

GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: 732101**Date: 26/12/2012****Subject Name: Advanced Internal Combustion Engine****Time: 10.30 am – 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) How the specific fuel consumption varies with power for (i) air standard cycle (ii) fuel air cycle (iii) actual cycle? **07**
- (b) Where do the following cycles have applications? **07**
- | | |
|---------------------------|-------------------|
| a. Otto cycle | e. Ericsson cycle |
| b. Diesel cycle | f. Atkinson cycle |
| c. Limited Pressure cycle | g. Stirling cycle |
| d. Joule or Brayton cycle | |
- Q.2** (a) What is the present state of alcohols for use as an alternative fuel for I.C. Engine? **07**
- (b) Describe the rating of CI and SI Engine Fuel. **07**
- OR**
- (b) Explain Alternative fuel for IC Engine with pros and cons. **07**
- Q.3** (a) Explain with neat sketch "Vacuum spark advance mechanism". **07**
- (b) Explain methods of generating air swirl in the CI engine. **07**
- OR**
- Q.3** (a) Define & Explain Knocking, Detonation & Ignition lag. **07**
- (b) Discuss the effect of the following engine variables on flame propagation **07**
- | | |
|-------------------|----------------------|
| a. Fuel-air ratio | d. Compression ratio |
| b. Engine load | e. Engine Speed |
| c. Turbulence | |
- Q.4** (a) Explain hybrid propulsion system. State its advantages & limitations. **07**
- (b) Explain separately scavenged two stroke engines. **07**
- OR**
- Q.4** (a) Explain new materials for IC engine component. **07**
- (b) Explain optical methods for flame velocity measurement. **07**
- Q.5** (a) Explain causes of Diesel smoke and control **07**
- (b) Describe Noise pollution & its control. **07**
- OR**
- Q.5** (a) Explain emission in SI and compare it with Diesel emission **07**
- (b) Explain effect of engine emission on human health & biological sphere. **07**
