

GUJARAT TECHNOLOGICAL UNIVERSITY

BE-6 SEMESTER – OLD PAPER – S22 TO W25 – QUESTION BANK

Subject Name & Code:

SPECIAL PURPOSE VEHICLE (3160213)

Unit 1: Introduction

Repeated Questions:

1. **Classify the special purpose vehicles.** (S24 - Q1a, 03 marks; W23 - Q1a, 03 marks; W22 - Q1a, 03 marks; S22 - Q1c, 07 marks)
2. **Explain advantages & disadvantages of wheel type & track type vehicle.** (W23 - Q2b, 04 marks; W22 - Q1b, 04 marks)
3. **Compare wheeled vehicle with tracked vehicle on the basis of; (i) Ground pressure (ii) Suspension (iii) Steering (iv) Speed.** (S25 - Q1b, 04 marks)
4. **Discuss the selection criteria of tracked type and wheeled type vehicles.** (W25 - Q1b, 04 marks; W24 - Q1b, 04 marks)

Other Important Questions:

1. **Define special purpose vehicle and give the advantages of it.** (W24 - Q1a, 03 marks)
 2. **Write the advantages and disadvantages of special purpose vehicles.** (W25 - Q1a, 03 marks)
 3. **What are the limitations of tracked vehicles?** (S23 - Q1a, 03 marks)
 4. **Explain in brief articulated vehicle.** (S22 - Q1a, 03 marks)
 5. **What are Articulated Vehicles?** (S24 - Q4a OR, 03 marks)
 6. **Explain Track Type Special Purpose Vehicle.** (S24 - Q2a, 03 marks)
 7. **Describe following types of SPV's in short: (i) Hauling (ii) Hoisting (iii) Conveying.** (S25 - Q1a, 03 marks)
 8. **What is the difference between trailer and semi trailer? List out at least six types of semi trailers.** (S23 - Q1b, 04 marks)
 9. **Explain various types of semi- trailers with its applications.** (W24 - Q1c, 07 marks)
 10. **List out various types of semi trailers.** (S25 - Q5a OR, 03 marks)
 11. **Classify the special purpose vehicles and give the application of each.** (S22 - Q1c, 07 marks)
 12. **Write short note on multi axle vehicles.** (W22 - Q2b, 04 marks)
 13. **Explain advantages and disadvantages of multi axle vehicles.** (S22 - Q3b, 04 marks)
 14. **Describe various provisions of adapted vehicles for the differently challenged persons.** (W25 - Q1c, 07 marks)
 15. **Different between wheel and track type vehicle.** (S22 - Q5b, 04 marks)
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Unit 2: Principles and design considerations of special purpose vehicles

Repeated Questions:

1. **Explain working principle and design consideration of final drive.** (S24 - Q2c, 07 marks; W22 - Q2c OR, 07 marks; W23 - Q4c, 07 marks; S22 - Q3c, 07 marks)
2. **Discuss design considerations of final drive for special purpose vehicles.** (W24 - Q2c OR, 07 marks; W25 - Q2c OR, 07 marks)
3. **Explain the design consideration of final drive of Special Purpose Vehicles.** (S23 - Q2b, 04 marks)
4. **Describe the effects of flywheel size in a power system of SPV.** (S25 - Q2a, 03 marks; S23 - Q2a, 03 marks; W24 - Q2a, 03 marks)
5. **Explain pneumatic & hydraulic control circuits of Special Purpose Vehicle.** (W22 - Q2c, 07 marks)
6. **Explain working principle and design consideration of lubrication system of SPV.** (S25 - Q2c, 07 marks)
7. **Explain working principles of lubrication system of Special Purpose Vehicle.** (S24 - Q2b, 04 marks)
8. **Explain Lubrication and Braking System used in Special Purpose Vehicles.** (W22 - Q1c, 07 marks)
9. **Explain air brake system in SPV with neat sketch.** (W23 - Q5b, 04 marks; S22 - Q5b, 04 marks)
10. **Explain air brake system with neat sketch.** (W22 - Q4a, 03 marks)
11. **Point out the basic goals of ergonomics in design of special purpose vehicle.** (W24 - Q2b, 04 marks)
12. **Discuss the basic goals of ergonomics in design of special purpose vehicle.** (S23 - Q3a, 03 marks)

Other Important Questions:

1. **Enlist the main purposes of lubrication system in SPV.** (W25 - Q2a, 03 marks)
 2. **Explain design consideration of electrical system of Special Purpose Vehicle.** (S24 - Q1c, 07 marks)
 3. **Give the requirements of a good steering system of SPV.** (W25 - Q2b, 04 marks)
 4. **Explain the working of Steering system of Special Purpose Vehicle with neat sketch.** (S24 - Q2c OR, 07 marks)
 5. **Explain any two steering gear box with neat sketch.** (S22 - Q1b, 04 marks; W23 - Q2c OR, 07 marks)
 6. **Explain gear box used in tractor with neat sketch.** (W22 - Q3c, 07 marks)
 7. **Discuss design considerations of engine for special purpose vehicles.** (W25 - Q2c, 07 marks)
 8. **Explain working principle and design consideration of hydraulic control circuits of SPV.** (S25 - Q2c OR, 07 marks)
 9. **Compare hydraulic and cable control system of bulldozer.** (W23 - Q1b, 04 marks)
 10. **Explain hydraulic and cable control system of bulldozer.** (W22 - Q4c OR, 07 marks)
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Unit 3: Earth Moving Machines

Repeated Questions:

1. **Explain purpose, construction and working tipper in detail.** (S24 - Q4c OR, 07 marks; W22 - Q3c OR, 07 marks; W23 - Q4c OR, 07 marks)
2. **Explain the working of three way tipper mechanism.** (S25 - Q3b, 04 marks)
3. **Explain the working of three way tipping mechanism with neat diagram.** (S23 - Q2c, 07 marks)
4. **Describe the working of three- way tipper mechanism in short.** (W24 - Q3a, 03 marks)
5. **Explain bulldozers with neat sketch.** (W25 - Q4c OR, 07 marks)
6. **Explain different types of bulldozer blades.** (S23 - Q4b, 04 marks)
7. **Explain different types of dozer blades.** (S22 - Q3c, 07 marks)
8. **Describe dozer. Explain different types of dozer blades.** (S22 - Q3c, 07 marks)
9. **Give the advantage and limitation of ripper.** (S24 - Q4a, 03 marks; W23 - Q2a, 03 marks; S22 - Q3a, 03 marks)
10. **Give the types of scraper and write applications of it.** (W25 - Q4a OR, 03 marks)
11. **Explain Scrapers.** (S24 - Q1b, 04 marks)
12. **Explain various types of road roller.** (S22 - Q4b, 04 marks)
13. **Explain different types of road rollers.** (W24 - Q3b, 04 marks; S23 - Q4a, 03 marks)
14. **What is the function of a Power shovel? Draw a neat sketch and explain the basic parts and operation of it.** (S23 - Q4c, 07 marks)
15. **What is the function of power shovel?** (S22 - Q3a, 03 marks; W23 - Q3a OR, 03 marks)
16. **Draw a diagram and explain the operation of power shovel.** (S25 - Q3c, 07 marks)
17. **Explain the various types of buckets used with excavators.** (W24 - Q5b, 04 marks)
18. **Explain the various types of excavator buckets.** (S25 - Q3b OR, 04 marks)
19. **Explain forklift with its uses and operation techniques.** (S22 - Q2c, 07 marks)
20. **Explain forklift.** (W23 - Q3a, 03 marks)
21. **Give advantage and limitation of fork lift.** (W22 - Q4b, 04 marks)
22. **Describe set of controls of a forklift.** (W25 - Q4b, 04 marks)
23. **Describe the lifting mechanism of a forklift.** (S23 - Q4b OR, 04 marks)
24. **Explain construction feature of Forklift.** (S24 - Q4b OR, 04 marks)
25. **List out the different types of loader.** (W25 - Q4a, 03 marks)
26. **Explain comparison of Wheel loader and Power Shovel.** (S24 - Q4b, 04 marks)
27. **Draw the sketch showing the construction of Wheel loaders and explain its purpose and working in detail.** (S24 - Q4c, 07 marks)
28. **Enlist the selection criteria for earth movers.** (W24 - Q2a OR, 03 marks)
29. **Give the selection criteria of earth moving machines.** (S25 - Q3a, 03 marks)
30. **Compare loader with excavators.** (S23 - Q4a OR, 03 marks)

Other Important Questions:

1. **Write a short note on dumpers.** (W24 - Q2b OR, 04 marks)
2. **Explain any one type of construction equipment dumper.** (W22 - Q3a, 03 marks; W23 - Q4a, 03 marks)
3. **Explain tipping mechanism of a dumper.** (W25 - Q4b OR, 04 marks)
4. **Explain with neat sketch of dumper.** (S22 - Q4b, 04 marks)
5. **Write short note on excavator.** (W22 - Q4c, 07 marks; W23 - Q5c, 07 marks)
6. **List the various types of excavators and explain any one excavator in detail.** (S22 - Q4c, 07 marks)
7. **Show the main parts of excavators in a diagram and explain function of each part.** (W25 - Q4c OR, 07 marks)
8. **Explain the special features and working of excavators with neat sketch.** (S23 - Q4c OR, 07 marks)
9. **Draw the sketch showing the construction of an excavator & explain its purpose.** (W22 - Q3b, 04 marks)
10. **Explain construction and working of backhoe with neat sketch.** (S25 - Q3c OR, 07 marks)

11. **Explain constructional and working features of backhoe with neat sketch.** (W24 - Q2c OR, 07 marks)
 12. **Draw a diagram of dragline and discuss special working features of it.** (W24 - Q3c, 07 marks)
 13. **Function of (1) Ripper (2) Scraper (3) Power shovel.** (S22 - Q5a, 03 marks)
 14. **Write the function of following special purpose vehicles. (i) Backhoe (ii) Compactor (iii) Motor Grader (iv) Skid Steer Loader (v) Trencher (vi) scraper (vii) Tipper.** (S23 - Q1c, 07 marks)
 15. **Write a function of following. (i) Ripper (ii) Tipper (iii) Trencher (iv) Scraper (v) Compactor (vi) Grader.** (W24 - Q5a, 03 marks)
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Unit 4: Tractors

Repeated Questions:

1. **Classify tractor with details.** (W25 - Q3a, 03 marks; W24 - Q4a, 03 marks)
2. **Explain the working of differential unit of a tractor.** (W25 - Q3b, 03 marks; W24 - Q4b, 04 marks)
3. **Describe three point linkage hitch of a tractor with neat sketch.** (W25 - Q3c, 07 marks; W24 - Q4c, 07 marks)
4. **Describe three point linkage type tractor hitches with neat sketch.** (S25 - Q4c, 07 marks)
5. **Explain three point linkage type hitch of a tractor with neat sketch.** (S23 - Q3c OR, 07 marks)
6. **Write a short note on power take off unit.** (S24 - Q3a, 03 marks; W22 - Q4a OR, 03 marks)
7. **Write short note on PTO unit.** (S22 - Q2c OR, 07 marks)
8. **Explain power take off unit of a tractor in brief.** (S23 - Q3b, 04 marks)
9. **Explain hydraulic control system of a tractor with neat sketch.** (S23 - Q5c OR, 07 marks; W25 - Q3c OR, 07 marks)
10. **Explain hydraulic system of tractor with neat sketch.** (W23 - Q2c, 07 marks)
11. **Discuss about power take off unit.** (S22 - Q4a, 03 marks)

Other Important Questions:

1. **Classify the tractor. How tractor is selected?** (S22 - Q4a, 03 marks)
 2. **Discuss the selection criteria of a tractor.** (S25 - Q4a, 03 marks)
 3. **What are the criteria for the selection of a farm tractor?** (S23 - Q3b OR, 04 marks)
 4. **Explain various types of tractor implements with detail.** (W25 - Q3a OR, 03 marks; W24 - Q4a OR, 03 marks)
 5. **Give the types of tractor drawn implements.** (S25 - Q4a OR, 03 marks)
 6. **Enlist different types of accessories of Wheeled Tractors use.** (S24 - Q3b, 04 marks)
 7. **Explain different accessories of wheeled tractors.** (W22 - Q5b, 04 marks)
 8. **Write a short note on a power tiller.** (W25 - Q3b OR, 04 marks; W24 - Q4b OR, 04 marks)
 9. **Write a short note on power tiller.** (S25 - Q4b OR, 04 marks)
 10. **Make a layout of tractor & give the name of main components used in tractor.** (S22 - Q5c, 07 marks; W22 - Q2a, 03 marks; W23 - Q5c OR, 07 marks)
 11. **Draw a layout of power transmission system of a tractor and explain the working of differential unit.** (S23 - Q3c, 07 marks)
 12. **Draw a layout of a power transmission of a tractor and give the functions of differential unit.** (S25 - Q4c OR, 07 marks)
 13. **Elaborate special features of tractor.** (S24 - Q3c, 07 marks)
 14. **Classify tractor with its application.** (W23 - Q4b, 04 marks)
 15. **Write short note on PTO shaft. Explain three standard types of PTO drives.** (S22 - Q2c OR, 07 marks; W23 - Q3c OR, 07 marks)
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Unit 5: Mobile Cranes

Repeated Questions:

1. **Explain construction and working principle of mobile crane with neat sketch.** (S24 - Q3c OR, 07 marks; W23 - Q1c, 07 marks)
2. **List the types of crane.** (W23 - Q5a, 03 marks)
3. **Enlist different types of crane are used in SPV.** (S22 - Q2a, 03 marks)
4. **Enlist different types Crane are used.** (S24 - Q3a OR, 03 marks)
5. **Classify cranes and give the characteristics of truck crane.** (S25 - Q5a, 03 marks)
6. **Give the classification of a crane and write the operating characteristics of mobile Cranes.** (S23 - Q5a, 03 marks)
7. **List out the basic characteristics of truck cranes.** (W25 - Q5a OR, 03 marks)
8. **Write short note on safety devices of crane.** (W23 - Q5b OR, 04 marks; W22 - Q5b OR, 04 marks)
9. **Write a short note on safety device of Crane.** (S24 - Q3b OR, 04 marks)
10. **Explain stability and design features of Mobile cranes.** (W22 - Q5c OR, 07 marks)

Other Important Questions:

1. **Explain stability and control systems of a mobile crane.** (W25 - Q5a, 03 marks)
 2. **Explain the control system and safety devices of mobile crane.** (S23 - Q5b OR, 04 marks)
 3. **Explain Safety consideration during crane operations.** (W23 - Q3c, 07 marks)
 4. **Explain the construction of Mobile crane.** (S22 - Q3b, 04 marks)
 5. **Explain telescopic crane with neat diagram.** (S25 - Q5c, 07 marks)
 6. **Explain the lattice boom crawler crane with neat sketch.** (S25 - Q5c OR, 07 marks)
 7. **Write the function of crane parts: (i) Boom (ii) Outriggers (iii) Rotex Gear.** (S23 - Q5a OR, 03 marks)
 8. **Explain the various types of pump used in crane operation.** (S23 - Q5b, 04 marks)
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Unit 6: Special purpose vehicles

Repeated Questions:

1. **Write short note on fire extinguishing vehicle.** (S24 - Q5b, 04 marks; W22 - Q5a, 03 marks)
2. **Write a short note on fire extinguishing vehicle.** (W24 - Q5c, 07 marks; S25 - Q5b OR, 04 marks)
3. **Explain the working of hover craft.** (S24 - Q5a OR, 03 marks; W23 - Q3b, 04 marks; W22 - Q4b OR, 04 marks; S22 - Q2b, 04 marks)
4. **Write short note on Hover Craft.** (S25 - Q5a OR, 03 marks)
5. **Explain articulated vehicle with its advantages.** (W24 - Q5b, 04 marks)
6. **What does mean by articulated vehicle?** (W23 - Q4a OR, 03 marks)
7. **What does mean by articulated vehicle.** (W22 - Q3a OR, 03 marks)
8. **Write a note on articulated vehicles.** (W25 - Q5c OR, 07 marks)
9. **Describe working features of Ambulance with detail.** (W24 - Q5c, 07 marks)
10. **Explain the different features of Ambulance.** (W23 - Q3b OR, 04 marks; W23 - Q5a OR, 03 marks)
11. **Explain Constructional and working features of an ambulance.** (S23 - Q5c OR, 07 marks)
12. **Explain Constructional working features of tipper.** (S22 - Q4c, 07 marks)

Other Important Questions:

1. **Explain the features of oil tankers with detail.** (W25 - Q5c, 07 marks)
 2. **What is baffle plate? Elaborate its significance in tanker.** (W23 - Q3b OR, 04 marks)
 3. **Explain fifth wheel arrangement of a truck.** (S25 - Q5b, 04 marks)
 4. **Show the main components of hovercraft in a diagram and explain each component with detail.** (S23 - Q2c OR, 07 marks)
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Unit 7: Ergonomic considerations

Repeated Questions:

1. **Explain human factor in special purpose vehicle design with reference to vibration and thermal stress on human performance.** (S24 - Q5c OR, 07 marks; W22 - Q5c, 07 marks)
2. **Discuss the effects of noise, vibration and thermal stresses on human performance.** (W25 - Q5b, 04 marks; W24 - Q5a, 03 marks)
3. **Explain thermal stresses on human performance.** (S22 - Q5a, 03 marks; W23 - Q4b OR, 04 marks)
4. **Explain economics of special purpose vehicle utilization.** (S24 - Q5b OR, 04 marks; W23 - Q5b OR, 04 marks; W22 - Q5a OR, 03 marks)
5. **Describe economics of special purpose vehicle utilization.** (S25 - Q2b, 04 marks; W25 - Q5b OR, 04 marks)
6. **Write a note on ergonomic considerations in SPV.** (S25 - Q1c, 07 marks)

Other Important Questions:

1. **Write short note on comfort in special purpose vehicle.** (S24 - Q5a, 03 marks)
2. **Explain human factors in SPV design with reference to comfort.** (S22 - Q5c, 07 marks)
3. **Discuss the effects of noise and vibration on human performance.** (S23 - Q3a OR, 03 marks)
4. **Write the importance of Ergonomics in Vehicle Designing.** (S24 - Q5c, 07 marks)
