Code No: **R42034** **R10** **Set No. 1**

IV B.Tech II Semester Supplementary Examinations, April - 2018

AUTOMATION IN MANUFACTURING

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1 a) Define `Fixed Automation' and `Flexible Automation'. Enumerate the differences between them. [8]
b) Explain any one mechanical feeding device with neat sketch. [7]

2 a) Draw the neat sketches of the Rachet and Pawl mechanism and discuss briefly. [8]
b) What is a buffer storage? Explain the two principle reasons for the use of buffer storage zones. Show by means of a diagram, the case of two processing lines separated by a storage buffer. [7]

3 a) Discuss the efficiency of automated flow lines with storage buffer. [8]
b) Write a short note on partial automation. [7]

4 Consider the following problem of assembly line balancing.

Task	Task Time(Min)	Immediate Predecessor
A	0.9	--
B	0.4	A
C	0.6	B
D	0.2	C
E	0.3	D
F	0.4	E
G	0.7	F
H	1.1	G

Assuming that 55 minutes per hour are productive, compute the cycle time needed to obtain 50 units per hour as the output. Determine
(i) The minimum number workstations required and assign tasks based on largest candidate rule
(ii) Compute line utilization [15]

5 a) Describe the unit load carrier AGV with the help of simple sketch. [8]
b) An overhead trolley conveyor is configured as a continuous closed loop. It has a delivery loop length of 75 m and return loop of 60 m. Each hook on the conveyor can hold one part, and the hooks are separated by 4.5 m. The speed of the conveyor is 40 m/min. Determine the total number of parts in the conveyor system, and the parts flow rate. [7]

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6 a) Briefly describe the Storage structure of an AS/RS. [8]
b) Discuss the use of automated work-in-process storage systems. [7]

7 a) Name the different types of adaptive control systems and distinguish between them. [8]
b) Draw the block diagram of Adaptive Control with Optimization system for drilling process. [7]

8 Explain the following:
(i) Any two types of CMM
(ii) Contact vs non contact inspection
(iii) Automated inspection vs manual inspection [15]