BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: B.TECH. **SEMESTER: V**
BRANCH: MECHANICAL **SESSION: MO/2022**

SUBJECT: ME301 IC ENGINE & GAS TURBINE

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. **The total marks of the questions are 25.**
2. **Candidates attempt for all 25 marks.**
3. **Before attempting the question paper, be sure that you have got the correct question paper.**
4. **The missing data, if any, may be assumed suitably.**
5. **Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.**

				CO	BL
Q1	(a)	Discuss the assumptions made in the analysis of an air standard cycle.	[2]	CO1	L-2
Q1	(b)	Calculate thermal efficiency of a diesel engine having a cylinder with bore 260 mm, stroke 385 mm and a clearance volume of 1450 cc, with fuel cut-off occurring at 5% of the stroke. Assume Υ = 1.4 for air.	[3]	CO1	L-3
Q2		An air standard Otto cycle has a compression ratio of 8 and temperature and pressure at the beginning of compression are 20^{o}C and 1 bar respectively. The constant volume heat addition is 1800 kJ/kg. Calculate the maximum temperature and pressure for the cycle and temperature at the end of the expansion process. What is the efficiency and mean effective pressure of the cycle? Take C_v= 0.718 kJ/kg-K and Y=1.4.	[5]	CO1	L-3
Q3	(a)	List out different factors on which the ignition lag depends in SI engine.	[2]	CO2	L-1
Q3	(b)	Explain different stages of combustion in CI engine with the help of pressure vs crank angle diagram.	[3]	CO2	L-2
Q4	(a)	Explain the phenomenon of diesel knock.	[2]	CO2	L-2
Q4	(b)	Explain the phenomena of abnormal combustion in SI engine. Differentiate between normal combustion and abnormal combustion.	[3]	CO2	L-2
Q5	(a)	Explain the principle of carburetion.	[2]	CO3	L-2
Q5	(b)	Describe the factors affecting the process of carburetion.	[3]	CO3	L-1

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