C.U.SHAH UNIVERSITY
Summer Examination-2018

Subject Name: Automobile Engines

Subject Code: 4TE04AEN1   **Branch: B.Tech (Automobile)**

Semester: 4   **Date: 03/05/2018**   **Time: 10:30 To 01:30**   **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) If the temperature of intake air in internal combustion engine increases, then its efficiency will **(1)**
(A) Remain same   (B) Decrease   (C) Increase   (D) None of these

(b) The operation of forcing additional air under pressure in the engine cylinder is known as **(1)**
(A) Scavenging   (B) Turbulence   (C) Supercharging   (D) Pre-ignition

(c) The _____ engines can work on very lean mixture of fuel. **(1)**
(A) Spark ignition   (B) Compression ignition
(C) Both (A) and (B)   (D) None of these

(d) The mean effective pressure obtained from engine indicator indicates the **(1)**
(A) Maximum pressure developed   (B) Minimum pressure
(C) Instantaneous pressure at any instant   (D) Average pressure

(e) The ignition quality of petrol is expressed by **(1)**
(A) Cetane number   (B) Octane number   (C) Calorific value   (D) All of these

(f) Compression ratio of I.C. Engines is **(1)**
(A) Ratio of volumes of air in cylinder before compression stroke and after compression stroke
(B) Volume displaced by piston per stroke and clearance volume in cylinder
(C) Ratio of pressure after compression and before compression
(D) Swept volume/cylinder volume

(g) The inlet valve of a four stroke cycle internal combustion engine remains open for **(1)**
(A) 130°   (B) 180°   (C) 230°   (D) 270°

(h) The power actually developed by the engine cylinder of an I.C. engine is known as **(1)**
(A) Theoretical power   (B) Actual power
(C) Indicated power   (D) None of these

(i) During idling, a petrol engine requires _____ mixture. **(1)**
(A) Lean   (B) Rich   (C) Chemically correct   (D) None of these

(j) For maximum power generation, the air fuel ratio for a petrol engine for vehicles, **(1)**

is of the order of

(A) 9 : 1   (B) 12 : 1   (C) 15 : 1   (D) 18 : 1

The knock in diesel engine occurs due to   **(1)**

(A) Instantaneous and rapid burning of the first part of the charge

(k) (B) Instantaneous auto ignition of last part of charge

(C) Delayed burning of the first part of the charge

(D) Reduction of delay period

The brake power of a diesel engine, keeping other parameters constant, can be   **(1)**
increased by

(A) Decreasing the density of intake air

(l) (B) Increasing the temperature of intake air

(C) Increasing the pressure of intake air

(D) Decreasing the pressure of intake air

The function of a distributor in a coil ignition system of I.C. engines is   **(1)**

(m) (A) To distribute spark   (B) To distribute power

(C) To distribute current   (D) To time the spark

A spark plug gap is kept from   **(1)**

(n) (A) 0.3 to 0.7 mm   (B) 0.2 to 0.8 mm

(C) 0.4 to 0.9 mm   (D) 0.6 to 1.0 mm

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

Q-2	**Attempt all questions**	**(14)**
(a)	What are the mixtures requirements of SI engine under varying condition?	**(07)**
(b)	Explain valve timing diagram of Two stroke SI engine with neat sketch.	**(04)**
(c)	Write a short note on firing order.	**(03)**

Q-3	**Attempt all questions**	**(14)**
(a)	Explain P-θ diagram for combustion in CI engine in detail.	**(07)**
(b)	Explain construction and working of a Bosch fuel injection pump with neat sketch.	**(07)**

Q-4	**Attempt all questions**	**(14)**
(a)	Enumerate the methods of turbocharging and explain briefly any one with neat sketch.	**(07)**
(b)	What is the function of lubrication system? Write types of lubrication system and explain any one with neat sketch.	**(07)**

Q-5	**Attempt all questions**	**(14)**
(a)	A four cylinder petrol engine has bore of 5.7 cm and stroke 9 cm. Its rated speed is 2800 rpm and it is tested at this speed against a brake which has torque arm of 0.356 m. The net brake load is 155 N and fuel consumption is 6.74 liter/hr. The Specific gravity of petrol used is 0.735 and it has low calorific value of 4200 kJ/kg. A morse test is carried out and cylinders are cut out in the order of 1, 2, 3, and 4 with corresponding brake loads of 111, 106.5, 104.2 and 111 N respectively. Calculate for this speed, engine torque, brake mean effective pressure, brake thermal efficiency, specific fuel consumption, mechanical efficiency and indicated mean effective pressure.	**(07)**
(b)	What is the purpose of supercharging? Which are supercharging limits? Differentiate between supercharging and turbo charging.	**(07)**

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

(a) Abnormal combustion knock produced by surface ignition in SI engine is more harmful than normal combustion knock- Justify the statement. **(07)**

(b) Explain carter carburettor with neat sketch. **(07)**

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

(a) Write a note on Forced Circulation Cooling system with neat sketch. **(07)**

(b) Which are the various methods of measurement of friction power? Explain any one method to measurement of friction power **(07)**

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

(a) Write a brief explanatory note on heat balance sheet. **(07)**

(b) Name of emission control measures in vehicles. With help of a diagram, describe working of catalytic converter. **(07)**