Sanjay Ghodawat University, Kolhapur

2018-19

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

FY B Tech	**School of Technology**	**Semester I/II**
FYT 105	**Elements of Mechanical Engineering (OLD)**	**Max Marks: 100**
Nov 2018	**End Semester Examination (ESE)**	**Time: 3Hrs**

26 Nov 2018 10:00 am to 1:00 pm

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

			Marks	Blooms Level	COs
Q1	a)	State the type of system for the following and justify your answer. i) Condenser ii) Diesel engine iii) Hydraulic braking system iv) Turbine v) Compressor vi) Vapour compression refrigeration system	06	L3	CO1
	b)	Attempt **any Two** from the following			
	I)	In a steady flow process, 405 KJ/s of work is done by machine. The specific volume of fluid, pressure and velocity one 0.40 m3/kg, 6.5 bar and 20 m/s resp. These values at outlet are 0.65 m3/kg, 1 bar and 285 m/s respectively. Discharge is at 27 m above inlet section and total heat loss between inlet and outlet section is 31 KJ/s. Mass flow date of fluid is 2.5 kg/s. Find change in internal energy	06	L3	CO1
	II)	Define heat and work. State similarity and dissimilarity between them. .	06	L1	CO1
	III)	Explain the principle of working of heat engine and refrigerator using second law of thermodynamics.	06	L2	CO1
Q2		Attempt **any Two** from the following			
	a)	Justify the following statements: (i) Heavier flywheel is needed for four-stroke engines than two-stroke engines which are producing the same power. (ii) In a four-stroke engine, camshaft is required to rotate at half the speed of crankshaft. (iii) Use of fins on the surface of the cylinder. (iv) Thermal efficiency of four-stroke engines is more than that of two-stroke engines.	08	L3	CO3
	b)	Describe with neat sketch four strokes of diesel engine.	08	L2	CO3
	c)	Suggest whether a petrol car or diesel car to be purchased based on the following parameters. i) Reliability ii) Environmental effects iii) Fuel efficiency and mileage iv) Usage difference	08	L3	CO3

Q3		Attempt **any Two** from the following			
	a)	Which type of refrigeration system used in domestic refrigerator? Explain the same in brief.	08	L2	CO2
	b)	Compare vapour compression refrigeration system and vapour absorption refrigeration system	08	L2	CO2
	c)	Define air conditioning. Explain with neat sketch summer air conditioning system.	08	L2	CO2
Q4	a)	Draw neat sketch of following operations performed on drilling machine 1) Counterboring 2) Countersinking 3) Reaming	06	L2	CO6
	b)	Attempt **any Two** from the following			
	I)	State the steps involved in manufacturing of flywheel using sand casting process.	05	L3	CO6
	II)	Classify metal joining processes. Explain in brief any one of them. .	05	L2	CO6
	III)	Compare hot working and cold working process.	05	L2	CO6
Q5		Attempt **any Two** from the following			
	a)	Recommend an applications of power transmission systems using the following elements i) Flat Belt ii) V Bellt iii) Ropes iv) Chain Drive v) Spur gear vi) Rack and pinion vii) Bevel gear viii) Worm and worm wheel	08	L2	CO5
	b)	Explain with neat sketch double acting reciprocating pump.	08	L2	CO5
	c)	Classify rotary compressor. Explain any one of them.	08	L2	CO5
Q6		Attempt **any Three** from the following			
	a)	Draw neat sketch of hydroelectric power plant.	06	L2	CO4
	b)	State the function of the following elements used in steam power plant i) Superheater ii) Economizer iii) Condenser iv) Boiler v) Turbine vi) Cooling tower	06	L2	CO4
	c)	Explain with neat sketch solar water heating system.	06	L2	CO4
	d)	What are renewable sources of energy? State its advantages and limitations.	06	L2	CO4