



Sanjay Ghodawat University, Kolhapur

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

2018-19

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 – II

Day and Date Wednesday

29/05/2019

End Semester Examination (ESE)

Time: Max Marks: 100

10.30 to 1.30 PM

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 nozzle is a device for increasing the velocity of a steadily flowing steam. At the inlet to a certain nozzle, the enthalpy of the fluid passing is 3000 kJ/kg and the velocity is 60 m/s. At the discharge end, the enthalpy is 2762 kJ/kg. The nozzle is horizontal and there is negligible heat loss from it. (a) Find the velocity at exists from the nozzle. (b) If the inlet area is 0.1 m ² and the specific volume at inlet is 0.187 m ³ /kg, find the mass flow rate.	07	L ₃	CO1
	OR			
a)	Air flows steadily at the rate of 0.4 kg/s through an air compressor, entering at 6 m/s with a pressure of 1 bar and a specific volume of 0.85 m ³ /kg, and leaving at 4.5 m/s with a pressure of 6.9 bar and a specific volume of 0.16 m ³ /kg. The internal energy of the air leaving is 88 kJ/kg greater than that of the air entering. Cooling water in a jacket surrounding the cylinder absorbs heat from the air at the rate of 59 W. Calculate the power required to drive the compressor.	07	L ₃	CO1
b)	Explain with neat sketch working of 4 stroke CI engine.	08		CO2
	OR			
b)	Compare CI and SI engine.	08	L ₂	CO2
Q.2	Solve any Two			
a)	Explain construction and working of winter air conditioning system.	07	L ₂	CO3
	OR			
a)	What are the advantages of vapour absorption refrigeration system over vapour compression refrigeration system.	07	L ₂	CO3

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	b)	Explain with neat sketch construction and working of Hydroelectric power plant.	08	L ₂	CO4
	OR				
	b)	Distinguish between renewable and non-renewable sources of energy with example.	08	L ₂	CO4
Q.3	Solve any Two				
	a)	Explain the following: 1) Point function and Path function 2) Extensive and Intensive Property	08	L ₂	CO1
	b)	Define the following terms in IC engine: 1) TDC 2) BDC 3) Compression Ratio 4) Clearance Volume	08	L ₁	CO2
	c)	Define the following terms in Refrigeration system: 1) ITR 2) WBT 3) DBT 4) COP	08	L ₁	CO3
	d)	Explain with neat sketch construction and working of Geo Thermal power plant.	08	L ₂	CO4
Q.4	Solve any Two				
	a)	Derive an expression to find the length of belt for cross belt drive system.	09	L ₂	CO5
	b)	What is priming in centrifugal pump? Explain construction and working of centrifugal pump with neat sketch.	09	L ₂	CO5
	c)	Describe with neat sketch construction and working of lobe pump with its advantages and disadvantages.	09	L ₂	CO5
Q.5	Solve any Two				
	a)	Describe in brief steps involved in sand casting process.	09	L ₂	CO6
	b)	Explain with neat sketch the operations performed on lathe machine and drilling machine.	09	L ₂	CO6
	c)	Explain types of rolling processes	09	L ₂	CO6
Q.6	Solve any Three				
	a)	Explain with neat sketch double acting reciprocating pump.	06	L ₂	CO5
	b)	Classify with neat sketch types of gears.	06	L ₂	CO5
	c)	Explain in brief arc welding processes	06	L ₂	CO6
	d)	List out different cutting and non-cutting operation with neat sketch performed in sheet metal processes.	06	L ₂	CO6

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