

BTECH (SEM V) THEORY EXAMINATION 2023-24 **I C ENGINE, FUELS & LUBRICATION**

TIME: 3 HRS

M.MARKS: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.

Q no.	Question	Marks	CO	I
a.	How will you differentiate between two stroke engine and four stroke engines?	2	1	
b.	What is the relation between mean effective pressure and mean pressure of an IC engine?	2	1	
c.	Explain – (i). Pre-ignition (ii). Auto-ignition (iii). Detonation.	2	2	
d.	Why is spark advance required? Discuss the factors that affect ignition timing.	2	2	
e.	What is the principle in carburetion?	2	3	
f.	What are the basic requirements of fuel injection in CI engines?	2	3	
g.	What are the advantages and disadvantages of PNG?	2	4	
h.	What causes the S.I. engine's emissions of hydrocarbons?	2	4	\mathbb{C}
i.	Does the cooling of the engine components come from the lubrication system? How come?	2	5	
j.	Why can't petrol (gasoline) be used in a compression ignition (CI) engine or diesel be fed to a spark ignition (SI) engine?	2	5	
	SECTION B	Ŷ,		
2.	Attempt any <i>three</i> of the following:			

SECTION B

2. Attempt any *three* of the following:

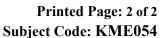
Q no.	Question	Marks	CO
a.	What a theoretical valve timing diagram is different from actual valve	10	1
	timing diagram (with diagram). Explain effect of each valve openings		
	and closing with their range of angle values. $\searrow \Im$		
b.	Explain that the requirement of air motion and swirl in CI engine	10	2
	combustion chamber is much more stringent that in an SI Engine.		
c.	What do you mean by MPFI System? Give the difference between L-	10	3
	MPFI & D- MPFI System.		
d.	Which are the alternative fuels for I.C. Engine? Write a short note on	10	4
	some of them.		
e.	What do you understand by ignition timing discuss various factors	10	5
	which affect the ignition timing?		

SECTION C

3. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	What is the basic difference between Otto cycle & Diesel cycle? Deduce	10	1
	the expression of work done, thermal efficiency and mean effective pressure for Diesel cycle.		

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Ь.	pressure and temperature at the beginning of compression stroke are 1 bar and 27 °C respectively. If the maximum pressure reached is 30 bar and the maximum temperature of the cycle is 1200 °C, calculate: (i) the temperature at the end of constant volume heat addition (ii) cut-off ratio (iii) work output (iv) efficiency of the cycle	10	1
	Take $C_v = 0.718 \text{ kJ/ kg K}$ and $C_p = 1.005 \text{ kJ/ kg K}$ for air.		

Attempt any one part of the following: 4.

Q no.	Question	Marks	CO	
a.	What does "delay period" mean? What variable influences the delay period?	10	2	
b.	How does a flame front propagate? Discuss the factors affecting the flame speed?	10	2	
	23	- 1	2.	
5.	Attempt any one part of the following:	2		
Q no.	Question	Marks	CO	
a.	Discuss briefly the scavenging in 2-stroke engine.	•10	3	

Attempt any one part of the following: 5.

Q no.	Question	Marks	СО
a.	Discuss briefly the scavenging in 2-stroke engine.	•10	3
b.	With the help of neat sketch explain the working principle of simple	10	3
	carburetor.		

Attempt any one part of the following: 6.

Q no.	Question	Marks	CO
a.	What are the major sources of air pollutants? What all pollutants are	10	4
	emitted by I. C. engines?		
b.	Explain catalytic convertor as after treatment device to control CO, HC	10	4
	& NOX.		

V

7. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	How the valve timing is controlled in the stratified charge injection	10	5
	engine. Explain with neat sketch.		
b.	Explain the construction and working of battery ignition system with a neat sketch.	10	5