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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

December 2023 Supplementary Examinations

Programme: B.E. **Semester: IV**
Branch: Industrial Engineering and Management **Duration: 3 hrs.**
Course Code: 22IM4PCINE **Max Marks: 100**
Course: Industrial Engineering

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.
3. Use of Statistical data permitted.

		UNIT - I	*CO*	*PO*	Marks
1	a)	In today's context How can industrial engineers contribute to sustainability efforts in any organization?	*CO1*	*PO1*	**05**
	b)	Modern Manufacturers (M&M) produces fruit crates, which it sells to farmers. With the current equipment, M&M produces 240 crates per 100 logs. It currently purchases 100 logs per day, and each log requires three labor hours to process. M&M is considering the hire of a professional buyer who can buy better quality logs at the same cost. If this is the case, M&M can increase production to 260 crates per 100 logs, and the labor hours required will increase by eight hours per day (for the buyer). a. Compute the labor productivity for the current method (i.e., no buyer). b. What will the labor productivity be if M&M hires the professional buyer? Suppose that M&M spends INR 12 per hour for each worker who constructs the crates. The buyer, however, is paid INR 24 per hour. The material cost is INR10 per log (regardless of who purchases them). c. Compute the multifactor productivity for the current method, using crates per dollar cost as the measure. d. How does the multifactor productivity change if the professional buyer is hired?	*CO2*	*PO2*	**10**
	c)	What are the key objectives of Industrial Engineering?	*CO1*	*PO1*	**05**
		OR			
2	a)	An employee works 48 hours in a week where the regular working hours are 40 hours per week, and the overtime rate is 1.5 times the regular hourly wage of INR 12 per hour. Calculate the employee's gross weekly wage including overtime pay.	*CO2*	*PO2*	**06**

		b)	What are the advantages and challenges of implementing Work Study techniques in a manufacturing or service industry setting?	*CO1*	*PO1*	**08**
		c)	Explain the time line of evolution of Industrial Engineering.	*CO1*	*PO1*	**06**
			UNIT - II			
	3	a)	With necessary assumptions Develop a man-type flow process chart for making copies at a college photocopy shop.	*CO3*	*PO3*	**08**
		b)	Construct a two-handed process chart for a clerk signing a letter and then placing the letter in the out tray. The letter is on the desk right of the clerk, the pen is to the right and the out tray to the left	*CO3*	*PO3*	**08**
		c)	Differentiate between micro motion and memo motion study	*CO1*	*PO1*	**04**
			UNIT - III			
	4	a)	Following datas were obtained by a work study personnel for assembly of a product. (i) **Maintenance time** (a) Get out and put away tools = 12.0 min / day (b) Cleaning of machine = 5.0 min / day (c) Oiling of machine = 5.0 min / day (d) Replenish coolant supply = 3.0 min / day (ii) **Interruption** (a) By foreman = 5.0 min / day (b) By porter = 4.0 min / day (iii) **Others** (a) Delay time due to power outage = 6.0 min / day (b) Personal time = 20.0 min / day Form the above data determine (i) total allowances (ii) total available cycle time (iii) Productive hours	*CO3*	*PO3*	**06**
		b)	Differentiate between predetermined motion time standards and method time measurements	*CO1*	*PO1*	**05**
		c)	List any 5 advantages, disadvantages and applications of Time study technique.	*CO1*	*PO1*	**09**
			OR			
	5	a)	Industrial engineer wants to assess the productivity of employees in a call center. Industrial engineer conducts a work sampling study over a 2-week period, taking 200 random observations during employees' working hours. Out of these observations, she finds that employees are engaged in active call handling for 120 observations. a. Calculate the estimated percentage of time employees spend on active call handling. b. Determine the margin of error for this estimate with a 95% confidence level.	*CO3*	*PO3*	**08**

		b)	In a packaging department, you have observed three workers performing the same packaging task. The observed times for each worker are as follows: Worker A: 15 minutes Worker B: 18 minutes Worker C: 20 minutes The performance ratings for each worker are as follows: Worker A: 100% Worker B: 95% Worker C: 90% Calculate the standard time for the packaging task.	*CO3*	*PO3*	**06**
		c)	List some of the common work measurement tools used for calculating standard time for an activity.	*CO1*	*PO1*	**06**
			UNIT - IV			
	6	a)	With a neat sketch explain components of man-machine system	*CO1*	*PO1*	**10**
		b)	List and explain various work-related stresses that can impact the human body	*CO1*	*PO1*	**10**
			UNIT - V			
	7	a)	List and explain various factors considered in workplace design.	*CO4*	*PO3*	**10**
		b)	Write short notes on: Reasons for organizations to adopt JIT List some of the key roles that the SCLM play in industrial engineering.	*CO1*	*PO1*	**10**

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