MECHANICAL ENGINEERING DEPARTMENT, GMIT, BHAVNAGAR.
IMPORTANT QUESTIONS

SUBJECT CODE: **2110006**
SUBJECT: **ELEMENTS OF MECHANICAL ENGINEERING**

Sr. No.	Detail
	INTRODUCTION
1.	What is Prime mover? How are they classified?
2.	State and explain Zeroth law & First law of Thermodynamics.
3.	Classify thermodynamic system and give example of each.
4.	Write similarities & differences between heat transfer and work transfer.
	ENERGY
1.	What do you mean by non-conventional energy sources? How does it differ from conventional sources?
2.	Give detailed classification of fuel. Write advantages & disadvantages of all
3.	Write a short-note on bio-fuels, LPG, CNG
	PROPERTIES OF GASES
1.	What is adiabatic process? Prove with usual notations the law of governing adiabatic process process as PV^{γ} = Constant.
2.	Explain Isothermal Process. For Isothermal process. Find expression of work done, Change in Internal Energy, Change in Enthalpy and Heat transfer.
3.	Derive Expression PV/T=constant with the help of Boyle's law and Charle's law.
4.	Derive relation between specific heat
	PROPERTIES OF STEAM
1.	What do you mean by Dryness fraction? Describe Combined calorimeter with a neat sketch.
2.	What is throttling process? Explain throttling calorimeter with neat sketch. Derive equation for dryness fraction.
3.	Explain Separating Calorimeter with neat sketch.
	HEAT ENGINES
1.	Define heat engine. What are the essential requirements of heat engine?
2.	Prove that efficiency of Carnot Engine working between temperature limits T1 and T2 is given by the expression $\eta = \dfrac{T_1 - T_2}{T_1}$

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3.	Derive an expression for efficiency of Otto cycle.
4.	Explain working of Rankine cycle with P-V diagram. Derive the formula for efficiency of Rankine cycle.
STEAM BOILERS	
1.	Differentiate between Fire tube and Water tube boiler.
2.	Discuss construction and working of Cochran boiler with sketch.
3.	Write short note on Babcock and Wilcox boiler
4.	With neat sketch explain construction and working of pressure gauge.
INTERNAL COMBUSTION ENGINES	
1.	Difference between Petrol (S.I.) engine and Diesel (C. I.) engine.
2.	Draw P-V diagram for an ideal Diesel cycle and Derive an expression for its air standard efficiency in terms of temperatures only.
3.	Explain working of four stroke Diesel Engine with neat sketch & P-V diagram
4.	Explain working of four stroke petrol engine with neat sketch & P-V diagram
5.	Numerical on Efficiency
PUMPS	
1.	Explain construction and working of centrifugal pump with sketch.
2.	Explain Double acting reciprocating pump with a neat sketch.
3.	What do mean by priming ?
AIR COMPRESSORS	
1.	Classify Air Compressors. Give the uses or application of compressed air
2.	What are the applications of compressor? Derive an expression of work done for single stage single acting reciprocating air compressor without clearance.
REFRIGERATION & AIR CONDITIONING	
1.	Explain with flow diagram, the working of a vapour absorption refrigerator.
2.	Draw line diagram of vapour compression refrigeration cycle and represent on P-h and T-S diagram and state function of individual components of vapour compression refrigeration system.
COUPLINGS, CLUTCHES & BRAKES	
1.	What is function of Coupling? Name only various types of couplings. Explain Oldham coupling.
2.	Differentiate between Clutch and Brake.
3.	What is brake? Describe an internal expanding shoe brake with a neat sketch and state its applications.

Sr. No.	Detail
TRANSMISSION OF MOTION & POWER	
1.	Compare individual drive and group drive
2.	State the application, advantages and disadvantages of (i) belt drive (ii) chain drive (iii) gear drive
ENGINEERING MATERIALS	
1.	Enlist physical properties of Engineering materials & define them