CS/B.Tech/Even/AUE/6th Sem/AUE-601/2014

9. a) A four cylinder engine running at 1200 rpm delivers 20 K W. The average torque when one cylinder was cut is 110 N-m. Find the indicated thermal efficiency if the calorific value of the fuel is 43MJ/Kg and the engine uses 360 grams of gasoline per KWh.

b) Explain the Willan's line method to measure the frictional power.

[8+7]

10. a) What are the main function of an injection pump? Explain with a neat sketch the working principle of a distributor type fuel injection pump.

b) Derive the expression for the efficiency of Diesel Cycle with P- V and T-S diagram.

[7+8]

11. Write short notes on any *three* of the following:

[3x5=15]

 a) Supercharger and Turbocharger

 b) Crankcase scavenge engine

 c) Valve timing diagram for 4 stroke IC engine

 d) Important qualities of SI engine fuel

 e) Morse Test

CS/B.Tech/Even/AUE/6th Sem/AUE-601/2014

2014

Automotive Petrol & Diesel Engines

Time Alloted : 3 Hours **Full Marks : 70**

The figure in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable

GROUP - A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following:

10x1=10

i) Gudgeon pin forms the link between-

 a) Piston and big end of connecting rod
 b) piston and small end of connecting rod
 c) Connecting rod and crank
 d) Big end and small end .

ii) If L is the stroke and N is the RPM, mean piston speed of two stroke engine is

 a) LN b) LN/2 c) 2LN d) none of the above.

iii) For the same compression ratio and heat addition

 a) η otto > η Diesel > η Dual
 b) η Diesel > η otto > η Dual
 c) η otto > η Dual > η Diesel
 d) η Dual > η Diesel > η otto

iv) Methanol by itself is not a good CI engine fuel because

    a) its octane no. is high

    b) its cetane number is low

    c) both (a) and (b)

    d) None of these.

v) Lean air mixture is required during

    a) Idling   b) Starting.

    c) Accelerating   d) Cruising

vi) Gasohol is a mixture of

    a) 90% ethanol + 10% gasoline

    b) 10% ethanol + 90% gasoline

    c) 40% ethanol + 60% gasoline

    d) 50% ethanol + 50% gasoline

vii) Morse test is applicable only to

    a) single cylinder SI engine

    b) single cylinder CI engine

    c) multicylinder SI and CI engine

    d) None of the above.

viii) Supercharging air compressor is driven by

    a) Exhaust gas turbine

    b) Engine itself

    c) Separate electrical motor

    d) None of the above.

ix) A two stroke engine can be identified by

    a) Cooling system

    b) Lubrication system.

    c) Absence of valves.

    d) Piston size.

x) Brake specific fuel consumption is defined as

    a) fuel consumption per hour

    b) fuel consumption per km

    c) fuel consumption per brake power

    d) fuel consumption per brake power hour

GROUP - B

(Short Answer Type Questions)
Answer any *three* of the following.   3x5=15

2. Compare the Otto, Diesel, Dual cycle for same compression ratio and heat rejection.

3. Define the followings (i) scavenging efficiency (ii) Charging efficiency

4. Compare four-stroke and two-stroke cycle engine.

5. Define Cetane number rating of diesel fuel. Explain its significance with respect to diesel engine knock.

6. What is meant by supercharging? What is its effect on engine performance?

GROUP - C

(Long Answer Type Questions)
Answer any *three* of the following.   3x15=45

7. a) In an Otto cycle air at 15°c and 1.05 bars is compressed adiabatically until the pressure is 13 bar. Heat is added at constant volume until the pressure rises to 35 bar. Calculate the air standard efficiency, the compression ratio and the mean effective pressure for the cycle. Take C_v= 0.718kJ/kg-k, R= 0.287 kJ/kg-k.   [10]

   b) What are the different kinds of fuels used in SI and CI engine?   [5]

8. a) Describe with a neat P-θ plot, the stages of normal combustion in a typical SI engine. Indicate clearly the region susceptible to knocking on the sketch so drawn. Explain in brief the factors influencing detonation in SI engine.

   b) Briefly explain the following factor which is influencing the engine performance i)Time loss factor ii) Heat loss factor iii) Exhaust blowdown factor.

                                [8+7]