

2014

B.Tech. V Sem. (Main/Back) Exam, 2014 Mechanical Engineering
Automobile Engineering

Time : 3 Hours

Total Marks : 80 Min.

Passing Marks 24

instructions to Candidates : Attempt any five questions selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

UNIT—I

- 1 (a) Describe briefly the basic layout of chassis and explain the different types of chassis frames.
(b) Describe the basic construction and operation of fixed-caliper, floating caliper and sliding caliper disc brakes.

OR

1. (a) Describe the constructional features and working of hydraulic clutch. List the advantages of hydraulic clutch. (6+3=9)
(b) With the help of neat sketch explain the working of fluid coupling. (7) ;

UNIT-II.

- 2.(a) What is synchromesh device ? Describe the working of synchromesh gear box with the help of neat sketch (MAJ)
(b) What is the use of an overdrive in an automobile ? Explain its working along with the advantages. (2+5=7)

OR

2. (a) Write short note on (any two) :
(i) Propeller shaft and Universal Joint
(ii) Hydraulic torque converter
(iii) Rear axles
(b) Describe the constructional features and working of following drive systems, along with neat sketch of each
(i) Hotchkiss open type drive
(ii) Torque tube drive

UNIT 3.

- 3.(a) Describe the advantages of radial ply tyres over bias ply tyres. Explain the different types of tyre treads and the characteristics asymmetric and directional tyres.
(b) Discuss in detail the Ackermann steering mechanism. Discuss the effect of camber, caster and toe-in and toe-out on the directional stability, steering effort and tyre wear of the vehicle.

OR

- 3.(a) With the help of neat sketch, describe the constructional features of rear suspension

system using leaf springs, along with the function of each

(b') Explain the different types of power steering with the help of eye sketches,

UNIT 4

4.(a) Describe briefly the construction and working of lead acid battery with the help neat sketch
DISCUSS when and how to make a battery load test

(b) Describe briefly. the working principle of alternator and explain how alternator voltage and current output are controlled

OR

4.(a) Describe the basic component in the contact-point ignition system and explain how they are operate

(b) With the help of simple diagram explain the working of following accessories

(i) Head lamp

(ii) Electric horn

Unit-V

5.(a) Describe the working of an automotive air conditioning system along with function of each component. How the evaporator icing is controlled

(b) Explain the various safety requirements of an automobile, Explain the function of airbags(3244) (344:7) and belts.

OR

5.(a) List the advantages of variable displacement compressor over fixed displacement compressor in automotive air conditioning. Explain the function of following air conditioner safety devices.

(i) Low pressure cutoff switch

(ii) High pressure relief valve

(iii) Thermal limiter and superheat switch

(b) Explain the following, briefly

(i) Night vision system

(ii) Global positioning system