

Seat No.	
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B.E. (Mechanical) (Part - IV) (Semester - VII)

Examination, April -2018

AUTOMOBILE ENGINEERING (Elective - I)

Sub. Code : 67506

Day and Date : Friday, 27 - 04 - 2018

Total Marks : 100

Time : 2.30 p.m to 5.30 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Draw neat sketch wherever necessary.
 - 3) Figures to the right indicate full marks.
 - 4) Make suitable assumptions if necessary.
 - 5) Use of non- programmable calculator is allowed.

- Q1) a)** Explain in details the automobile body construction, write different materials used for automobile body. [9]
- b)** Explain with neat sketch front engine front wheel drive. [8]
- Q2) a)** What are the good requirements of the clutch? [8]

OR

Explain with neat sketch the constructional details of single plate clutch.

- b)** What is a need of gear box in automobile? Explain the final drive gears. [8]
- Q3) a)** What do you understand from [8]
- i) Caster
 - ii) Camber
 - iii) King pin inclination
 - iv) Scrub radius.

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- b) Which are the different types of springs used in the suspension system? Explain any one of them with neat sketch. [9]

OR

Explain interconnected and self-leveling suspension system.

- Q4) a) Explain with neat sketch Anti - lock braking system used in modern cars. List benefits of ABS over conventional brakes. [8]

- b) Draw a layout sketch of hydraulic braking system used in 4 wheeler vehicle? Explain working and how differential braking is achieved with this system? [9]

OR

List types of power and power assisted brakes used in automobiles? Explain air brake system with neat sketch?

- Q5) a) Draw a neat circuit diagram of automobile starting, battery charging and ignition circuit and explain working of all. [9]

- b) Draw a layout sketch of automobile air conditioning system showing all necessary components and explain working? [8]

OR

Explain with neat sketch Electronic Controlled Management (ECM) system used in automobile? List benefits?

- Q6) a) Define and explain how to estimate. [4]

- i) Air Resistance.
- ii) Gradient Resistance.
- iii) Rolling Resistance.
- iv) Tractive effort.

OR

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- a) Explain what is relation between engine speed and road wheel speed?
How to select gear box and final drive ratio?
- b) A motor vehicle weights 7975.5N and engine develops 14.7 kW at 2500 rpm. At this engine speed road speed of the car on the top gear is 64.37 km/hr. Bottom gear reduction is 3.5:1 and efficiency of transmission is 88% on top and 80% is bottom gear. The diameter of tyre is 0.762 m and the projected frontal area is 1.116 m². The coefficient of air resistance is 0.0314 N-hr²/km²-m² and road resistance is 0.023.W. Estimate. [12]
- Speed of the car in bottom gear.
 - Tractive effort available at wheels in top and bottom gear.
 - Gradicut vehicle can climbin bottom gear.
 - Tractive effort required to start car in level and to attain speed of 48.28 km/hr in 10 seconds.

