Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

V SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: ERGONOMICS IN AUTOMOTIVE DESIGN PE-II [AAE 4026]

REVISED CREDIT SYSTEM
(05/12/2016)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A. Briefly, explain the following: **(05)**
Loads in the L1/S1 region, Effects of armrests, avoid curvature in seat cushion and seat back, avoid long cushion length.

1B. List and explain three types of problem-solving methodologies adopted to solve different problems encountered during development of automotive products. **(03)**

1C. What is the importance of ergonomics in automotive design? **(02)**

2A. List and explain the different angles of driver postures defined by HPM and HPD. **(05)**

2B. Discuss the maximum hand reach study provided in SAE J287. **(03)**

2C. How steering wheel is located in considering occupants packaging? **(02)**

3A. After establishing driver position in vehicle packaging, what are the different zones are considered to place the control and display? Explain any three zones. **(05)**

3B. List the advantages and disadvantages of touch display used in the in-vehicle display. **(03)**

3C. What are the characteristics of good control and good visual display? **(02)**

4A. With a neat sketch write the steps involved to find the obstruction angles β_L and β_R. **(05)**

4B. With a neat sketch explain monocular, binocular and ambinocular views of human eyes. **(02)**

4C. Briefly, explain the following visibility issues **(03)**
a) Light transitivity b) Shade bands c) plane and convex combination mirror

5A. List the problems encounters during entry and exit from passenger car for a driver with short legs, a driver with tall torso and older aged passengers. **(05)**

5B. Briefly, explain the heavy-truck cab entry and exit. **(03)**

5C. What are the different methods are adopted to evaluate the entry and exit for vehicles? **(02)**