

**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)
- The condition of steam in boiler drum is always
    - Dry
    - Wet
    - Saturated
    - Superheated
  - In which case, the potential energy is converted into the mechanical energy
    - Hydel energy
    - Solar energy
    - Wind energy
    - Nuclear energy
  - Sensible heat is also called as
    - Enthalpy of saturated water
    - Enthalpy of evaporation
    - enthalpy of dry saturated steam
    - Enthalpy of super heated steam
  - If  $x$  is the weight of dry steam and  $y$  is the weight of water suspension, then dryness fraction is equal to
    - $\frac{x}{x+y}$
    - $\frac{y}{x+y}$
    - $\frac{x}{x-y}$
    - $\frac{y}{x-y}$
- 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  $250^\circ\text{C}$ . 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)
- The propelling force in a steam turbine depends on the \_\_\_\_\_ action of the turbine
    - Dynamic
    - Static
    - Both
    - None
  - Francis turbine is a \_\_\_\_\_ turbine
    - Impulse
    - Reaction
    - Both
    - None
  - An example for tangential flow turbine is
    - Pelton wheel
    - Kaplan Turbine
    - Thomson turbine
    - Modern Francis Turbine
  - Delaval turbine is also called
    - Impulse steam turbine
    - Gas turbine
    - Reaction turbine
    - 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)

\* \* \* \* \*