DEPARTMENT OF AUTOMOBILE ENGINEERING

Sub: Automobile Component Design   Sub Code: AE5I (22558)

Subject Incharge: Mr. Jaslok Pandey   CO NO: CO502.1

VISION

"To develop technically skilled engineers with value-based education in automotive industry to face upcoming chances".

MISSION

- *Understanding the need for regional automotive industries.*
- *Provide hands on skills for life long professional development.*
- *To create responsible students with sense of ethics & discipline.*

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Assignment No: 01

1. Describe Failure by fracture with suitable example.
2. Describe Ergonomics and Aesthetics.
3. List Reason to adopt standardization in component design.
4. Explain Basic Automobile Component design procedure.
5. State any any two Aesthetics consideration.
6. List Ergonomics consideration for designing Automobile component.
7. Explain the phases of design process of Automobile Component.
8. Describe Aesthetic in Automobile Component design.
9. Explain the Terms preferred Number and Standardization

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DEPARTMENT OF AUTOMOBILE ENGINEERING

Sub: Automobile Component Design   Sub Code: AE5I (22558)
Subject Incharge: Mr. Jaslok Pandey   CO NO: CO502.2

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Assignment No: 02

1. Describe load factor and service factor.
2. Sketch a method to reduce stress concentration in cylindrical members with holes.
3. State any two uses of each of following,
   Stress –strain diagram and S-N curve.
4. Describe any two failure theories with their application.
5. Define bearing pressure and crushing stress.
6. Describe elastic failure.
7. State causes of stress concentration.
8. Define working stress, factors of safety.
9. State different modes of failure of automobile components.
10. Explain the maximum principle stress theory.
11. Define stress concentration state its causes explain different methods to reduce stress concentration with suitable example.

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Assignment No: 03

1. State and justify material for clutch lining.
2. A semi-elliptical leaf spring sustains a load of 70KN. the overall length of the spring is 1m, consist of 18 leaves hold together by U-bolt spaced 100mm apart with overall depth to width ratio of two. The allowable stress for spring material is 400MPA. Take E= 210KN/mm².
3. Calculate maximum minimum average pressure in a plate clutch if axial load is 4KN the inside and outside radii of fraction lining are 50 and 100 mm respectively.
4. Find the minimum size of hole that can be punch in 20 mm thick plate having ultimate shear strength of 300 MPA and the maximum allowable compressive strength of punch material is 1200mpA .
5. Explain in detail the design procedure of tie rod.
6. Describe the design procedure for propeller shaft.
7. Describe design procedure for multiplate clutch.
8. State functions of leaf spring and state suitable material for it.
9. Draw a neat sketch of universal coupling used in propeller shaft.
10. State and justify material for leaf spring.
11. Why nipping is provide in leaf spring.
12. Describe design procedure of wall spring.
13. A multi disc cultch has 5 plates having 4 pairs of active friction surface. If the intensity of pressure is not be exceed 0.127N/mm^2.find the power transmitted at 500 rpm the outer and inner radii of friction surfaces are 125mm and 75 respectively assume wear and coefficient of friction =0.3 .
14. A truck spring has 10 numbers of leaves the support are 1185 mm apart and the central (support) is 85mm wide the load on the spring is 20 KN and take permissible stress of 300 N/mm^2 determine the thickness of leaves if the width of spring is 85mm

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Assignment No: 04

1. Describe the functions of piston crown and piston skirt.
2. Calculate stroke length and bore length if piston diameter is 100mm.
3. List basic design requirements of piston.
4. Crankpin sustains a load of 35KN, if allowable bearing pressure is 7N/mm². Length of pin is 1.2 times diameter of pin.
5. Describe design procedure for piston pin.
6. List sequentially steps to design rocker arm.
7. State functions and name suitable materials of the following, piston crown, piston rings, piston pin.
8. Define indicated power and state it's mathematically expression.
9. State stresses induce in piston pin.
10. State Rankine formula for connecting rod cross section design.
11. Describe design procedure of push rod.
12. Describe design procedure of valve spring.
13. List the functions of cylinder block.
14. Sate and justify material for push rod.
15. List basic design requirement of connecting rod.
16. Design the piston pin with following data –
    Maximum pressure on piston=4N/mm²   Diameter of piston =70mm
    Allowable stresses due to bearing and bending and shearing are given 30N/mm², 80N/mm² and 60N/mm² respectively.
17. Sate functions and name suitable material for connecting rod. Select suitable cross sections for connecting rod with justification.

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Sub: Automobile Component Design   Sub Code: AE5I (22558)
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Assignment No: 05

1. Describe design procedure for fully floating rear axle.
2. Describe design procedure for I section of front axle.
3. Front axle carries a load of 100KN. Will drag is 1.4m. Distance between wheel centre and spring centre is 100mm. if stress is not exceeding 100MPA finds its diameter.
4. Compare front axle and rear axle on the basis of force to be support, stresses induce, cross section used.
5. Draw proportionate sketch of fully rare axle.
6. Describe the design procedure of front axle.
7. Design the diameter of rear axle shaft for fully floating type with following data –
   Engine power = 60KW at 300rpm
   Gear box ratio =4.5:1, 2.5:1, 1.6:1 , 1:1
   Differential reduction =5:1
   f_s for the shaft = 70N/mm²
8. State functions and material for front axle. draw proportionate diagram of front axle showing cross section at different positions

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