Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name: Internal Combustion Engines

Subject Code: 4TE05ICE1 Branch: B.Tech. (Mechanical)

Semester: 5 Date: 24/03/2017 Time: 02:30 To 05:30 Marks: 70

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

a) Define Compression ratio. **(1)**

b) What is carburetion? **(1)**

c) Draw CRDI system. **(1)**

d) What is firing order? **(1)**

e) Draw Battery Ignition system. **(1)**

f) Define: Mechanical efficiency **(1)**

g) Define Brake Power. **(1)**

h) The cross section area of once cylinder of an engine multiplied by its stroke is called…….. **(1)**

i) Number of exhaust manifold in V-8 engine is two. True or false. **(1)**

j) Rope brake dynamometer is used to determine_____. **(1)**

k) Blow by gases are emitted by **(1)**

(a) PCV (b) Air pump (c) Fuel tank (d) Cooling water pump

l) EGR system is employed for controlling emissions of **(1)**

(a) HC (b) CO (c) NO (d) HC and CO

m) Diesel engine is generally preferred for road transport because **(1)**

(a) Capital cost (b) Operating cost (c) Maintenance cost (d) Manufacturing Cost

n) Which oil is more viscous? **(1)**

(a) SAE 20 (b) SAE 40 (c) SAE 70 (d) SAE 80

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

(a) Explain valve timing diagram of four stroke high & low Speed petrol Engine with **(7)**

neat sketch.

(b) Write a short note on scavenging process. **(7)**

Q-3 **Attempt all questions** **(14)**

(a) Explain Rating of SI engine. **(5)**

(b) Explain Rating of CI engine fuels. **(5)**

(c) Desirable properties of good I. C. Engine Fuels. **(4)**

Q-4 **Attempt all questions** **(14)**

(a) Write a short note on solex carburettor with neat sketch. **(7)**

(b) Explain types of nozzles used in IC engine with neat sketch. **(7)**

Q-5 **Attempt all questions** **(14)**

(a) Explain stages of combustion in CI engine. **(7)**

(b) What is detonation? Which are the factors affecting the detonation? **(7)**

Q-6 **Attempt all questions** **(14)**

(a) Explain in detail about MIST lubricating system. **(5)**

(b) Write a short note on Forced Circulation Cooling system. **(5)**

(c) Explain about Antifreeze solutions and corrosion inhibitors. **(4)**

Q-7 **Attempt all questions** **(14)**

(a) Explain types of superchargers in detail. **(5)**

(b) Explain types of turbochargers in detail. **(5)**

(c) Explain flame ionization detector for measuring HC emissions. **(4)**

Q-8 **Attempt all questions** **(14)**

(a) A 4-cylinder, 4-stroke petrol engine 60 mm bore and 90 mm stroke was tested at constant seed. The fuel supply was fixed to 0.13 kg/min and plugs of 4-cylinders were successively short-circuited without change of speed. **(7)**

The power-measurement were as follows:

With all cylinder working =16.25 KW, (B.P)

With No. 1st –cylinder cut-off =11.55 KW, (B.P)

With No. 2nd –cylinder cut-off =11.65 KW, (B.P)

With No. 3rd –cylinder cut-off =11.70KW, (B.P)

With No. 4th –cylinder cut-off =11.50 KW, (B.P)

Find (a) The I.P of the engine (b) The mechanical efficiency and (c) Indicated Thermal efficiency if C.V of fuel used is 42,000 KJ/kg. (d) Also find the relative efficiency on IP basis assuming clearance volume 65 cu cm.

(b) Discuss Heat balance sheet for four stroke CI engine. **(7)**