

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR (AUTONOMOUS)

Siddharth Nagar, Narayanavanam Road – 517583

**QUESTION BANK (DESCRIPTIVE)****Subject with Code:** Tractor System and Controls(19AG0728) **Course & Branch:** TSC (AGE)**Year & Sem:** IV&I**Regulation:** R19

UNIT –I
INTRODUCTION TO TRANSMISSION SYSTEM

1	a	What is drive train of tractor? Mention its function and components.	[L1][CO1]	[6M]
	b	What is clutch? Explain its necessity, types and function .	[L2][CO1]	[6M]
2	a	What is gearbox and mention its types? State the principle of theory of gearing.	[L1][CO1]	[4M]
	b	Explain the principle of operation of single plate clutch with neat diagram.	[L2][CO1]	[8M]
3	a	Why a tractor needs clutch? What are the essential features of a good clutch?	[L1][CO1]	[4M]
	b	Explain about sliding mesh gearbox.	[L2][CO1]	[8M]
4	a	Mention the different mechanical and hydraulic types of clutch.	[L1][CO1]	[6M]
	b	Explain about the working of fluid coupling.	[L2][CO1]	[6M]
5	a	Explain about the torque convertor with neat diagram	[L2][CO1]	[6M]
	b	Mention the different mechanical means of power transmission on farms.	[L1][CO1]	[6M]
6	a	Differentiate between mechanical and hydraulic clutches.	[L4][CO1]	[6M]
	b	What is the function of differential unit and final drive of tractor?	[L1][CO1]	[6M]
7	a	Explain the considerations for the design of disc or plate clutch when pressure is uniform.	[L2][CO1]	[7M]
	b	What is the velocity ratio, power transmitted by belt pulley and relation between tension and length of the open and closed belt?	[L1][CO1]	[5M]
8	a	Mention the different types of gears.	[L1][CO1]	[4M]
	b	What power is transmitted by a belt arrangement if the tension on the tight side of the belt is 60 kg and the tension on slack side is 25 kg. The diameter and the speed of the driving pulley is 0.95m and 250 rpm respectively.	[L3][CO1]	[8M]
9	a	Explain the considerations for the design of disc or plate clutch when wear is uniform.	[L2][CO1]	[6M]
	b	What is Centrifugal clutch?	[L1][CO1]	[6M]
10	a	What is the principle of operation of mechanical and hydraulic clutch.	[L1][CO1]	[4M]
	b	A single plate clutch with both sides has an outer diameter of 20 cm. The maximum intensity of pressure at any point in the contact surfaces does not exceed 1 kg/ cm ² . If the coefficient of friction is 0.3, determine the power transmitted by clutch operating at 2000 rpm speed.	[L4][CO1]	[8M]

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1	a	What is the function of brake and where are the brake pedals located in tractor?	[L1][CO2]	[6M]
	b	Explain about the internal expanding shoe brakes with neat diagram.	[L2][CO2]	[6M]
2	a	Explain advantages and working of power steering system with neat diagram.	[L2][CO2]	[8M]
	b	Why two independent foot pedals are provided for brake system of tractor?	[L1][CO2]	[4M]
3	a	What is brake pedal free play?	[L1][CO2]	[4M]
	b	Explain the working of disc type clutch of tractor	[L2][CO2]	[8M]
4	a	Mention the different types of steering system of tractor	[L1][CO2]	[6M]
	b	What is Ackerman steering?	[L1][CO2]	[6M]
5	a	Mention the importance of brake and steering system of tractor.	[L1][CO2]	[8M]
	b	Mention the principle of operation of mechanical brake.	[L1][CO2]	[4M]
6	a	State the function of steering arm and tie rod?	[L1][CO2]	[4M]
	b	Explain working of mechanical steering system with neat diagram	[L2][CO2]	[8M]
7	a	Explain the classification of brakes.	[L2][CO2]	[6M]
	b	Distinguish between clutch and brake.	[L4][CO2]	[6M]
8	a	What is Pascal's law? And which type of clutch follows this law	[L1][CO2]	[4M]
	b	Explain the principle of operation of hydraulic brake.	[L2][CO2]	[8M]
9	a	Explain Toe-in, Toe-out, camber angle, caster angle and wheel base with neat diagram.	[L2][CO2]	[12M]
10	a	Explain about external contracting shoe brake with neat diagram.	[L2][CO2]	[12M]

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UNIT –III
HYDRAULLIC SYSTEM IN TRACTOR

1	a	What is the function of hydraulic system in tractor?	[L1][CO3]	[4M]
	b	Explain merits of hydraulic system over mechanical system	[L2][CO3]	[8M]
2	a	What is the need of hydraulic system in tractor?	[L1][CO3]	[4M]
	b	Explain the principle of operation of hydraulic system in tractor.	[L2][CO3]	[8M]
3	a	Explain about the basic components of hydraulic system of tractor.	[L2][CO3]	[6M]
	b	Explain the working of draft control type hydraulic system of tractor	[L2][CO3]	[6M]
4	a	Mention the different types of hydraulic system of tractor	[L1][CO3]	[6M]
	b	Briefly explain about position control hydraulic system	[L2][CO3]	[6M]
5	a	Mention the importance of hydraulic system of tractor.	[L1][CO3]	[6M]
	b	Explain different types of hydraulic valves.	[L2][CO3]	[6M]
6	a	Explain merits of hydraulic system over mechanical system.	[L2][CO3]	[6M]
	b	What is mixed control type hydraulic system and what are the advantages and disadvantages of hydraulic system .	[L1][CO3]	[6M]
7	a	Explain about the hitching of implements in tractor.	[L2][CO3]	[6M]
	b	What are the advantages of three- point linkage of tractor	[L1][CO3]	[6M]
8	a	What is control board of tractor?	[L1][CO3]	[6M]
	b	Briefly explain the components of dash board of tractor	[L2][CO3]	[6M]
9	a	What are the different means of power transmission of tractor?	[L1][CO3]	[8M]
10	a	Discuss some important terms connected with tractors.	[L2][CO3]	[4M]

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UNIT –IV
TRACTOR POWER OUTLET

1	a.	What are the different tractor power outlets?	[L1][CO4]	[6M]
	b.	Distinguish between belt pulley and PTO	[L4][CO4]	[6M]
2	a.	List the traction aids.	[L1][CO4]	[4M]
	b.	What are the different types of tractor tyres with neat diagram	[L1][CO4]	[8M]
3	a.	Define tractive efficiency, gross tractive resistance (μ_g), net traction coefficient (μ), coefficient to rolling resistance (ρ).	[L1][CO4]	[8M]
	b.	Briefly discuss about ply rating and its importance & what is the inflation pressure for front and rear wheels?	[L2][CO4]	[4M]
4	a.	What are the PTO standards set by ASAE?	[L1][CO4]	[4M]
	b.	What are the different types of PTO? Explain in detail.	[L1][CO4]	[8M]
5	a.	What are the advantages of three point linkage hitch in a tractor?	[L1][CO4]	[4M]
	b.	What are the factors affecting traction? Explain any two factors affecting traction in detail.	[L1][CO4]	[8M]
6	a.	Explain suspension method of C.G measurement of tractor.	[L2][CO4]	[6M]
	b.	What are the safety devices of tractor?	[L1][CO4]	[6M]
7	a..	What are the types of tractor accidents?	[L1][CO4]	[6M]
	b.	What are the advantages of three- point linkage of tractor	[L1][CO4]	[6M]
8	a.	Explain in detail the hitching implements of tractor	[L2][CO4]	[6M]
	b.	Briefly explain the components of dash board of tractor	[L2][CO4]	[6M]
9	a.	Determine drawbar pull of a track type tractor with 35 cm wide and 160 cm long track. The weight of tractor is 3500kg. The lugs on the wheel are such that the soil is sheared off in a plane area at the ends of lugs and the soil parameters are: $C=14\text{KPa}$, $\phi=30^\circ$, $K_c=3$, $K_\phi=0.5$ and $n=0.2$	[L4][CO4]	[12M]
10	a.	In detail explain the methods of determining the C.G Measurement of tractor.	[L2][CO4]	[12M]

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UNIT –V
TRACTOR TESTING AND PERFORMANCE

1	a	What is the importance of tractor testing?	[L1][CO5]	[5M]
	b	Explain the different types of tractor testing.	[L2][CO5]	[5M]
2	a	Illustrate in detail the tractor operation safety precautions.	[L4][CO5]	[4M]
	b	Discuss the preparation of testing tractor performance.	[L2][CO5]	[8M]
3	a	Discuss about traction theory.	[L2][CO5]	[6M]
	b	Discuss about periodical maintenance of tractor.	[L2][CO5]	[6M]
4	a	Discuss about mechanics of tractor chassis.	[L2][CO5]	[8M]
	b	What is function of tractor chassis?	[L2][CO5]	[4M]
5	a	List some roll- over protection structures (ROPS) of tractor.	[L1][CO5]	[4M]
	b	Write general precautions to be followed in hydraulic and transmission and wheel system	[L1][CO5]	[8M]
6	a	Discuss few ergonomic consideration for tractor safety	[L2][CO5]	[8M]
	b	What are the safety devices of tractor?	[L1][CO5]	[4M]
7	a	What are the types of tractor accidents?	[L1][CO5]	[6M]
	b	What are the different types of tyre? Explain them.	[L2][CO5]	[6M]
8	a	Define weight transfer?	[L1][CO5]	[4M]
	b	Briefly explain the components of dash board of tractor	[L2][CO5]	[8M]
9	a	Discuss about the method of start and stop of tractor.	[L2][CO5]	[12M]
10	a	Discuss about the troubleshooting of tractor when engine gives out blue smoke and black smoke and when clutch does not engage and clutch slips	[L2][CO5]	[12M]

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