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**B.Tech. MECHANICAL ENGINEERING  
(BTMEVI)**

**Term-End Examination**

**June, 2013**

**BIME-012 : AUTOMOBILE ENGINEERING**

*Time : 3 hours*

*Maximum Marks : 70*

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**Note:** *Attempt any five questions. All questions carry equal marks. Use of scientific calculator is permitted.*

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1. (a) Explain briefly various parts of an automobile with the help of simple sketch. 7+7
- (b) An unsuper charged petrol engine develops 735 kW with air fuel ratio 12.8. The bsfc is 0.350 kg/kWh and mechanical efficiency is 86%. The inlet pressure is 730 mm of mercury absolute and the mixture temperature is 325K. The engine is supercharged to a pressure ratio of 1.6 by a supercharger of adiabatic efficiency 0.7 and mechanical efficiency 0.9. Assuming that air - fuel ratio remains unchanged and IP is proportional to inlet density. Calculate the power required to run the supercharger. Assume that volumetric efficiency does not change due to supercharging.

2. (a) Define scavenging and scavenging efficiency. Explain with sketches different scavenging arrangements based on charge flow. 7+7
- (b) What is a chassis ? List the various components of a chassis.
3. (a) Explain briefly the various sources from which pollutants are emitted from SI engine 7+7
- (b) Enumerate the factors which affect battery life. Explain briefly 'trickle charging'.
4. (a) What is a clutch ? What are the functions of a clutch ? 7+7
- (b) What is the necessity of a braking system ? Define the term 'braking efficiency'. How are brakes classified ?
5. (a) What purposes are served by a gear box in the transmission system of an automobile ? Define gear ratio. How gear ratio is obtained ? 7+7
- (b) What do you mean by the term "Ignition" ? How is it related with "combustion" ? What are the requirements of an ignition system for an IC engine ?
6. (a) Give the layout of a steering system and label the various parts. Also explain the working of the steering system. 7+7
- (b) Describe the main lights in a modern vehicle. What is the purpose of direction signal light ? What is the use of tail lights ?

7. (a) What are the factors on which the life of an 7+7 automobile depends ?
- (b) Describe in brief the main components of automobile air conditioning.
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