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Question Paper Code : 72161

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Sixth/Seventh/Eighth Semester

Mechanical Engineering

ME 6602 – AUTOMOBILE ENGINEERING

(Common to Mechatronics Engineering, Robotics and Automation Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is frameless construction?
2. State the function of pushrod and rocker arm.
3. Which is most commonly used supercharger in automobile? Why petrol engines are rarely supercharged?
4. Give short note on Unit Injector system.
5. What is a free wheel? What is the importance of the free wheel in the transmission of an automobile?
6. Write short note on Panhard rod.
7. Give types of stub axle.
<https://www.freshersnow.com/previous-year-question-papers/>
8. What is an include angle?
9. What are the merits and demerits of supercritical methanol (SCM) transesterification process?
10. Mention any four types of fuel cells.

PART B — (5 × 16 = 80 marks)

11. (a) With neat diagram explain components and drive systems in an automobile chassis.

Or

- (b) List I.C. Engine parts, its materials and functions.

12. (a) Draw the layout of an electronic ignition system and mention the function of each component.

Or

- (b) With a neat sketch, explain the working of a turbocharger and state how it differs from superchargers.

13. (a) Explain construction and working principle of a constant mesh gear box with neat sketch.

Or

- (b) With the aid of neat sketch explain the Torque tube drive.

14. (a) Explain with neat diagram steering geometry parameters in an automobile.

Or

- (b) Explain any one of the front independent suspension system with neat diagram.

15. (a) Explain LPG is an alternate fuel for petrol engine with diagram. Also explain its performance and emission characteristics.

Or

- (b) Explain construction and working principle of hybrid vehicle with neat sketch.



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Question Paper Code : 50880

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Sixth/Seventh/Eighth Semester

Mechanical Engineering

ME 6602 – AUTOMOBILE ENGINEERING

(Regulations 2013)

(Common to Mechatronics Engineering/Robotics and Automation Engineering)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. Sketch the Layout of Front engine and rear wheel drive vehicle.
2. Enumerate any two demerits of a monocoque body construction over conventional body construction.
3. Compare and contrast between Carburetion and Mono point fuel injection used in motorcycles.
4. Differentiate between Bharat Stage III and Bharat Stage IV emission norms.
5. Mention the function of transfer case box used in all wheel drive vehicle.
6. Enumerate the forces acting on rear (live) axle of a vehicle.
7. Express a relation satisfying the condition for true rolling condition of a vehicle.
8. With a neat Block Diagram, list the components of a typical traction control system used in modern passenger car.
9. Differentiate between bio-fuel and bio-diesel.
10. Sketch the layout of a series configured electric vehicle.



PART – B

(5×16=80 Marks)

11. a) Explain about the various aerodynamics forces and its influenced moments acting on a fast-moving passenger car. (16)
(OR)
- b) Discuss about the procedures followed in incorporating Variable Valve Timing on a conventional IC engine. (16)
12. a) Describe the working of a Common Rail Diesel Injection System with a neat sketch. (16)
(OR)
- b) Explain about any one of after treatment methods adapted to minimize the engine pollutants. (Include relevant figures). (16)
13. a) What is a torque converter ? Describe the working of a torque converter. (Include a simple sketch). (16)
(OR)
- b) Enumerate the components used and its functions in a Hotchkiss drive configuration. (Include a simple layout). (16)
14. a) Draw the layout of a typical steering system used in a vehicle fitted with rigid suspension configuration and briefly discuss about the function of its constituent members. (16)
(OR)
- b) With relevant block diagrams, analyze the working of 4 channel 4 sensor type ABS system used in passenger cars. (16)
15. a) i) List any 2 methods of hydrogen production. (4)
ii) Explain about anyone of thermochemical production process of Hydrogen. (12)
(OR)
- b) With an indicative sketch, discuss about the working of a Polymer Electrolyte Membrane fuel cell. (16)

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Question Paper Code : 80667

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2016.

Sixth Semester

Mechanical Engineering

ME 6602 — AUTOMOBILE ENGINEERING

(Common to Seventh Semester Mechatronics Engineering)

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the classification of chassis name according to its control method.
2. What are the main components of I.C. engine?
3. Define "Intermittent injection" of petrol engine.
4. Write the Emission norms of Euro BS IV for petrol vehicle (in g/Km.)
5. What is the use of slip joint?
6. List the types of Automobile clutches.
7. Name any four types of suspension spring.
8. Describe the advantages of steering Geometry.
9. What is the working principle of Fuel cell?
10. What you understand by the term Hybrid vehicle?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the construction of various chassis frames used in automobile with neat figure. (16)

Or

- (b) Explain with suitable sketches and valve timing diagram, the working of a Variable Valve Timing (VVT) system used in automobiles. (16)

12. (a) (i) What are the main functions of ECU? (4)
(ii) Describe the construction details of distributor type Diesel fuel injection pump with sketch. (12)

Or

- (b) (i) What are the types of electronic ignition systems used in S.I. engine? (2)
(ii) Draw and explain the circuit diagram of electronic ignition system using a magnetic pick-up method. (14)
13. (a) (i) What are the functions of the transmission system? (8)
(ii) Sketch and explain the working method of fluid flywheel. (8)

Or

- (b) Describe the line diagram of Synchromesh unit and mention the component (spring with ball type system). (16)
14. (a) (i) What are the functions of steering system? (4)
(ii) Discuss in detail working method of steering linkage system with suitable sketches. (12)

Or

- (b) (i) What are the requirements of a good braking system? (8)
(ii) Explain the merits of independent suspension system. (8)
15. (a) What are the engine modification to be undertaken in the S.I. engine for Alcohols or Ethanol as alternate Fuel? (16)

Or

- (b) (i) What are the advantages of Hybrid electric vehicle? (8)
(ii) Explain the construction and working of the PEM fuel cell with sketch. (8)
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Question Paper Code : 4141103/05/18
(An)

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Sixth/Seventh/Eighth/Tenth Semester
Mechanical Engineering
ME 6602 – AUTOMOBILE ENGINEERING
(Common to : Mechanical Engineering (Sandwich)/Mechatronics Engineering/
B.E. Robotics and Automation Engineering)
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A**(10×2=20 Marks)**

1. List atleast two IC engine component and material they are made up of.
2. Mention any two moments connected with vehicle aerodynamics.
3. Mention atleast two types of electronic ignition systems.
4. Are Euro and Bharat emission norms the same ? If not then the difference between them.
5. What is a fluid flywheel ? Where is it used ?
6. What is torque tube drive ? Where it is used ?
7. Mention the type of steering gear commonly used in light motor vehicles.
8. What is traction control ? Mention its significance.
9. What is gasohol ?
10. Mention atleast two merits of an hybrid electric vehicle.

PART – B**(5×13=65 Marks)**

11. a) Briefly explain with sketches different types of vehicle chassis and body.

(OR)

- b) List atleast six IC engine components and mention their functioning, material they are made up of and a schematic of the same.



12. a) Explain with a sketch the functioning of a capacitive discharge ignition system. List its merits over a transistorized coil ignition system.

(OR)

- b) With the help of an illustration, explain the working of a port fuel injection system in a SI engine. Mention its merits and demerits with regard to throttle body injection.

13. a) State the need for a clutch in an automobile. Describe the diaphragm operated clutch system with a sketch.

(OR)

- b) What is the function of a rear axle ? Draw a schematic of a rear axle of a bus/truck.

14. a) Describe with an illustration the steering geometry and how it affects motion of an automobile. Mention the difference between manual and power assisted steering.

(OR)

- b) What is the need for a suspension system ? Draw a schematic of a front suspension system, indicate the parts and their function.

15. a) Compare the performance and emission characteristics of a vehicle fuelled with Bio-ethanol with that of a neat gasoline fuelled vehicle.

(OR)

- b) Explain the necessary engine modifications for a CI engine to be fuelled with natural gas. Support your answer with its significance and how it affects the functioning of the engine.

PART – C

(1×15=15 Marks)

16. a) Discuss the working and salient features of the following with neat sketches.

i) Hotchkiss drive. (7)

ii) Transfer box mechanism. (8)

(OR)

b) i) Explain the working principle, merits and demerits of a fuel cell with schematic diagrams. (10)

ii) Compare the merits of a pure electric vehicle over conventional automotive vehicle. (5)