Devi Ahilya University, Indore

Institute of Engineering & Technology

Class Test: I, MER1C3 Elements of Mechanical Engineering

Section: ETC "B" Engineering" I Year

Duration: 70 Min. **Max. Marks: 20**

Q.1 0.2 m^3 of air at 4 *bar* and 130°*C* is contained in a system. A reversible adiabatic expansion takes place till the pressure falls to 1.02 *bar*. The gas is then heated at constant pressure till enthalpy increases by 72.5 *kJ*.

Calculate the following: (i) Work done.

(ii) Calculate the index of expansion, if the above processes are replaced by a single reversible polytropic process giving the same work between the same initial and final states (5)

Q.2 Explain First law of thermodynamics and give their limitations.

Q.3 Explain different types of pattern allowances (5)

Q.4 what are types of casting process. explain any one casting process (5)

+2
+4
+4

(10)

(60)

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BE I Year CS-A & B, CLASS TEST –I, Date 02 /12/2022

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Note: Attempt all questions.

Q.1 Prove that energy a property of the system 02

Q.2 Derive steady flow energy equation for a boiler (two fluid stream inlet and two fluid stream outlet. 04

Q3 Air flows steadily at the rate of 0.5 kg/s through an air compressor, entering at 7 m/s velocity, 100 kPa pressure and 0.95 m^3/kg volume and leaving at 5 m/s, 700 kPa and 0.19m^3/kg. The internal energy of air leaving is 90 kJ/kg greater than that of air entering. Cooling water in the compressor jackets absorbs heat from the air at the rate of 58 kW. Calculate (a) the rate of shaft work input to the air in kW. (b) ratio of inlet to outlet pipe diameter. 06

Q4 Explain the SAW and SMAW processes with suitable sketches. 04

Q5 Write short notes on (i) spot ERW and continuous spot ERW processes. (ii) Types of electrodes 04