

- Q.20 State the assumptions in the derivation of Bernoulli's equation.
- Q.21 Define viscosity and state Newton's law of viscosity.
- Q.22 Write down the advantages and disadvantages of pneumatic system.

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### 3rd Sem / Automobile

#### Subject:- Basics of Thermodynamics, Hydraulics and Pneumatics

Time : 3Hrs.

M.M. : 60

### SECTION-D

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

- Q.23 Explain diesel cycle with PV and TC diagram. Write its assumptions also.
- Q.24 What is hydraulic brake? Explain construction and working with the help of neat sketch.
- Q.25 Explain the construction and working of a reciprocating air compressor with neat sketch.

**(Note :** Course outcome/CO is for office use only)

### SECTION-A

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

- Q.1 When there is no transfer of mass and energy to and from the system, it is a type of  
a) isolated system      b) closed system  
c) open system      d) constant flow system
- Q.2 Heat energy required to raise the temperature of unit mass of the substance by one degree is known as  
a) Enthalpy      b) Entropy  
c) Internal Energy      d) Specific heat
- Q.3 Energy can neither be created nor be destroyed, but it can be transformed from one form to another. This statement is known as  
a) Zeroth law of thermodynamics  
b) First law of thermodynamics

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- c) Second law of thermodynamics  
d) Kinetic theory of gases
- Q.4** Rain drops are spherical due to  
a) Viscosity  
b) surface tension forces  
c) atmospheric pressure  
d) air resistance
- Q.5** Bernoulli's theorem deals with the law of conservation of  
a) mass                                    b) energy  
c) momentum                            d) none of the above
- Q.6** The lubricator in a pneumatic circuit is the  
a) first element in line  
b) second element in line  
c) third element in line  
d) last element in line

### SECTION-B

**Note:** Objective/Completion type questions. All questions are compulsory.  $(6 \times 1 = 6)$

- Q.7** Define Boyle's law.  
**Q.8** Diesel cycle is also known as \_\_\_\_\_

- Q.9** For a thermodynamic process to be reversible, the temperature difference between hot body and working substance should be \_\_\_\_\_
- Q.10** Pneumatic systems have \_\_\_\_\_ output to weight ratio.
- Q.11** Laminar flow is also called \_\_\_\_\_
- Q.12** Piezometer measures \_\_\_\_\_ pressure only.

### SECTION-C

**Note:** Short answer type questions. Attempt any eight questions out of ten questions.  $(8 \times 4 = 32)$

- Q.13** State and explain Kelvin Planck's statement.
- Q.14** Describe the Carnot cycle with PV diagram.
- Q.15** Explain thermodynamic equilibrium and its types.
- Q.16** Find the pressure at a depth of 20m from the free surface of water in a reservoir.
- Q.17** Define laminar and turbulent flow.
- Q.18** Differentiate between pneumatic system and hydraulic system.
- Q.19** An accumulator has a ram of 25 cm diameter and a lift of 10m. If the liquid is supplied at a pressure of 6 MPa, find the capacity of accumulator.