Supplementary – July 2019

Unit – IV

7. a) Explain the different types of lubricants with an example for each type. 6
    b) Give the classification of power transmission drive. 4
    c) Differentiate between welding and soldering. 4
    d) Name the different types of bearing and explain the construction of a ball bearing. 6

8. a) Differentiate belt drive and gear drives. 5
    b) Explain any 5 properties of good lubricant. 5
    c) Explain welding, brazing and soldering. 6
    d) Explain the construction of Roller bearing. 4

Unit – V

9. a) Define Robot. Discuss the different types of robot configuration. 6
    b) Sketch and explain
       (i) Facing (ii) Turning (iii) Knurling (iv) thread cutting. 6
    c) What are the basic components of NC machines explain with a flow diagram. 8

10. a) Explain Slot milling and End milling. 4
    b) Explain the different drilling operation. 6
    c) What is automation? Explain the types of automation. 5
    d) Differentiate between NC machines and CNC Machines. 5

BT* Bloom's Taxonomy, L* Level

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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belagavi)

First/Second Semester B.E. (Credit System) Degree Examinations

Supplementary Examinations – July 2019

17ME104 – ELEMENTS OF MECHANICAL ENGINEERING

Duration: 3 Hours

Max. Marks: 100

Note: 1) Answer *Five full* questions choosing *One full* question from each Unit.
      2) Assume missing data (if any) suitably.

		Marks	BT*
	Unit – I		
1 a)	With the help of temperature-enthalpy diagram, explain the different parameters that effect in the formation of superheated steam.	6	L*2
b)	Explain the working of Babcock & Wilcox boiler.	5	L2
c)	Difference between Impulse and Reaction turbine.	4	L2
d)	Find the specific volume, enthalpy, internal energy and entropy of wet steam at 15 bar pressure and dryness fraction 0.8, V$_f$=0.11m³/kg, h=884.5kJ/kg, h$_{fg}$=1910.3kJ/kg, S$_f$=2.398kJ/kgK, Stg=3.977kJ/kgK.	5	L1
2 a)	Give the functions of Boiler mounting and Accessories.		
	(i) Steam stop valve (ii) Blow off cock	4	L1
	(iii) Super heater (iv) Feed pump.	10	L1
b)	Sketch and explain the construction and working of Lancashire boiler.	6	L2
c)	With a sketch explain the working of De laval Steam Turbine.		
	Unit – II		
3 a)	Sketch and explain the construction and working of Impulse turbine.	6	L2
b)	With the line diagram, explain open cycle gas turbine and closed cycle gas turbine.	8	L2
c)	4 stroke diesel engine has a piston diameter 250mm and stroke 400mm. The mean effective pressure is 4 bar and speed is 500 rpm. The diameter of the brake drum is 1000mm and the effective brake load is 400N. Find IP, BP and FP.	6	L1
4 a)	Explain the working of a 4 stroke petrol engine.	6	L2
b)	Sketch and explain the working of Francis Turbine.	8	L2
c)	The following observation were made during a test on a two-stroke cycle oil engine. Bore=200mm, Stroke=250mm, Speed =350rpm, Brake drum dia =1.2m Net brake load =450N, Mean effective pressure =2.8bar, oil consumption =3.6kg/hr, calorific value of oil =41868 kJ/kg. Determine IP,BP,FP,η$_m$, η$_{it}$, η$_{bt}$	6	L5
	Unit – III		
5 a)	With a neat sketch, explain working of centrifugal pump.	8	L2
b)	Define the following.		
	(i) Refrigerant effect (ii) Ton of Refrigeration (iii) COP (iv) Relative COP.	4	L1
c)	With a neat sketch, explain the working of vapor compression refrigeration system.	8	L2
6 a)	What are uses of compressed air and explain the working of reciprocating air compressor.	6	L2
b)	Name the refrigerant that are commonly used. What are the properties of good refrigerant?	6	L1
c)	With a neat sketch, explain the working of air conditioner.	8	L2

P.T.O.