Unit – IV

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

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

Unit – V

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

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

BT* Bloom's Taxonomy, L* Level

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USN

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 Impluse 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=0.11m^3/kg, h_f=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 (ii) Supper heater (iv) Feed pump.	4	L1
	b)	Sketch and explain the construction and working of Lancashire boiler.	10	L2
	c)	With a sketch explain the working of De laval Steam Turbine.	6	L2
		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.