RV College of Engineering®
Mysore Road, RV Vidyaniketan Post,
Bengaluru - 560059, Karnataka, India

**Date : **	**CIE – 1**	**Max. Marks : 10 + 50**
Semester : III	**UG**	**Duration : 30 + 90 Min**
Course Title: Work Systems Design		**Course Code : IM233AI**

SCHEME & SOLUTIONS

Sl. No	Solutions with Scheme	M
	Part – A	
1.	Cumulative/ Continuous & Snapback/ Fly back	2
2.	Any Four of Five symbols. Each ½ mark.	2
3.	A two-handed process chart records the motions of the left and right hands of an operator.	2
4.	Cycle time is the total time to complete one unit of work. It is used to balance workloads and plan production.	2
5.	Normal Time = Observed Time × (Performance Rating / 100)	2
	Part – B	
1.	Three phases: Manual Production, Automated Production, Automated Integrated Production. Explanation-2m each phase. Illustration-4m	10
2.	Any five principles…Each 1 mark Application in workstation design – 3 marks Examples – 2 marks	10
3.	Stepwise explanation (at least 6 steps) – 6 marks, Clarity and logical flow – 2 marks, Example or application – 2 marks Steps: 1. Select the task to be studied 2. Obtain and record job-related information 3. Break the task into elements 4. Time each element using a stopwatch 5. Apply performance rating to get normal time 6. Add allowances to compute standard time *Example:* Setting standard time for packaging 100 units using observed time and allowances.	10
4.	Step 1: Calculate Normal Time for Each Element….4m Step 2: Compute Total Normal Time…2m Step 3: Apply Allowances to Get Standard Time Standard Time = 42.67 seconds….4m	10
5.	○ At least 4 factors – 4 marks	10

	○ Explanation of impact – 4 marks ○ Example – 2 marks Factors: • Task complexity • Repetitiveness • Time availability • Required accuracy Complex, repetitive tasks may justify slower methods like MTM. Quick estimates for new tasks favor analytical estimating. *Example:* Using MOST for warehouse tasks due to time constraints.	