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Manipal Institute of Technology, Manipal



(A Constituent Institute of Manipal University)

V SEMESTER B.TECH (AERONAUTICAL AND AUTOMOBILE ENGINEERING) END SEMESTER EXAMINATIONS, DEC 2015/JAN 2016

SUBJECT: AUTOMOTIVE CHASSIS AND SUSPENSION [AAE 355] REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

✤ Answer ANY FIVE FULL the questions.

- ✤ Missing data may be suitable assumed.
- **1A.** What are the probable defects in Automotive Frames? (02)
- **1B.** List different types of cross-sections used for Automotive frames. **(03)**
- 1C. A vehicle chassis can be considered as a simply supported beam of 5 m long (05) and is supported at A and B each being 1 m from its front and rear ends. Loads of 4 kN and 5 kN is carried 0.5 m in front of A and 1.5 m behind respectively. a) Find the magnitude of reactions at A and B. b) If an extra load of 6 kN is to be added to the beam in such a position that the reactions at A and B are to be equal. At What distance from B must the 6 kN load to be situated?
- 2A. Mention different types of brakes based on Construction. (02)
- **2B.** What are the requirements of braking system? (03)
- **2C.** Derive an expression for the stopping distances in meter of a truck equipped (05) with all wheel brakes in terms of the coefficient of friction and speed in km/hr. Calculate the value of μ if the vehicle is stopped in 27.45 m from 64 km/h. If the coefficient of friction is reduced to 0.3 by rain, what will be the stopping distance?
- **3A.** Differentiate between power brake and power assisted brake. (02)
- **3B.** Calculate the minimum stopping distance for a vehicle travelling at 60 km/hr **(03)** with a deceleration equal to the acceleration due to gravity.
- **3C.** With a neat diagram, explain the working principle of Air-brake system. **(05)**

4A.	Discuss various parameters that influence the wheel alignment of an automobile.	(06)							
4B.	Explain worm and worm wheel type steering gear.								
4C.	Define turning circle radius for an automobile.	(01)							
5A.	Explain with line diagram Pneumatic suspension system.								
5B.	Explain Macpherson strut type front suspension with neat sketch.								
5C.	Define the following term: (1) Shackle (2) Brake dip.	(02)							
6A.	Enumerate the drawbacks of Ladder frame.								
6B.	Write any five characteristics that should be kept in mind while designing Aluminum wheels.	(04)							
6C.	What are the desirable properties in automobile tyres?	(04)							