P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)
Fifth Semester, B.E. - Automobile Engineering
Semester End Examination; Dec - 2017 / Jan - 2018
Automobile Engines and Components

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

1 a.	Discuss briefly the historical development of automobile.	8
b.	With a neat sketch, explain working principle of four stroke diesel engine with PV diagram.	12
2 a.	With a neat sketch, explain theoretical scavenging process.	10
b.	Compare between two and four stroke engine.	5
c.	Compare between SI and CI engine.	5

UNIT - II

3 a. The cylinder of four stroke diesel engine has the following specifications: Brake power = 3.74 kW, Speed = 1000 rpm, indicate mean effective pressure = 0.35 MPa, mechanical efficiency = 80%. Determine the bore and length of cylinder linear.   6

   b. With a neat sketch, explain different types of cylinder liners.   8

   c. What are the advantages of cast iron cylinder block and aluminum cylinder block?   6

4 a. What are the functions of gasket? Name four different types of gasket.   8

   b. With a neat sketch, explain two different types of mufflers.   12

UNIT - III

5 a. With the help of neat sketch, explain the working of compression ring and oil control ring.   10

   b. The following data is given for the piston of four-stroke diesel engine :

   Cylinder bore = 250 mm, Maximum gas pressure = 4 MPa, Bearing pressure at small end of the connecting rod = 15 MPa, length of the piston in bush of small end = 0.45 D, Ratio of inner to outer diameter of the piston = 0.6, Mean diameter of the piston boss = 1.4* outer diameter of the piston pin, allowable bearing stress for piston pin = 84 N/mm^2. Calculate;   10

   i) Outer diameter of the piston pin

   ii) Inner diameter of the piston pin

   iii) Mean diameter of piston boss

   iv) Check the design for bending stress.

6 a. What do you mean by piston slap? What are the methods to overcome the piston slap?   10

   b. What is the purpose of using piston pin? With a neat sketch, explain the different methods of locking piston pin.   10

UNIT - IV

7 a. Determine the dimensions of connecting road for a diesel engine with the following data: cylinder bore = 100 mm, length of connecting rod = 350 mm, Maximum gas pressure = 4 MPa, Factor of safety = 6.   10

  b. Determine the dimension of big end and small end bearings of the connecting rod for a diesel engine with the following data :

Cylinder bore = 100 mm, Maximum gas pressure = 4 MPa, (1/d) ratio of piston pin bearing = 2, (1/d) ratio of piston pin bearing = 1.3, allowable bearing pressure for piston pin bearing = 12 MPa, allowable bearing pressure for Crank pin bearing = 7.5 MPa.   10

8a. Describe material used, construction, and functions of crank shaft.   10

  b. With a neat sketch, explain the function and constructional details of vibration tampers.   6

  c. Write a short note on selecting bearing material.   4

UNIT - V

9 a. With a neat sketch, explain the following:

i) Valve seats   12

ii) Valve spring.

  b. With a neat sketch, explain overhead valve actuating mechanism.   8

10 a. With a neat sketch, explain free type and positive type valve rotators.   12

  b. With a neat sketch, explain chain and type camshaft drive.   8

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