School of Aeronautics (Neemrana)

Instructions For Students / Faculty

Mid Term I (Total 40 Marks, 1 Hr. & 30 Min, Syllabus From Beginning of The Session)

Total number of questions to be given are 8, each carrying 10 marks and it is compulsory to attend 2 questions from each part i.e. Part A and B. There is a choice of two questions out of four in each part. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

Mid Term II (Total 50 Marks, 1 Hr. & 45 Min, Syllabus From Beginning of The Session)

Total number of questions to be given are 8, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and three questions from Part B. There is a choice of two questions out of four in part A and 3 questions out of 4 in Part B. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

Mid Term III (Total 60 Marks, 2 Hrs, Syllabus From Beginning of The Session)

Total number of questions to be given are 10, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and 4 questions from Part B. There is a choice of two questions out of four in part A and 4 questions out of 6 in Part B. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

* LIST OF ELABORATIVE THEORY QUESTION SUBJECTS: Aircraft Materials, Aircraft System, Aircraft Rules & Regulation-I, Mechanics of Composite Materials, Aircraft Design, Aircraft Rules & Regulation-II, Avionics-I, Helicopter Theory, Maintenance of Airframe and System Design, Avionics-II, Airlines and Airport Management, Maintenance of Power Plant & Systems

FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICAL ELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'B' OF QUESTION PAPER

STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF

Question Paper & Student Details

Mid Term*	Mid Term 1	Date of Submission of QP	07/09/2019
Name of Faculty*	varsha	Date of Examination*	09/09/2019
Subject*	7MH3 - Robotics and Machine Vision Syst...	Course*	B.Tech (Mechatronics Engine...
Batch	Second (2)	Semest...	Semester : 7
Email Id of Faculty:*	svarsha2631@gmail.com	Phone Number of Faculty*	935 106 2262

Student Name

Student Reg No.

Part A

Question : 1*

(a) What is robotics ? State the laws of robotics and explain robot specification?

(b) State the advantages of Robot and mention the limitations of robot?

Lesson Plan*	1	Topic*	Introduction of Robotics	Source*	RROBOTICS,LAKSH

Question : 2*

Briefly explain the work envelope with neat diagram?

Lesson Plan*	3	Topic*	Introduction to robotics	Source*	ROBOTICS, LAKSH

Question : 3*

How do you classify robot? Writes its application in aerospace industry?

Lesson Plan* 4   **Topic*** Types of Robot   **Source*** ROBOTICS, LAKSH

Question : 4*

List out four common robot configuration and explain its applications. Describe the merit and demerit of different types of robot configuration?

Lesson Plan* 4   **Topic*** robot configuration   **Source*** ROBOTICS, LAKSH

Part B

Question : 1*

List the various mechanism used in mechanical gripper, Explain it with diagrams? Derive gripper force for any one of the gripper?

Lesson Plan* 5   **Topic*** Grippers   **Source*** ROBOTICS, LAKSH

Question : 2*

The diagram in Fig.1 shows the linkage mechanism and dimension of a gripper used to handle a work part for a machining operation. What is the amount of actuating force is required to deliver 30 lb?

Lesson Plan* 6   **Topic*** gripper force   **Source*** ROBOTICS, LAKSH

Question : 3* The gripper shown in Fig. 2 is a simple pivot type device used for holding the cardboard. The gripper is to be actuated by a piston device to apply actuating force. How much Actuating force is required for holding the cardboard?

Lesson Plan* 6 **Topic*** gripper force **Source*** ROBOTICS, LAKSH

Question : 4* What is end effectors ? Explain types of End effectors?

Lesson Plan* 7 **Topic*** End effectors of robot **Source*** ROBOTICS, LAKSH

Question : 5

Lesson Plan **Topic** **Source**

Question : 6

Lesson Plan **Topic** **Source**

Upload Scanned Document In Case of Numerical or Diagram for any of the above question

archive-1.zip (164 KB)   +

Mention question number with relevant fig / numerical / equations. Max 150 KB

I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.

Fig. 1

Fig. 2
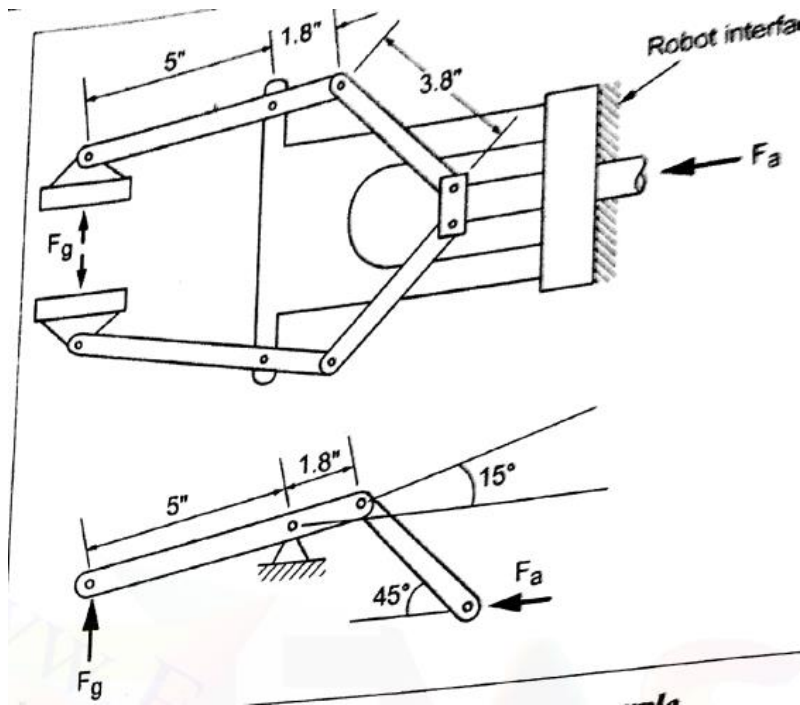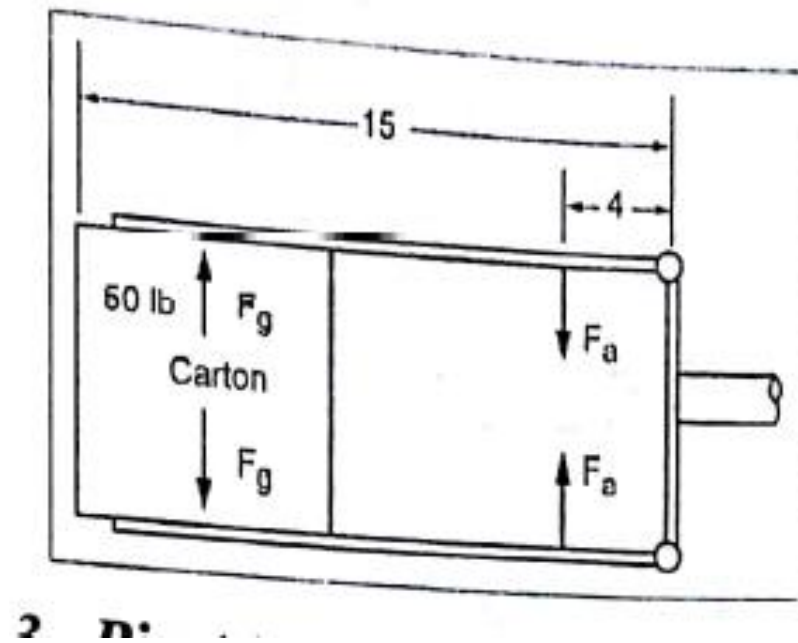
Answer Sheet Details	
Mid Term	Mid Term 1
Name of Faculty	varsha
Subject	7MH3 - Robotics and Machine Vision System (Old)
Date of Submission of QP	14/09/2019
Batch	Second (2)
Email Id of Faculty:	svarsha2631@gmail.com
Date of Examination	09/09/2019
Course	B.Tech (Mechatronics Engineering)
Semester	Semester : 7
Phone Number of Faculty	935-106-2262

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Part A

Question : 1	First Law: A robot may not injure a human being, or, through inaction, allow a human being to come to harm. Second Law: A robot must obey orders given it by human beings, except where such orders would conflict with the First Law. Third Law: A robot must protect its own existence as long as such protection does not conflict with the First or Second Law. Specification of Robots: 1. Degree of Freedom 2. Repeatability 3. Pay load 4. Max speed 5. Load capacity Limitaions of Robots: 1. Payload to robot weight ratio is poor. 2. The robot repeatibility and accuracy can constaint the range of potential applicatio. 3. Robot structural configuration often constraint joint limit and thus the work volume.
Question : 2	Work enevelop 1. Cartesian 2. Culindrical 3. Spherical 5. Rectangular 6. Scara Explain advantages and disadvantage of each with neat diagram.
Question : 3	Classification of Robots: 1. Based on motion 2. Based on degree of Freedom 3. Based on drive 4. Based on fingre 5. Based on control system 6. Based on Application 7. Based on Configuration

Question : 4	Four type of configurtion 1. Polar configuration 2. Cartesian configuration 3. Cylindrical configuration 4. Revolute configration
Part B	
Question : 1	Different mechanism used in mechanical gripper are: 1. linkage actuation 2. Gear and rack actuation 3. Cam actuation 4. Screw actuation 5. Rope and pulley actuation 6. Miscellenious Mechanical force depends on friction, number of fingers, acceleration due to gravity.
Question : 2	1. The analysis would required that the moment about the pivote arms be summed and made equal to zero. 2. The piston device would have to provide an actuating force of 188lb to close the gipper with a force against the cartoon.
Question : 3	1. Draw free body diagram of the figure. 2. how the symmetric of the figure can be used to advantages so that only one- half of the mechanism needs to be considered. 3. The moment might be summed about the pivote point for the finger link against which the 30lb gripper force is applied. 4. The actuating force applied to the plunger to deleiver this force of 92.94lb to each finger is pictured. 5. 133.44lb actuating force is produced.
Question : 4	End effector In robotics, an end effector is a device or tool that's connected to the end of a robot arm where the hand would be. The end effector is the part of the robot that interacts with the environment. types of end effector Grippers. Grippers are the most common type of end effector. ... Force-Torque Sensors. Force-torque sensors (FT sensors) are pucks installed between the robot flange and the tool that interacts with the part. ... Material Removal Tools. ... Welding Torches. ... Collision Sensors. ... Tool Changers.
Question : 5	
Question : 6	
Upload Scanned Document In Case of Numerical or Diagram for any of the above question	

I have scrutinized the answer sheet. There is no spelling mistake or any type of irrelevant answers.

The message has been sent from 157.37.230.46 (India) at 2019-09-16 12:09:21 on Chrome 76.0.3809.132
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