End-TermExamination
(CBCS)(SUBJECTIVE TYPE)(OffLine)
Course Name:<>, Semester:<>
(May, 2024)

Subject: Thermal Engineering II	

Subject Code:BMA-208	**Maximum Marks :60**

Time :3 Hours

Note:Q. 1 is compulsory. Attempt one question each from the Units I, II, III & IV.

			(2.5*8=20)	
Q1				
	(a)	Explain the effect of clearance volume on work done of reciprocating air compressor.		
	(b)	Discuss the variation of pressure and velocity in Impeller and Diffuser in centrifugal air compressor.		
	(c)	Calculate the clearance ratio of an IC engine with the help of given data: Clearance volume= $0.001m^3$, stroke length= 0.25m and cylinder diameter= 0.2m		
	(d)	Distinguish between pre-ignition and detonation in IC engine.		
	(e)	What are the effects of regeneration and reheating on the thermal efficiency of gas turbine?		
	(f)	What is the difference between open and closed gas turbine?		
	(g)	Explain the control volume, sonic velocity and Mach number.		
	(h)	Discuss the continuity equation during the compressible flow.		
UNIT-I				
Q2	(a)	Explain the working of two stage reciprocating air compressor.	(5,5)	
	(b)	Discuss the expression for work done in single stage reciprocating air compressor when gas is compressed adiabatically and isothermally.		
Q3	(a)	Explain the working of centrifugal air compressor with diagram.	(5,5)	
	(b)	Discuss the velocity vector diagram and work done by impeller of a centrifugal air compressor.		
UNIT-II				
Q4	(a)	Discuss the actual valve timing diagram and actual PV diagram of a 4 stroke petrol engine.	(10)	
Q5	(b)	Explain the coil ignition system of IC engine.	(5,5)	
	(c)	Four stroke petrol engine is having high efficiency then 2 stroke petrol engine. Justify the statement.		
UNIT-III				
Q6	(a)	In a constant pressure open cycle gas turbine air enters the compressor at 2 bar and 20°C where it is compressed to a pressure ratio of 7. The gases enter the gas turbine at 680°C and expands to original pressure. Calculate the work ratio and thermal efficiency when a gas turbine plant operates on Brayton cycle.	(10)	
Q7	(b)	The pressure ratio and maximum temperature of Brayton cycle are 6 and 900k. Air enters the compressor at 1 bar and 303K for 3kg/s of air flow. Calculate the compressor work input, turbine work output and thermal efficiency.	(10)	
UNIT-IV				
Q8	(a)	Explain the working of turbojet and Ram jet propulsion with diagram.	(10)	
Q9	(b)	Air flows with a velocity of 600ft/s and has a pressure 20psia and temperature of 600°C. Determine the stagnation pressure.	(10)	
	(c)	Explain the Mach wave, Mach cone and Mach angle with the help of neat sketch.		