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BME-033

00330

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

Term-End Examination

June, 2014

BME-033 : HEAT POWER TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *Answer **five** questions in all. Question No.1 is **compulsory**. Answer **four** more questions from the remaining questions. Use of calculator is **permitted**.*

1. Choose the correct answer from the given alternatives : **7x2=14**

   (a) The combustion process in a CI engine starts with the help of :
   - (i) Spark
   - (ii) Temperature
   - (iii) Pressure
   - (iv) All of the above

   (b) A carburettor is used to supply :
   - (i) petrol, air and lubricating oil
   - (ii) air and diesel
   - (iii) petrol and lubricating oil
   - (iv) petrol and air

(c) The possible sequence of firing order in four stroke, four cylinder engine is :

(i) 1-2-4-3 (ii) 2-1-3-4

(iii) 3-4-2-1 (iv) 1-4-3-2

(d) Heat transfer taking place without any material medium is known as :

(i) Conduction

(ii) Convection

(iii) Radiation

(iv) All of the above

(e) The noise developed in an engine is controlled with the help of the following device :

(i) Control volume

(ii) Mufflers

(iii) Filters

(iv) All of the above

(f) The thermal efficiency of petrol engine is about :

(i) 15% (ii) 30%

(iii) 50% (iv) 70%

(g) The total number of instantaneous centres for a mechanism consisting of n links is :

(i) $\frac{n}{2}$ (ii) n

(iii) $\frac{n-1}{2}$ (iv) $\frac{n(n-1)}{2}$

2. (a) With a neat sketch explain the working of a four stroke CI engine. 7+7

(b) A six-cylinder, two-stroke engine produces a torque of 1100 Nm at a speed of 2100 r.p.m. It has a bore of 123 mm and stroke of 127 mm. What is its bmep ?

3. (a) What is a kinematic pair ? How are kinematic pairs classified ? Explain briefly different types of kinematic pairs according to the type of contact. 7+7

(b) Deduce the formula for velocity ratio of a compound belt drive.

4. (a) What are the different modes of heat transfer that occur in an IC engine ? State the drawbacks of an over cooled engine. 7+7

(b) What is the function of antifreezing solutions ? Name some commonly used antifreezers. How does the lubricating oil help in engine cooling ?

5. (a) What are the functional requirements of an injection system used in compression ignition or diesel engine ? 7+7

(b) Explain the working principle of a simple carburettor with a neat diagram.

6. (a) Derive an expression of energy and coefficient of fluctuation of speed. 7+7

(b) What are the functions of inlet and exhaust manifolds in an engine ?

7. Find the power transmitted by a belt running over a pulley of 600 mm diameter at 200 r.p.m. The coefficient of friction between the belt and pulley is 0.25, angle of lap 160° and maximum tension in the belt is 2500 N. 14