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3rd Sem. / Automobile
Subject : Basics of Thermodynamics, Hydraulics and Pneumatics

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice Questions. All questions are compulsory (6x1=6)

Q.1 Enthalpy is the heat supplied to a system at
- a) Constant volume
- b) Constant temperature
- c) Constant pressure
- d) Constant entropy

Q.2 The efficiency of Diesel cycle approaches to Otto cycle when
- a) Cut-off is zero
- b) Cut-oof is increased
- c) Cut-off is decreased
- d) Cut-off has no effect

Q.3 Entropy is the measure of
- a) Orderness of the system
- b) Disorderness of the system
- c) Temperature of the system
- d) State of the system

SECTION-D

Note: Long answer type questions. Attempt any two out of three questions. (2x8=16)

Q.23 Explain Carnot cycle with PV and TS diagram. Write its assumptions also.

Q.24 Explain the construction and working of a centrifugal hydraulic pump with neat sketch.

Q.25 Describe the construction and working of a pneumatic gun with neat sketch.

Q.4 Phenomenon of cavitation is related to

a) Vapour pressure b) Viscosity

c) Capillarity d) Surface tension

Q.5 Pneumatic is related to use of

a) Water b) Air

c) Both A & B d) None of these

Q.6 Continuity equation deals with the law of conservation of

a) Mass b) Energy

c) Momentum d) None of these

SECTION-B

Note: Objective/Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Define Joule's Law.

Q.8 Throttling process is a constant_____ process.

Q.9 The efficiency of Otto cycle is _____ than that of Diesel cycle for same compression ratio.

Q.10 Reciprocating pumps are used for high____and low_____.

Q.11 Pitot tube is used for measurement of _____.

Q.12 Vacuum pressure is also called_____.

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 What are the limitations of 1st law of Thermodynamics?

Q.14 Differentiate between Otto cycle and Diesel cycle.

Q.15 What do you mean by thermodynamic property? Explain its types.

Q.16 What minimum intensity of pressure, a diver's suit must be able to withstand if it is to be used 40m below the surface of ocean. Take specific gravity of ocean water as 1.03.

Q.17 What are the limitations of Bernoulli's theorem.

Q.18 An accumulator has a ram of 20cm. If the liquid is supplied at a pressure of 6MPa and capacity of accumulator is 40 MNm, find the stroke length.

Q.19 Write down the important application of Hydraulic pump.

Q.20 Find the mass of a gas occupying 5.5m^3 at 7 bar abs. and 200^{0}C. Take gas constant R = 287 J/Kg K.

Q.21 What are the various components of a pneumatic system?

Q.22 Define surface tension and capillarity.