

01923

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

Term-End Examination

December, 2012

BIME-012 : AUTOMOBILE ENGINEERING

Time : 3 hours

Maximum Marks : 70

Note: *Answer any five questions. All the questions carry equal marks. Assume missing data, suitably, if any.*

1. (a) What are the factors considered for selecting a suitable power unit in a vehicle ? Discuss in brief the important features of an automotive power plant. 7+7=14
- (b) A 4 cylinder 4 stroke C1 engine develops 14.7 KW at 1000 rpm. The mean effective pressure is 5.5 bar. Calculate the bore and stroke of the engine. Assume the length of stroke = 1.5 bore dia.

2. (a) What is the necessity of cooling an I.C. engine ? Describe in brief an I.C. engine cooling system. 7+7=14
- (b) Discuss the need for a gear box in automobiles.

3. (a) What is a fluid skywheel ? Describe its working principle, construction and operating characteristics with a suitable labelled diagram.
- (b) What are the different types of suspension systems used in automobiles ? Explain a Macpherson strut suspension system with a properly labelled diagram. **7+7=14**
4. (a) What is transaxle ? Describe its working with a suitable diagram.
- (b) Discuss the functions of a front rigid axle. What is a stub axle ? Describe different types of stub axles. **7+7=14**
5. (a) What are pneumatic brakes ? Compare them with hydraulic brakes and describe their working in brief.
- (b) What is a limited slip differential ? How it is different than a conventional differential ? **7+7=14**
6. (a) Why horns are used on the vehicles ? Describe the common type of horns.
- (b) Explain the working principle, construction and functions of an alternator used in automobiles. **7+7=14**

7. (a) Why are batteries used in automobiles ?
How are their capacities specified ? What
are maintenance free batteries ? How are
the automotive batteries charged ?
- (b) Discuss the criterion for designing the head
light system of a vehicle. **7+7=14**
8. Write short notes on following : **3½x4=14**
- (a) Power steering
- (b) Disc brakes
- (c) Automobile Air-conditioning
- (d) Engine lubrication
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