MECHANICAL TEST PAPER 14-04-2017

1. Which of the following variables controls the physical properties of a perfect gas
(a) pressure (b) temperature
(c) volume (d) all of the above
(e) atomic mass.

2. The unit of temperature in S.I. units is
(a) Centigrade (b) Celsius
(c) Fahrenheit (d) Kelvin
(e) Rankine.

3. Which of the following laws is applicable for the behavior of a perfect gas
(a) Boyle's law (b) Charle's la
(c) Gay-Lussac law (d) all of the above
(e) Joule's law.

4. The unit of mass in S.I. units is
(a) kilogram (b) gram
(c) tone (d) quintal
(e) Newton.

5. The unit of length in S.I. units is
(a) meter (b) centimeter
(c) kilometer (d) millimeter.

6. The unit of time in S.I. units is
(a) second (b) minute
(c) hour (d) day
(e) year.

7. The unit of energy in S.I. units is
(a) watt (b) joule
(c) joule/s (d) joule/m
(e) joule m.

8. According to Gay-Lussac law for a perfect gas, the absolute pressure of given mass varies directly as
(a) temperature
(b) absolute
(c) absolute temperature, if volume is kept Constant
(d) volume, if temperature is kept constant
(e) remains constant, if volume and temperature are kept constant.

9. General gas equation is
(a) PV=nRT (b) PV=mRT
(d) PV = C (c) PV=KiRT
(e) Cp -Cv = Wj

10. An ideal gas as compared to a real gas at very high pressure occupies
(a) more volume (b) less volume
(c) same volume (d) unpredictable behavior
(e) no such correlation.

11. Which of the following can be regarded as gas so that gas laws could be applicable, within the commonly encountered temperature limits.
(a) 02, N2, steam, C02
(b) Oz, N2, water vapour
(c) S02, NH3, C02, moisture
(d) 02, N2, H2, air
(e) steam vapours, H2, C02.

12. According to Dalton's law, the total pres sure of the mixture of gases is equal to
(a) greater of the partial pressures of all
(b) average of the partial pressures of all
(c) sum of the partial pressures of all
(d) sum of the partial pressures of all divided by average molecular weight
(e) atmospheric pressure.

13. The unit of pressure in S.I. units is
(a) kg/cm2
(b) mm of water column
(c) pascal
(d) dynes per square cm
(e) bars

14. Temperature of a gas is produced due to
(a) its heating value
(b) kinetic energy of molecules
(c) repulsion of molecules
(d) attraction of molecules
(e) surface tension of molecules.

15. A closed system is one in which
(a) mass does not cross boundaries of the system, though energy may do so
(b) mass crosses the boundary but not the energy
(c) neither mass nor energy crosses the boundaries of the system
(d) both energy and mass cross the boundaries of the system
(e) thermodynamic reactions take place.

16. According to kinetic theory of gases, the absolute zero temperature is attained when
(a) volume of the gas is zero
(b) pressure of the gas is zero
(c) kinetic energy of the molecules is zero
(d) specific heat of gas is zero
(e) mass is zero.

17. The pressure'of a gas in terms of its mean kinetic energy per unit volume E is equal to
(a) E/3 (b) E/2 (c) 3E/4
(d)2E/3 (e) 5E/4.

18. Kinetic theory of gases assumes that the collisions between the molecules are
(a) perfectly elastic
(b) perfectly inelastic
(c) partly elastic
(d) partly inelastic

(e) partly elastic and partly inelastic.

19. Kinetic energy of the molecules in terms of absolute temperature (T) is proportional to
(a) T (b) j (c) J2 (d) Vr (e) 1/Vr.

20. Superheated vapour behaves
(a) exactly as gas
(b) as steam
(c) as ordinary vapour
(d) approximately as a gas
(e) as average of gas and vapour.

21. No liquid can exist as liquid at
(a) – 273 °K
(b) vacuum
(c) zero pressure
(d) centre of earth
(e) in space.

22. Absolute zero pressure will occur
(a) at sea level
(b) at the center of the earth
(c) when molecular momentum of the system becomes zero
(d) under vacuum conditions
(e) at a temperature of – 273 °K

23. The unit of power in S.I. units is
(a) Newton (b) pascal
(c) erg (d) watt
(e) joule.

24. The condition of perfect vacuum, i.e., absolute zero pressure can be attained at
(a) a temperature of – 273.16°C
(b) a temperature of 0°C
(c) a temperature of 273 °K
(d) a negative pressure and 0°C temperature
(e) can't be attained.

25. Specific heat of air at constant pressure is equal to
(a) 0.17 (b) 0.21
(c) 0.24 (d) 1.0
(e) 1.41

26. Intensive property of a system is one whose value
(a) depends on the mass of the system, like volume
(b) does not depend on the mass of the system, like temperature, pressure, etc.
(c) is not dependent on the path followed but on the state
(d) is dependent on the path followed and not on the state
(e) remains constant.

27. Characteristic gas constant of a gas is equal to
(a) C/Cv (b) Cv/Cp
(c) Cp – Cv (d) Cp + Cv
(e) Cp x Cv

28. The behavior of gases can be fully determined by
(a) 1 law (b) 2 laws
(c) 3 laws (d) 4 laws

29. Boyle's law i.e. pV = constant is applicable to gases under
(a) all ranges of pressures
(b) only small range of pressures
(c) high range of pressures
(d) steady change of pressures
(e) atmospheric conditions.

30. The ratio of two specific heats of air is equal to
(a) 0.17 (b) 0.24 (c) 0.1 (d) 1.41
(e) 2.71.