No. of Printed Pages : 6

BME-033

DIPLOMA IN MECHANICAL ENGINEERING/ ADVANCED LEVEL CERTIFICATE IN MECHANICAL ENGINEERING (DMEVI/ACMEVI)

Term-End Examination 00872

June, 2013

BME-033 : HEAT POWER TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *All questions are* ***compulsory****. Use of calculator is* ***permitted.***

1. Choose the correct answer from the given four alternatives : **14x1=14**

   (a) The ratio of indicated thermal efficiency to the corresponding air standard cycle efficiency is called
   - (i) efficiency ratio
   - (ii) relative efficiency
   - (iii) overall efficiency
   - (iv) mechanical efficiency

   (b) In a petrol engine the spark gap is
   - (i) 0.10mm
   - (ii) 0.6mm
   - (iii) 0.1mm
   - (iv) 0.15mm

(c) Piston rings are usually made of

(i) Cast -iron (ii) Aluminium

(iii) Bronze (iv) Carbon steel.

(d) Fuel consumption with increase in back pressure will

(i) increase

(ii) decrease

(iii) remain unaffected

(iv) none of the above

(e) The material for centre electrode in spark plug is

(i) carbon

(ii) platinum

(iii) platinum - tungsten alloy

(iv) Nickel alloy

(f) The fuel which detonates easily is

(i) n- heptane (ii) iso - octane

(iii) benzene (iv) alcohal

(g) Auto ignition in a S.I. engine means

(i) automatic ignition of the charge at the end of compression

(ii) ignition induced by the passage of a spark

(iii) ignition of the charge before the passage of the flame front.

(iv) ignition induced to supplement the process of normal combustion.

(h) The quantity of heat lost to the cooling water in an IC. engine is about

(i) 10%

(ii) 30%

(iii) 50%

(iv) 70%

(i) Orsat apparatus is used for determining

(i) the Calorific value of fuel

(ii) volumetric analysis of the dry products of combustion

(iii) volumetric analysis of the wet products of combustion

(iv) gravimetric analysis of the products of combustion.

(j) The thermal efficiency of high speed diesel engine is

(i) 20%

(ii) 35%

(iii) 50%

(iv) 70%

(k) Cetane number is the measure of

(i) viscosity of fuel

(ii) auto - ignition - temperature

(iii) ignition quality

(iv) Calorific value of fuel.

(l) The function of a carburettor in a S.L engine is to control

(i) air - fuel ratio

(ii) mixture of air and fuel

(iii) speed

(iv) pressure drop between venturi and nozzle tip.

(m) The amount of diesel in a C.I engine is controlled by

(i) rack and pinion arrangement

(ii) throttle

(iii) governor

(iv) nozzle

(n) In a two - stroke cycle engine, the operations namely suction, compression , expansion and exhaust are completed in the number of revolutions of crank shaft equal to

(i) four (ii) three

(iii) two (iv) one

2. Answer *any two* of the following : **2x7=14**

(a) Name the two general classes of combustion engines and state how do they basically differ in principle ?

(b) What is the function of a governor ? Enumerate the types of governors and discuss with a neat sketch the Porter governor.

(c) Compare the relative advantages and disadvantages of four stroke and two stroke cycle engine.

3. Answer *any two* of the following : 2x7=14

(a) Define 'Combustion'. State the general conditions necessary for combustion.

(b) Explain the difference between

(i) pre - ignition and auto - ignition

(ii) detonation and auto - ignition

(c) Describe briefly the essential features of good commercial carburettor for automotive engines.

4. Answer *any two* of the following : 2x7=14

(a) What is the importance of lubrication in I.C. engines ?

(b) Describe briefly ' cooling air' ' and ' cooling water ' requirements for I.C engines

(c) Explain the role of anti - freeze solutions in water - cooling system.

5. Answer *any two* of the following : 2x7=14

(a) Define the term ' Air pollution '. Name the major pollutants, which are emitted from the exhaust due to incomplete combustion in IC engines.

(b) What is the function of fly wheel in a prime mover ?

(c) Define the following terms :

(i) Belt - drive

(ii) Rope - drive

(iii) Chain - drive

(iv) Slip of a belt

(v) Centrifugal tension

(vi) Creep of a belt

(vii) Pulley