

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3160213****Date:14-07-2023****Subject Name:Special Purpose Vehicle****Time:10:30 AM TO 01:00 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) What are the limitations of tracked vehicles?	<b>03</b>
	(b) What is the difference between trailer and semi trailer? List out at least six types of semi trailers.	<b>04</b>
	(c) 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	<b>07</b>
<b>Q.2</b>	(a) Describe the effects of flywheel size in a power system of SPV.	<b>03</b>
	(b) Explain the design consideration of final drive of Special Purpose Vehicles.	<b>04</b>
	(c) Explain the working of three way tipping mechanism with neat diagram.	<b>07</b>
	<b>OR</b>	
	(c) Show the main components of hovercraft in a diagram and explain each component with detail.	<b>07</b>
<b>Q.3</b>	(a) Discuss the basic goals of ergonomics in design of special purpose vehicle.	<b>03</b>
	(b) Explain power take off unit of a tractor in brief.	<b>04</b>
	(c) Draw a layout of power transmission system of a tractor and explain the working of differential unit.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Discuss the effects of noise and vibration on human performance.	<b>03</b>
	(b) What are the criteria for the selection of a farm tractor?	<b>04</b>
	(c) Explain three point linkage type hitch of a tractor with neat sketch.	<b>07</b>
<b>Q.4</b>	(a) Explain various types of road roller in brief.	<b>03</b>
	(b) Explain different types of bulldozer blades.	<b>04</b>
	(c) What is the function of a Power shovel? Draw a neat sketch and explain the basic parts and operation of it.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Compare loader with excavators.	<b>03</b>
	(b) Describe the lifting mechanism of a forklift.	<b>04</b>
	(c) Explain the special features and working of excavators with neat sketch.	<b>07</b>
<b>Q.5</b>	(a) Give the classification of a crane and write the operating characteristics of mobile Cranes.	<b>03</b>
	(b) Explain the various types of pump used in crane operation.	<b>04</b>
	(c) Describe hydraulic control system of a tractor with neat diagram.	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) Write the function of crane parts: (i) Boom (ii) Outriggers (iii) Rotex Gear	<b>03</b>
	(b) Explain the control system and safety devices of mobile crane.	<b>04</b>
	(c) Explain Constructional and working features of an ambulance.	<b>07</b>

\*\*\*\*\*