

**P.E.S. College of Engineering, Mandya - 571 401***(An Autonomous Institution affiliated to VTU, Belagavi)***Eighth Semester, B.E. - Automobile Engineering****Semester End Examination; July / Aug. - 2022****Earth Moving Equipment's and Tractors**

Time: 3 hrs

Max. Marks: 100

**Course Outcomes***The Students will be able to:**CO1: Explain the construction, working principle and operation of different Earth moving equipment's and determine the operating capacity.**CO2: Discuss different undercarriage and Suspension systems used in earth moving equipment and their advantages and limitations.**CO3: Describe different Transmission Systems and final drive systems, their construction and working principle used in earth moving equipment's**CO4: Explain the construction, working and selection of different types of pumps, valves and actuators used in hydraulic system.**CO5: Discuss the different steering and brake systems used in off and on highway vehicles and explain their construction and working principle.***Note:** I) **PART - A** is compulsory. **Two** marks for each question.II) **PART - B:** Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
<b>I : PART - A</b>		<b>10</b>			
I a.	List the types of dozer.	2	L1	CO1	PO1
b.	Define the tyre size.	2	L1	CO2	PO1
c.	Name the types of final drives.	2	L1	CO3	PO1
d.	Write an equation for Pascal's law.	2	L1	CO4	PO1
e.	List the types of brakes.	2	L1	CO5	PO1
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
1 a.	List the types of earth moving equipment's. Explain their application.	9	L2	CO1	PO1
b.	Illustrate the types of scrapers with their special features. Sketch and explain the construction and working of a scraper.	9	L2	CO1	PO2
c.	List the factors to be considered to calculate the output of bulldozer. Explain the steps to calculate the output of bulldozer.	9	L2	CO1	PO2
<b>UNIT - II</b>		<b>18</b>			
2 a.	Explain the role of undercarriage components of crawler with a neat sketch.	9	L2	CO2	PO2
b.	Explain the construction and working of wheel and crawlers tractors with line diagrams.	9	L2	CO2	PO2
c.	List and explain the properties and application of tyres.	9	L2	CO2	PO2

**UNIT - III****18**

- 3 a. Sketch and explain the working of Hydro shift automatic transmission. 9 L2 CO3 PO2
- b. Explain any two configurations of double reduction final drive. Why it is necessary in earth moving equipment? 9 L2 CO3 PO2
- c. List the types of PTOs. Sketch and explain any one. 9 L2 CO3 PO2

**UNIT - IV****18**

- 4 a. With neat sketch, explain the basic components of hydraulic system. 9 L2 CO4 PO2
- b. Sketch and explain the cylinder cushioning. 9 L2 CO4 PO2
- c. With a neat sketch, explain the depth and draft control system. 9 L2 CO4 PO2

**UNIT - V****18**

- 5 a. Sketch and explain the integral power steering system. 9 L2 CO5 PO2
- b. List the types of steering systems used in crawler tractor. Sketch and explain any one. 9 L2 CO5 PO2
- c. Sketch and explain the construction and working of disc brake. 9 L2 CO5 PO2

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