GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN MECHANICAL ENGINEERING

SEMESTER- VI

Subject Name: **Automobile Engineering (Elective –I)**
Subject Code: **2361929**

Sr. No.	Subject Content	Hrs.
1	**INTRODUCTION.** 1.1 Know the objectives of learning this subject. 1.2 Need, Scope & importance of Automobile Engineering (AE) in industries. 1.3 Need of attitude, knowledge & skill required for application of AE. 1.4 Automobile-definition, classification, parts, description/ specification, performance parameters , Indian and international manufacturers. 1.5 Vehicle –types of bodies, important dimensions and specification parameters.(including earth moving machineries.) 1.6 Chassis- components and their function, classification.	3
2	**ENGINE SYSTEMS.** 2.1 Internal combustion engines-types and classification used in automobile, thermodynamic cycles used, main parts/elements , fuel used and general arrangement sketch for each, performance parameters , applications and selection criteria. 2.2 Fuels-types, properties and applications. 2.3 Need and working of various types of LPG/CNG kits. 2.4 Air, fuel and exhaust gases circuits and working for petrol and diesel engines. 2.5 Carburetor-functions, types, sketch, elements , working, essential features, specifications, limitations and applications. 2.6 Petrol injection -functions, types, sketch, elements, working, comparison with carbureted fuel supply, merits, limitations and applications. 2.7 Fuel injection system for CI engines-functions, types, sketch, elements, working and applications. 2.8 Fuel injection systems for LPG and CNG-functions, types, sketch and working. 2.9 Fuel injection pump and fuel injector-functions, types , specifications and applications. 2.10 Engine lubricants-types, standards/designations, properties and applications. 2.11 Lubrication-main parts of engine required lubrication, types, sketch, working and applications. 2.12 Engine cooling system-need, types, sketch, elements , working and performance parameters.	12

	2.13 Supercharging and turbo charging- concept , need and applications. **Note** : Application type (selection of spares/consumables/ etc) question/s of 6-8 marks out of 70.	
3	**TRANSMISSION AND SUSPENSION SYSTEMS.** 3.1 Introduction and requirement of transmission system. 3.2 Transmission system-types(electrical & electromagnetic, hydraulic and mechanical) and sub types, general arrangement, elements and working. 3.3 Main units (clutch, transmission, drive line and driving axle),their sub units, functions and essential features. 3.4 Clutch- principle of operation, types, sketch/arrangement , working and applications. 3.5 Gear box- important terminology in context of automobile engineering (including first/second/third/reverse/neutral gear), types and sub types, sketch/arrangement, working and applications. 3.6 Drive line – types (including propeller shaft, universal joint, sprockets, chains),sketch/arrangement, elements, working and applications. 3.7 Driving axle- types (including final, differential, half shaft, etc), sub types, constructional sketch/arrangement, elements, working and applications. 3.8 Rear axle-functions, types and working. 3.9 Suspension –introduction, functions and requirements, elements - their types and working. 3.10 Suspension system- types, components, sketch/ arrangement , working and applications. 3.11 Wheels- essential requirements , types and applications. 3.12 Need and methods of wheel balancing. 3.13 Tyres- essential requirements , types and applications. **Note** : Application type (selection of spares/consumables/ etc) question/s of 4-6 marks out of 70.	10
4	**CONTROL SYSTEMS.** 4.1 Steering system- purpose, functions, general arrangement, basic parts and working. 4.2 Steering gears- types, sketch/arrangement, working and applications. 4.3 Power steering- types, sketch/arrangement, elements , working and applications. 4.4 Front and rear axle- functions, types and working, stub axle-functions their shapes and working. 4.5 Braking system- functions, requirements, classification and types- sketch/arrangement, elements, working and applications. **Note** : Application type (selection of spares/consumables/ etc) question/s of 3-5 marks out of 70.	6

5	**ELECTRICAL SYSTEMS.** 5.1 Major systems (starting, charging, ignition and lighting), their subcomponents and functions. 5.2 Common troubles and their remedies for electrical systems.	2
6	**REPAIRS AND MAINTENANCE.** 6.1 Preventive maintenance steps for various automobiles. 6.2 Requirements for running automobiles (like changing lubricants, engine tuning, noise level, regular checking of brake shoes and other parts, regular checking of various alignments, cleaning and adjustment, etc .) 6.3 Fault tracing methods and tools/equipments/ devices/ instruments used for fault tracing. 6.4 Common troubles, their causes and remedies. 6.5 Tools/equipments/devices used for carrying out preventive/breakdown maintenance and their applications. 6.6 Standard operative conditions for test. **Note** : Application type (identifying troubles and suggesting remedies) question/s of 4-6 marks out of 70.	6
7	**STANDARDS AND CERTIFICATIONS.** 7.1 Various emission standards and parameters for Pollution Under Control (PUC) certification. 7.2 Various tests and certificates requirements for on-road condition. 7.3 Insurance-need, types, various agencies and documents required. 7.4 Valuation-need and considerations.	3
	Total	42

Notes:

A. FOR STUDENTS.

a. It is advised that student download this copy of syllabus and plan to achieve the objectives of learning this subject.

B. FOR PAPER SETTER/MODERATOR.

a. Refer GTU syllabus and do not take reference of previous TEB question papers.
b. Ask the questions from each topic having marks weightage proportionate to hours allotted to that topic.
c. Optional questions must be asked from the same topic. That is weightage of compulsory attendance part of questions will be equal to proportionate to hours allotted to each topic.

d. Marks ratio of knowledge: comprehension: application types questions must be 40:30:30.
e. Submit solution / answer keys along with distribution of marks in each question for the paper being submitted.

Reference Books:

1. Automobile Engineering — R.K.Rajput (Laxmi Publications)
2. Automobile Engineering — KIRPAL SINGH