3rd Sem / Branch : Mechatronics
Subject:- Mechanical Engineering Fundamentals

Time : 3Hrs.   M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory   (10x1=10)

Q.1   _____ is the thermal property of materials.
a)   Strength   b)   Corrosion resistance
c)   Conductivity   d)   Stiffness

Q.2   The property of material by virtue of which it can rolled into thin is called
a)   malleability   b)   ductility
c)   plasticity   d)   toughness

Q.3   Unit of stress in S.I. system is
a) N/m^2 b)   N/m
c) N/m^3 d)   none of the above

Q.4   _____ is extensive property
a)   Temperature   b)   Specific volume
c)   Density   d)   Mass

Q.5   Close system allow
a)   only mass transfer
b)   only energy transfer
c)   both mass and energy transfer
d)   none of the above

a)   open system   b)   closed system
c)   isolated system   d)   extensive system
e)   intensive property

Q.30   Explain the concept of irreversibility and give two example of irreversible process.

Q.31   Explain Kelvin-Planck statement.

Q.32   Define first law of thermodynamic and its application.

Q.33   What do you understand by law of conservation of energy?

Q.34   Explain the terms;
a)   crank throw   b)   piston speed
c)   swept volume

Q.35   Explain Otto cycle along with neat and clean diagram of P-V and T-S.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions.   (2x10=20)

Q.36   Explain different types of the thermodynamic system.

Q.37   Explain the working principle of four stroke petrol engine.

Q.38   Describe the comparison between four stroke and two stroke cycle engine.

Q.6 Joule's experiment relates
  a) zeroth law of thermodynamic
  b) first law of thermodynamic
  c) second law of thermodynamic
  d) third law of thermodynamic
Q.7 _____ is a reversible process
  a) Mixing of two gases
  b) Spontaneous chemical reactions
  c) Extension of spring
  d) none of the above
Q.8 Petrol engine works on which cycle
  a) Otto cycle   b) diesel cycle
  c) both a and b   d) none of the above
Q.9 Stroke of an I.C. engine is equal to
  a) half the crank radius
  b) twice the crank radius
  c) the crank radius
  d) none of the above
Q.10 In Otto cycle heat is added at
  a) constant volume
  b) constant pressure
  c) constant temperature
  d) constant entropy

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)
Q.11 Define brittleness.
Q.12 Bronze are alloy of copper and tin. (True/False)

Q.13 Define linear strain.
Q.14 What is proof stress?
Q.15 Define factor of safety.
Q.16 What is system?
Q.17 System and surrounding are separated by _____.
Q.18 Define bore.
Q.19 In C.I. engine, only air enter into cylinder during suction stroke. (True/False)
Q.20 What is the full form of T.D.C. in IC engine?

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)
Q.21 Explain any five thermal properties of a material.
Q.22 Give the classification of the materials.
Q.23 Draw stress-strain curve for ductile materials.
Q.24 Explain the terms;
  a) percentage elongation
  b) yield point
Q.25 Explain different types of strain.
Q.26 Draw stress-strain curve for ductile materials.
Q.27 Explain the following process;
  a) Quasi-static process b) Reversible process
Q.28 What is the enthalpy and internal energy of the system?
Q.29 Give one example of each term;