

Q1.

1 container contains

$$27 \text{ server rack} * 13 \text{ servers} \\ = 351 \text{ servers}$$

$$\text{Purchase + deployment cost of 1 container} = 625 \text{ L}$$

$$\text{Electricity consumption of 1 server} = 100 \text{ W/hr}$$

$$\text{" " " 351 server} = 35100 \text{ W/hr} \\ (\text{i.e., one container})$$

$$\text{Electricity cost} = 10 \text{ INR per KWh}$$

$$\text{for } 35100 \text{ KW/hr} = 35 \cdot 100 * 10 \text{ INR} \\ = 351 \text{ INR (for 1 hour)}$$

$$\text{For 30 day} = 351 * 24 * 30 \text{ INR} = 25272 \text{ L (for 10 containers)}$$

$$\text{Warehouse cost to keep 5 container} = 10 \text{ L/month}$$

$$\text{Staff cost to monitor 5 container} = 1.2 \text{ L/month}$$

Total cost to maintain 10 container

$$= (625 * 10) \text{ L} + 3(25272) \text{ L} + \\ (10 * 2) \text{ L} + (1.2 * 2) \text{ L}$$

$$= (6250 + 25272 + 20 + 2.4) \text{ L}$$

$$= \boxed{6297.672 \text{ L}}$$



Q 2.

XYZ wants service from provider P

- (a) Availability guarantee = 98.5% over the service period
- (b) Service period = 30 days
- (c) Max service hr per day = 22 hours
- (d) Cost per day = 12500 INR
- (e) Service credit allocation to the account if availability guarantees are not satisfied.

Uptime %	Service Credit
< 98.5%	5%
< 98%	15%
< 97.5%	25%
< 97%	35%

Five outages observed

- (i) 3 hour 35 minutes
- (ii) 1 hr. 15 minutes
- (iii) 5 hour 20 minutes
- (iv) 35 minutes
- (v) 3 hour 45 minutes

} Various days



② Total outage in minutes

$$3 \times 60 + 35 + 60 + 15 + 320 + 225 + 35$$

$$215 = 215 + 75 + 320 + 225 + 35$$

$$= 870$$

$$\begin{array}{r} 215 \\ 75 \\ 320 \\ 225 \\ \hline 815 \text{ minutes} \\ + 35 \\ \hline 850 \end{array}$$

③ Total availability in minutes

$$30 \times 22 \times 60 - 870$$

$$39600 - 870$$

$$= 38730 \text{ minutes}$$

④ Total cost if negotiation is not honoured

$$12500 \times 30 = 375000 \text{ INR}$$

⑤ SLA violation cost

$$= \frac{\text{Total availability} \times 100}{\text{Total service time}}$$

$$= \frac{38730 \times 100}{39600}$$

$$= 97.80 \%$$

$$\text{service credit} = 15\%$$

$$\frac{15}{100} \times 375000$$

$$= 56250 \text{ INR}$$

⑥ Effective payable cost = 375000

$$- \frac{56250}{318750 \text{ INR}}$$



4

Availability guarantee = 99.5% over time  
 Service period = 30 days  
 Maximum service hour = 15 hr/day  
 Cost = INR 2500 per day

uptime %	Service credit
< 99.5%	15%
< 99%	25%
< 90%	35%

### Outage

- (i) 1 hr 30 minutes
- (ii) 30 minutes
- (iii) 5 minutes
- (iv) 20 minutes
- (v) 10 minutes

Compute the effective payable cost

$$\text{Total downtime} = 90 + 30 + 5 + 20 + 10 \\ = 155 \text{ minutes}$$

$$\text{Total service time} = 30 \times 15 \times 60 \\ = 27000 \text{ minutes}$$

$$\text{Total cost without service credit} = 30 \times 2500 \\ = 75000 \text{ INR}$$

$$\text{Total service provide} = \frac{26845}{27000} \times 100 = 99.42\%$$

$$\text{Effective payable cost} = 75000 - \left( \frac{75000 \times 15}{100} \right) \\ = 63750$$



$$\text{Effective payable cost} = 75000 * \left(1 - \frac{15}{100}\right)$$

$$= 75000 * \frac{85}{100} = \boxed{63750}$$

③

70000 per hour

Time 3 years

Efficiency 40%

power & cooling cost 3 per hour

Management 2

70000

+ 3 \* 24 \* 365 \* 3

+ 2 \* 24 \* 365 \* 3

= 201400

—

7

80%

1

7 \* 24 \* 365 \* 3

+ 1 \* 24 \* 365 \* 3

= 8 \* 24 \* 365 \* 3

= 210240