GOVERNMENT COLLEGE of ENGINEERING, AMRAVATI

(An Autonomous Institute of Government of Maharashtra)

Course Code & Name: MEU 403 Thermal Engineering & Energy Conversion

Time: 1.00 Hr **CLASS TEST-2: IV Sem (Summer-18) B.Tech. (Mechanical Engg.)** **Max. Marks: 15**

Note: Solve any three Questions & each question carry equal 5 marks

Q.1. Discuss with a neat sketch of the typical layout of steam power plant? Describe the functions of following devices in power plant: Economiser & superheater

Q.2. Elaborate the applications of compressed air in engineering practices.

Q.3. Derive the condition for minimum work for 'z-stages' of compression in a multistage reciprocating air-compressor.

Q.4. A single-stage single-acting reciprocating air compressor has bore of 20 cm & stroke of 30 cm. The compressor runs at 600 rpm. The clearance volume is 4 % of swept volume & index of compression and expansion is 1.3. The suction conditions are: 0.97 bar, 27°C & delivery pressure is 5.6 bar. The atmospheric conditions are: 1.01 bar & 17°C. Determine: (i) FAD, (ii) Volumetric efficiency & (iii) Indicated Power

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Course Code & Name: MEU 403 Thermal Engineering & Energy Conversion

Time: 1.00 Hr **CLASS TEST-II: IV Sem(2015-16) B.Tech. (Mechanical Engg.)** **Max. Marks: 15**

Note: Solve any three Questions & each question carry equal 5 marks

Q.1. What do you mean by supersaturation flow? What are the effects of supersaturation flow?

Q.2. In a convergent-divergent nozzle, the steam enters at 15 bar & 300°c and leaves at a pressure of 2 bar. The inlet velocity to the nozzle is 150 m/s. Determine the required throat and exit areas for the Flow rate of 1 kg/s. assume nozzle efficiency to be 90% & specific heat of steam as C_{ps}=2.4 kj/kg.k

Q.3. Distinguish between impulse and reaction turbine.

Q.4. In a condenser test, the following observations were made: vacuum=690 mm of Hg ; barometer reading =750 mm of Hg ; mean temperature of condensation =35°c ; hot well temperature = 28°c ; mass of cooling water = 50,000 kg/h ; inlet temperature = 17°c ; outlet temperature = 30°c ; mass of condensate per hour = 1250 kg. Find a) the mass of air present per m^3 of condenser volume ; b) the state of steam entering the condenser ; and c) the vacuum efficiency. Take R for air = 287 J/kg-K.

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Course Code & Name: MEU 403 Thermal Engineering & Energy Conversion

Time: 1.00 Hr **CLASS TEST-2: IV Sem (2013-14) B.Tech. (Mechanical Engg.)** **Max. Marks: 15**

Note: Solve any three Questions & each question carry equal '5' marks

Q.1. Differentiate Fans, blowers & compressors (emphasize technical points only).

Q.2. The following particulars refer to two-stage single-acting air compressor:

Capacity 4.5 CMM measured under free conditions at 15°C & 1.013 bar; Delivery pressure = 17.2 bar; Suction pressure = 0.98 bar; Speed = 120 r.p.m.; Temperature at the start of compression = 30°C; Index of compression = 1.2; Clearance volume of LP cylinder = 6% of stroke; Assume that the intercooler pressure is chosen such that the work is shared equally between the two cylinders.

$\frac{L}{D}=1$

I.P & D & L

$\frac{n-1}{n}$. $\frac{n-1}{n}$

Q.3. Derive the condition for minimum work in two-stage air compressor.

Q.4. Describe with a neat sketch the working principle of MHD.