FULL NAME: **ENROLLMENT NO :**

KADI SARVA VISHWAVIDHYALAYA
LDRP INSTITUTE OF TECHNOLOGY & RESEARCH, GANDHINAGAR.

B.E. 2nd Semester (ELECT/AUTO/MECH/IT Engg)
MID SEMESTER EXAMINATION

Date : 06/03/2014 **Branch : (ELECT/AUTO/MECH/IT Engg)**
Subject Code: CC104 **Subject Name : Elements of Mechanical Engg.**
Time : 12:00 to 1:30 P.M **Max. Marks : 30**

Instructions: 1) All questions are **compulsory**.
2) Figures to the **right** indicate full marks.
3) Use of scientific calculator is permitted.
4) Indicate **clearly**, the options you attempt along with its respective question number.
5) Use the last page of main supplementary for **rough work**.

Q.1 **(10)**

(A) Explain the following. (5)
(i)Zeroth law of thermodynamics (ii) First law of thermodynamics.

(B) Write short note: (1)LPG (2) CNG. (5)

Q.2 **(10)**

(A) Explain with neat sketch Babcok –Wilcox Boiler. (5)

(B) The following data relates to a trial on a gas engine: Cylinder = 35 mm ,Stroke = 55mm (5)
Mean effective pressure = 0.65 bar N/mm^2 ,Speed of gas engine =166 r.p.m, Explosions =72
Torque on the crank shaft = 200 N-m , Calculate IP,BP, and Mechanical efficiency.

OR

Q.2 ATTEMPT ANY TWO QUESTIONS **(10)**

(A) Explain the Boyle's Law and Charles's Law. (5)

(B) Define the following terms: (i) Dryness fraction (ii) Sensible heat (ii) Latent heat (5)
(iv) Super heated steam.

(C) Prove that :For otto cycle $\eta_{otto} = 1-1/(r)^{\gamma-1}$ (5)

Q.3 ATTEMPT ANY TWO QUESTIONS **(10)**

(A) Give comparison between Two stroke and four stroke cycle. (5)

(B) Derive Characteristics equation of a perfect Gas which is PV=mRT. (5)

(C) Write short note: Carnot Cycle (5)

(D) A hypothetical cycle engine working between 400 C and 40 C produces 0.13 MJ of work. (5)
Determine (i) The engine thermal efficiency (ii) The heat added (3) The entropy changes
During heat rejection process.

----------All the best----------

Enrollment/ID No.	

FULL NAME:

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LDRP INSTITUTE OF TECHNOLOGY & RESEARCH, GANDHINAGAR.

B.E. 1st Semester (EC/CE/CIVIL Engg)
MID SEMESTER EXAMINATION

Date : 13/10/2014 | **Branch : (EC/CE/CIVIL Engg)**
Subject Code: CC104 | **Subject Name : Elements of Mechanical Engg.**
Time : 02:00 to 3:30 P.M | **Max. Marks : 30**

Instructions:
1) All questions are **compulsory**.
2) Figures to the **right** indicate full marks.
3) Use of scientific calculator is permitted.
4) Indicate **clearly**, the options you attempt along with its respective question number.
5) Use the last page of main supplementary for **rough work**.

Q.1 (10)

(A) Explain the following. (5)
(i)Zeroth law of thermodynamics (ii) First law of thermodynamics.

(B) Explain Four stroke diesel Engine with neat sketch. (5)

Q.2 (10)

(A) Write short note: (1)LPG (2) CNG. (5)

(B) Explain the Boyle's Law and Charles's Law. (5)

OR

(A) For Perfect gas Prove that Cp-Cv= R (5)

(B) Define the following terms: (i) Dryness fraction (ii) Sensible heat (ii) Latent heat (5)
(iv) Super heated steam (v) Degree of super heat.

Q.3 ATTEMPT ANY TWO QUESTIONS (10)

(A) Give comparison between Two stroke and four stroke cycle. (5)

(B) Derive Characteristics equation of a perfect Gas which is PV=mRT. (5)

(C) Define the following terms: (1) Elasticity(2) Fatigue (3) Hardness (4) Toughness (5)
(5) Ductility

(D) The following reading were taken during the test of single cylinder 4 stroke oil engine. (5)
Cylinder diameter = 250 mm , Stroke length= 400 mm , mean effective pressure = 6.5 bar
Engine speed = 250 r.p.m . Net load on the brake = 1080 N ,
effective diameter of the brake= 1.5 m , Fuel used/ hour = 10 Kg. CV of fuel = 44300 KJ/Kg
Calculate IP, BP, Mechanical efficiency, Indicated thermal efficiency.

----------All the best----------