



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-1: IV Sem (Summer-18) B.Tech. (Mechanical Engg.)

Max. Marks: 15

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

Q.1. Describe with neat sketch the various psychometric terms & processes.

Q.2. Classify Internal Combustion Engines and enlist their applications

Q.3. Calculate the percentage loss in air standard efficiency of a Diesel engine with compression ratio 14 and if fuel cut-off is delayed from 5% to 8%.

Q.4. VCR cycle uses R-12 as refrigerant and the liquid evaporates in the evaporator at -15°C . The temperature of this refrigerant at the delivery from the compressor is 15°C when the vapor is condensed at 10°C . Find the COP if:- (i) there is no undercooling & (ii) the liquid is cooled by 5°C before expansion by throttling. Take specific heat at constant pressure for superheated vapor as 0.64 kJ/kg-K and that for liquid as 0.94 kJ/kg-K .

T_{sat} ($^{\circ}\text{C}$)	Enthalpy (kJ/kg)		Entropy (kJ/kg-K)	
	Liquid	Vapour	Liquid	Vapour
-15	22.3	180.88	0.0904	0.7051
+10	45.4	191.76	0.1750	0.6921



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CLASS TEST-1: IV Sem (2017-18) B.Tech. (Mechanical Engg.)

Max. Marks: 15

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

Q.1. Describe with neat sketch the various psychometric terms & processes.

Q.2. Compare Dual, Diesel & Otto cycles for the same compression ratio. Also derive the Air standard efficiency for Dual cycle.

Q.3. An Engine uses 6.5 kg of oil per hour of calorific value 30000 kJ/kg. If the BP of the engine is 22 kW and mechanical efficiency is 85%, Calculate: Indicated Thermal efficiency, Brake thermal efficiency & Specific fuel consumption in kg/BP/hour.

Q.4. VCR cycle uses R-12 as refrigerant and the liquid evaporates in the evaporator at -15°C . The temperature of this refrigerant at the delivery from the compressor is 15°C when the vapor is condensed at 10°C . Find the COP if:- (i) there is no undercooling & (ii) the liquid is cooled by 5°C before expansion by throttling. Take specific heat at constant pressure for superheated vapor as 0.64 kJ/kg-K and that for liquid as 0.94 kJ/kg-K.

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	Liquid	Vapour	Liquid	Vapour
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$$\frac{h_3 - h_2}{h_1 - h_4}$$

$$\frac{22}{20}$$



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Course Code & Name: MEU 403 Thermal Engineering & Energy Conversion
CLASS TEST-1: IV Sem (2013-14) B.Tech. (Mechanical Engg.)

Time: 1.00 Hr

Max. Marks: 15

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

- Q.1. Describe with neat sketch the various psychometric terms & processes.
- Q.2. Compare Dual, Diesel & Otto cycles for the same compression ratio. Also derive the Air standard efficiency for Dual cycle.
- Q.3. An Engine uses 6.5 kg of oil per hour of calorific value 30000kJ/kg. If the BP of the engine is 22 kW and mechanical efficiency is 85%, Calculate: Indicated Thermal efficiency, Brake thermal efficiency & Specific fuel consumption in kg/BP/hour.
- Q.4. 800 CMM of recirculated air at 22°C DBT & 10°C DPT is to be mixed with 300 CMM of fresh air at 30°C DBT & 50% RH. Determine- enthalpy, specific volume, specific humidity, DBT, WBT, RH & DPT of resulting mixture.