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**B. TECH**  
**(SEM-V) THEORY EXAMINATION 2020-21**  
**I C ENGINES, FUELS AND LUBRICATIONS**

Time: 3 Hours

Total Marks: 100

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

**SECTION A**

1. Attempt all questions in brief.

2 x 10 = 20

Q no.	Question	Marks	CO
a.	Compare SI and CI engines.	2	1
b.	What do you mean by overhead type valve mechanism?	2	1
c.	Discuss the factors affecting the flame speed in CI engine.	2	2
d.	Explain any three types of combustion chambers used in SI engines.	2	2
e.	Define MPFI.	2	3
f.	What do you mean by Turbo charging?	2	3
g.	What are the various pollutants present in combustion products?	2	4
h.	What do you mean by rating of rating of SI and CI engine fuels?	2	4
i.	What is crankcase ventilation?	2	5
j.	Write short note on ignition timing.	2	5

**SECTION B**

2. Attempt any three of the following:

Q no.	Question	Marks	CO
a.	What is the necessity of I.C. engine testing? What are the basic measurements carried out for I.C. engine testing? Discuss Morse test used during performance testing of I.C. engines.	10	1
b.	What is ignition lag in SI engines? Discuss the effect of various engine variables on ignition lag of SI engine.	10	2
c.	Explain the working principle of carburetor. What are the limitations of a simple carburetor? Sketch and explain the simple carburetor.	10	3
d.	What are the effects of pollutants from CI engines on environment and human beings? How can these be controlled to certain extent?	10	4
e.	Explain the various Wet sump lubricating system. Compare wet sump and dry sump lubrication.	10	5

**SECTION C**

3. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	An engine works on Dual cycle having compression ratio of 10. The pressure and temperature at the beginning of compression stroke are 1 bar and 27° C respectively. If the maximum pressure reached is 42 bar and the maximum temperature of the cycle is 1500° 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. Take $C_v = 0.717 \text{ kJ/kg K}$ and $C_p = 1.004 \text{ kJ/kg K}$ for air.	10	1
b.	Sketch and explain the actual valve timing diagram for SI engine. Deduce the expression of thermal efficiency for Otto cycle.	10	1

4. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	Explain the stages of combustion in CI engine. Write a short note on fuel rating of CI engine.	10	2
b.	What is swirl in CI engine? Explain different methods of swirl generation. State advantages and disadvantages of compression swirl.	10	2



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**5. Attempt any one part of the following:**

Q no.	Question	Marks	CO
a.	What do you mean by Supercharging? What is the effect of supercharging on following operating parameters of CI engines? i. Power output. ii. Fuel consumption. iii. Mechanical efficiency.	10	3
b.	State the functional requirements of fuel injection system. Classify different types of fuel injection system and explain any one with neat sketch.	10	3

**6. Attempt any one part of the following:**

Q no.	Question	Marks	CO
a.	What is a three-way catalytic convertor? Give the catalysts used in it. How does the 3-way catalytic convertor differ in operation compared with 2-way convertor?	10	4
b.	List down 4 properties that are important in the selection of fuels for an Engine. Explain the reasons for looking for alternate fuels for IC engines.	10	4

**7. Attempt any one part of the following:**

Q no.	Question	Marks	CO
a.	Explain the following with neat sketch. (i) Capacitive Discharge Ignition System (CDI). (ii) Transistorized Coil Ignition System (TCI).	10	5
b.	Compare Battery and Magneto Ignition system. Describe with neat Sketch Battery Ignition system.	10	5

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