Reg.No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

II SEM. M. Tech. (MANUFACTURING ENGG. & TECH.)
END SEMESTER EXAMINATIONS

APRIL 2018

SUBJECT: **PRODUCTION AUTOMATION [MME- 5222]**
REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer all the questions.
- Missing data may be suitable assumed.

1A. Explain the salient features of following types of production with sketch. **(02)**
i) Process Type Layout ii) Cellular Layout

1B. Explain the principle of working of touch trigger probe with a sketch and list its applications in CNC machines. **(04)**

1C. Write the steps followed in computer assisted CNC programming. **(02)**

1D. Explain the working of an incremental encoder which is used as a feedback device in CNC system. **(02)**

2A. Explain the working of LM Guideways with sketch and state its advantages over the conventional guideways. **(03)**

2B. Write the nomenclature of Tungsten carbide inserts used in Turning center tools. **(03)**

2C. Explain the different types of tool magazines used in CNC machining centers with sketch. **(04)**

3A. List the steps followed in conducting the process capability study in a CNC machine with tabular column and related formulae. **(04)**

3B. Explain the following features of Computer Numerical Control system. **(03)**
i) Tool Length offset in CNC Turning center
i) Cutter Radius Offset in Vertical Machining Center

3C. Sketch the arrangement and write the allowable error while conducting the following geometry tests on a CNC Turning Centre. **(03)**
i) Runout of spindle nose.
ii) Parallelism of spindle axis to turret movement.

4A. A point P(7,3,2) is attached to a frame (a,b,c) and subjected to the following transformations. Find the coordinates of the point relative to the reference frame. **(04)**

a) Rotation of 90 about Z axis
b) Rotation of 90 about Y-axis
c) Translation by [4,-3,7]

4B. Explain the architecture of machine vision system in detail **(04)**

4C. Sketch and explain the working of cylindrical configuration robot. **(02)**

5A. Write a note on magnetic grippers highlighting their features. **(03)**

5B. A Robot must pick up the components from incoming conveyor system and place on different locations of the pallet as shown in the figure Q5(B). The spacing between dropping location is 20 cm in both x and y directions. Using the appropriate commands write the complete compact robot program to achieve this task efficiently. Assume suitable variable locations. **(05)**

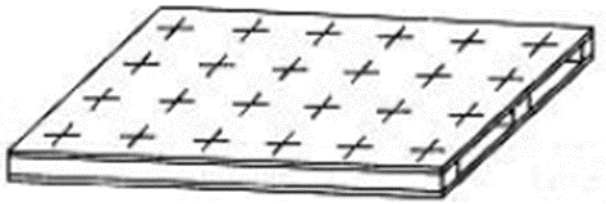

Figure Q5(B). Pallet for placing components

5C. List the factors to be considered in Work Cell Design. **(02)**