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10EME14/24

**First/Second Semester B.E. Degree Examination, June/July 2013**  
**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 the correct answers for the following : (04 Marks)
- i) Lunar is \_\_\_\_ form of energy  
A) Stored B) Transitional  
C) Celestial D) Capital
  - ii) Enthalpy is also called as \_\_\_\_  
A) Sufficient heat B) Insufficient heat  
C) Total heat D) Incomplete heat
  - iii) Steam pressure is \_\_\_\_ in water tube boilers  
A) Low B) High  
C) Medium D) Absolute
  - iv) Feed check valve is a boiler mounting for \_\_\_\_  
A) Safety B) Operation  
C) Testing D) Security
- b. Compare and contrast renewable and non renewable energy sources. (06 Marks)
- c. Enumerate the advantages and disadvantages of superheated steam. (04 Marks)
- d. Explain briefly air preheater, superheater and Chimney with respect to boilers. (06 Marks)
- 2 a. Choose the correct answers for the following : (04 Marks)
- i) An example for a reaction turbine is  
A) Laval turbine B) Curtis turbine  
C) Zoelly turbine D) Parson's turbine
  - ii) The weight to power ratio of a gas turbine is  
A) High B) Less  
C) Moderate D) Equal
  - iii) Draft tube is a \_\_\_\_ steel pipe  
A) Closed B) Open  
C) Converging D) Diverging
  - iv) Kaplan turbine is a \_\_\_\_ head turbine  
A) High B) Low  
C) Medium D) Simple
- b. With a neat sketch, explain the working principle of an impulse turbine. (06 Marks)
- c. List any four differences between closed cycle and open cycle gas turbines. (04 Marks)
- d. Define radial flow, axial flow and mixed flow with respect to water turbine. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and or equations written eg. 42.8 50. will be treated as malpractice.

- 3 a. Choose the correct answers for the following : (04 Marks)
- Flywheel is used as an energy \_\_\_\_\_  
 A) Receiver B) Reservoir  
 C) Mixer D) Multiplier
  - Mechanical efficiency of a four-stroke engine is  
 A) Medium B) High  
 C) Low D) Balanced
  - The output shaft in IC engines is  
 A) Camshaft B) Crankshaft  
 C) Rotary shaft D) Axial shaft
  - In C.I. engines, charge means  
 A) Air and fuel B) Only fuel  
 C) Air and water D) Only air
- b. List any four differences between two-stroke and four-stroke engines. (04 Marks)
- c. A six cylinder 4-stroke I.C. engine develops 50 kW of indicated power at mep of 700 kPa. The bore and stroke length are 70mm and 100mm respectively. If the engine speed is 3700 rpm, find the average misfires per unit time. (06 Marks)
- d. Draw a schematic diagram of I.C. engines and name the parts. (06 Marks)
- 4 a. Choose the correct answers for the following : (04 Marks)
- Brine is an example for  
 A) Coolant B) Effluent  
 C) Deodourant D) Refrigerant
  - The value of COP is greater than  
 A) Infinity B) Ten  
 C) Unity D) Hundred
  - A thermostat in A.C. is used to control  
 A) Pressure B) Temperature  
 C) Volume D) Efficiency
  - The viscosity of an ideal refrigerant should be  
 A) Low B) High  
 C) Moderate D) Unity
- b. Mention the uses of any four refrigerants. (04 Marks)
- c. With a neat sketch, explain the working of a vapour absorption refrigerator. (06 Marks)
- d. List the differences between vapour compression refrigeration and vapour absorption refrigeration. (06 Marks)

## PART – B

- 5 a. Choose the correct answers for the following : (04 Marks)
- Compound side swiveling method is used to produce
 

A) Hole	B) Threads
C) Knurl	D) Taper
  - Lathe Dog is
 

A) A part	B) A component
C) An accessory	D) An assembly
  - \_\_\_\_\_ is an operation to produce a conical surface at the end of a predrilled hole
 

A) Counter Boring	B) Counter sinking
C) Tapping	D) Reaming
  - The supporting section (core) of a drill is called
 

A) Web	B) Tang
C) Land	D) Margin
- b. With a neat sketch, explain the principle and operation to produce a 'taper' on lathe by tail stock set over method. (06 Marks)
- c. Differentiate between cross slide and compound slide. (04 Marks)
- d. With a neat sketch, explain the operation of a radial drilling machine. (06 Marks)
- 6 a. Choose the correct answers for the following : (04 Marks)
- Conventional milling is also called
 

A) End milling	B) Climb milling
C) Peripheral milling	D) Up milling
  - The milling process used to produce V – blocks is called
 

A) Form milling	B) Slot milling
C) Angular milling	D) Slab milling
  - Flint is an example for a \_\_\_\_\_ abrasive
 

A) Artificial	B) Natural
C) Strong	D) Weak
  - The bond used for manufacturing elastic grinding wheels is called
 

A) Shellac	B) Vitrified
C) Resinoid	D) Oxy – chloride
- b. Differentiate between up milling and down milling. (06 Marks)
- c. List any four differences between horizontal milling machine and vertical milling machine (04 Marks)
- d. With a neat sketch, explain the principle of centreless cylindrical grinding. (06 Marks)

- 7 a. Choose correct answers for the following : (04 Marks)
- i) Spelter is used in,  
 A) Welding  
 C) Soldering  
 B) Brazing  
 D) Electroplating
- ii) \_\_\_\_\_ is used as flux in welding,  
 A) Sodium phosphate  
 C) Sodium silicate  
 B) Sodium carbonate  
 D) Sodium chloride
- iii) A good lubricant should be,  
 A) Highly volatile  
 C) Less volatile  
 B) Non-volatile  
 D) Moderately volatile
- iv) Collar bearing is an example for,  
 A) Radial bearing  
 C) Thrust bearing  
 B) Journal bearing  
 D) Sleeve bearing
- b. With a neat sketch explain a foot step bearing. (06 Marks)
- c. Explain splash lubrication with a neat sketch. (06 Marks)
- d. Differentiate between welding and brazing. (04 Marks)
- 8 a. Choose correct answers for the following : (04 Marks)
- i) V-belts are,  
 A) Repairable  
 C) Quickly repairable  
 B) Not repairable  
 D) Easily repairable
- ii) Belts transmit motion by \_\_\_\_\_,  
 A) Friction  
 C) Suction  
 B) Abrasion  
 D) Expulsion
- iii) The surface of the tooth below the pitch circle is called \_\_\_\_\_,  
 A) Clearance  
 C) Backlash  
 B) Flank  
 D) Face
- iv) Module indicates the \_\_\_\_\_ of the pitch,  
 A) Whole  
 C) Total  
 B) Fraction  
 D) Integration
- b. Differentiate between an open belt drive and cross belt drive. (04 Marks)
- c. Enumerate the advantages and disadvantages of gear drives. (06 Marks)
- d. A V-belt drive transmits 10 kW power at 240 rpm. The grooved pulley has a mean diameter of 1.2 m and groove angle of  $45^\circ$ . Taking  $\mu = 0.3$  and angle of lap equal to  $\pi$  radians, determine the tensions on each side of the belt. (06 Marks)