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**BME-033**

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

## Term-End Examination

00185

## December, 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.** Select the correct answer from the given alternatives : *7×2=14*

(a) A petrol engine has compression ratio from

(i) 6 to 10

(ii) 10 to 15

(iii) 15 to 25

(iv) 25 to 40

(b) When the sleeve of the Porter governor moves upwards, the speed of governor _____ .

(i) increases
(ii) decreases
(iii) remains unaffected
(iv) None of the above

(c) Velocity ratio is defined as

(i) Speed of driver/speed of follower
(ii) Speed of follower/speed of driver
(iii) Speed of pulley/speed of belt
(iv) Speed of belt/speed of pulley

(d) In a 4-stroke engine the working cycle is completed in

(i) One revolution of the crank shaft
(ii) Two revolutions of the crank shaft
(iii) Three revolutions of the crank shaft
(iv) Four revolutions of the crank shaft

(e) A carburettor is used to supply

(i) Petrol, air and lubrication
(ii) Air and diesel
(iii) Petrol and lubricating oil
(iv) Petrol and air

(f) The following is a CI engine :

(i) Diesel engine
(ii) Petrol engine
(iii) Gas engine
(iv) None of the above

(g) In a 4-stroke cycle diesel engine, during suction stroke,

(i) only fuel is sucked in

(ii) only air is sucked in

(iii) mixture of fuel and air is sucked in

(iv) None of the above

**2.** (a) What is the function of governor ? Describe the Porter governor with a neat sketch. 7

(b) Differentiate between flywheel and governor. 7

**3.** (a) Compare the relative advantages and disadvantages of 4-stroke and 2-stroke cycle engines. 7

(b) State the functions of carburettor in a petrol engine. 7

**4.** A single cylinder 4-stroke diesel engine has a bore of 150 mm and a stroke of 200 mm. When the engine runs at 400 rpm, it develops 10 kW power. The area of the indicator diagram is 7·25 $cm^2$ and its maximum length is 6·125 cm. The spring constant is 8 bar/cm. Determine the *14*

(i) mean effective pressure

(ii) indicated power

(iii) mechanical efficiency of the engine

**5.** 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 angle of contact on smaller pulley and the length of the belt and rpm of the driven sheave, if driving sheave rotates with 1,520 rpm and S = 3%. *14*

**6.** (a) Explain the working of a magneto ignition system. *7*

(b) With a neat diagram, explain the dry sump lubrication system. *7*

**7.** (a) What is a slip gauge ? How are the slip gauges classified for their guaranteed accuracy and grades ? *7*

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