



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program:	B.Tech ADE	Semester –	V
Subject (Course):	Ergonomics & Styling	Max. Marks	: 100
Course Code :	ADEG 351	Duration	: 3Hrs
No. of page/s:	03		

Instructions:

Attempt ALL questions. **Section A** (each carrying 4 marks) carries 20 Marks. **Section B** (each carrying 8 marks) carries 40 marks. **Section C** (each carrying 20 marks) carries 40 marks.

Section A (20 marks)

- | | | |
|---|-------|-----|
| 1. Define system. Explain briefly the components of a system. | [3+1] | CO5 |
| 2. “Maximum actuating force for break operation should be 5th percentile right leg strength of female” – Explain. | [4] | CO4 |
| 3. Mention ANY eight principles of ergonomics. | [4] | CO3 |
| 4. Define drag. Explain its importance in automobile design. | [4] | CO2 |
| 5. List and describe the various tools used in clay modeling in automotive industry. | [4] | CO2 |

SECTION B (40 marks)

- | | | |
|---|-------|-----|
| 6. Describe in brief the ergonomic principles of designing a work system. | [8] | CO5 |
| 7. A) Discuss the ergonomic design consideration for designing vehicle display and control. | [4+4] | CO5 |

OR

- | | | |
|--|-----|-----|
| B) Explain how anthropometric principles are applied in designing products. | [8] | |
| 8. Define SgRP? It is one of the most important vehicle package dimension – Discuss. | [8] | CO6 |

- | | | |
|---|-------|-----|
| 9. Describe FIVE characteristics of good exterior design. Redesign ONE exterior element. | [4+4] | CO1 |
| 10. A) Differentiate isometric drawing & perspective drawing.
B) Draw a THREE point perspective drawing of a building assuming you are standing near the corner. | [4+4] | CO1 |

SECTION C (40 marks)

- | | | |
|---|---------------|-------------|
| 11. A) Explain vehicle packaging. | [2] | CO6 |
| B) Describe the main components of a vehicle package. | [2] | |
| C) Explain the following vehicle dimensions. Also mark these dimensions in a diagram.
a. H- Point
b. AHP
c. BOF
d. A47
e. H30 | [(5 x 2) + 6] | |
| 12. A) Describe in detail the various hand modeling methods, tools and raw materials used in Industrial/Automotive design. | [5] | CO1,
CO2 |
| B) List and describe different components/features in interior of a typical driver's compartment of a Sports utility vehicle that add to aesthetic appeal. | [5] | |
| C) Draw the interior of a Sports Utility vehicle in two point perspective (viewer positioned inside a cuboid) showing the components. Show the vanishing points, blocks of construction, contour lines and center lines for all components of interior. | [10] | |

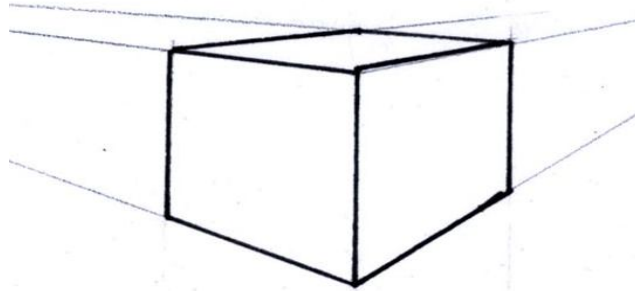
OR

13. A) Explain the TEN styling nomenclatures used to design a CAR. [5+5]

Illustrate using suitable diagrams (side view and front view).

CO1,
CO2

B) Draw a cuboid in Two Point perspective as shown below. [10]



Design a mini truck from the cuboid. You can divide the cuboid into further blocks as per design. Show the use of contour lines and centre lines. Illustrate the wheels.

*****END*****



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Semester – V
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Section A (20 marks)

1. Explain characteristic of a system? [4] C05
2. Define the following: [2+2] C04
 - a. Anthropometry
 - b. Biomechanics
3. Mention at least EIGHT principles of ergonomics. [2+2] C03
4. Describe relationship of drag & speed. [4] C02
5. List and explain various tools used for [4] C01
 - i. digital sculpting
 - ii. manual/hand sculptingin automotive industry.

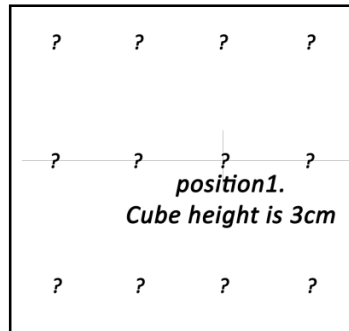
SECTION B (20 marks)

6. Discuss the ergonomic design consideration for designing vehicle display and control. [4+4] C05
- OR
7. Explain how anthropometric principles are applied in designing products [8] C05
 7. Describe in brief the ergonomic principles of designing a work system. [8] C05
 8. What do you understand by SgRP? Why it is one of the most important vehicle package dimension? [8] C06

9. Describe five characteristics of good interior design. [4+4] CO1
Redesign one interior element.
10. A) Describe an aerodynamic form. Describe its importance in automobile design. [4+4] CO2
B) Describe measurement of drag and its quantitative effect.

SECTION C(40 marks)

11. A) Describe Vehicle packaging. [2] CO6
B) Explain the main components of a vehicle package? [2]
C) Explain the following vehicle dimensions. Also mark these dimensions in a diagram. [(5 x 2) + 6]
a. H- Point
b. AHP
c. BOF
d. A47
e. H30
12. A) Describe clay modeling in automotive industry. Discuss on the raw materials used and the various tools used. Explain with schematic diagrams. [5 + 5] CO1, CO2
Explain process of Vehicle design in a Design studio from sketch to clay modeling.
- B) Imagine a cube of 3cm height in space, in Two Point perspective at position O1 as shown in diagram. [10]
Draw the perspective grid of FOUR by FOUR of the same cube.
Show the relevant vanishing points and horizon line.



OR

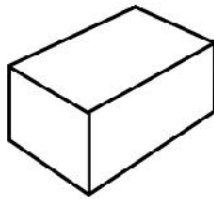
13. A) Explain various wheel proportions (length and height) with diagram, for a/an

[10] CO1,
CO2

- a) Micro Car
- b) Super Car
- c) American Pickup truck
- d) Luxury Sedan
- e) Mid Size SUV

B) Draw a cuboid in Two Point perspective as shown below. Design a Speed form to make it look “*dynamic and fast*”. Use only geometric incisions or additions (No curves/circles/semicircles to be used).

[10]



- i. Perform and illustrate with diagrams step by step, the subtractive or additive modifications till reaching the final design.
- ii. Draw the final design in SIDE VIEW and the above shown TWO point perspective.
- iii. Justify the final design in your own design vocabulary.

*****END*****