

Exam Date & Time: 07-Dec-2023 (02:30 PM - 05:30 PM)



# MANIPAL ACADEMY OF HIGHER EDUCATION

SEVENTH SEMESTER B.TECH END SEMESTER EXAMINATIONS, NOV/DEC 2023

**Automobile Engineering [MME 4063]**

**Marks: 50**

**Duration: 180 mins.**

**A**

**Answer all the questions.**

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

- 1) During routine car maintenance, the technician observed a distinct metallic noise in the engine and found an excessive gap between the piston and the cylinder liner. Identify the phenomena. With a neat sketch, suggest a suitable correction for the issue. (4)
  - A)
  - B) With a neat sketch, explain the construction and working of a lubrication system that does not use an oil pump to circulate the lubricating oil. (4)
  - C) Identify and define the factors for incorporating ignition advance in an automobile. (2)
- 2) Differentiate between single plate and multi plate type clutch assembly. (4)
  - A)
  - B) List the limitations of a simple carburettor and the methods to overcome them in an automobile. (3)
  - C) With a neat sketch, explain the working of a mechanical fuel pump. (3)
- 3) A car manufacturer wants to incorporate independent suspension in the front axle. There is a limitation in the space at the front end to accommodate a sizeable transverse engine. Suggest a suitable suspension system with reasons and explain its working using a neat sketch. (4)
  - A)
  - B) With a neat sketch, explain the working of a gear train used in vehicles that allow the wheels at each end of a drive axle to rotate at different speeds while cornering. (4)
  - C) A car manufacturer wants to replace the constant mesh gearbox with the synchromesh gearbox. What may be the reasons for the change? Elaborate. (2)
- 4) With a neat sketch, explain the working of a braking system that utilises partial vacuum from the inlet manifold. (4)
  - A)
  - B) What are the effects of setting a wrong camber and caster angle during wheel alignment? (3)

- C) List the functions of tyres in a vehicle. (3)
- 5) A car is subjected to emission testing but fails as it does not meet the emission standards. The service engineer identifies crankcase emission to be the primary reason. Suggest a system to control the same and with a neat sketch explain its working. (4)
- A)
- B) With the help of a conceptual illustration, discuss the general configuration of electric vehicles. (4)
- C) What are the significant differences in BS-VI emission standards over BS-IV? (2)

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