

1. What are the stages of combustion in a SI engines?  
The stages of combustion in a SI engines are: FIRST STAGE: Ignition lag (or) preparation phase SECOND STAGE: propagation of flame THIRD STAGE: After burning
2. What are the various factors that affect the flame speed? a) Turbulence b) F/A ratio c) T, P d) Compression ratio e) Engine speed, size & output
3. Define normal combustion? In normal combustion, the flame initiated by the spark travels across the combustion chamber in a fairly uniform manner.
4. Define abnormal combustion and its consequences? Under certain operating conditions the combustion deviates from its normal Course leading to loss of performance and possible damage to the engine are termed as abnormal combustion (or) knocking combustion. Consequences are (1).Loss of power (2). Recurring preignition (3). Mechanical damage to the engine
5. What is equivalence ratio? The ratio of the actual fuel-air ratio to the stoichiometric fuel ' air ratio. 6. Short note on SI engine equivalence ratio requirements? In a homogeneous mixture with equivalence ratio close to 1.0 the flame speed is normally of the order of 40cm/s .However in a SI engine the maximum flame speed is obtained when  $\Phi$  is between 1.1 and 1.2 (i.e.) when the mixture is slightly richer than stoichiometric.
6. . Explain the type of vibration produced when auto ignition occurs. Two different vibrations are produced. 1. In one case, a large amount of mixture may auto ignite giving use to a very rapid increase in pressure throughout the chamber and there will be a direct blow on free vibration of the engine parts 2. In another case, larger pressure differences may exit in the combustion chamber and the resulting gas vibration can force the walls of the chamber to vibrate at the same frequency as the gas.
7. What is the method to detect the phenomenon of knocking? The scientific method to detect the phenomenon of knocking is to use a pressure transfer this transducer is connected, usually to a cathode ray oscilloscope. Thus pressure-time traces can be obtained from the pressure transducer.
8. List out some of the knock limited parameters? The knock limited parameters are: 1. Knock limited compression ratio 2. Knock limited into pressure 3. Knock limited Indicated mean effective pressure. (Klimep)
9. Define performance number? Performance number is defined as the ratio. Of Knock limited Indicated mean effective pressure with the sample fuel to knock limited Indicated mean effective pressure with ISO-OCTANE .when the inlet pressure is kept constant.
10. List the factors that are involved in either producing (or) preventing knock. The factors that are involved in either producing (or) preventing knock are temperature, pressure, density of the unburned charge and the time factor.
11. List the parameters which are affecting knock in SI engine? The parameters which are directly (or) indirectly connected with knocking are inlet temperature of mixture compression ratio, mass of inducted charge, power output of the engine.