Seat No.: ____

Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY ME – SEMESTER-1 (NEW) EXAMINATION – WINTER 2016

Subject Code: 2714701 Subject Name: Concepts in Mechatronics Engineering

Time: 2:30 pm to 5:00 pm

Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.

Q.1	(a) (b)	What are the types of kinematic pairs? Briefly discuss with neat sketches etc. Explain working principle and construction of DC motor with neat sketch.	07 07
Q.2	(a) (b)	Explain poles and throws in terms of electrical switching. State the procedure and related equations for determining the degree of freedom of a given mechanism.Explain giving example of any one mechanism. OR	07 07
	(b)	State the importance of inversions giving examples of slider crank and four bar mechanisms and their applications. Give neat sketches.	07
Q.3	(a)	Compare open belt and cross belt drive for power transmission stating advantages and disadvantages.	07
	(b)	Explain single phase AC motors.	07
		OR	~
Q.3	(a)	What are the advantages of gear drive? Explain the various gears used for different shaft axes with neat sketches.	07
	(b)	Explain construction and operating mechanism of power MOSFET.	07
Q.4	(a) (b)	Explain the torsion and bending with related equations and sketches. Write a short note on 'factor of safety' giving examples. OR	07 07
Q.4	(a)	Explain longitudinal and torsional vibrations giving neat sketches and related equations.	07
	(b)	State the different cams and followers used in mechanical engineering applications. Give neat sketches.	07
Q.5	(a) (b)	Briefly explain the stepper and servo motor used in electrical actuation. Briefly explain any one thiristor device.	07 07
Q.5	(a) (b)	Write a short note on IGBT. Write a short note on 'selencid'	07
	(U)	while a short note on solenoid.	07

Date:04/01/2017

Total Marks: 70

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