



Sanjay Ghodawat University, Kolhapur

2018-19

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

EXM/P/09/01

Year and Program: 2018-19

School of Technology

Department of FY B.Tech

Course Code: FYT104

Course Title: Elements of  
Mechanical Engineering

Semester – I

Day and Date

End Semester Examination  
(ESE)

Time: Max Marks: 100

Monday, 26<sup>th</sup> November 2018

10:00am to 1:00pm

**Instructions:**

- 1) All questions are compulsory.
- 2) Assume suitable data wherever necessary.
- 3) Figures to the right indicate full marks.

Q.1	Solve any Two	Marks	Bloom's Level	CO
a)	A turbine operates under steady flow conditions, receiving steam at the following state: Pressure 1.2 MPa, temperature 188°C, enthalpy 2785 KJ/kg, velocity 33.3 m/s and elevation 3 m. The steam leaves the turbine at the following state: Pressure 20 KPa, enthalpy 2512 KJ/kg, velocity 100 m/s, and elevation 0 m. Heat is lost to the surroundings at the rate of 0.29 KJ/s. If the rate of steam flow through the turbine is 0.42 Kg/s, what is the power output of the turbine in KW OR	07	L <sub>3</sub>	CO1
a)	Classify thermodynamic properties. Give example of each.	07	L <sub>2</sub>	CO1
b)	Explain in brief working of four stroke diesel engine. State its advantages over four stroke petrol engine. OR	08	L <sub>2</sub>	CO2
b)	State the function of following parts in an IC Engine i) Flywheel ii) Cam shaft iii) Valves iv) Piston Rings	08	L <sub>2</sub>	CO2
Q.2	Solve any Two			
a)	Draw a neat sketch of vapour absorption refrigeration system. State the function of following parts used in it. i) Absorber	07	L <sub>2</sub>	CO3

- ii) Generator
- iii) Throttle valve
- iv) Condenser

OR

- |    |  |    |                |     |
|----|--|----|----------------|-----|
| a) | State the parameters controlled in an air conditioning unit. Which parts are used to control these parameters? Arrange them in sequence. | 07 | L <sub>3</sub> | CO3 |
| b) | Define Casting. Explain the process of manufacturing of cylinder using sand casting process.   | 08 | L <sub>3</sub> | CO4 |

OR

- |    |   |    |                |     |
|----|---|----|----------------|-----|
| b) | Briefly explain the classification of metal forming processes. State the advantages & limitations of hot working process over cold working process. | 08 | L <sub>2</sub> | CO4 |
|----|---|----|----------------|-----|

**Q.3 Solve any Two**

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|----|---|----|----------------|-----|
| a) | State various statements of second law of thermodynamics. Explain working of heat pump and refrigerator using second law of thermodynamics. | 08 | L <sub>2</sub> | CO1 |
| b) | Give classification and application of IC Engine. Explain construction and working of two stroke petrol engine.                             | 08 | L <sub>2</sub> | CO2 |
| c) | Explain with neat sketch working of window air conditioning unit. State applications of air conditioning.                                   | 08 | L <sub>2</sub> | CO3 |
| d) | What are different methods used for joining of metals? Explain in brief arc welding process.  | 08 | L <sub>2</sub> | CO4 |

**Q.4 Solve any Two**

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|----|--|----|----------------|-----|
| a) | Draw neat sketch of simple and compound belt drive system. Which type of belt system will you recommend if input motor speed of 1400 rpm is to be reduced to output shaft speed of 100 rpm. Assume pulleys are available from 20 mm diameter to 125 mm diameter in steps of five. Support your answers with calculation. | 09 | L <sub>3</sub> | CO5 |
| b) | State one application each for different types of gears used in power transmission. What are its advantages over belt drive and chain drive.   | 09 | L <sub>2</sub> | CO5 |

	c)	Why priming is necessary for centrifugal pump? Explain with neat sketch working of centrifugal pump.	09	L <sub>2</sub>	CO5
<b>Q.5</b>		<b>Solve any Two</b>			
	a)	Draw block diagram of steam power plant. Explain the importance of economizer and superheater in steam power plant. State the factors affecting in the selection of site for steam power plant.	09	L <sub>2</sub>	CO6
	b)	Draw neat sketch of hydroelectric power plant. State the stages of energy conversion in the process. State its advantages and limitations.	09	L <sub>2</sub>	CO6
	c)	What are renewable and nonrenewable sources of energy? Explain with neat sketch working of geothermal power plant.	09	L <sub>2</sub>	CO6
<b>Q.6</b>		<b>Solve any Three</b>			
	a)	Explain with neat sketch single acting reciprocating pump.	06	L <sub>2</sub>	CO5
	b)	How are the compressors classified? Discuss in brief various applications of compressor.	06	L <sub>2</sub>	CO5
	c)	State different types of solar collectors used. Explain any of the in brief.	06	L <sub>2</sub>	CO6
	d)	Briefly explain wind power plant. State its advantages and limitations	06	L <sub>2</sub>	CO6

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