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Total No. of Questions : 6

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**EKS-313****B.E. I Semester (CGPA) Civil Engg.  
Examination 2017****BASIC MECHANICAL ENGINEERING****Paper : CE-104****Time Allowed : Three Hours****Maximum Marks : 60**

**Note:** Attempt all questions. Use of steam table is permitted. Use neat and clean diagram wherever required.

Q.1. Answer in one word - 2 each

- a) A Cochran boiler is a \_\_\_\_\_, \_\_\_\_\_ fire tube boiler.
- b) A \_\_\_\_\_ flame is one in which supply of oxygen is more than to acetylene.
- c) The latent heat of vaporization is \_\_\_\_\_ at the critical point.
- d) The four stroke cycle is complete in \_\_\_\_\_ revolutions of crankshaft.
- e) During throttling process \_\_\_\_\_ remain unchanged.

Q.2. a) Describe the process of formation of steam and give its graphical representation also. 4

b) Explain the construction and working of locomotive boiler with the well labelled diagram. 6



(2)

OR

- a) Find the internal energy of 1 kg of superheated steam at a pressure of 10 bar and  $280^{\circ}\text{C}$ . If this steam be expanded to a pressure of 1.6 bar and 0.8 dry. Determine the change in internal energy. Assume specific heat of super heated steam as  $2.1 \text{ kJ/kgK}$ . 5
- b) How are boiler classification? State which types of boiler is used for power generation and why? 5

- Q.3. a) Distinguish between petrol engine and diesel engine. 4
- b) A petrol engine has a cylinder diameter of 60 mm and stroke 100 mm. If the mass of the charge admitted per cycle is 0.0002 kg, find the volumetric efficiency of the engine. Assume characteristics constant for the charge as  $287 \text{ J/kg K}$ . 6

OR

- a) Explain the following terms : 6
- Indicated power
  - Overall efficiency
  - Brake power
  - Compression ratio
- b) Explain merits and demerits of 2-stroke engine over 4-stroke engine. 4

- Q.4. a) Differentiate between summer and winter air conditioning. 5
- b) Derive an expression for the quantity of heat flow through a composite slab. 5



(3)

OR

- a) A metal pipe having an external diameter of 150mm carries steam at  $200^{\circ}\text{C}$ . The pipe is covered by a layer of 25mm thick of an insulating material whose conductivity is 0.21 w/mk. If the outer surface is at  $100^{\circ}\text{C}$ , find the amount of heat lost per meter length per minute. 6
- b) Define the following : 4
- i) Specific humidity
  - ii) Dew point
  - iii) Dry bulb temperature
  - iv) Relative humidity

- Q.5. a) Compare between cast Iron and steel on compositions, properties types and applications. 5
- b) Distinguish between primary, secondary and tertiary measurement. 5

OR

- a) Draw labelled diagram of sine-bar and explain construction and working. 4
- b) Define following : 6
- i) Brittleness
  - ii) Ductility
  - iii) Fatigue
  - iv) Strength



(4)

6

Q.6. a) Differentiate between :

i) Arc welding and Gas welding

ii) Chills and chaplets

iii) Moulding material and metallurgical generated defects.

b) Explain the different types of moulding mixture with their compositions and applications. 4

OR

a) Enumerate the different types of pattern with their uses. 4

b) Explain the principle working and construction of MIG plant. 6

