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B.Tech
(SEM VII) THEORY EXAMINATION 2021-22
AUTOMOBILE ENGINEERING

Time: 3 Hours**Total Marks: 100****Notes: 1. Attempt all sections. if require any missing data; then choose suitably****SECTION A****1. Attempt All****02X10=20**

a.	Classify an automobile on the basis of transmission system and wheel drive system.
b.	Define gear ratio. How many types of gearboxes are generally used in automobiles?
c.	Why a clutch is necessary in the transmission system of an automobile?
d.	Explain camber and its effect on tire wear.
e.	What is meant by fading of vehicle brakes? How types of brakes are used in automobiles?
f.	State various types of suspension used in Automotive-vehicles
g.	What do you mean by power steering? Explain EPS.
h.	What is the main function of Carburetor? State its limitations. Explain MPFI concept
i.	What do you understand from Euro norms? Which norm is adopted in India now days?
j.	What do you mean by breakdown maintenance in context with automotive vehicles?

SECTION B**2. Attempt any 03 parts of the following:****03X10=30**

a.	Compare sliding mesh, constant mesh and synchro-mesh gear box with neat sketch. What are synchronizers? Point out their utility in transmission
b.	State the difference between dry and wet types of friction clutch. List the properties of a good clutch lining. Draw a neat sketch of single plate clutch and explain its working.
c.	Compare the constructional and operational aspects of disc and drum brakes with neat sketch. Which one is preferred and why?
d.	Draw the schematic arrangements for the common rail and individual pump injection systems. Point out the relative merits and demerits of these systems compared to conventional carburetor system.
e.	Name the pollutants emitted by gasoline engines and petrol engines into the atmosphere. Explain the constructional details and working of 3-way catalytic convertor with neat sketch.

SECTION C**3. Attempt any 01 part of the following:****01X10=10**

(a)	It is possible to make a faster climb in low gear on certain gradients than in top gear. Comment on the validity of this statement. Explain rolling, air, gradient resistance and tractive effort associated with gear box design.
(b)	Explain the main parts of an automobile frame with a neat sketch. Also explain the principle of automatic transmission

4. Attempt any 01 part of the following:**01X10=10**

(a)	State and explain the principle of Ackerman steering mechanism. Derive condition for correct steering. Explain how Davis steering mechanism differs from Ackerman steering mechanism.
(b)	Explain the steering gear boxes used in automobiles with neat sketch.



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5. Attempt any 01 part of the following: 01X10=10

(a)	What is meant by independent suspension system? How it is achieved in front and rear wheel? Explain the constructional details and working of telescopic shock absorber and leaf springs
(b)	Explain the constructional details and working of tandem master cylinder

6. Attempt any 01 part of the following: 01X10=10

(a)	Explain types of starting motors and describe each in brief. Also, describe the main components and working of Battery ignition system with neat sketch.
(b)	What is the resistor bypass circuit? Draw the wiring system of a typical passenger car lighting system

7. Attempt any 01 part of the following: 01X10=10

(a)	Apply the knowledge of automobile engineering to demonstrate the preventive, operative and breakdown maintenance. Quote practical examples to justify your answer
(b)	Discuss the causes of failures of automotive transmission system. Suggest remedies for its repair.

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