

B.E DEGREE EXAMINATIONS: APRIL/MAY 2014

(Regulation 2009)

Sixth Semester

AUTOMOBILE ENGINEERING

AUE122: Automotive Safety

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The most effective section against safety and bending is
 - a) Square hollow section
 - b) Round bar
 - c) Round hollow section
 - d) Rectangular bar
2. The most prominent defect that usually occurs in the frames due to accidents is the
 - a) Vertical bending
 - b) Horizontal bending
 - c) Alignment fault
 - d) Damp vibration
3. For safety reasons, always the brake pipe in hydraulic brakes is made up of
 - a) PVC
 - b) Steel
 - c) Rubber
 - d) Copper
4. Lateral bending of the frame side members may be caused on account of
 - a) Weight of passengers
 - b) Side wind
 - c) Engine torque
 - d) Braking torque
5. When turning a corner,
 - a) the front wheels are toeing out
 - b) the front wheels are turning on different angles
 - c) the inside front wheels has a greater angle than the outside wheel
 - d) all of the above
6. The brake warning light warns the driver of
 - a) water in the master cylinder
 - b) air in the hydraulic system
 - c) failure of the primary or secondary circuit of hydraulic system
 - d) power-brake failure
7. The type of steering usually broken safely during collision is called as
 - a) Manual steering
 - b) Mechanical steering
 - c) Collapsible steering
 - d) Power steering
8. The brake pedal during ABS operation
 - a) Is pushed upward forcefully
 - b) Pedal stroke becomes longer

- c) Transmits slight kickback to the driver's foot
 - d) All of the above
9. Trafficators are light signals used for
 - a) Heavy traffic
 - b) Light traffic
 - c) Reversing the car in traffic
 - d) Indicating the turning direction
10. Expand the letters "SRS" written where ever there is an airbag in the car.
 - a) Super refreshing system
 - b) Super resistant system
 - c) Supplementary restraining system
 - d) Supplementary refreshing system

PART B (10 x 2 = 20 Marks)

11. What is preventive safety design of automobile body?
12. What is a crumple zone?
13. From safety view point, which is the ideal location for the fuel tank in the car body?
14. Compare the use of steel and aluminium as car body materials.
15. Why is it desirable to thickly upholster the interior of the car body?
16. Compare the advantages of an inertia reel type safety belt over the lap type?
17. Why do good automobile manufacturers resort to crash tests?
18. What is hazard flasher?
19. From where is the drive given to the windscreen wiper?
20. Why do we use laminated glass for the windscreens of automobiles?

PART C (5 x 14 = 70 Marks)

21. a) Discuss in detail various requirements of automobile body and describe the commonly used materials for automobile body.
(OR)
 - b) i) Describe clearly main components of a car body with the help of a neat sketch. (12)
 - ii) What is the purpose of bumper? (2)
22. a) i) Explain the necessity of passenger protection. Describe various active and passive systems to achieve the same. (10)
 - ii) Why it is important to have the maximum possible glass area in the car body? (4)**(OR)**
 - b) Describe in detail the safety features of a racing car.
23. a) Write short notes on airbag system and collapsible steering column.

(OR)

b) Use simple diagrams discuss the construction and working of the following accessories in an automobile:

- a) Windscreen wiper (7)
- b) Child lock (3)
- c) Seat belt (4)

24. a) Name any two major object detection system and explain any one type in detail.

(OR)

b) Explain the working principle of ABS featured with EBD system with the help of neat sketch.

25. a) i) Describe in detail various types of safety glass used in automotive body making. (10)

ii) What is a toughened glass? Where is it used? (4)

(OR)

b) i) What is a remote entry device? (8)

ii) Discuss in details various 'state of the art' vehicle safety systems. (8)
