DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech.   **Branch :Mechanical Engineering**   **Semester : VI**

Subject Code & Name: BTMEC604B IC Engines

Max Marks: 60   **Date:23-08-2022**   **Duration: 3.45 Hr.**

Instructions to the Students:
1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		
A)	Compare Two Stroke and Four Stroke engines in a detail.	(Analyze)	**6**
B)	Explain with neat sketch how actual cycle of engine is different than air-standard cycle?	(Understand)	**6**
C)	Comment on "Zero Pollution Vehicles"? Explain it with neat sketch.	(Understand)	**6**
Q.2	**Solve Any Two of the following.**		
A)	Explain stages of combustion of Spark Ignition engine with Pressure-Crank angle diagram.	(Understand)	**6**
B)	Explain the phenomenon of Knock in Compression Ignition Engine.	(Understand)	**6**
C)	Compare the factors responsible for reduction of abnormal combustion of Spark Ignition and Compression ignition engine.	(Analyze)	**6**
Q. 3	**Solve Any Two of the following.**		
A)	Explain Simple Carburetor with a neat sketch	(Understand)	**6**
B)	Discuss Parallel Hybrid vehicle with a neat diagram of layout.	(Understand)	**6**
C)	Explain the battery ignition system of engine with a neat sketch.	(Understand)	**6**
Q.4	**Solve Any Two of the following.**		
A)	How Supercharging improves the power output of engine? Explain any one type of supercharger with neat sketch.	(Application)	**6**
B)	State different exhaust emissions of I.C.Engine. Explain its effects on ecology.	(Understand)	**6**
C)	A six-cylinder, gasoline engine operates on the four-stroke cycle. The bore of each cylinder is 75 mm and the stroke 95 mm. The clearance volume per cylinder is 65 cc. At a speed of 3800 rpm the fuel consumption is 18 kg/hr and the torque developed is 145 Nm. Calorific		

value of fuel is 43000 kJ/kg and Adiabatic constant $\gamma = 1.4$ for air.

Calculate: (i) the brake thermal efficiency (ii) brake mean effective pressure in bar (iii) the relative efficiency on a brake power basis assuming the engine works on the Otto Cycle. (Application) **6**

Q. 5 Solve Any Two of the following.

A) Explain operating principle, construction and working of Fuel Cell Technology. (Understand) **6**

B) Why there is need of alternative fuels? List out different alternative fuels. (Application) **6**

C) Discuss "Octane Rating" and "Cetane Rating" of fuel (Understand) **6**

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