

B.E./B.TECH. Degree Examination, December 2020

Semester - VI

ME16602 – Automobile Engineering

(Regulation 2016)

Time: Three hours

Maximum : 80 Marks

Answer **ALL** questions

PART A - (8 X 2 = 16 marks)

1. If the wheel diameter, gear ratio and speed of the vehicle are all doubled, what will be its effect on the rpm of the electric motor? Choose the correct option
 - a) It will become twice.
 - b) It will become half.
 - c) No change.
 - d) It will become four times.
2. Answer in True/False. A) Aerodynamic drag force is lower in a cold climate. B) Ground Clearance should be decreased for low aerodynamic drag force. C) Wind Velocity always increases aerodynamic drag force.
 - (i) A)-True, B)-True, C)-False
 - (ii) A)-True, B)-False, C)-False
 - (iii) A)-False, B)-False, C)-True
 - (iv) A)-False, B)-True, C)-False
3. The path taken by intake air is
 - a) Carburetor (or throttle body) air cleaner intake manifold intake ports cylinders
 - b) Air cleaner carburetor (or throttle body) intake ports intake manifold cylinders
 - c) Air cleaner intake manifold carburetor (or throttle body) intake ports cylinders
 - d) Air cleaner carburetor (or throttle body) intake manifold intake ports cylinders
4. The following is known as 'Breaker less Ignition system'.
 - a) Battery coil ignition system.
 - b) Magneto Ignition system
 - c) Electronic Ignition system
 - d) All the above.
5. Elucidate about vehicle aerodynamics.
6. Differentiate between SI and CI engine fuel injection system?
7. Discriminate fluid coupling and torque converter.
8. Enumerate any 2 combustion and emission characteristics of SI and CI engine with Natural gas as an alternate fuel.

PART B - (4 X16 = 64 marks)

09. (a) (i) Enumerate the components of a typical vehicle chassis; With aid of a suitable assembly sketch to identify their location and explain about their functions. **(10)**
- (ii) Compare Yamaha Rx100 and Yamaha FZ with following aspect: Completion of cycle, Flywheel, valve mechanism, cooling requirement, volumetric efficiency, thermal efficiency, power produced and Lubrication requirement. According to Industry specification Yamaha Rx100 as 2-stroke Engine and Yamaha FZ as 4-stroke engine. **(6)**

(OR)

- (b) (i) With variable valve timing, power and torque can be optimized across a wide rpm band. Justify with a neat sketch. **(12)**
- (ii) Justify how EGR is suitable for an emission control system. **(4)**
10. (a) (i) Explain the gasoline direct fuel injection system with a neat sketch. Justify it with reference to maintaining stoichiometric air/fuel ratio. **(13)**
- (ii) Justify why turbocharger is commonly used in diesel engine for air addition process. **(3)**

(OR)

- (b) Discuss any two types of electronic ignition system with a neat sketch. Justify its advantages over battery coil ignition system. **(16)**
11. (a) Appraise upon automatic transmission system used in a modern car. With aid of a suitable sketch and explain in detail? **(16)**

(OR)

- (b) (i) Enumerate your analysis on Hotchkiss drive over Torque tube drive **(8)**
- (ii) With an aid of simple hydraulic circuit, Analyze the working of power steering system used in a vehicle. **(8)**
12. (a) (i) With a simplified circuit diagram, Analyze the working of a typical Antilock Braking System used in a vehicle. **(10)**
- (ii) Appraise upon EBD used in a modern car. **(6)**

(OR)

- (b) Explain hybrid technology and its various operating modes in detail? Compare their advantages and disadvantages of each mode. **(16)**