a) Needle valve (b) Nozzle (c) Diaphragm (d) Compressor spring	1	K2	CO2
4.	Which of the following is the correct flow of fuel in an individual pump fuel injection system? (a) Fuel tank – filter – feed pump – injector (b) Fuel tank – filter – injector- feed pump (c) Fuel tank – feed pump – filter – injector (d) Filter- feed pump – fuel tank – injector	1	K2	CO2
5.	If there are 5 contacting surfaces, how many discs are needed in a multi disc clutch? (a) 1 (b) 5 (c) 6 (d) 4	1	K1	CO3
6.	Transfer box takes power from the transmission and sends to (a) front axle (b) rear axle (c) Both a & b (d) None of the mentioned	1	K1	CO3
7.	Shocks are absorbed by leaf spring through : (a) Bending (b) Compression (c) Twisting (d) tension	1	K1	CO4
8.	Generally which brakes are on the front wheels? (a) Drum brake (b) Disk brake (c) Shoe brake (d) Double shoe brake	1	K1	CO4
9.	NOx emissions are increased due to hydrogen combustion because of : (a) High flame speed (b) High flame temperature (c) light weight (d) None of the mentioned	1	K1	CO5
10.	3 way catalytic converter as _____ catalyst processes (a) 3 (b) 2 (c) 4 (d) 1	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	What are the two types of cylinder liner?	2	K1	CO1
12.	Summarize the characteristics of a good chassis.	2	K2	CO1
13.	Define common rail injection system.	2	K1	CO2
14.	Summarize the requirements of ignition system? And state its types.	2	K2	CO2
15.	What is automatic transmission?	2	K1	CO3
16.	What is transfer box? Where it is used?	2	K1	CO3
17.	Define king pin inclination.	2	K1	CO4
18.	Summarize the functions of suspension system in automobile.	2	K2	CO4
19.	What are the alternative fuels?	2	K1	CO5
20.	What are the types of fuel cell?	2	K1	CO5
21.	How does a turbo charger work?	2	K1	CO6
22.	What is super charging?	2	K1	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain briefly the construction of an IC engine with suitable diagram.	*11*	*K2*	*CO1*
		OR			
	b)	Explain about the construction and operation of a variable valve timing mechanism adopted in IC engine.	*11*	*K2*	*CO1*
24.	a)	What is Unit injection system? Explain with suitable diagram.	*11*	*K2*	*CO2*
		OR			
	b)	With suitable diagram, explain the working of electronically controlled gasoline injection system.	*11*	*K2*	*CO2*
25.	a)	What are the types of gearbox? Explain sliding mesh gearbox with a neat sketch.	*11*	*K2*	*CO3*
		OR			
	b)	Summarize the working principle of differential unit with a neat sketch.	*11*	*K2*	*CO3*
26.	a)	What are the types of steering gearbox? Explain in detail about rack and pinion type steering gearbox.	*11*	*K2*	*CO4*
		OR			
	b)	With neat sketch explain the operation of a telescopic shock absorber.	*11*	*K2*	*CO4*
27.	a)	Explain with neat sketch of Solid oxide fuel cells.	*11*	*K2*	*CO5*
		OR			
	b)	Explain with a schematic of a Parallel hybrid electric vehicle system with its merits.	*11*	*K2*	*CO5*
28.	a)	What the types are of turbocharges? Explain in detail about WGT.	*11*	*K2*	*CO6*
		OR			
	b)	With a neat sketch, Explain the working of turbo charger and state how it differs from supercharger.	*11*	*K2*	*CO6*