

B.E DEGREE EXAMINATIONS: MAY/JUNE 2013

Fourth Semester

AUTOMOBILE ENGINEERING

AUE105: Automotive Chassis

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. In commercial vehicle layouts of engine is located forward, rear or under floor mainly to
 - a) Better utilization of space
 - b) Increase fuel economy
 - c) Better weight distribution
 - d) Reduce the weight of chassis
2. Which part in the steering column allows for changes in the angle between the upper and lower shafts?
 - a) Flexible coupling
 - b) Coupling cover
 - c) Universal joint
 - d) Collapsible section
3. Critical whirling speed of a shaft is increased by
 - a) Increasing its length
 - b) Decreasing its length
 - c) Decreasing its diameter
 - d) None of the above
4. Which type of rear axle is used on trucks?
 - a) Semi-floating
 - b) Fully-floating
 - c) Second-quarter floating
 - d) Third- quarter floating
5. The turning circle for a car is approximately
 - a) 1 metre
 - b) 10 metres
 - c) 15 metres
 - d) 100 metres
6. The tyre-tube assembly is mounted over the
 - a) Axle
 - b) Wheel rim
 - c) Wheel hub
 - d) Differential housing
7. The shock absorber is otherwise called as
 - a) Damper
 - b) Torsion bar
 - c) Spring
 - d) Radius rod
8. Zinc liners between the leaves of spring are sometimes used to
 - a) Increase cushioning effect
 - b) Decrease vibrations
 - c) Provide damping
 - d) Prevent squeaking
9. The brake efficiency of a new vehicle is about
 - a) 30 Percent
 - b) 50 Percent

- c) 80 Percent
d) 100 Percent
10. Most anti-skid devices are employed on
a) Rear brakes
b) Front brakes
c) Secondary brakes
d) Primary brakes

PART B (10 x 2 = 20 Marks)

11. What are the main functions of frame and name some of the components mounted on the chassis frame?
12. What is power steering and name two basic types of power steering?
13. What is the material used for propeller shafts?
14. What is a differential and where is it used?
15. State the three types of rear axle casings.
16. Why is an automobile tyre usually black in colour?
17. What is unsprung weight?
18. Which type of independent suspension is used in Maruti 800 car?
19. What is meant by “fading” of brakes?
20. What is the necessity for bleeding of brakes?

PART C (5 x 14 = 70 Marks)

21. a) (i) Name three types of chassis construction and state its advantages. (4)
(ii) Define castor, camber, king pin inclination, toe-in and toe-out. (10)
- (OR)**
- b) (i) What are the types of steering gears? (2)
(ii) Explain any two types of steering gear mechanism with the help of a neat sketch? (12)
22. a) What are the types of rear axle drives? Explain it with the help of a neat sketch?
(OR)
- b) Explain the operation of a differential in an automobile. Discuss in detail the construction and operation of the differential.
23. a) Discuss in detail different methods of supporting live rear axle shafts. Also describe the advantages and disadvantages of each one.

(OR)

- b) (i) Explain the types of wheels with neat sketch. (6)
- (ii) Discuss in detail various tyre-carcass types with the help of a neat sketch? (8)

24. a) (i) What are the objectives of vehicle suspension? (2)
- (ii) Explain the types of front wheel (dead axle) independent suspension with neat sketch. (12)

(OR)

- b) (i) What is the need for a helper spring and explain it with a neat sketch? (6)
- (ii) Explain briefly the action of air suspension. Draw the schematic diagram showing the layout of an air suspension system. (8)

25. a) (i) Explain the working principle of drum brake with the help of neat sketch. (7)
- (ii) Describe any type of hydraulic brake with the help of neat sketch. (7)

(OR)

- b) (i) Explain the layout of air brake system. (6)
- (ii) What is ABS? Explain its main parts of an ABS and its working? (8)
