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

CLASS: B.TECH **SEMESTER : VI**
BRANCH: PROD. & IND. ENGG. **SESSION : SP/2023**

SUBJECT: ME301- INTERNAL COMBUSTION ENGINE & GAS TURBINE

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Name the engine components that works on duel cycle.	[3]		1
Q.1(b)	The following data refers to a petrol engine working on OTTO four stroke cycle. Brake Power = 14.7 kW, Suction Pressure = 0.9 bar, Mech. Efficiency 80%, Compression Ratio = 5, Index of Compression curve = 1.35, Index of expansion curve = 1.3, Maximum Explosion pressure = 24 bar, Engine Speed = 1000 r.p.m, Ratio of stroke to bore = 1.5, Find stroke length of the piston.	[7]		3
Q.2(a)	What are the different combustion Stages? Explain with examples.	[3]		2
Q.2(b)	Why Multi point fuel injection system are commonly used in CI engines, explain with neat sketch. Draw and analyze the theoretical P-θ for the stages of SI engine combustion.	[7]		3
Q.3(a)	What is knocking? Which type of IC engine the phenomena of knocking happens and why, explain with suitable diagrams, figures and graphs ?	[5]		2
Q.3(b)	Name and brief about the types of conventional Ignition system? Why Firing order is important, What is the probable firing order of 6 cylinder inline engine?	[5]		3
Q.4(a)	Write short notes on diesel engine emission and its effect and parameters of controlling emissions.	[5]		1
Q.4(b)	Explain Morse Test with neat diagrams.	[5]		3
Q.5(a)	Prove that for a simple turbine Efficiency, $\eta = 1 - (1/r^{(\gamma - 1/\gamma)})$: where, r= pressure ratio and γ = gas constant	[5]		3
Q.5(b)	Explain the working of Jet propulsion with a diagram. Classify rocket propulsion.	[5]		4

::::::02/05/2023::::::M