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BME-033

01604

DIPLOMA IN ELECTRICAL AND MECHANICAL ENGINEERING

Term-End Examination

June, 2011

BME-033 : HEAT POWER TECHNOLOGY

Time : 2 hours *Maximum Marks : 70*

Note : *Answer **any five** of the following questions including Question No.1 which is **compulsory**. Use of calculator is permitted.*

1. (i) In a four stroke cycle engine all four operations are performed in _____. **7x2=14**

(a) one crank revolution

(b) two crank revolution

(c) three crank revolution

(d) four crank revolution

(ii) A carburettor is used in the S.I. engine for _____ .

(a) Injecting the fuel

(b) Starting the engine

(c) For mixing fuel with air

(d) All of the above

(iii) The electrical energy to the spark plug is supplied by _____ .

(a) Battery ignition system

(b) Magneto ignition system

(c) Electronic ignition system

(d) All of the above

(iv) Which of the following lubrication system is used in large stationary marine and aircraft engines ?

(a) Mist lubrication system

(b) Wet sump lubrication system

(c) Dry sump lubrication system

(d) None of the above

(v) Heat transfer by _____occurs through the emission and absorption of electromagnetic waves.

(a) Conduction

(b) Convection

(c) Radiation

(d) All of the above

(vi) The total number of instantaneous centres for a mechanism consisting of n links is _____.

(a) $\frac{n}{2}$

(b) n

(c) $\frac{n-1}{2}$

(d) $\frac{n(n-1)}{2}$

(vii) When the sleeve of a porter governor moves upwards, the speed of governor.

(a) increases

(b) decreases

(c) remains unaffected

(d) none of the above

2. (a) How IC engines are classified ? Explain the different processes which must occur in a 4 - stroke engine.

(b) A car engine has 4 cylinders of 68 mm bore and 75 mm stroke. The compression ratio is 8. Calculate the cubic capacity of the engine and the clearance volume of each cylinder. **7x2 =14**

3. (a) Explain the working principle of a simple carburettor. **7x2 = 14**

(b) Explain the working of a magneto ignition system.

4. (a) Describe different types of mechanical drives and discuss the advantages and disadvantages of flat belt and V- belt drives.

(b) 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 1520 rpm and S=3%. **7x2 = 14**

5. (a) What are plain gauges ? How are plain gauges classified ? Explain briefly. **7x2 = 14**

(b) An engine runs at 1800 rpm and needs speed fluctuation limited to 0.5%. Find the weight of the fly wheel whose mass is concentrated along a rim of 320 mm mean radius. Take E_f = 87.3 Nm.

6. A sprocket with 30 teeth is mounted on the shaft of an electric motor which delivers 15 kW. The motor rotates at 850 rpm and drives a compressor at 360 rpm. The permissible pressure in the lubricant is 16.2 N/mm^2. One chain is to be used. Find the velocity ratio, diameter of roller and pitch circle diameter of sprockets. **14**