



**ZEAL EDUCATION SOCIETY'S  
ZEAL COLLEGE OF ENGINEERING AND  
RESEARCH  
NARHE | PUNE -41 | INDIA**



Record No.: ZCOER-ACAD/R/16K

Revision: 00

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**Unit Test –V**

**Department: Robotics & Automation Semester: II**

**Academic Year: 2023-2024**

**Class and Div.: TE A**

**Date: 14/04/2024**

**Course: Robot Programming**

**Maximum Marks: 30**

**Duration: 1 Hr**

**General Instructions (If any):**

1. Qu.1 or Qu.2 , Qu.3 or Qu.4, Qu.5 or Qu.6 and Qu.7 or Qu.8
2. Neat diagrams must be drawn whenever necessary.
3. Figures to the right indicate full marks.
4. Use of calculator is allowed.
5. Assume suitable data whenever necessary.

Question No.		Question	Marks	CO	Blooms Level
Q1	A	<p>Explain the following program used in AML for gripper:</p> <pre> GRASP: SUBR(GRIPPER_OPENING,&lt;MIN_OFS,MAX_OFS&gt;,F); TOGO: NEW REAL; FMONS: NEW APPLY(\$MONITOR,PINCH_FORCE(F)); CLEANUP(\$CLN);  MOVE(GRIPPER,GRIPPER_OPENING+MIN_OFS,FMONS);  IF QMONITOR(FMONS(1)) EQ O THEN BEGIN IF QMONITOR(FMONS(2)) EQ O THEN RETURN('TOO SMALL'); TOGO = GRIPPER_OPENING+MIN_OFS-QPOSITION(GRIPPER); DMOVE(XYZ# &lt; GRIPPER&gt;, (TOGO/2*(HANDFRAME)(2,2))# &lt; TOGO&gt;,FMONS(1)); END ELSE IF QMONITOR(FMONS(2)) EQ O THEN BEGIN TOGO = GRIPPER_OPENING+MIN_OFS-QPOSITION(GRIPPER); DMOVE(XYZ# &lt; GRIPPER&gt;, (-TOGO/2*HANDFRAME)(2,2))# &lt; TOGO&gt;,FMONS(2)); END;  RETURN( IF QPOSITION(GRIPPER) LE GRIPPER_OPENING+MAX_OFFSET THEN 'OK' ELSE 'TOO BIG');  CLN: SUBR: ENDMONITOR(FMONS); END; END;</pre>	15	CO 4	Apply

		<pre> <b>PRESENCE: NEW &lt;LED,1,ON,ON&gt;;</b> <b>NO_PRESENCE: NEW &lt;LED,1,ON,ON&gt;;</b>  <b>PINCH_FORCE: SUBR(F);</b>   <b>RETURN(&lt;&lt;SLP,SRP&gt;,</b>     <b>1,O,F&gt;&gt;);</b> <b>END;</b>  <b>ANY_FORCE: SUBR(F);</b>   <b>RETURN(PINCH_FORCE(F)</b>     <b>#SIDE_FORCE(F)#TIP_FORCE(F));</b> <b>END;</b>  <b>NO_SENSING: NEW &lt;&gt;;</b>  <b>APPROACH_MOVE(OBJECT_PLACE,&lt;0,0,0&gt;,3.5,PRESENCE);</b> <b>APPROACH_MOVE(HANDFRAME,&lt;0,0,-1&gt;,3.5,</b>   <b>TIP_FORCE(3.0*OZ),SLOWLY);</b> <b>FINAL_MOVE(HANDFRAME,&lt;0,0,.1&gt;,3.5,NO_SENSING);</b> <b>GRASP(1.5,&lt;-.1,.1&gt;,16.0*OZ);</b> </pre>			
OR					
Q2	A	Explain various sensor instructions used in AML?	07	CO 1	Understandi ng
	B	Explain the following code & output when executed in AML: <ul style="list-style-type: none"> <li>i. MONITOR (LED, 2,0,0,1.5, 'passed');</li> <li>MOVE (ARM, fgoal, LED);</li> <li>ii. ATTN: SUBR;</li> <li>MOTPARMS: NEW STOPMOVE;</li> <li>WAITMOVE;</li> <li>BREAK (EOL, 'ATTENTION REQUESTED');</li> <li>APPLY ('AMOVE', MOTPARMS);</li> <li>END;</li> </ul>	08	CO 1	Understandi ng
Q3	A	Explain the following program used in AML for palletization:	15	CO 1	Apply

		<pre> PALLET: SUBR(COUNTS,SPACING,PLACE); WHERE: NEW NILTRANS; IF ?PLACE THEN   (IF AGGSIZE(PLACE) EQ 3 THEN &amp;WHERE(1) ELSE &amp;WHERE) =PLACE RETURN(&lt;&lt;1,1&gt;,       COUNTS,       SPACING,       WHERE,       WHERE&gt;);  END;  -----  PALLET_GOAL: SUBR(!P); RETURN(P(5)); END;  -----  INDEX_PALLET: SUBR(!P); IF P(1,1) LT P(2,1) THEN   P(1,1) = P(1,1) + 1 ELSE IF P(1,2) LT P(2,2) THEN   P(1) = &lt;1,P(1,2)+1&gt; ELSE RETURN('EXHAUSTED'); P(5,1) = DOT((P(1)-1)*P(3)#&lt;0&gt;,P(4,2))+P(4,1); RETURN('OK'); END;  -----  RESET_PALLET: SUBR(!P,NEW_INDICES,NEW_LOC); IF ?NEW_LOC THEN   IF AGGSIZE(NEW_XF) EQ 3 THEN     P(4,1) = NEW_LOC   ELSE P(4) = NEW_LOC; IF ?NEW_INDICES THEN    IF NEW_INDICES GT P(2) OR NEW_INDICES LE 0 THEN     RETURN('ILLEGAL_BOUNDS');   ELSE P(1) = NEW_INDICES  P(5,1) = DOT((P(1)-1)*P(3)#&lt;0&gt;,P(4,2))+P(4,1)  RETURN('OK'); END; </pre>			
OR					
Q4	A	Define Dynamic Variable. How dynamic variable is used in AML?	07	CO 1	Apply
	B	Explain the following instruction in AML with example: i. ACCEL ii. WAITMOVE iii. SETTLE iv. QGOAL	08	CO 1	Understandi ng

----- ALL THE BEST -----