Total No. of Questions: 4

Enrollment No.....

Faculty of Engineering

Mid Sem – II Examination May – 2022

EN3ES18 Basic Mechanical Engineering

Programme: B.Tech. Branch/Specialisation: All

Duration: 2 Hrs. **Maximum Marks: 40**

Q.1 i. If the expansion ratio is 10 and cut off ratio is 2. Calculate the compression ratio is 1

a) 5 b) 20 c) 40 d) 0.2

ii. The process of replacing the exhaust gas in a cylinder of IC engine with fresh mixture is known as 1

(a) Scavenging (b) Supercharging

(c) Pre-ignition (d) Turbulence

iii. _____ is a device that controls both the input of fuel and expulsion of exhaust fumes. 1

a) Piston b) Crank shaft c) Crank d) Camshaft

iv. Constant Volume heat rejection takes place in 1

a) Otto Cycle b) Diesel Cycle

c) Carnot Cycle d) Both (a) & (b)

v. For the same compression ratio, the air standard efficiency of Otto cycle is ____ than that of diesel cycle. 1

a) less b) more c) equal d) Cannot be determined

vi. The process of generation of heat in the boiler is an example of 1

a) constant pressure b) constant volume

c) constant enthalpy d) constant entropy

vii. Which of the following is a water tube boiler? 1

a) Simple vertical b) Cochran

c) Lancashire d) None of these

viii. According to IBR, Minimum capacity of a boiler is 1

a) 22.75 Lts. b) 21.7 Lts. c) 25 Lts. d) 20.5 Lts.

ix. Which mounting is used to extinguish fire in a furnace when water level falls below an unsafe level
a) Steam stop valve b) Fusible plug
c) Pressure Gauge d) Water level indicator 1

x. Amount of water evaporated in kg/kg of fuel burnt is called
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Boiler power

Q.2 i. Explain the working of two stroke petrol engine with neat sketch. 4

ii. In an ideal constant volume cycle the pressure an temperature at the beginning of compression are 105kN/m^2 and 50^{0}C respectively. The compression ratio is 7:1. The heat supplied during the cycle is 1500 KJ/kg of working fluid. Determine the maximum temperature, thermal efficiency and work done during the cycle/kg of working fluid. Assume Cv=0.718 KJ/kg. 6.

OR iii. Derive the expression for air standard efficiency of diesel engine. 6

Q.3 i. Define the following terms 4
a) Artificial draught (b) Equivalent evaporation

ii. Write the working principle of Cochran Boiler with neat sketch. 6

OR iii. How much air is used per kg of coal burnt in a boiler having chimney of 32.3 m height to create a draught of 19 mm of water column when the temperature of flue gases in the chimney is 370^{0}C and the temperature of boiler house is 29.5^{0}C? 6

Q.4 i. What are differences between 4-stroke engine and 2-stroke engine (any five). 5

ii. Derive the relation between height of chimney and draught produced by the chimney 5

OR iii. Describe the mountings of boiler with their function with neat sketch. 5

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