MECHANICAL ENGEINEERING DEPARTMENT

B.E. Semester -VII

Internal Combustion Engines
(Professional Elective V) (3171923)

ASSIGNMENT – 05 - Rating Testing and Performance of ICE (CO-4)

Theory

SR.	Question	Blooms Taxonomy level	Maximum marks
1	Define : • Specification • Performance	R	3
2	List the basic parameters to be tested for a typical I C Engine.	R	3
3	Classify the Dynamometer in brief and discuss the how the Prony Brake Dynamometer is measuring Brake Power.	R	4
4	Outline the process to measure Indicated Power of a multi-cylinder engine by MORSE Test.	U	4

Examples

SR.	Data	Blooms Taxonomy level	Maximum marks
1	Following are the observations collected during a performance testing of a 2 stroke diesel engine over the time of 30 minutes at full load: • Engine Speed : 350rpm • Net brake load : 650N • Mean Effective Pressure : 3bar • Fuel consumption : 1.8kg • Air used : 32kg/kg of fuel • Cylinder Bore : 210mm • Piston Stroke : 260mm • Brake drum Diameter : 1m • Cooling Water supplied : 175kg • Water inlet temperature : 30°C	A	8

- Water outlet temperature   : 60°C
- Room temperature   : 25°C
- Exhaust Gas Temperature   : 300°C
- Steam Formed in Exhaust   : 1.3 kg/kg of fuel
- Specific heat of steam in exhaust : 2 kJ/kg K
- Specific Heat of dry exhaust gas : 1.005 kJ/kg K
- Calorific Value of fuel   : 43000 kJ/kg

Draw a heat/energy balance sheet for mentioned engine using given observations.

2 A Morse test on a 12 cylinder turbocharged, 2 stroke CI engine is carried out. During which following readings were recorded:

- Bore Diameter   :380mm
- Stroke Length   :500mm
- Engine Speed   :200rpm
- Law of Brake power   : $W \times N/180$ kW

Condition	Break load N	Condition	Break load N		
All cylinder firing	2000	Cy 07 cut off	1800	A	8
Cy 01 cut off	1795	Cy 08 cut off	1824		
Cy 02 cut off	1814	Cy 09 cut off	1785		
Cy 03 cut off	1814	Cy 10 cut off	1804		
Cy 04 cut off	1795	Cy 11 cut off	1814		
Cy 05 cut off	1804	Cy 12 cut off	1795		
Cy 06 cut off	1819	All cylinder firing	2020		

Calculate the brake mean effective pressure in bar and mechanical efficiency with all cylinder firing.