Subject Code: 2170202   **Date: 23/09/2016**
Subject Name: Auto. Component Design   **Sem: 7TH**
Time: 10:00 TO 10:50   **Total Marks: 20**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

QUE.1 **(A)** A pair of straight teeth spur gears is to transmit 20kw when the pinion rotates at 300 rpm. **6**
The velocity ratio is 1:3. The allowable static stress for pinion and gear materials are
120MPa and 100MPa. The pinion has 15 teeth and its face width is 14 times module.
Determine i) module ii) face width iii) pitch circle diameters of both the pinion and gear
from standpoint of strength only.
Take $Cs = 1$ $y = 0.154 – (0.912/$ No. of teeth$)$
$Cv = 3/(3+v)$

QUE.2 **(A)**   **3**

Why I-Section is most preferred as a cross section of connecting rod?

(B)   **4**

List the design consideration for design of piston.

OR

(B)   **4**

Explain material selection of gears

QUE.3 **(A)** Determine the size of cross section of a connecting rod of 4-stroke diesel engine having I   **7**
section from the following data:
Brake power =10 Kw,   Mechanical efficiency=80%, Maximum explosion pressure =3.75
MPa, Indicated mean effective pressure =0.5 MPa, Maximum engine speed =1200 r.p.m.,
Angularity of connecting rod for constant explosion pressure = 5°, Stroke/bore ratio =1.2,
Length of connecting rod = 2 x stroke.

OR

(A) Following data refers to 4-stroke 4-cylinder petrol engine: **7**
Cylinder bore =100 mm, Stroke length =125 mm, Maximum explosion pressure=2.5 MPa ,
Power developed = 80 KW ,Specific fuel consumption = 180 gm/kwh , speed=2500 r.p.m. ,
Permissible tensile stress for material of piston = 40 MPa , Permissible bending stress for
piston pin =120 MPa .
Determine 1) Piston crown thickness based on strength and heat dissipation point of
view 2) Piston pin size

****************************** **ALL THE BEST** ******************************