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Question Paper Code : 53314

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Sixth/Seventh/Eighth/Tenth Semester

Mechanical Engineering

ME 6602 – AUTOMOBILE ENGINEERING

(Common to Mechanical Engineering (Sandwich), Mechatronics Engineering, Robotics and Automation Engineering)

(Regulation 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is VVT? Mention its advantage.

2. Mention the necessity of an oil ring in an IC engine.

3. Decode : TCIS and WGT

4. Why a catalytic converter in a modern day IC engine is called three way catalytic converter.

5. Are AMT and CVT type gearbox one and the same? Comment.

6. State the function of an axle.

7. Mention any two steering geometry parameters and their significance.

8. List the functions of a suspension system.

9. What is gasohol?

10. Mention atleast two demerits of an electric vehicle.

PART B — (5 × 13 = 65 marks)

11. (a) With suitable illustration discuss about different types of vehicle layouts and body / chassis construction. (6 + 7)

Or

(b) (i) Mention the various resistances and moments acting on an automobile. Also represent the same with the help of a schematic. (4 + 5)

(ii) Mention different types of automobiles. (4)

12. (a) (i) Explain with a sketch the functioning of a three way catalytic converter. (9)

(ii) Briefly discuss the operation of a turbocharger and its merits. (4)

Or

(b) With the help of an illustration, explain the working of a gasoline direct injection system in a SI engine. Mention its merits and demerits with regard to port fuel injection. (10 + 3)

13. (a) (i) State the need for a gearbox in an automobile. Draw a sketch of a five speed synchromesh gearbox, clearly indicating different parts. (3 + 7)

(ii) What is a torque tube drive? Where it is used? (3)

Or

(b) (i) What is the function of a universal joint? Draw a schematic of the same and brief on its working. Also discuss the difference between slip joint and a universal joint. (2 + 6 + 2)

(ii) Differentiate between fluid flywheel and torque converter. (3)

14. (a) Describe with an illustration the hydraulic braking system used in a four wheeler. Mention the difference between hydraulic and pneumatic braking systems. (9 + 4)

Or

(b) List some commonly used rear suspension systems? Draw a schematic of any one rear suspension system, indicate the parts and their function. (3 + 6 + 4)

15. (a) (i) Compare the performance and emission characteristics of a vehicle fuelled with Bio-diesel with that of a neat diesel fuelled vehicle. (10)

(ii) Mention the advantages of ethanol as a fuel in a SI engine. (3)

Or

(b) (i) Explain the necessary engine modifications for a SI engine to be fueled with natural gas. Support your answer with a schematic. (8)

(ii) Draw a schematic of a hybrid electric vehicle and mention its merits over an electric vehicle. (5)

PART C — (1 × 15 = 15 marks)

16. (a) (i) State the need for switching to high pressure electronically operated Diesel injection systems? With a schematic explain the operation of a unit injection system. (4+ 7)

(ii) Briefly discuss about ABS and its working. (4)

Or

(b) (i) State the need for a differential in a vehicle. Draw a schematic of a differential and name the different parts. (2 + 5)

(ii) Elaborate on the Bharat stage VI norms. (4)

(iii) Show how a steering system is able to turn the wheels with a schematic. (4)