

Solution

ICE (2161906)

Roll. No.: _____

Enrolment No.: _____

Sign of Student: _____

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GUJARAT TECHNOLOGICAL UNIVERSITY
SHANTILAL SHAH ENGINEERING COLLEGE, BHAVNAGAR
Progressive Assessment Test-1 (AY-2019-20 Even Term)

B.E. Semester 6th Mechanical Engineering

Sub Name: *Internal Combustion Engine*

Sub Code: 2161902

Time: 30 Minutes

Total Marks: 10

Date: 03-03-2020

Q.1. Tick the most appropriate answer for following multiple choice questions [5 marks]

1. With dissociation peak temperature is obtained
 - At the stoichiometric air-fuel ratio
 - When mixture is slightly lean
 - When mixture is slightly rich
 - None of above
2. Venturi in carburetor result in
 - Decrease in air velocity
 - Increase in air velocity
 - Decrease in fuel flow
 - Increase of manifold vacuum.
3. For 110% theoretical air, the equivalence ratio is
 - 1.1
 - 1
 - 0.909
 - 0.827
4. Fuel injection pressure in CI engine solid injection system is around
 - <10 bar
 - 10-20 bar
 - 200-250 bar
 - 30-50 bar
5. For SI engine fuels most preferred are
 - Aromatics
 - Paraffins
 - Olefins
 - Napthenes
6. The cubic capacity of a four stroke eight-cylinder IC engine with cylinder bore d mm, stroke length L mm is
 - $\pi d^2 L / 4$
 - $2\pi d^2 L$
 - $\pi d^2 L$
 - None of the above
7. Consider the following statements regarding a two-stroke IC engine
 - I. The process of exchanging the incoming charge and the combustion product is called scavenging.
 - II. The scavenging process controls the efficiency of a two-stroke engine.
 - III. It can be either spark ignition or compression ignition type.
 - IV. It does not contain any inlet or exhaust valves.

The correct statement is/are

- I only
- I and II only
- I, II and III only
- All of these

8. In SI engine flame speed increases

- With turbulence
- With fuel-air ratio
- Both a & b
- None of above

9. Knocking take place in CI engine

- At starting of combustion
- At the end of combustion
- During combustion
- None of the above

10. Increasing the compression ratio in SI engine the knocking tendency

- decreases
- increases
- not affected
- none of the above

Q.2. Tick the most appropriate answers for following multi choice questions [2 marks]

1. Depending upon the number of stroke, IC engines can be classified into

- Single stroke engine
- Two stroke engine
- Three stroke engine
- Four stroke engine

2. Which of the following components belong to a simple carburetor?

- Float Chamber
- Spark Plug
- Throttle valve
- Venturi / Choke tube

3. Which of the following losses is considered in actual cycle compared to fuel-air cycle

- Time Losses
- Variable Sp. Heat Losses
- Heat losses
- Dissociation

4. Which of the followings are SI engine combustion Stages?

- Flame propagation
- Ignition lag
- Un-controlled combustion
- After burning

Q.3. Fill the blank with correct answers [3 Marks]

1. Octane (C_8H_{18}) Burned with dry air. The volumetric analysis of the product on dry basis is CO_2 : 10.02 %, O_2 : 5.62%, CO : 0.88 % and N_2 : 83.48%. Air-Fuel ratio for this combustion is _____.

Answers Acceptable in Range [18:01 to 22:1]

2. A four-stroke, four-cylinder spark ignition engine having cylinder bore 10cm and stroke length 12cm is running at 3000rpm. The carburetor venturi throat has the diameter of 3.5cm. The volumetric efficiency at this engine speed is 80%, the coefficient of discharge of the air flow is 0.82. The pressure and temperature of the ambient air are 1.013 bar and $25^\circ C$ respectively. Assuming the flow to be incompressible, the depression at the venturi throat is _____ kPa.

Answers Acceptable in Range [4.5 to 6.5]

3. During the operation of an Otto cycle with compression ratio of 10, C_p decreases by 2%. If the ratio of specific heat is 1.4, then the percentage change in the efficiency of the cycle (correct to 1 decimal place) is _____ %

Answers Acceptable in Range (1.15 to 1.25%)
