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Total No. of Questions : 09] **[Total No. of Pages : 01**

B. Tech. (Sem. – 6th)
AUTOMOTIVE DESIGN - II
SUBJECT CODE : AE – 302
Paper ID : [A0719]

Time : 04 Hours **Maximum Marks : 60**

Instruction to Candidates:
1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section – A ***(10 × 2 = 20)***

Q1) a) Write the main application areas of toothed belts.
b) Explain the concept of minimum number of teeth on a sprocket.
c) Name different types of springs.
d) What is specific advantage of worm and worm wheel?
e) Write main differences between rolling and sliding type of bearings.
f) Which material is preferred for crankshaft and why?
g) Name the material used for piston.
h) Write a short note on valve trains.
i) Write types of failures of connecting rod.
j) What are various types of failures of cam shaft?

Section – B ***(4 × 5 = 20)***

Q2) Give design procedure of a chain drive.
Q3) What is meant by nipping of leaf springs and derive its formula.
Q4) What will be the main difference in the design of shaft for a spur gear assembly versus that for a helical gear assembly?
Q5) Explain the differences between design methodology adopted for a sliding and rolling type bearing.
Q6) Write a short note on design of connecting rod.

Section – C ***(2 × 10 = 20)***

Q7) Select a single row deep groove ball bearing for a radial load of 4000 N and an axial load of 5000 N, operating at a speed of 1600 r.p.m. for an average life of 5 years at 10 hours per day. Assume uniform and steady load.
Q8) Explain the design procedure for lubrication systems.
Q9) Describe the conditions under which a designer will prefer a
(a) Helical compression spring
(b) Helical tension spring
(c) Leaf spring
(d) Balleville spring
(e) Pneumatic spring.