Total No. of Printed Pages:2

SUBJECT CODE NO: H-156
FACULTY OF ENGINEERING AND TECHNOLOGY
F. E. (All) (CGPA)
Basic Mechanical Engineering
(REVISED)

[Time: Three Hours]   [Max.Marks: 80]

Please check whether you have got the right question paper.

N.B
i)   Q. No. 1 and Q. No.6 are compulsory
ii)   Attempt any two questions from the remaining questions in each section 'A' and 'B'
iii) Assume suitable data if necessary and mentioned it clearly
iv)   Figure to right indicate full marks
v)   Use of non-programmable calculator in allowed

Section A

Q.1   Solve <u>any five</u>   10
   a) Define system, surrounding and boundary
   b) Define the term process and cycle
   c) Define TDC and BDC
   d) State and explain Boyle's law
   e) Write four applications of Refrigeration system
   f) Represent Isothermal process on PV and TS diagram
   g) Differentiate between intensive and extensive property
   h) State zeroth law of thermodynamics

Q.2   a) Explain with neat sketch construction and working of bourdon tube pressure gauge   08
      b) Differentiate between heat and work   07

Q.3   a) State first law of thermodynamics and explain the joule's experiment to prove the first law of   07
          thermodynamic
      b) 2kg of air at 150℃ and 3 bar expands according to $PV^{1.2} = C$ to final pressure 1 bar. Calculate   08
          heat transfer, work transfer and change in internal energy during the process
          [Take $R = 0.287 KJ/kg\ K$ and $\gamma = 1.41$]

Q.4   a) Explain with neat diagram working of four stroke CI engine. Represent on PV and TS diagram   08
      b) Explain with neat diagram the working of air conditioner   07

Q.5   a) Explain paddle-wheel work   07
      b) Explain with neat sketch working principle of reciprocating air compressor. Also write its   08
          applications.

Section B

Q.6 Solve <u>any five</u>   10
   a) State the working principle of centre lathe
   b) Enlist the application of plain carbon steel
   c) Define forging operation
   d) State the function of flux in joining process
   e) Differentiate between soldering and brazing
   f) State the function of brake
   g) How the gears are classified
   h) State the function of tailstock

Q.7 a) Explain the construction and working of single plate clutch with neat diagram   07
     b) A pinion with 25 teeth rotating at 100rpm drives a gear which rotates at 200rpm. Module is   08
        5mm. find the following:
        1) Circular and diametral pitch
        2) Pitch circle diameter of pinion and gear
        3) The centre distance
        4) Velocity ratio

Q.8 a) What is heat treatment process? Explain in detail annealing heat treatment process   08
     b) Explain with neat sketch sand casting process   07

Q.9 a) Enlist the various operations carried out on lathe machine. Explain any two operations with neat 08
        sketch
     b) Explain column and knee type milling machine with neat sketch.   07

Q.10 a) Explain surface grinding machine with neat sketch   07
     b) What is cold forging operation? Explain with neat diagram the working principle of drop   08
        forging