MANIPAL INSTITUTE OF TECHNOLOGY



MANIPAL (A constituent unit of MAHE, Manipal)

V SEMESTER B.TECH. (AUTOMOBILE ENGINEERING) END SEMESTER EXAMINATIONS, NOV 2019

SUBJECT: ERGONOMICS IN AUTOMOTIVE DESIGN [AAE 4026]

REVISED CREDIT SYSTEM (27/11/2019)

Т	Time: 3 Hours MAX. MARKS: 50		
	Instructions to Candidates:		
	✤ Answer ALL the questions.		
	 Missing data may be suitable assumed. 		
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1A.	Define anthropometry and biomechanics with suitable examples.	(02)	
1B.	Explain three major consideration in human capability and characteristics in the ergonomics consideration.	(03)	
1C.	List and explain the NINE ergonomic engineer's responsibilities.	(05)	
2A.	What is CTD? What causes CTD?	(02)	
2B.	Explain the complete understanding of L5/S1 phenomenon in vehicle seat design. What is the effect of L5/S1 on armrest?	(03)	
2C.	Explain the reason for the standard dimension / size, to be maintained, for the following along with SAE number: i) Seat cushion length ii) Seat width iii) Seatback height iv) Lateral location of the seat v) Bolster height.	(05)	
3A.	Explain the following phrase with example: i) "What people don't understand, does not exist." ii) "Hands-free may not be risk-free."	(02)	
3B.	List the difference between HPM and HPD.	(03)	
3C.	Explain the following design considerations terms w.r.t developing the occupant package: i) Comfortable seated posture ii) Visibility of interior and exterior area iii) Operating controls iv) Entry and Egress space.	(05)	
4A.	Explain the procedure for maximum hand reach as per the SAE J287 standard.	(02)	
4B.	What are the advantages and disadvantages of touch screen display used in the vehicles?	(03)	

4C.	What Is Field of View? Explain the following characteristics on which driver in a vehicle depends on: (i) the driver (ii) the vehicle (iii) the targets (iv) the environment.	(05)
5A.	List and explain problems during entry and exit.	(02)

5B.	With a neat sketch explain the running board design.	(03)

5C. List and explain important vehicle dimensions during entry and exit. **(05)**