Reg.No. _____

Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14ME2016
Sub. Name : Thermal Engineering II

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	Explain with neat sketch the port timing diagram of 2 stroke petrol engine.	CO1	**10**
	b.	Explain the working principle of battery ignition system with a neat diagram.	CO1	**10**
		(OR)		
2.	a.	An engine develops 20 kW of brake power with a mechanical efficiency of 80% consuming petrol at the rate of 5.8 kg/hr. Calculate (a) Brake thermal efficiency (b) Specific fuel consumption and (c) Indicated thermal efficiency if the calorific value of the fuel is 42,000 kJ/kg.	CO1	**20**
3.	a.	Derive an expression for air standard efficiency of dual cycle.	CO1	**20**
		(OR)		
4.	a.	Air enters in to a constant volume cycle at 27° C and 1 bar and the compression ratio is 7.5.The maximum Temperature of the cycle is 1000 K. Find the Air Standard efficiency and Mean effective pressure of the cycle.	COI	**20**
5.	a.	An air-conditioning system is to be designed for a restaurant with the following data: Outside design conditions : 40^0C DBT and 28^0C WBT Inside design conditions : 25^0C DBT and 50% RH Solar heat gain through walls, roof and floor : 5.87 kW Solar heat gain through glass : 5.52 kW Occupants : 25 Sensible heat gain per person : 58 kW Latent heat gain per person : 58 kW Lightening load : 2.3 kW Sensible heat gain from other sources : 11.63 kW Infiltrated air : 15 m^3/min Determine Room sensible heat factor.	CO4	**20**
		(OR)		
6.	a.	Explain summer air-conditioning system for hot and dry weather with a neat sketch.	CO4	**20**
7.	a.	A conical diffuser has entry and exit diameters of 15 cm and 30 cm respectively. The pressure, temperature and velocity of air at entry are 0.89 bar, 340 K and 180 m/s. Determine the exit pressure, exit velocity and the force exerted on the diffuser walls.	CO2	**20**
		(OR)		
8.	a.	Air at p_1= 3bar, T_1= 288K and M_1=1.5 is brought to sonic velocity in a frictionless constant area duct through which heat transfer can occur. Determine the final pressure and temperature, and heat added during the process.	CO2	**20**
		Compulsory:		
9.	a.	Explain open cycle constant pressure gas turbine with a neat sketch.	CO3	**10**
	b.	Explain closed cycle constant pressure gas turbine with a neat sketch.	CO3	**10**

ALL THE BEST