**Student name (                                         )       Student ID (                                            )**

1. S & OP exercise

Based on the given information, calculate the total cost for Chase strategy and Level strategy.

Which strategy is better and what is the total cost when using mixed strategy?

- Regular time working hours for a worker is 160 hours per month and overtime is limited to 30 percent of the regular time capacity. Currently have 30 workers and they are paid $15 for regular time, $22 for overtime. Unused overtime capacity has no cost and unused regular time is paid $15. Hiring cost for a worker is $3000 and firing cost is $1500.

**Chase strategy**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Period (month) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Total |
| Forecasted demand (hrs) | 5000 | 7000 | 10000 | 12000 | 16000 | 11000 | 8500 | 6000 |  |
| Workforce level  (workers) |  |  |  |  |  |  |  |  |  |
| Undertime (hrs) |  |  |  |  |  |  |  |  |  |
| Overtime (hrs) |  |  |  |  |  |  |  |  |  |
| Utilized time (hrs) |  |  |  |  |  |  |  |  |  |
| Hires (workers) |  |  |  |  |  |  |  |  |  |
| Layoffs (workers) |  |  |  |  |  |  |  |  |  |
| Cost | | | | | | | | | |
| Utilized time |  |  |  |  |  |  |  |  |  |
| Undertime |  |  |  |  |  |  |  |  |  |
| Overtime |  |  |  |  |  |  |  |  |  |
| Hires |  |  |  |  |  |  |  |  |  |
| Layoffs |  |  |  |  |  |  |  |  |  |
| Total cost |  |  |  |  |  |  |  |  |  |

**Student name (                                         )       Student ID (                                            )**

**Level strategy**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Period (month) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Total |
| Forecasted demand (hrs) | 5000 | 7000 | 10000 | 12000 | 16000 | 11000 | 8500 | 6000 |  |
| Workforce level  (workers) |  |  |  |  |  |  |  |  |  |
| Undertime (hrs) |  |  |  |  |  |  |  |  |  |
| Overtime (hrs) |  |  |  |  |  |  |  |  |  |
| Utilized time (hrs) |  |  |  |  |  |  |  |  |  |
| Hires (workers) |  |  |  |  |  |  |  |  |  |
| Layoffs (workers) |  |  |  |  |  |  |  |  |  |
| Cost | | | | | | | | | |
| Utilized time |  |  |  |  |  |  |  |  |  |
| Undertime |  |  |  |  |  |  |  |  |  |
| Overtime |  |  |  |  |  |  |  |  |  |
| Hires |  |  |  |  |  |  |  |  |  |
| Layoffs |  |  |  |  |  |  |  |  |  |
| Total cost |  |  |  |  |  |  |  |  |  |

**Mixed strategy**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Period (month) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Total |
| Forecasted demand (hrs) | 5000 | 7000 | 10000 | 12000 | 16000 | 11000 | 8500 | 6000 |  |
| Workforce level  (workers) |  |  |  |  |  |  |  |  |  |
| Undertime (hrs) |  |  |  |  |  |  |  |  |  |
| Overtime (hrs) |  |  |  |  |  |  |  |  |  |
| Utilized time (hrs) |  |  |  |  |  |  |  |  |  |
| Hires (workers) |  |  |  |  |  |  |  |  |  |
| Layoffs (workers) |  |  |  |  |  |  |  |  |  |
| Cost | | | | | | | | | |
| Utilized time |  |  |  |  |  |  |  |  |  |
| Undertime |  |  |  |  |  |  |  |  |  |
| Overtime |  |  |  |  |  |  |  |  |  |
| Hires |  |  |  |  |  |  |  |  |  |
| Layoffs |  |  |  |  |  |  |  |  |  |
| Total cost |  |  |  |  |  |  |  |  |  |

**Student name (                                         )       Student ID (                                            )**

2. Resource planning exercise

Developing a Master Production Schedule based on given information

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Item: Round Table | Order Policy: 150 units  Lead time: 1 week | | | | | | | |
| Quantity on hand: 50 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Forecast | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Customer orders booked | 24 | 17 | 35 | 13 | 5 | 0 | 0 | 0 |
| Projected on-hand  inventory |  |  |  |  |  |  |  |  |
| MPS quantity |  |  |  |  |  |  |  |  |
| MPS start |  |  |  |  |  |  |  |  |
| Available-to-promise  (ATP) inventory |  |  |  |  |  |  |  |  |

3. Sequencing jobs at a workstation exercise

- There are 5 jobs in backlog. Determine the schedule by using the FCFS rule, and calculate the average days past due and flow time.

|  |  |  |  |
| --- | --- | --- | --- |
| Customer | Time Since Order Arrived (days ago) | Processing time  (days) | Due date  (days from now) |
| A | 10 | 22 | 30 |
| B | 15 | 8 | 17 |
| C | 8 | 19 | 35 |
| D | 0 | 14 | 40 |
| E | 3 | 18 | 35 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Customer Sequence | Start time  (days) |  | Processing time (days) |  | Finish time (days) | Due date | Days past due | Days ago since order arrived | Flow time (days) |
|  |  | + |  | = |  |  |  |  |  |
|  |  | + |  | = |  |  |  |  |  |
|  |  | + |  | = |  |  |  |  |  |
|  |  | + |  | = |  |  |  |  |  |
|  |  | + |  | = |  |  |  |  |  |

Average days past due ( ) Average flow time ( )