PAPER ID-311586

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM V) THEORY EXAMINATION 2025-26
I C ENGINES, FUELS & LUBRICATION

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question	CO	Level
a.	What is supercharging in I.C. Engines?	1	K2
b.	State the functional requirement of an injection system.	1	K2
c.	Why the power output of an engine reduces at high altitude compares to its rated output at sea level.	1	K2
d.	Explain the principle of carburetion.	2	K2
e.	Enlist various types of cooling systems along with its importance.	3	K2
f.	Explain the role of lubricants in engine	4	K2
g.	Distinguish between physical ignition delay and chemical ignition delay.	5	K2

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

a.	Compare the otto and diesel cycle for the same maximum pressure and heat input & same compression ratio and heat rejection	1	K2
b.	Describe the phenomenon of detonation or knocking in CI engine	2	K2
c.	Explain the different factors affecting detonation in S.I. engine.	3	K2
d.	In an air-standard Otto cycle, the compression ratio is 10. The condition at the beginning of the compression process is 100 kPa and 27 oC. Heat added at constant volume is 1500 kJ/kg, while 700 kJ/kg of heat is rejected during the other constant volume process in the cycle. Specific gas constant for air = 0.287 kJ/kgK. Calculate:- (i) Thermal efficiency (ii) Mean effective pressure (in kPa) of the cycle.	4	K3
e.	Derive the formula of air standard efficiency of otto cycle.	5	K3

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Explain the stages of combustion in SI engine with neat sketches. Also draw T-S diagram.	2	K2
b.	Discuss the combustion chamber design for CI engine with neat sketch	2	K2

4. Attempt any *one* part of the following: **07 x 1 = 07**

a.	Describe the construction and working of a simple carburetor. What are the limitations of carburetors?	3	K2
b.	What is turbocharging? Explain the working of waste-gate and variable geometry turbochargers.	3	K2

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5. Attempt any *one* part of the following: 07 x 1 = 07

a.	Explain the sources and types of engine pollutants. Discuss their effects on the environment and human health	4	K2
b.	Explain the formation mechanisms of NOx, CO, hydrocarbons, and particulate emissions in IC engines	4	K2

6. Attempt any *one* part of the following: 07 x 1 = 07

a.	Describe various methods used to control exhaust emissions in CI engines	5	K2
b.	Explain different engine cooling systems used in IC engines. Describe the construction and working of radiators and cooling fans	5	K2

7. Attempt any *one* part of the following: 07 x 1 = 07

a.	Define engine friction and lubrication. Explain the principle of lubrication, types of lubrication systems, and properties of lubricating oils	6	K2
b.	Describe ignition system requirements in SI engines. Explain magneto ignition system briefly.	6	K2