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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

TEST 1

Winter Semester: 2021 - 22

Course Code: MEC 1001

Course Name: Fundamentals of Automobile Engineering

Program & Sem: B. Tech MECH & IV Sem

Date: 27th April 2022

Time: 03:00 PM to 04:00 PM

Max Marks: 30

Weightage: 15 %

Instructions:

- (i) Read the all questions carefully and answer accordingly.
- (ii) Scientific and non-programmable calculators are permitted

Part A [Memory Recall Questions]

Answer both the Questions. Each question carries FOUR marks.

(2Qx 4M= 08M)

1. Transmission system is the system by means of which power developed by the engine is transmitted to road wheels to propel the vehicle. In automobiles, the power is developed by the engine which is used to turn wheels. Write four requirements of engine Transmission system.

(C.O.No.2) [knowledge]

2. Most automotive clutches are a dry single plate clutch with two friction surfaces. No matter the application, the function and purpose of a clutch is to transmit torque from a rotating driving motor to a transmission. Mention four function of clutch in an engine.

(C.O.No.1) [Knowledge]

Part B [Thought Provoking Questions]

Answer both the Questions. Each question carries SIX marks.

(2Qx6M=12M)

3. An engine is a machine designed to convert one or more forms of energy into mechanical energy. Mechanical heat engines convert heat into work via various thermodynamic processes. Enumerate six differences between SI and CI engine.

(C.O.No.1) [Comprehension]

4. Engine valves are mechanical components used in internal combustion engines to allow or restrict the flow of fluid or gas to and from the combustion chambers or cylinders during engine operation. Explain valve timing diagram of SI engine.

(C.O.No.2) [Comprehension]

Part C [Problem Solving Questions]

Answer the Question. The question carries TEN marks.

(1Qx10M=10M)

5. An engine or motor is a machine designed to convert one or more forms of energy into mechanical energy. Available energy sources include potential energy, heat energy, chemical energy, electric potential and nuclear energy. With a schematic diagram explain working principle of compression Ignition engine.

(C.O.No. 1) [Comprehension]



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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

TEST 2

Winter Semester: 2021 - 22

Course Code: MEC 1001

Course Name: Fundamentals of Automobile Engineering

Program & Sem: B. Tech (All Branch) & III Sem

Date: 02 JUNE 2022

Time: 03:00 PM -04:00PM

Max Marks: 30

Weightage: 15 %

Instructions:

(i) *Read the all questions carefully and answer accordingly.*

(ii) *Scientific and non-programmable calculators are permitted*

Part A [Memory Recall Questions]

Answer both the Questions. Each question carries FOUR marks. (2Qx 4M=08M)

1 An engine or motor is a machine designed to convert one or more forms of energy into mechanical energy. Write four objectives of engine cooling system. (C.O.No.3)
[Knowledge]

2 A lubricant is a substance that helps to reduce friction between surfaces in mutual contact, which ultimately reduces the heat generated when the surfaces move. Brief objectives of lubrication system and its main purpose. (C.O.No.4)
[Knowledge]

Part B [Thought Provoking Questions]

Answer both the Questions. Each question carries SIX marks. (2Qx6M=12M)

3 A brake is a mechanical device that inhibits motion by absorbing energy from a moving system. It is used for slowing or stopping a moving vehicle, wheel, axle, or to prevent its motion, most often accomplished by means of friction. Enumerate six differences between disk and drum brake. (C.O.No.3)
[Comprehensive]

4 Internal combustion engine cooling uses either air or liquid to remove the waste heat from an internal combustion engine. For small or special purpose engines, cooling using air from the atmosphere makes for a lightweight and relatively simple system. Brief at least four parts of liquid cooling system. (C.O.No.4) [Comprehensive]

Part C [Problem Solving Questions]

Answer the Question. The question carries TEN marks. (1Qx10M=10M)

5 With a schematic diagram explain the working principle of Thermosiphon water cooling system.
(C.O.No.4) [Comprehensive]

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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

END TERM EXAMINATION

Winter Semester: 2021 - 22

Course Code: MEC 1001

Course Name: Fundamentals of Automobile Engineering (OE-2)

Program & Sem: B.Tech & VI Sem / IV Sem / II Sem

Date: 1st July 2022

Time: 01:00 PM to 04:00 PM

Max Marks: 100

Weightage: 50%

Instructions:

- (i) *Read all the questions carefully and answer accordingly.*

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries SIX marks.

(5Qx6M= 30M)

Q.NO 1. A motor vehicle, also known as motorized vehicle or automotive vehicle, is a self-propelled land vehicle, commonly wheeled, that does not operate on rails (such as trains or trams) and is used for the transportation of people or cargo. Brief the functions of Piston, Cylinder head and valves.
(C.O.No.1) [Knowledge]

Q.NO 2. Propulsion transmission is the mode of transmitting and controlling propulsion power of a machine. The term transmission properly refers to the whole drivetrain, including clutch, gearbox, prop shaft, differential, and final drive shafts. Brief the requirements of Propeller shaft and Differential drive.
(C.O.No.2) [Knowledge]

Q.NO 3. Internal combustion engine cooling uses either air or liquid to remove the waste heat from an internal combustion engine. For small or special purpose engines, cooling using air from the atmosphere makes for a lightweight and relatively simple system. Write the function of splash lubrication system with a neat sketch.
(C.O.No.3) [Knowledge]

Q.NO 4. Suspension systems must support both road holding/handling and ride quality, which are at odds with each other. Mention the major components of McPherson suspension system and its requirements.
(C.O.No.4) [Knowledge]

Q.NO 5. The steering system converts the rotation of the steering wheel into a swiveling movement of the road wheels in such a way that the steering-wheel rim turns a long way to move the road wheels a short way. Brief the requirements of steering system.
(C.O.No.5) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries TEN marks.

(4Qx10M=40M)

Q.NO 6. The steering column turns a large screw which meshes with the nut by recirculating balls. The nut moves a sector of a gear, causing it to rotate about its axis as the screw is turned; an arm attached to the axis of the sector moves the Pitman arm, which is connected to the steering linkage and thus steers the wheels. Explain Ackerman steering mechanism with a neat sketch.

(C.O.No.5) [Comprehension]

Q.NO 7. Suspension is the system of tires, tire air, springs, shock absorbers and linkages that connects a vehicle to its wheels and allows relative motion between the two. Suspension systems must support both road holding/handling and ride quality, which are at odds with each other. With a neat sketch explain the function of Leaf and coil spring suspension system.

(C.O.No.4) [Comprehension]

Q.NO 8. A brake is a mechanical device that inhibits motion by absorbing energy from a moving system. It is used for slowing or stopping a moving vehicle, wheel, axle, or to prevent its motion, most often accomplished by means of friction. Explain the working principle of drum brake with a neat sketch.

(C.O.No.3) [Comprehension]

Q.NO 9. The gearbox is a mechanical device used to increase the output torque or to change the speed (RPM) of a motor. The shaft of the motor is connected to one end of the gearbox and through the internal configuration of gears of a gearbox, provides a given output torque and speed determined by the gear ratio. Explain the working principle of Gear box with a neat sketch.

(C.O.No.2) [Comprehension]

Part C [Problem Solving Questions]

Answer both the Questions. Each question carries FIFTEEN marks.

(2Qx15M=30M)

Q.NO 10. An engine or motor is a machine designed to convert one or more forms of energy into mechanical energy. Available energy sources include potential energy, heat energy, chemical energy, electric potential and nuclear energy. Explain the working principle of Diesel Engine with a schematic diagram of all 4stroke position and valve timing diagram. (C.O.No.1) [Comprehension]

Q.NO 11. A chassis is the load-bearing framework of an artificial object, which structurally supports the object in its construction and function. Write the requirement of Chassis and briefly classify the same. (C.O.No.4) [Comprehension]