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I/IV B. TECH. DEGREE EXAMINATIONS, NOV / DEC - 2015

First Semester

BT / CSE / ECE / EEE

BASIC MECHANICAL SCIENCE

Time : **Three Hours** Maximum Marks : **60**

Answer Question No. 1 Compulsory. 12x1=12 M

Answer ONE question from each Unit. 4x12=48 M

1. Explain the following in brief :
   a) What are three basic elements of belt drive ?
   b) What is meant by polygon of chain ?
   c) Describe the function of Pickerning governor or a spring-controlled gravity governor.
   d) Define thermodynamic property ?
   e) What is internal energy ?
   f) What is the difference between SI engine and CI engine ?
   g) What is scavenging ?
   h) Explain the term specific fuel consumption ?
   i) What is Joules cycle ?
   j) Describe the boiler draught ?
   k) How do you classify the pumps ?
   l) What is the use of rotary compressor ?

UNIT - I

2. a) What data is required for selecting the belt drive from manufactures catalogue ?
   b) What are the friction losses of chain drive ? Explain chain lubrication ?

(OR)

3. The controlling force in a spring controlled governor is 1500 N when the radius of rotation of the balls is 200 mm and 887.5 N when it is 130 mm. The mass of each ball is 8 kg. If the controlling force curve is a straight line, determine the controlling force and the speed of rotation when the radius of rotation is 150 mm.

P.T.O.

UNIT - II

4. a) State the Law's of thermodynamics. What is its importance ?

   b) Derive the general flow equation and state the assumptions ?

(OR)

5. a) Difference between Otto cycle and diesel cycle.

   b) Difference between two-stroke and four-stroke cycle.

UNIT - III

6. a) Explain the working principle of Babcock Wilcox boiler with a neat sketch ?

   b) Describe the function of injector with a sketch ?

(OR)

7. a) What is the difference between vapour compression and vapor absorption cycle ?

   b) Explain the principle of working of Carnot's reverse cycle ?

UNIT - IV

8. a) How are pumps classified ? What is the difference between centrifugal and reciprocating pumps ?

   b) Explain the working of a centrifugal pump ?

(OR)

9. A two stage air compressor is used to compress 1 kg of free air from 1 bar and $32^{o}C$ to 26 bars. The value of n is 1.3 and R is 0.287 kJ/kgK, Find

   (i) the intermediate pressure,

   (ii) work required for best performance,

   (iii) work for a corresponding single stage compressor and

   (iv) percentage saving in work in two stage compressor.