

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE- SEMESTER-VII EXAMINATION – WINTER 2025**

**Subject Code: 3160213**

**Date:25-11-2025**

**Subject Name: Special Purpose Vehicle**

**Time: 02:30 PM TO 05:00 PM**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	<b>MARKS</b>
<b>Q.1</b>	<b>03</b>
(a) Write the advantages and disadvantages of special purpose vehicles.	<b>03</b>
(b) Discuss the selection criteria of tracked type and wheeled type vehicles.	<b>04</b>
(c) Describe various provisions of adapted vehicles for the differently challenged persons.	<b>07</b>
 <b>Q.2</b>	
(a) Enlist the main purposes of lubrication system in SPV.	<b>03</b>
(b) Give the requirements of a good steering system of SPV.	<b>04</b>
(c) Discuss design considerations of engine for special purpose vehicles.	<b>07</b>
<b>OR</b>	
(c) Discuss design considerations of final drive for special purpose vehicles.	<b>07</b>
 <b>Q.3</b>	
(a) Classify tractor with details.	<b>03</b>
(b) Explain the working of differential unit of a tractor.	<b>04</b>
(c) Describe three point linkage hitch of a tractor with neat sketch.	<b>07</b>
<b>OR</b>	
<b>Q.3</b>	
(a) Explain various types of tractor implements with detail.	<b>03</b>
(b) Write a short note on power tiller.	<b>04</b>
(c) Explain the hydraulic control system of a tractor with neat sketch.	<b>07</b>
 <b>Q.4</b>	
(a) List out the different types of loader.	<b>03</b>
(b) Describe set of controls of a forklift.	<b>04</b>
(c) Explain bulldozers with neat sketch.	<b>07</b>
<b>OR</b>	
<b>Q.4</b>	
(a) Give the types of scraper and write applications of it.	<b>03</b>
(b) Explain tipping mechanism of a dumper.	<b>04</b>
(c) Show the main parts of excavators in a diagram and explain function of each part.	<b>07</b>
 <b>Q.5</b>	
(a) Explain stability and control systems of a mobile crane.	<b>03</b>
(b) Discuss the effects of noise, vibration and thermal stresses on human performance.	<b>04</b>
(c) Explain the features of oil tankers with detail.	<b>07</b>
<b>OR</b>	
<b>Q.5</b>	
(a) List out the basic characteristics of truck cranes.	<b>03</b>
(b) Describe economics of special purpose vehicle utilization.	<b>04</b>
(c) Write a note on articulated vehicles.	<b>07</b>

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024****Subject Code:3160213****Date:05-12-2024****Subject Name:Special Purpose Vehicle****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		<b>MARKS</b>
<b>Q.1</b>	(a) Define special purpose vehicle and give the advantages of it. (b) Discuss the selection criteria of tracked type and wheeled type vehicles. (c) Explain various types of semi-trailers with its applications.	<b>03</b> <b>04</b> <b>07</b>
<b>Q.2</b>	(a) Describe the effects of flywheel size in a power system of SPV. (b) Point out the basic goals of ergonomics in design of special purpose vehicle. (c) Discuss design considerations offinal drive for special purpose vehicles.	<b>03</b> <b>04</b> <b>07</b>
	<b>OR</b>	
	(c) Discuss design considerations of engine for special purpose vehicles.	<b>07</b>
<b>Q.3</b>	(a) Enlist the selection criteria for earth movers. (b) Write a short note on dumpers. (c) Explain constructional and working features of backhoe with neat sketch.	<b>03</b> <b>04</b> <b>07</b>
<b>Q.3</b>	(a) Describe the working of three-way tipper mechanism in short. (b) Explain different types of road rollers. (c) Draw a diagram of dragline and discuss special working features of it.	<b>03</b> <b>04</b> <b>07</b>
<b>Q.4</b>	(a) Classify tractor with details. (b) Explain working of differential unit of a tractor. (c) Describe three-point linkage hitch of a tractor with neat sketch.	<b>03</b> <b>04</b> <b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Explain various types of tractors implements with detail. (b) Write a short note on a power tiller. (c) Explain hydraulic control system of a tractor with neat sketch.	<b>03</b> <b>04</b> <b>07</b>
<b>Q.5</b>	(a) Discuss the effects of noise, vibration and thermal stresses on human performance. (b) Explain the various types of buckets used with excavators. (c) Write a short note on fire extinguishing vehicle.	<b>03</b> <b>04</b> <b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) Write a function of following. (i) Ripper (ii) Tipper (iii) Trencher (iv) Scraper (v) Compactor (vi) Grader (b) Explain articulated vehicle with its advantages. (c) Describe working features of Ambulance with detail.	<b>03</b> <b>04</b> <b>07</b>

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**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3160213****Date:13-12-2023****Subject Name: Special Purpose Vehicle****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

**MARKS**

<b>Q.1</b>	(a) Classify the special purpose vehicles.	<b>03</b>
	(b) Compare hydraulic and cable control system of bulldozer.	<b>04</b>
	(c) Explain construction and working principle of mobile crane with neat sketch.	<b>07</b>

<b>Q.2</b>	(a) Give the advantage and limitation of ripper.	<b>03</b>
	(b) Explain advantages & disadvantages of wheel type & & track type vehicle.	<b>04</b>
	(c) Explain hydraulic system of tractor with neat sketch.	<b>07</b>

**OR**

	(c) Explain any two steering gear box with neat sketch.	<b>07</b>
<b>Q.3</b>	(a) Explain forklift.	<b>03</b>
	(b) Explain the working of hover craft.	<b>04</b>
	(c) Explain Safety consideration during crane operations.	<b>07</b>

**OR**

<b>Q.3</b>	(a) What is the function of power shovel?	<b>03</b>
	(b) What is baffle plate? Elaborate its significance in tanker.	<b>04</b>
	(c) Write short note on PTO shaft. Explain three standard types of PTO drives.	<b>07</b>
<b>Q.4</b>	(a) Explain any one type of construction equipment dumper.	<b>03</b>
	(b) Classify tractor with its application.	<b>04</b>
	(c) Explain working principle and design consideration of final drive.	<b>07</b>

**OR**

<b>Q.4</b>	(a) What does mean by articulated vehicle?	<b>03</b>
	(b) Explain thermal stresses on human performance.	<b>04</b>
	(c) Explain purpose, construction and working tipper in detail.	<b>07</b>
<b>Q.5</b>	(a) List the types of crane.	<b>03</b>
	(b) Explain air brake system in SPV with neat sketch.	<b>04</b>
	(c) Write short note on excavator.	<b>07</b>

**OR**

<b>Q.5</b>	(a) Explain the different features of Ambulance.	<b>03</b>
	(b) Explain Economics of special purpose vehicle utilization.	<b>04</b>
	(c) Draw a layout of tractor & give the name of main components used in tractor.	<b>07</b>

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3160213****Date:17-12-2022****Subject Name:Special Purpose Vehicle****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		<b>MARKS</b>
<b>Q.1</b>	(a) Classification of Special Purpose Vehicles.	<b>03</b>
	(b) Explain advantages & disadvantages of wheel type & & track type vehicle.	<b>04</b>
	(c) Explain Lubrication and Braking System used in Special Purpose Vehicles.	<b>07</b>
<b>Q.2</b>	(a) Make a layout of tractor & give the name of main components used in tractor.	<b>03</b>
	(b) Write short note on multi axle vehicles.	<b>04</b>
	(c) Explain pneumatic & hydraulic control circuits of Special Purpose Vehicle.	<b>07</b>
	<b>OR</b>	
	(c) Explain working principle and design consideration of final drive.	<b>07</b>
<b>Q.3</b>	(a) Explain any one type of construction equipment dumper.	<b>03</b>
	(b) Draw the sketch showing the construction of an excavator & explain its purpose.	<b>04</b>
	(c) Explain gear box used in tractor with neat sketch.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) What does mean by articulated vehicle.	<b>03</b>
	(b) Explain the different features of Ambulance.	<b>04</b>
	(c) Explain purpose, construction and working tipper in detail.	<b>07</b>
<b>Q.4</b>	(a) Explain air brake system with neat sketch.	<b>03</b>
	(b) Give advantage and limitation of fork lift.	<b>04</b>
	(c) Write short note on excavator.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Write short note on PTO unit.	<b>03</b>
	(b) Explain the working of hover craft.	<b>04</b>
	(c) Explain hydraulic and cable control system of bulldozer.	<b>07</b>
<b>Q.5</b>	(a) Write short note on fire extinguishing vehicle.	<b>03</b>
	(b) Explain different accessories of wheeled tractors.	<b>04</b>
	(c) Explain human factor in SPV design with reference to vibration and thermal stress on human performance.	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) Explain Economics of special purpose vehicle utilization.	<b>03</b>
	(b) Write short note on safety devices of crane.	<b>04</b>
	(c) Explain stability and design features of Mobile cranes.	<b>07</b>

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