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**Question Paper Code: 34704**

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fourth Semester

Mechanical Engineering

01UME404 – THERMAL ENGINEERING

(Regulation 2013)

(Use of Steam table, Psychrometric chart are permitted)

Duration: 1:15hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

- The thermodynamic cycle working with air as working cycle is known as
  - induction stroke
  - compression stroke
  - power stroke
  - exhaust stroke
- Constant volume cycle refers to
  - Diesel cycle
  - Brayton cycle
  - Otto cycle
  - Dual cycle
- The power developed inside the cylinder is called
  - Mechanical efficiency
  - Brake power
  - Indicated power
  - Thermal efficiency
- Carburettor is used for
  - S.I. engines
  - Gas engines
  - C.I. engines
  - None of the above
- Increasing the velocity and decreasing the pressure is done by
  - Diffuser
  - Turbine
  - Compressor
  - Nozzle

6. De-Laval turbine is an example of
- (a) Impulse turbine (b) Reaction turbine  
(c) Low head turbine (d) Middle head turbine
7. For complete intercooling, the temperature at the inlet and exit of the compressor are
- (a)  $T_i < T_e$  (b)  $T_i > T_e$  (c)  $T_i = T_e$  (d)  $T_i \neq T_e$
8. In reciprocating air compressor, the method of controlling the quantity of air delivered is done by the
- (a) Throttle control (b) Clearance control  
(c) Blow off control (d) All the above
9. The C.O.P of an air refrigeration system is \_\_\_\_\_ a vapour compression system.
- (a) More than (b) Less than  
(c) Equal to (d) No such comparison
10. A sling psychrometer measures temperature of
- (a) Dry bulb (b) wet bulb  
(c) dew point (d) both dry bulb and wet bulb

PART – B (3 x 8= 24 Marks)

**(Answer any three of the following questions)**

11. An engine working on Otto cycle has a volume of  $0.45 \text{ m}^3$ , pressure of 1 bar and temperature of  $30^\circ \text{ C}$  at the beginning of compression stroke. At the end of compression stroke the pressure is 11 bar. The heat of 210 kJ of heat is added at constant volume. Determine (i) pressure, temperature and volume at salient points (ii) percentage clearance, (iii) efficiency, (iv) net work per cycle, (v) MEP, (vi) ideal power developed by the engine if the number of working cycles per min is 210. (8)
12. With a neat sketch explain the working principle of a simple carburetor. (8)
13. What is velocity compounding? List advantages and limitations of velocity compounding. (8)
14. In a two stage compressor in which inter cooling is perfect, prove that work done in the compressor is minimum when the pressure in the inter cooler is geometric mean between the initial and final pressure. Draw the P-V and T-S diagram for two stage compression. (8)

15. Explain with neat sketch about the Vapour Li-Br vapor absorption Refrigeration system. (8)