

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-VII Examination-Nov/Dec.-2011

Subject code: 171902

Date: 22/11/2011

Subject Name: Automobile Engineering

Time: 10.30 am-01.00 pm

Total marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Classify Auto-vehicles from different aspects. Quote 07
examples of each basis of their classification.
- (b) What are the functions of the following accessories? 07
- i) Mirror ii) Speedometer iii) Odometer
iv) Windscreen wiper v) Sun visors vi) Horn
vii) Fuel Gauge

- Q.2** (a) Explain the single plate clutch with neat sketch. 07
- (b) Describe the common features and major differences in a 07
constant mesh and synchromesh gear box.

OR

- (b) Describe construction and explain working of a fluid 07
flywheel with the help of suitable diagrams. Discuss the
characteristics, merits and demerits.

- Q.3** (a) What is transfer box? Where it is used? Describe clearly 07
the construction and working of any transfer box.
- (b) Explain the working of conventional differential gear box 07
with neat sketch.

OR

- Q.3** (a) Explain the working principal of two universal joints to 07
obtain constant velocity.
- (b) (i) Explain rolling resistance, gradient resistance, and wind 03
resistance
- (ii) The engine of a jeep is known to be able to provide 04
40.5 kW for propulsion purposes. In a certain application,
the jeep weighing 12459 N, is required to pull a trailer of
gross weight 10673 N at a speed of 57.75 km/hr in top gear
on level. The resistance to motion is given by the equation
 $R = a \cdot W + b \cdot V^2$, Where $a = 0.016$ and $b = 0.055$, W in N and
 V in km/hr. Find out if the jeep is adequate for the job, if
the transmission efficiency is 90%.

- Q.4** (a) Differentiate clearly between the function of spring and a 07
shock absorber. Explain the construction and working of a
telescopic type of shock absorber with the help of neat
diagram.
- (b) Write notes on i) Torsion bar 07
ii) Helper spring

OR

- Q.4 (a)** Draw a simplified wiring circuit for the lighting system of car and discuss the same. **07**
- Q.4 (b)** Name different types of driving licenses. What restrictions are imposed on a learner's driving license? Discuss the details in order to get a permanent license. **07**
- Q.5 (a)** Explain the terms: Camber, Castor, and steering axis inclination. What are the effects of each on steering characteristics of a vehicle? **07**
- (b)** What is "Ply rating" of a tyre? How does a tubeless tyre differ from a tubed tyre in its construction? Compare the merits and demerits of tubeless tyres. **07**
- OR**
- Q.5 (a)** Draw a neat sketch and compare a disk brake and drum brake. **07**
- (b)** Explain construction and working of vacuum brake. **07**

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