ME101/ME201

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M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)
BANGALORE – 560 054

SEMESTER END EXAMINATIONS – JANUARY 2016

Course & Branch	: **B.E.-Common to All Branches**	**Semester**	: **I/II**
Subject	: **Elements of Mechanical Engineering**	**Max. Marks**	: **100**
Subject Code	: **ME101/ME201**	**Duration**	: **3 Hrs**

Instructions to the Candidates:
- Answer one full question from each unit.

UNIT – I

1.	a)	Draw a neat sketch of Nuclear power plant and describe its working.	CO1	(10)
	b)	What are the advantages and disadvantages of Renewable Energy Resources?	CO1	(05)
	c)	What are boiler mountings and accessories? Name the boiler accessories.	CO1	(05)
2.	a)	With a neat sketch explain the working of water tube boiler and label the parts.	CO1	(10)
	b)	What is compounding of steam turbines? Name the types of compounding and explain with neat sketch any one of them.	CO1	(06)
	c)	1 kg of superheated steam at 1.5 MPa contains 3000 kJ of heat energy. Find the superheated temperature. If 500 kJ of heat energy is removed at the same pressure, what is the condition of the steam? Specific heat of superheated steam = 2.25 kJ/kg-K	CO1	(04)

UNIT – II

3.	a)	With necessary diagrams, explain the working principle of an I.C engine in which fuel is ignited by spark and crankshaft makes two revolutions to complete one cycle.	CO2	(10)
	b)	A 2 stroke diesel engine has a piston diameter of 200 mm and a stroke of 300 mm. It has main effective pressure of 2.8 bar and speed of 400 rpm. The diameter of the brake drum is 1 m and the effective brake load is 64 kg. Find the indicated power, brake power, mechanical efficiency of the engine and average piston speed.	CO2	(10)
4.	a)	With a neat sketch, explain the working principle of vapour absorption system. What are the advantages of absorption system over vapour compression refrigeration system?	CO2	(08)
	b)	Explain the desirable properties of a good refrigerant.	CO2	(06)
	c)	Explain the following: i) C.O.P ii) Relative humidity iii) Dry bulb temperature	CO2	(06)

UNIT – III

5.	a)	Name the different types of taper turning and explain any one of them with a neat sketch.	CO3	(06)
	b)	Sketch and explain the working of a Radial drilling machine.	CO3	(08)

	c)	Differentiate between: i) Boring and reaming ii) Counter sinking and counter boring iii) Turning and facing	CO3	(06)
6.	a)	Explain the following: i) *Centreless grinding* ii) Cylindrical grinding	CO3	(10)
	b)	Name any four different milling operations and explain *any one* with a neat sketch.	CO3	(06)
	c)	Explain any two types of bonding materials used in grinding wheel.	CO3	(04)

UNIT – IV

7.	a)	*Differentiate between CNC and NC machines.*	CO4	(06)
	b)	Explain the different types of flames obtained in gas welding with their importance.	CO4	(06)
	c)	Explain with a neat sketch arc welding process.	CO4	(08)
8.	a)	Differentiate between sliding contact and rolling contact bearings.	CO4	(05)
	b)	What do you mean by anti-friction bearings? *Explain:* i) Ball bearings ii) Roller bearings	CO4	(10)
	c)	With a neat sketch explain journal thrust bearing.	CO4	(05)

UNIT – V

9.	a)	Derive an expression for ratio of belt tensions for a cross belt drive.	CO5	(08)
	b)	Sketch and explain the following gear drives: i) Spur gear ii) Bevel gear	CO5	(06)
	c)	The driven pulley of 400 mm diameter of a belt drive runs at 200 rpm. The angle of lap is 165^0 and the coefficient of friction between the belt and pulley is 0.25. Find the power transmitted if the initial tension is not to exceed 10 kN.	CO5	(06)
10.	a)	What is the significance of lubrication?	CO5	(05)
	b)	With neat sketch explain the following: i) Wick feed lubricator ii) Needle lubricator	CO5	(10)
	c)	What are the properties of a good lubricant?	CO5	(05)

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