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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V- EXAMINATION - SUMMER 2016

Date: 19/05/2016

Subject Code: 150202

Subject Name: Automobile Systems

Time: 02:30 PM to 05:00 PM **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. 0.1 (a) Explain the vehicle layout of four wheel drive with neat sketch. Also state the merits and 07 demerits of four wheel drive. Explain various defects in frame and body in details. 07 **(b)** Differentiate sliding mesh and constant mesh gear box with neat sketch. 07 **Q.2** (a) Explain the working of torque convertor with neat sketch. Also state the merits and demerits of **(b)** 07 torque convertor. OR A sliding mesh type of gear box gives 4- forward speeds only. The counter or lay shaft speed is 07 half that of the engine speed and assume the smallest gear is not to have less than 29 teeth. Calculate the number of teeth and corresponding exact speed ratios for the following cases: (1) Gear ratio on top gear = 1:1(2) Gear ratio on third gear = 1.4:1(3) Gear ratio on second gear = 2.28:1(4) Gear ratio on first gear = 3.8:1Also sketch the arrangement of the gear box. Q.3(a) Classify various clutches and explain working of centrifugal clutch with neat sketch. **07** Differentiate hydraulic brake and pneumatic brake. 07 **(b)** Classify various brakes and explain working of internal expanding shoe brake with neat sketch. Q.3 07 (a) Enlist various clutch lining materials & explain the role of lining materials in clutch operation. **(b) 07** Explain the following terms in details: (1) Camber, (2) scrub radius, (3) Steering axis **07 Q.4** (a) inclination. Explain Hydro elastic suspension system with neat sketch. 07 **(b) Q.4** (a) Classify shock absorber and explain Telescopic type shock absorber with neat sketch. **07** Explain the working of power assisted steering with neat sketch. 07 **(b)** A car weighing 0.9 tonnes is occupied by 4 persons each weighing 60 kg, and loaded with 0.5 07 (a) belongings weighing 200 kg. Its frontal area is 2.5 m² and it can attain a maximum speed of 90 km/hr on level road. Determine the maximum inclination it can raise at 30 km/hr in top gear. Take co-efficient of rolling resistance as 0.03 and aerodynamic co-efficient as 0.032. Explain construction and working of hotch kiss drive with neat sketch. **07 (b)** Explain the following terms in details. (1) Over inflation, (2) Air bleeding, (3) Under inflation. **Q.5 07** (a) Explain various bevel gears used in final drive with neat sketch. 07 ********

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