

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

**00568** Term-End Examination

**June, 2017**

**BME-033 : HEAT POWER TECHNOLOGY**

*Time : 2 hours*

*Maximum Marks : 70*

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*Note : Attempt any **five** questions. Use of scientific calculator is allowed. Assume any missing data suitably.*

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1. At the shaft of a 4-cylinder, 4-stroke spark ignition engine, a torque of 160 Nm is developed at 3000 rpm. The bore and stroke of the engine are equal and the engine has a mechanical efficiency of 85%. The indicated mean effective pressure of all four cylinders is 960 kPa. Find the bore and the stroke. 14

2. (a) Compare the relative advantages and disadvantages of 4-stroke and 2-stroke engines.
- (b) Explain the functions of a carburettor in a petrol engine with the help of a neat sketch. 7+7

3. A V-belt drive is required to transmit 8.2 kW of power from a driving sheave (pulley) of 110 mm to a driven sheave of 320 mm. The centre distance is 230 mm. Find the angle of contact on the smaller pulley, the length of the belt and rpm of the driven sheave, if the driving sheave rotates with 1520 rpm. Given  $S = 3\%$ .

14

4. (a) What is a slip gauge ? How are slip gauges classified for their guaranteed accuracy and grades ?

(b) What are the two basic systems of giving tolerances of the shaft and hole ? Explain. 7+7

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

(b) Define the term 'Air pollution'. Name the major pollutants which are emitted from the exhaust due to incomplete combustion in I.C. engines.

7+7

6. (a) What are the functional requirements of an injection system used in a compression ignition or a diesel engine ?
- (b) Describe the functions of inlet and exhaust manifolds in an engine. 7+7
7. Write short notes on the following : 7+7
- (a) Anti-freeze Solutions
- (b) Pre-ignition and Auto-ignition
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