

QUESTION BANK

AUTOMOTIVE SYSTEM & HEAVY EQUIPMENTS

SEMESTER:- 6TH

BRANCH:- AUTOMOBILE ENGG.

THEORY:- 2

CHAPTERS:

1. FRONT AXLE
2. STEERING & STEERING GEOMETRY
3. SUSPENSION SYSTEM
4. BRAKE SYSTEM
5. WHEEL & TYRES
6. CHASSIS & HEAVY EQUIPMENTS

**STATE COUNCIL FOR TECHNICAL EDUCATION &
VOCATIONAL TRAINING, ODISHA, BHUBANESWAR**

CHAPTER-1 : FRONT AXLE

1. Explain about any two type of stub axles.
2. What loads are coming to axle?
 - a. Vertical bending load due to vehicle weight
 - b. Driving torque
 - c. Braking torque
 - d. Side thrust
3. Name the types of front axles.
4. What are the functions of a front axle ?
5. What is difference between dead front axle & live front axle?
6. Explain the neat sketches ,construction of a front axle.
7. Explain with the help of simple diagram the different types of stub axles.
8. Define Axle and its Types ?
9. Explain about the Construction and function of front Axle with Neat Sketch ?
10. Define Front Axle ?
11. Define Stub Axle ?

CHAPTER-2 : STEERING & STEERING GEOMETRY

1. Write about king pin inclination
2. Discuss about toe-in and toe-out.
3. Define steering gear.)

The steering gear is used to convert the rotational movement of the steering wheel into linear movement of the steering linkage . Moreover it provides mechanical advantage.

4. What is the purpose of Toe-in and Toe-out ?

The purpose of providing a toe-in and toe-out is straightline stability of the vehicle , after negotiating a turn.

5. Define king pin inclination.

The tilt of the king pin from the vertical reference line is known as King Pin Inclination (KPI). It is also called as Steering Axis Inclination (SAI)

6. Define castor and camber.

Castor: The tilt of the king pin from the vertical reference line when viewed from side is known as castor. Camber: The camber angle is the inward or outward tilt of the wheel relative to the vertical reference

7. Explain briefly Ackermann steering mechanism with a neat sketch.

8. Write the function of Steering System in an Automobile ?

9. What is Steering Ratio ?

10. List out the different types of steering gear system.

11. What the purpose of a steering system?

12. Explain the working of the steering system with neat sketches.

13. Sketch and explain various steering geometries.

14. Explain a typical power steering system.

15. Explain the wheel alignment system.

16. Explain any one type of steering gear box with neat sketch.

17. What is the necessity of a steering gear?

18. Explain the steering geometry with neat sketch.

19. Explain the working of power steering with neat sketch.

20. Explain the Ackerman principle of steering with neat sketch.
21. Explain the working of torsion bar with neat sketch.
22. Derive the fundamental equation for correct steering angle ?
23. What is Davis and Ackermann Principle ? Explain it in Details ?
24. Define Understeer and Oversteer ?
25. Explain about the Constructional details of Rack and Pinion Steering Gear Box System ?

CHAPTER-3 : SUSPENSION SYSTEM

1. What are the different types of springs used in suspension system?
 - ☐ Leaf springs (Rigid axle suspension)
 - ☐ Coil springs (Independent suspension)
 - ☐ Torsion bar (Independent suspension)
2. Discuss the working of suspension system used in cars ?
3. List the use of Suspension System ?
4. Explain the working of suspension systems and also list the advantages and disadvantages of independent front and rear suspension.
5. Explain the working principle of pneumatic suspension system.
6. Explain the operation of a telescopic type shock absorber.
7. Explain the working of rear independent suspension system with neat sketch.
8. Explain the working of front independent suspension system with neat sketch.
9. Explain the working of shock absorber with neat sketch.
10. What are the objectives and components of suspension system.
11. Explain the difference between Rigid axle and Independent suspension system ?
12. Explain about the constructional details of Torsion Bar ?
13. Explain about the construction of leaf spring , coil and rubber spring suspension ?

CHAPTER-4 : BRAKE SYSTEM

1. Describe the Hydraulic braking system
2. Describe the Anti-lock braking system (ABS)
3. What are the functions of Brake Linings ?
4. Define the term Braking Efficiency ?
5. Compare Disc and Drum Brake ?
6. Explain the functions of automobile brake system and its requirements.
7. Briefly explain the brake balance & brake torque.
8. Discuss the working of a diagonal braking system with a layout. Also explain the working of master cylinder in a hydraulic brake.
9. Explain the working principle of antilock braking system.
10. Explain with the help of simple diagram the different types of stub axles
11. Explain the mechanical brakes with neat sketch.
12. Explain the pneumatic or air brakes with neat sketch.
13. Define Brake and its Types ?
14. What do you mean by brake fading ?
15. What do you mean by Bleeding of Brakes ?

CHAPTER-5 : WHEEL & TYRES

1. Classify wheels.

- a. Disc wheel b. Wire wheel c. Split wheel d. Light alloy wheel

2. Write down the types of tread patterns in tyres.

- a. Rib pattern b. Lug pattern c. Rib-and-Lug pattern d. Block pattern

3. What is meant by the term 'tread'?

The tread is an external rubber layer preventing the carcass from wear and external damage which are produced by the road surface.

4. State the important parameters in radial type.

- 1. Performance of the tyre 2. Shape of the tyre

5. Name the various materials used in manufacturing of tyres.

- i. Nylon ii. Terylene iii. Rubber iv. Glass fiber v. Steel

6. Write down the basic constituents of a tyre.

- 1. Rubber – natural or synthetic
- 2. Nylon or Rayon cord fabric
- 3. Steel

7. What are the inspecting methods used in tyres?

- 1. Visual inspection 2. Thorough inspection.

8. Describe 154 SR-14 in tyre designation.

The code 154 SR-14 refers to the tyre having speed rating up to 170kmph of radial tyre and the width of W=154mm with D=14inches.

9. Define tube vulcanization.

The process of repairing a punctured tube is known as tube vulcanization.

10. What is meant by camel block?

Fresh tread material is known as 'Camel Block' is placed around the tread and put in retreading machine and clamped.

11. Define wheel track and wheel base.

The distance between the tyre centers, mounted on the same axle is known as wheel track. The wheelbase is the distance between the centers of the front and rear wheels

12. What are the different types of tyres used in automobile ?

☒ Crossply tyres

☒ Radialply tyres

☒ Beltedbias tyres

13. Give the function of tyre?

a. Braking forces to the Road Surface

b. Changing & Maintain Direction of Travel

c. Absorbing Road shocks

14. What are the Wheel Alignment Parameters ?

15. What is wheel balancing?

Balancing the wheel assemblies correctly to avoid such vibration is known as wheel balancing.

16. Classify wheel balancing.

1. Static balance 2. Dynamic balance

17. What are cross ply and radial ply tyres?

18. What are the advantages of wire wheel over disc wheel?

CHAPTER-6 : CHASSIS & HEAVY EQUIPMENTS

1. Explain with neat sketches the various types of chassis & discuss their advantages and disadvantages.
2. Discuss the frame type chassis construction with neat sketch.
3. List any four components of a chassis.
4. List any four characteristics of a good chassis.
5. Give any two requirements of a good frame.
6. What are the functions of a frame ?
7. What are the types of frames ?
8. What are the stresses to which the frame members are subjected to?
9. Explain with neat sketch the various types of chassis and discuss their advantages & disadvantages.
10. What are the functions of a frame?
 - o To support the chassis components and the body.
 - o To withstand static and dynamic loads without undue deflection or distortion.
 - o To carry the load of the passengers or goods carried in the body.
11. What are the stresses to which the frame members are subjected to?
 - ☒ Frame longitudinal members—bending stress
 - ☒ Frame side members—twisting stress
12. What are the types of frames?
 - a. Ladder type frame
 - b. Perimeter type frame
 - c. X type frame
 - d. Backbone type frame
13. What is meant by the term Chassis?

A complete vehicle without a body structure is known as Chassis. It comprises of basic structure, power unit, transmission system, controls and auxiliaries.

14. Explain briefly the various types of chassis construction with the help of suitable diagrams and the types of frame with neat sketch.
15. Explain with neat sketches the various types of chassis & discuss their advantages and disadvantages.
16. Explain briefly about the defects in chassis frame.
17. What are the functions of frame?
18. List out the various materials used in the construction of chassis frames.
19. Explain briefly the various types of chassis construction with suitable diagrams.

THANK YOU