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BIMEE-031

DIPLOMA – VIEP – MECHANICAL ENGINEERING (DMEVI)

Term-End Examination

00433

December, 2016

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 S.I. engines, the throttle valve of carburettor controls the quantity of

(i) Fuel

(ii) Air

(iii) Fuel and air mixture

(iv) Lubricating oil

(b) An engine operates between temperature limits 900 K and T_2 and another between T_2 and 400 K. For both engines to be equally efficient, T_2 should be

(i) 600 K
(ii) 700 K
(iii) 625 K
(iv) 650 K

(c) A heat engine develops 60 kW work having an efficiency of 60%. The amount of heat rejected will be

(i) 400 kW
(ii) 10 kW
(iii) 40 kW
(iv) 20 kW

(d) In Carnot cycle, addition and rejection of heat takes place at

(i) constant pressure
(ii) constant temperature
(iii) constant volume
(iv) constant speed

(e) If the compression ratio is increased in an S.I. engine, the knocking tendency will

(i) increase
(ii) decrease
(iii) not be affected
(iv) cannot be predicted

(f) Anti-knock property of a C.I. engine fuel can be improved by adding

(i) Tetra-ethyl lead

(ii) Amyl nitrate

(iii) Hexadecane

(iv) Trimethyle pentane

(g) Carbon deposit on the cylinder head of an I.C. engine tends to increase

(i) clearance volume

(ii) compression ratio

(iii) swept volume

(iv) None of the above

2. (a) "In agriculture field, it is better to use C.I. engines than S.I. engines." Justify this statement.

(b) Explain the phenomenon of auto-ignition. Explain how auto-ignition is responsible for knocking in S.I engines. 7+7

3. (a) "Supercharging is preferred in diesel engines than petrol engines." Justify the statement.

(b) What is the reason that two-stroke engines are not used in cars even though they develop theoretically twice the power than that of four-stroke engines ? 7+7

4. (a) Discuss with suitable sketches the magneto-ignition systems used in petrol engines.

(b) The efficiency of an Otto cycle is 60% and $\gamma = 1{\cdot}5$. What is the compression ratio ? 7+7

5. (a) Describe briefly the multipoint fuel injection system.

(b) Explain briefly the various sources from which pollutants are emitted from S.I. engines. 7+7

6. (a) "Compressed Natural Gas (CNG) is preferable in S.I. engines than C.I. engines." Justify this statement.

(b) Why are there lubrication and cooling systems in an engine ? Discuss briefly. 7+7