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BTECH , MAY –2014
AUTOMOTIVE DESIGN II
Paper Code (AE-302)
Paper Id. [A0719]

Time Allowed: 4 Hours Max. Marks: 60

Note: Section A is compulsory. Attempt any four questions from Section B. Attempt any two questions from Section C. Design data book by **ONLY** PSG College is permitted.

Section A

1.	(i)	Write the main application areas of chain drives.	(2)
	(ii)	Can we make a quarter turn drive using a V-belt?	(2)
	(iii)	What are main advantages of leaf springs over helical ones?	(2)
	(iv)	What is meant by Herringbone gear?	(2)
	(v)	What are self aligning bearings?	(2)
	(vi)	Which material is preferred for connecting rod and why?	(2)
	(vii)	Name the material used for camshaft.	(2)
	(viii)	Write the purpose of tappets.	(2)
	(ix)	What are different types of failures of piston?	(2)
	(x)	Name different types of failures of cylinder?	(2)

Section B

2. A belt drive consists of two V-belts in parallel, on grooved pulleys of the same size. The angle of the groove is 30°. The cross-sectional area of each belt is 750 mm^2 and μ = 0.12. The density of the belt material is 1.2 Mg/m^3 and the maximum safe stress in the material is 7 MPa. Calculate the power that can be transmitted between pulleys of 300 mm diameter rotating at 1500 r.p.m. Find also the shaft speed in r.p.m. at which the power transmitted would be a maximum. (5)

3. Explain the surging phenomenon in springs. Can it occur in leaf springs? (5)

4. What is meant by following: (5)
   (i) Mitre gears
   (ii) Angular bevel gears
   (iii) Crown bevel gears
   (iv) Internal bevel gears

5. What are the factors influencing the selection of a (5)
   (i) Sliding type bearing
   (ii) Rolling type bearing

6. What are possible types of failures of a intake and exhaust manifolds? (5)

Section C

7. Describe the conditions under which a designer will prefer a (10)
   (i) Chain drive
   (ii) Spur gear drive
   (iii) Helical gear drive
   (iv) Bevel gear drive
   (v) Worm and worm wheel drive.

8. Explain various checks that are required while designing any lubrication system. (10)

9. A truck spring has 12 number of leaves, two of which are full length leaves. The spring supports are 1.05 m apart and the central band is 85 mm wide. The central load is to be 5.4 kN with a permissible stress of 280 MPa. Determine the thickness and width of the steel spring leaves. The ratio of the total depth to the width of the spring is 3. Also determine the deflection of the spring. (10)

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