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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

July / August 2017 Supplementary Semester Examinations

Course: Elements of Mechanical Engineering — Duration: **3 hrs**
Course Code: **14ME1ICEME / 14ME2ICEME** — Max Marks: **100**

Date: 27.07.2017

Instructions: **Answer any five full questions choosing one from each unit.**
2. Assume missing data (if any) suitably

UNIT 1

1	a)	Classify and compare conventional and non-conventional sources of energies	**04**
	b)	Elaborate the experiment that is used to demonstrate the mechanism of formation of steam along with temperature-enthalpy diagram.	**08**
	c)	With a neat sketch illustrate the working of an externally fired stationary water tube boiler.	**08**

UNIT 2

2	a)	With the help of neat sketches describe the working of open cycle and closed cycle gas turbine.	**12**
	b)	Explain the principle of working of domestic air conditioner with a neat sketch.	**08**

UNIT 3

3	a)	Explain the construction and working of 4 stroke petrol engine with P-V diagram.	**10**
	b)	A Single cylinder 4-Stroke I.C. engine has a swept volume of 6 litres and runs at a rated speed of 300 rpm. At full load, the torque developed was measured with a belt dynamometer whose pulley diameter is 1m. The tension in the tight side and slack side of the belt is 700N and 300N respectively. 4 kg of fuel was consumed in one hour. The indicated mean effective pressure is 6 bar and the calorific value of the fuel is 42000 kJ/kg. Calculate the Brake power, Indicated power, Mechanical efficiency, Brake specific fuel consumption, Indicated and Brake thermal efficiencies.	**10**

OR

4	a)	Explain the principle of Arc welding with a neat sketch.	**08**
	b)	Categorize the advantages and disadvantages of Brazing process.	**06**
	c)	Interpret the standard V-thread profile used for fasteners.	**06**

UNIT 4

5	a)	Explain the construction and working of an engine lathe with a neat sketch.	**12**
	b)	Explain the working of a radial drilling machine with neat sketch.	**08**

OR

6 a) List the different milling operations and explain Slab milling, Slot milling and Angular milling operations. **10**

b) With the help of sketches explain the principle of cylindrical grinding and the working of cylindrical grinding machine. **10**

UNIT 5

7 a) Gear A rotates at 200 rpm clockwise and drives gear B. Gear C drives gear D. Gear E drives gear F. Gears B and C are mounted on the same shaft. Also, gears E and D are compounded. Number of teeth on each gear is given in the following table. Determine the speed and direction of rotation of gear F. Sketch the gear train. **08**

Gear	A	B	C	D	E	F
No. of teeth	20	50	25	75	25	65

b) Explain the principle of working of roller bearings with a neat sketch. **04**

c) Explain closed loop control system with an example. Also list its merits and demerits. **08**

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