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**First/Second Semester B.E. Degree Examination, June 2012**  
**Elements of Mechanical Engineering**

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing at least two from each part.**  
**2. Answer all objective type questions only on OMR sheet page 5 of the answer booklet.**  
**3. Answer to objective type questions on sheets other than OMR will not be valued.**

**PART – A**

- 1 a. Choose your answers for the following : (04 Marks)**
- i) The condition of steam in boiler drum is always  
 A) Dry B) Wet  
 C) Saturated D) Superheated
- ii) In which case, the potential energy is converted into the mechanical energy  
 A) Hydel energy B) Solar energy  
 C) Wind energy D) Nuclear energy
- iii) Sensible heat is also called as  
 A) Enthalpy of saturated water B) Enthalpy of evaporation  
 C) enthalpy of dry saturated steam D) Enthalpy of super heated steam
- iv) If x is the weight of dry steam and y is the weight of water suspension, then dryness fraction is equal to  
 A)  $\frac{x}{x+y}$  B)  $\frac{y}{x+y}$   
 C)  $\frac{x}{x-y}$  D)  $\frac{y}{x-y}$
- b. Sketch and explain the working of Babcock and Wilcox boiler. (10 Marks)
- c. Determine the specific volume and density of 1 kg steam at a pressure of  $7 \times 10^5$  Pa, when the condition of steam is i) Wet, having dryness fraction 0.9 ii) Dry iii) Superheated at 250°C. If required use the extract of the steam table provided below :

P	$t_s$	$V_g$
7 bar	437.92 K	0.27334 m <sup>3</sup> /kg

(06 Marks)

- 2 a. Choose your answers for the following : (04 Marks)**
- i) The propelling force in a steam turbine depends on the \_\_\_\_\_ action of the turbine  
 A) Dynamic B) Static  
 C) Both D) None
- ii) France turbine is a \_\_\_\_\_ turbine  
 A) Impulse B) Reaction  
 C) Both D) None
- iii) An example for tangential flow turbine is  
 A) Pelton wheel B) Kaplan Turbine  
 C) Thomson turbine D) Modern Francis Turbine
- iv) Delaval turbine is also called  
 A) Impulse steam turbine B) Gas turbine  
 C) Reaction turbine D) Water turbine
- b. What is compounding? With a suitable diagram, explain the velocity compounding. (10 Marks)
- c. Distinguish between impulse and reaction turbine. (06 Marks)



- 6 a. Choose your answers for the following : (04 Marks)
- The cutting tool in a milling machine is mounted on  
A) Tool holder B) Arbor  
C) Column D) Table
  - Removal of material by mechanical action of abrasive particles is called as  
A) Slot milling B) Grinding  
C) Reaming D) Tapping
  - In \_\_\_\_\_ grinding, the work piece is held over a work rest in between two grinding wheels.  
A) Cylindrical centre B) Centreless cylindrical  
C) Surface grinding D) None of these
  - Chip thickness in \_\_\_\_\_ milling is minimum at the beginning of cut and reaches to the maximum when the cut ends.  
A) Up B) Down  
C) Both D) None
- b. Sketch and explain centreless grinding. (08 Marks)
- c. Draw the neat sketch of horizontal milling machine and explain parts. (08 Marks)
- 7 a. Choose your answers for the following : (04 Marks)
- The hard filler material used in brazing is  
A) Solder B) Flux  
C) Spelter D) Electrode
  - Solder is essentially a  
A) Tin silver base B) tin lead base  
C) Silver lead base D) bismuth lead base.
  - Resistance of lubricating oil to flow is  
A) Porosity B) Electricity  
C) Viscosity D) None
  - Support provided for rotating shaft is  
A) Bearings B) Lubricant  
C) Axle D) Pedestal
- b. Explain briefly the metal joining processes of soldering, brazing and welding. (09 Marks)
- c. Briefly discuss the three types of flames used in gas welding and mention their applications. (07 Marks)
- 8 a. Choose your answers for the following : (04 Marks)
- \_\_\_\_\_ belts are acid and water proof  
A) Leather B) Balata  
C) Textile D) Canvas
  - The ratio of pitch circle diameter to number of teeth is  
A) Pitch B) Circular pitch  
C) Module D) Addendum
  - The surface of the gear tooth below the pitch surface is called  
A) bottom tooth B) Face  
C) Flank D) Tooth depth
  - Mitre is a type of  
A) Spur gear B) Helical gear  
C) Bevel gear D) Worm gear
- b. Derive an equation for ratio of tension in belt drive. (08 Marks)
- c. Write the different types of gear trains with their application. (08 Marks)

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