



# Sanjay Ghodawat University, Kolhapur

2017-18

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

FY B Tech

School of Technology

Semester I

FYT 105

Elements of Mechanical Engineering

Max Marks: 100

Nov 2017

Re - End Semester Examination (ESE)

Time: 3 Hrs

27 Dec

**Instructions for Students:** 1) Use of non-programmable calculator is allowed  
2) All questions are compulsory

- Q1** a) The following data is given for an air compressor, if rate of air flow is 300 kg/min and
- Marks 06 COs CO1

	Inlet	Outlet
Pressure	90 kpa	600 kpa
Specific volume	$0.65 \text{ m}^3/\text{kg}$	$0.10 \text{ m}^3/\text{kg}$
Specific internal energy	67 KJ/Kg	128 KJ/Kg
Velocity	11 m/s	7 m/s

Heat rejected to cooling water is 75 kW

Find (i) Power required to drive the compressor in kW.

b) Solve any Two

- i) How do you classify properties as intensive or extensive property? Give three examples of each
- 05 CO1
- ii) Write statement of first law of thermodynamics and state its limitations.
- 05 CO1
- iii) Define following terms
- 05 CO1
- 1) Thermodynamic state
  - 2) Thermodynamic process
  - 3) Path function

<b>Q2</b>	<b>Solve any Two</b>		
a)	Explain with neat sketch vapour absorption refrigeration system.	08	CO3
b)	Explain construction of summer air condition system. State the function of each element used in it.	08	CO3
c)	Write any six psychrometric properties of air	08	CO3
<b>Q3</b>	<b>Write short notes on any Three</b>	18	
a)	Explain construction of IC engine with neat sketch	06	CO2
b)	Working two stroke diesel engine	06	CO2
c)	Four stroke petrol engine	06	CO2
d)	Comparison of two stroke & four stroke engine	06	CO2
<b>Q4</b>	a) Write steps involved in sand casting process.	06	CO6
	b) Solve <b>any Two</b>		
	i) Draw neat sketch of any four operations performed on drilling	05	CO6
	ii) Explain various sheet metal operations.	05	CO6
	iii) Classification of metal joining process.	05	CO6
<b>Q5</b>	<b>Solve any Two</b>		
a)	Derive an expression for length of belt for Cross belt drive system	08	CO5
b)	Explain the types of gears with its applications	08	CO5
c)	What is priming? Explain working of centrifugal pump.	08	CO5
<b>Q6</b>	<b>Write short notes on any Three</b>	18	
a)	Tidal Power plant	06	CO4
b)	Steam Power plant	06	CO4
c)	Wind Mill	06	CO4
d)	Types of solar collectors	06	CO4

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