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Question Paper Code : 20148

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Fourth Semester

Automobile Engineering

AT 6402 — AUTOMOTIVE CHASSIS

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

(Codes/Tables/Charts to be permitted, if any, may be indicated)

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Suggest a suitable power flow layout for a vehicle to be operated in a hilly region alone?
2. Mention the different types of stub axles.
3. State the advantages of universal joint.
4. What is meant by Non-slip differential?
5. List out the various types of load acting on rear axles.
6. Define-Tubeless tyre.
7. Give the merits of helper coil spring.
8. List the functions of ELIGOS spring.
9. Define bleeding of brakes.
10. Give the short note on minimum stopping distance.

PART B — (5 × 13 = 65 marks)

11. (a) Discuss the various chassis layouts in the trucks based on power plant location with neat sketches. (13)

Or

- (b) (i) Derive the condition for true rolling motion and Ackerman's steering system.
- (ii) A track has a pivot pins 1.1 m apart, the length of each track arm is 1150 mm and the track rod is behind the front axle and 1.0 m long. Determine the wheel base which will give true rolling for all wheels when the car is turning so that the inner wheel stub axle is 55° to the centre line of the car. A geometrical construction may be used. (13)

12. (a) Explain the construction and working of (i) Torque tube drive (ii) Hotchkiss drive. (13)

Or

- (b) Describe with neat sketch, the construction and working principles of differential. (13)

13. (a) Describe about the types of rear axles used in automobiles with neat sketches. (13)

Or

- (b) Discuss the classification of tyres based on the ply with the aid of neat sketch. (13)

14. (a) Discuss any three conventional suspension used in automobiles with neat sketches. (13)

Or

- (b) Describe the construction and working principles of any three independent suspension systems. (13)

15. (a) Explain in detail the forces acting on a vehicle moving downward incline in a different condition (i) Brakes applied on front wheel only (ii) Brakes applied on rear wheel only (iii) Brakes applied on both wheels. (13)

Or

- (b) Discuss about the construction and working principles of Hydraulic breaking system with neat sketch. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Write a case study on recent developments in electronically controlled braking system. (15)

Or

- (b) Write a case study on recent material used for manufacturing of tyres and their advantages over the older materials. (15)