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# MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

*(A constituent unit of MAHE, Manipal)*

## VI SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)

## END SEMESTER EXAMINATIONS, APRIL-2018

SUBJECT: AUTOMOTIVE CHASSIS AND SUSPENSION [AAE 3252]

**REVISED CREDIT SYSTEM**
**(20/04/2018)**

Time: 3 Hours MAX. MARKS: 50

**Instructions to Candidates:**

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

**1A.** Explain the construction of conventional chassis frame with neat sketch. **(03)**

**1B.** An Automobile chassis, considering it as an overhanging beam having 7 m length. A uniformly varying load of 18 KN/m is acting on length of 3 m from front support and on rest of the length uniformly varying load of 2 KN/m is acting .A point load of 10 KN is acting at 3 m distance from the front end with the two supports one at the extreme front of the chassis and other at a distance of 5 m from the front. Calculate the maximum bending moment. Draw the bending moment and shear force diagram. **(05)**

**1C.** Sketch and explain Haltenberger Steering Linkage. **(02)**

**2A.** A motorcar weighs 13341.5 N and has a wheelbase of 2.65 m. The CG is 1.27 m behind the front axle and 0.76 m above the ground level. Maximum braking on all four wheels on level ground will bring the vehicle uniformly to rest from a speed of 64 km/hr in a distance of 25.9 m. Calculate the value of an adhesion between the tyre and the road. **(04)**

Under same road condition the vehicle descends a hill of gradient 1 in 20 and is braked on the front wheels only. Determine the load distributed between the front and rear wheels and the distance required to bring the car in rest.

**2B.** Write the purpose of Servo Brakes in automobile. **(02)**

**2C.** Why telescopic shock absorber is used in automobile? **(04)**

**3A.** Explain three characteristics of suspension system. **(03)**

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**3B.** Write the difference between active and passive suspension. **(02)**

**3C.** List different types of steering gearbox and write construction and working of any two. **(05)**

**4A.** Discuss any three technologies available for run flat tyre. **(03)**

**4B.** Write a note on essential features of any three types of automotive wheels. **(04)**

**4C.** Sketch and explain Brake valve operation in Hydraulic brakes. **(03)**

**5A.** Explain working and construction of electric Brake and state its advantages and disadvantages. **(04)**

**5B.** What is engine mounting? **(02)**

**5C.** With neat sketch explain the working of semi- floating and fully –floating type front axle. **(04)**