

Total No. of Questions :8]

SEAT No. :

PE2692

[Total No. of Pages : 3

[6583]-242

**T.E. (Robotics and Automation)**  
**ROBOT PROGRAMMING**  
**(2019 Pattern) (Semester-VI) (311508A)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1, or 2, Q.3 or 4, Q.5 or 6, Q.7 or 8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figure to the right indicates full marks.
- 4) Use of Calculator is allowed.
- 5) Assume Suitable data if necessary.

Q1) a) Explain the following instructions with relevant examples in VAL II programming language. [10]

- i) FLIST
- ii) DPART
- iii) IOGET
- iv) WVSET
- v) ABORT

b) Write a VALII language code for weldment of the following path: [8]



Details of trajectory path: Y1 is Home position, Y1-Y2 is straight path, Y2-Y3 triangular weave, Y4-Y5-Y6 circular arc, Y6-Y7 is straight path, and Y7-Y8-Y9 circular arc.

OR

P.T.O.

- Q2) a)** Write a short note on production rate calculations using robot. [9]
- b)** Explain the following codes and comment on output after execution of codes in VAL II programming language. [9]

i) APPRO P1 50	ii) WSET 1= 15, 27, 37
MOVE P1	MOVE X1
CLOSEI	WSTART 1
DEPART 150	CIRCLE X1, X2, X3
OPENI	DEPART 150
END	

- Q3) a)** Explain the following instructions in detail: [9]

i) SetDo do 15, 1;

ii) MoveAbsJ p50, v50, z30, tool2;

iii) MoveL offs(p2, 0, 0, 10), v100, z50, tool1;

iv) VAR num length;

v) MoveL p10, v1000, z50, tool10/WObj:=wobj1;

- b)** Write a short note on pick and place commands in RAPID language. [9]

OR

- Q4) a)** Write a RAPID language code and flowchart to calculate the volume of sphere. [9]
- b)** Explain the programme structure of RAPID language. State the general rules to write programs in RAPID language. [9]

- Q5) a)** Write a short note on Variable declaration in AML programming language. [9]

- b)** Explain the following instructions in detail in AML language: [8]

i) MOVE (<JX, JY>, <9.5, 1.4>);

ii) DEFIO (21, 0, 1, 1, 1);

iii) READ (0, DATA2)

iv) DISPLAY ('Hello', EOL);

OR

- Q6)** a) Write a short note on sensor commands in AML language. [9]  
b) Explain the following instructions with relevant examples in AML language: [8]  
i) ERASE  
ii) ENDMONITOR  
iii) ACCEL  
iv) QGOAL

- Q7)** a) What are the key features of Robot Studio online software, and how are they utilized in different stages of robot programming? [9]  
b) What challenges arise in scenarios involving multiple robots and machine interference, and how are they typically addressed? [8]

OR

- Q8)** a) How is jogging performed in virtual robotics, and what are the primary components involved? [9]  
b) Write a short note on Robot cycle time analysis. [8]