

Narayani Institute of Technology
Asahat, Angul

Sub:- Thermal Engineering - II
Sem:- 4th Semester

Branch:- Mechanical Engg.

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MODEL QUESTIONS :-

2 Marks :-

- 1) Define mechanical efficiency?
- 2) what is indicated thermal efficiency?
- 3) what is mean effective pressure?
- 4) what do you mean by specific fuel consumption?
- 5) what is calorific value of fuel?
- 6) what do you mean by vapour?
- 7) what is a stroke in air compressor?
- 8) Define volumetric efficiency in air compressor?
- 9) what do you mean by steam?
- 10) what do you mean by flow and non flow process?
- 11) what do you mean by T-S diagram?
- 12) what is boiler mountings?
- 13) Define modes of heat transfer?
- 14) Define Fourier law of heat conduction?
- 15) what is Newton's law of cooling?
- 16) write Stefan Boltzmann law?
- 17) Define emissivity and absorptivity?

5 Marks :-

- 1) What is IC engine and its efficiency?
- 2) Write different types of efficiency is calculated on IC engine with formulae?
- 3) Function and use of Industrial air compressor?
- 4) Classify air compressor?
- 5) Write working principle on air compressor?
- 6) Write parts and explain reciprocating air compressor?
- 7) Term used in air compressor explain?
- 8) Define work done of single stage compressor?
- 9) Define work done of two stage compressor?
- 10) Difference between Gas and vapour?
- 11) Classify all types of boiler?
- 12) Difference between Fire tube and water tube boiler?
- 13) Write working of Wilcox Boiler?
- 14) What is boiler mountings explain?
- 15) Define Carnot cycle and with P-V, T-S diagram?

8 Marks :-

- 1) What is IC engine and its efficiency terms used in the calculation?
- 2) Define what is a compressor and its principle used for reciprocating compressor?
- 3) Details explain the terminology used in the reciprocating air compressor?
- 4) What is a steam and its properties used, also sketch the diagram for steam representation?
- 5) Explain working principle of Cochran boiler?
- 6) What do you mean by boiler draught and its types?
- 7) Explain Rankine cycle with P-V, T-S diagram also explain its efficiency
- 8) What is heat transfer and define its modes and explain the black body radiation?

Problems :-

1) A 4 cylinder 4 stroke engine 100mm x 120 mm cylinder size was tested at 1600 rpm, Given Fuel consumption is 0.27 l/d/min, Specific gravity 0.74, Net load on brake drum is 400N, Const of dynamometer (K) is = 20380, Calorific value of fuel is 44 MJ/kg, Mechanical efficiency is 80%, Calculate :-

- (i) Brake thermal efficiency
- (ii) Indicated thermal efficiency
- (iii) B.S.F.C
- (iv) I.M.E.P

2) A single cylinder, single acting reciprocating air compressor has a piston displacement of 0.01 m^3 at 100 rpm. The suction pressure and temperature are 1 bar and 27°C respectively, delivery pressure is 8 bar, without clearance.

Calculate,

(i) Temp. at end of compression

(ii) work required at
isentropic compression $\gamma = 1.4$
polytropic compression $n = 1.2$

(iii) Isothermal efficiency, where $R = 300 \text{ Nm/kgK}$

3) Calculate the specific volume, specific enthalpy and specific internal energy of wet steam at 18 bar, dryness fraction 0.9.

4) A Carnot engine working between 400°C & 40°C produces 130 kJ of work. Determine

(i) The engine thermal efficiency

(ii) The heat added

(iii) The entropy changes during heat rejection process

5) In an ideal Rankine cycle steam enters the turbine at 3 MPa and 350°C and is condensed in the condenser at a pressure of 75 kPa . Determine the thermal efficiency of the cycle.