



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Program: B.Tech ADE
Subject (Course): Ergonomics & Styling
Course Code : ADEG 351
No. of page/s: 03

Semester – V
Max. Marks : 100
Duration : 3Hrs

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. Explain the various wheel proportions, wheel to fender gap used for a
a. Performance/Super Car for their length and height.
b. Pickup Truck for their length and height. | [4] | CO1,
CO2 |
| 5. List FOUR names of vehicle designers and respective firms. | [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. | [4+4] | CO6 |
| 9. Describe any FOUR Design DNA traits followed in international Brands - BMW/Alfa R/ Bentley/ Porsche. Label and illustrate with suitable sketches. | [4x2] | CO1 |

10. A) Differentiate isometric drawing & perspective drawing. [4+4] CO1
B) Draw a THREE-point perspective drawing of a building assuming you are standing near the corner. Draw the details.

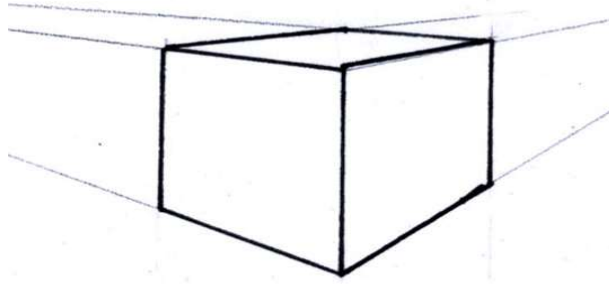
SECTION C (40 marks)

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 [(5 x 2) + 6]
dimensions in a diagram.
a. H- Point
b. AHP
c. BOF
d. A47
e. H30

12. A) Describe in detail the various clay modelling tools and raw materials used in Industrial/Automotive design. [10] CO1, CO2
B) 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 centerlines for all components of interior. List and describe various components you have used for aesthetic appeal. [10]

OR

13. A) Explain the TEN styling nomenclatures used to design a CAR. Illustrate and label using suitable diagrams (side view, rear view and front view). [5+5] CO1, CO2
B) Draw a cuboid in Two Point perspective as shown below. [10]



Design a pickup truck of “POWERFUL” theme from the cuboid. You can divide the cuboid into further blocks as per design. Show the use of contour lines and centerlines. Illustrate the wheels. Explain the styling parameters that you have tweaked to make it look powerful.

*****END*****



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Section A (20 marks)

- | | | |
|--|-------|-----|
| 1. Explain characteristic of a system? | [4] | CO5 |
| 2. Define the following: | [2+2] | CO4 |
| a. Anthropometry | | |
| b. Biomechanics | | |
| 3. Mention at least EIGHT principles of ergonomics. | [4] | CO3 |
| 4. Describe atleast TWO types/categories of passenger vehicles in context of form and utility. Give examples for each. | [4] | CO2 |
| 5. Explain the various wheel proportions, wheel to fender gap used for a | [4] | CO1 |
| a. Luxury Sedan for their length and height. | | |
| b. Micro Car/Sub Compact for their length and height. | | |

SECTION B (20 marks)

- | | | |
|--|-------|-----|
| 6. Discuss the ergonomic design consideration for designing vehicle display and control. | [4+4] | CO5 |
| OR | | |
| Explain how anthropometric principles are applied in designing products | [8] | |
| 7. Describe in brief the ergonomic principles of designing a work system. | [8] | CO5 |
| 8. What do you understand by SgRP? Why it is one of the most important vehicle package dimension? | [4+4] | CO6 |
| 9. Describe any FOUR Design DNA traits followed in international Brands - BMW/Alfa R/ Bentley/ Porsche. Label and illustrate with suitable sketches. | [4x2] | CO1 |

10. A) Draw a TWO-point perspective drawing of a train at station assuming you are standing outside the train. [4+4] CO2
- B) List TWO names of vehicle designers, respective firms and illustrate their work.

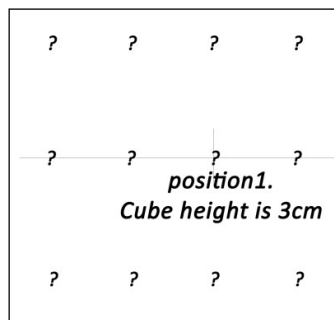
SECTION C(40 marks)

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 and the various tools used. Explain with schematic diagrams. Explain process of Vehicle design in a Design studio from sketch to clay modeling. [6 + 4] CO1, CO2

- B) Imagine a cube of 3cm height in space, in Two Point perspective at position 01 as shown in diagram. Draw the perspective grid of FOUR by FOUR of the same cube. Show the relevant vanishing points and horizon. [10]



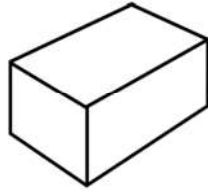
OR

13. A) Explain the TEN styling nomenclatures used to design a CAR. Illustrate and label using suitable diagrams (side view, rear view and [10] CO1, CO2

front view).

B) Design a family car of “ELEGANT” theme from the cuboid. You can divide the cuboid into further blocks as per design. Show the use of contour lines and centerlines. Illustrate the wheels. Explain the styling parameters that you have tweaked to make it look powerful

[10]



*****END*****