Enrollment No: _____   **Exam Seat No:_____**

C.U.SHAH UNIVERSITY
Summer Examination-2018

Subject Name: Automobile System Design

Subject Code: 4TE05ASD1   **Branch: B.Tech (Automobile)**

Semester: 5   Date: 23/3/2018   Time: 10:30 To 01:30   Marks: 70

Instructions:
  (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  (2) Instructions written on main answer book are strictly to be obeyed.
  (3) Draw neat diagrams and figures (if necessary) at right places.
  (4) Assume suitable data if needed.

Q-1   **Attempt the following questions:**   **(14)**

a)	Define Ergonomics for design.	**(1)**
b)	Write the causes of fatigue failure.	**(1)**
c)	Classify types of belts.	**(1)**
d)	Name the materials used for brake lining.	**(1)**
e)	Differentiate between single plate and multi plate clutch.	**(1)**
f)	Write the condition for the transmission of maximum power by flat belt.	**(1)**
g)	Differentiate between Aesthetic & Reliability consideration in design.	**(1)**
h)	What do you mean by torsional rigidity of shaft.	**(1)**
i)	Write the advantages & disadvantages of brakes.	**(1)**
j)	List the various types of chain drives.	**(1)**
k)	Write the advantages of wire rope over fibre rope.	**(1)**
l)	Define Leaf spring.	**(1)**
m)	Write the characteristics for the material of friction clutches.	**(1)**
n)	What do you mean by Standardization in design.	**(1)**

Attempt any four questions from Q-2 to Q-8

Q-2   **Attempt all questions**
  a)   Explain the principles of design for Manufacture & Assembly.   **(07)**
  b)   Discuss Goodman method and Soderberg method for the combination of stresses.   **(07)**

Q-3   **Attempt all questions**
  a)   Explain Wear and Thermal consideration in design.   **(07)**
  b)   Describe with neat sketch, working and applications of Cone Clutch.   **(07)**

Q-4   **Attempt all questions**
  a)   Describe with schematic diagram Hydraulic Braking System.   **(07)**
  b)   Explain design procedure of chain drive.   **(07)**

Q-5   **Attempt all questions**
  a)   Explain design procedure for Internal Expanding Shoe Brake.   **(07)**
  b)   A pulley of 0.9 m diameter revolving at 200 rpm is to transmit 7.5 kW. Find the   **(07)**
          width of leather belt if the maximum tension is not exceed 145 N in 10 mm

width. The tension in the tight side is twice that in the slack side. Determine the diameter of the shaft and the dimensions of the various parts of the pulley, assuming it to have six arms. Maximum shear stress is not exceed 63 MPa.

Q-6 **Attempt all questions**

a) Explain step by step design procedure for Leaf spring. **(07)**

b) 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 defection of spring. **(07)**

Q-7 **Attempt all questions**

a) Discuss general design consideration of Suspension system. **(07)**

b) Explain the design procedure of Propeller shaft for bending. **(07)**

Q-8 **Attempt all questions**

a) Explain design consideration of Steering system. **(07)**

b) Discuss design procedure of Front and Rear axle. **(07)**