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BIMEE-031

DIPLOMA – VIEP – MECHANICAL ENGINEERING (DMEVI)

Term-End Examination

00882

December, 2017

BIMEE-031 : I.C. ENGINES

Time : 2 hours *Maximum Marks : 70*

Note : *Question no. 1 is* ***compulsory****. Attempt* ***five*** *questions in all. All questions carry equal marks. Use of scientific calculator is permitted.*

1. Choose the correct answer from the given four alternatives : *7×2=14*

(a) In isothermal compression

(i) there is no gain in internal energy

(ii) temperature increases very slowly

(iii) there is no exchange of heat with environment

(iv) entropy change is zero

(b) A rich mixture will have an air-fuel ratio

(i) less than chemically correct

(ii) more than chemically correct

(iii) chemically correct

(iv) Any of the above

(c) During idling, a petrol engine requires

(i) rich mixture

(ii) lean mixture

(iii) chemically correct mixture

(iv) variable mixture

(d) Hot spots

(i) are defects in S.I. engines

(ii) are the hottest spots in engines

(iii) are the spots where heavier fractions of fuel are vaporised

(iv) do not exist in engines

(e) Ignition quality of diesel fuel is expressed by

(i) octane number

(ii) cetane number

(iii) carbon percentage

(iv) calorific value

(f) Most of the heat generated in I.C. engines is transferred to surrounding medium by

(i) conduction only

(ii) convection only

(iii) conduction and convection

(iv) radiation only

(g) A nozzle is used to

(i) increase velocity and decrease pressure

(ii) increase velocity as well as pressure

(iii) decrease velocity as well as pressure

(iv) decrease velocity and increase pressure

2. (a) An engine working on the Otto cycle is supplied with air. The compression ratio is 8. Calculate the cycle efficiency.
(given for air : $\gamma = 1{\cdot}4$)

(b) What is Pre-ignition ? What are the effects of pre-ignition ? 7+7

3. (a) What is a Carburettor ? State the main functions of a carburettor employed in a motor car engine. Explain the working of a simple carburettor.

(b) What do you understand by Firing Order ? Give the firing order of four and six cylinder engines. 7+7

4. (a) What are the properties which are essential for a good S.I. engine fuel ? What is Octane Rating ?

(b) What is Scavenging ? Why is scavenging important in two-stroke engines compared to four-stroke engines ? 7+7

5. (a) Why is aluminium used in manufacturing automotive pistons ? What are piston rings ?

(b) Explain Crankcase Ventilation with the help of a suitable diagram. 7+7

6. (a) Why is air cooling used in motorcycles ? Discuss the merits and demerits of air cooling over water cooling. How can air cooling be made more effective ?

(b) Compare the relative advantages and disadvantages of four-stroke and two-stroke cycle engines. 7+7