	National Institute of Technology Meghalaya An Institute of National Importance		CLASS TEST 1
Branch	**Mechanical Engineering**	Programme	**B.Tech**
Course Name	**IC Engines**	Semester	**V**
Course Code	**ME 311**	Year/Period	**2021/Autumn**
Time : 45 minutes	**Answer All Questions**	Maximum Marks	**15**

Knowledge Level (KL)			
	K1 : Remembering	**K3** : Applying	**K5** : Evaluating
	K2 : Understanding	**K4** : Analysing	**K6** : Creating

No.	Questions	Marks	COs	KL
1	The compression ratio of in an air-standard Otto cycle is 8. At the beginning of compression process the pressure is 1 bar and the temperature is (300+x) K ('x' is the last two digits of your roll number). The heat transfer to the air per cycle is 1900 kJ/kg of air. Draw the P-V and T-S diagrams with appropriate terminologies for the respective processes. Assuming the characteristics gas constant for air to be 0.287 kJ/kg-K, calculate. a) The thermal efficiency of the cycle (%) b) The net work done in the cycle (kJ/kg) c) The volume at the beginning of the compression (m^3) d) The temperature at the end of compression (K) e) Mean effective pressure (bar)	**[10]**	**CO1**	**K3**
2	A two cylinder, four stroke SI engine having bore diameter and stroke length as 90 mm and (100+x) mm ('x' is the last two digits of your roll number), respectively is running at 1500 rpm. Its carburetor venuri has a 25 mm throat. Assuming $C_{d,a}$= 0.8, ρ_a= 1.17 kg/m^3 and η_v= 80%, determine the suction pressure difference (Pa) created at the throat.	**[05]**	**CO2**	**K3**

Course Outcomes		
	CO1	Recognize the types, constructions, terminologies and cycles associated with IC engines and solve related problems. (Applying)
	CO2	Identify the types of fuels, methods of fuel supply in SI and CI engines and solve related problems (Applying)
	CO3	Apprehend associated combustion in SI and CI engine and solve related problems. (Applying)
	CO4	Categorize different types of cooling and lubrication systems. (Applying)
	CO5	Perform measurement and testing of engine performances and emissions. (Analysing)