



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 II

FYT 105

Elements of Mechanical Engineering

Max Marks: 100

May 2018

End Semester Examination (ESE)

Time: 3 Hrs

30th May 2018

Instructions for Students: 1) Use of non-programmable calculator is allowed
10:30 AM to 1:30 PM 2) All questions are compulsory

	Marks	COs
Q1 a) Air at 90 kPa is compressed steadily to 500 kPa. The mass flow rate of the air is 0.02 kg/s and a heat loss of 15 kJ/kg occurs during the process. Assuming the changes in kinetic and potential energies are negligible, determine the necessary power input to the compressor. Assume enthalpy of air at inlet and exit as 280.13 kJ/kg and 400.98 kJ/kg respectively	06	CO1
b) Solve any Two		
I) Distinguish between open system and closed system	06	CO1
II) State and explain zeroth law of thermodynamics.	06	CO1
III) Define following terms	06	CO1
i) Property		
ii) State		
iii) Path function		

Q2 Solve any Two

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|----|---|----|-----|
| a) | Explain with neat sketch vapour compression refrigeration system. | 08 | CO3 |
| b) | Describe with neat sketch summer air condition system. | 08 | CO3 |
| c) | Define the following terms | 08 | CO3 |
| | i) Absolute humidity | | |
| | ii) Wet bulb Temperature | | |
| | iii) Dry Air | | |
| | iv) Refrigeration | | |

Q3 Solve any Two

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|----|--|----|-----|
| a) | Explain with neat sketch working of 2 stroke petrol engine | 08 | CO2 |
| b) | Differentiate between CI Engine & SI Engine | 08 | CO2 |
| c) | Discuss in detail classification of IC engine | 08 | CO2 |

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|-----------|------|--|----|-----|
| Q4 | a) | Describe in brief steps involved in sand casting process. | 06 | CO6 |
| | b) | Solve any Two | | |
| | i) | Explain with neat sketch the operations performed on lathe machine | 05 | CO6 |
| | ii) | Classify rolling process. Draw a neat sketch of any one of them. | 05 | CO6 |
| | iii) | Differentiate between hot working and cold working process. . | 05 | CO6 |

Q5 Solve any Two

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|----|---|----|-----|
| a) | Derive an expression for length of belt for open belt drive system | 08 | CO5 |
| b) | Explain with neat sketch single acting reciprocating compressor. | 08 | CO5 |
| c) | What is priming? Explain working of centrifugal pump with neat sketch.. | 08 | CO5 |

Q6 Write short notes on (any three)

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|----|-----------------------------------|----|-----|
| a) | Classification of energy sources. | 06 | CO4 |
| b) | Hydroelectric power plant | 06 | CO4 |
| c) | Pressurised water reactor | 06 | CO4 |
| d) | Types of solar collectors | 06 | CO4 |
