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Section (A) BS(SE) 4
Operations Research

MAJOR ASSIGNMENT

Question (2)

* The MD of the compeny has the following goals which are arranged in order of priority
* P_1 No under utilization of plant production capacity.
* P_2 Sells maximum possible number of products A and B. the "MD" has twice as much desire to sell product "A" as far product "B", because the net profit of product "A" is twice the amount from that of product B.
* P_3 Maximise overtime operation of the plant.

We are formulating the above as goal programming problem and solving it -

Let x_1 and x_2 be the number of product A and B - Since :-

$$x_1 + x_2 + z_1^- - z_1^+ = 500 -$$

where z_1^- = under utilization of product capacity variable

z_1^+ = overtime production operation capacity variable -

* goal is the maximization of sales.

Then $x_1 + z_2^- = 150 -$

and $x_2 + z_3^- = 200 -$

where z_2^- = under achivment of sall goals of Product "A" -

z_3^- = under achierment of the sall goal of product "B" -

Minimise

$$V = P_1 d_1^- + 2P_2 d_2^- + P_2 d_3^- + P_3 d_1^-$$

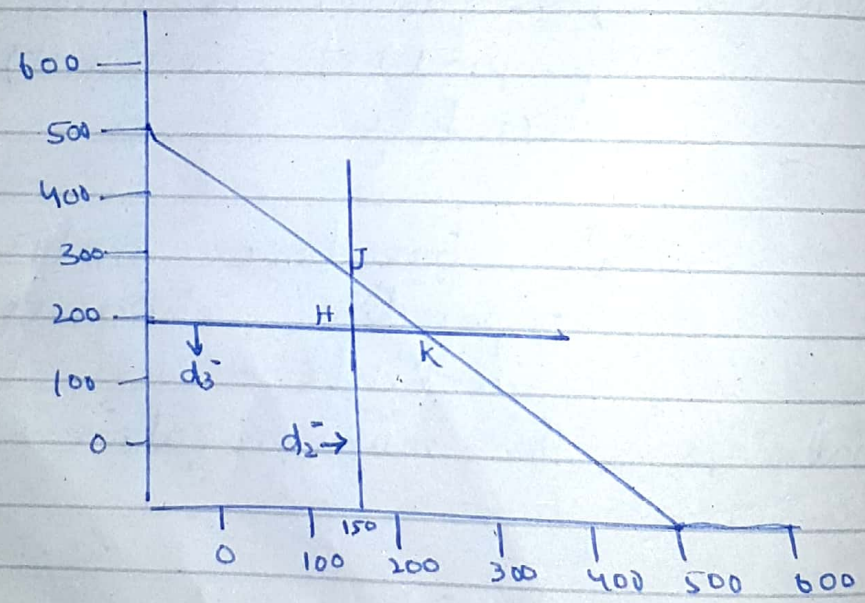
subjucted to constraints

$$X_1 + X_2 + d_1^- - d_1^+ = 500$$

$$X_1 + d_2^- = 150$$

$$X_2 + d_3^- = 200$$

and $X_1, X_2, d_1^-, d_2^-, d_3^-, d_1^+ \geq 0$



Question 3 (Answer) (4)

Reasearch papes-

Sumarrey

Introductions-

* The CPM (critical path Method) technique is used to search out the longest path to do required activities-

This has been done to reduce the restriction and enhance the computing potency of classic CPM analysis.

* It will replicate all of the various interaction communications, and defects of a path within the kind of project network diagram.

* This technique is used to hunt down the longest path to perform activities which ends up the creation of an intensive network of prsi ndency activties

inside the targeted Surrounding.
* In CPM network calculations it is assumed that each interaction occurs at a specific time.
* By plotting the curve supporting the time-cost line, the gradient obtained throughout this curve may be used to do specific calculations

Literature Review :-
* CPM can be useful an many aspects of life In the past many authors have been Succeeded in exploiting CPM to calculate the time, resources and value required for projects and events.

Dragon fly ALGORITHM :-
These creature proform task expeditiously in groups. and this can be the most purpose of the Study Said (SI) Swarm Intelligence.

Researchers through out this field attempt to resolve the native rules for interaction.

The particle Swarm Improvement formula is, in addition another well-regarded SI paradigm -
The Substitute Bee colony is another recent and trendy SI based formula This is formula another time stimulate the social behavior of honey bees once hunt necter and has been projected by Karaboga-

CPM STIMULATIONS-
* The classic CPM analysis is easy and effective for straight forward, and small-scale CPM network- while facing complicated large scale CPM network CPM formula becomes inefficient-

Research METHODOLOGY :-
The benifit of these kind of approches are to use the dragonflies to achiere goals such as environmental identifications and many more -

The pattern of dragon flies are below -

* Splitting, settings, coherence search food, Deviation from the enemy -

$E_i = X^- + X$

X = positive of the current Individual -

X^- = shows the position of the enemy -

* The method of calculating the dragon fly algorithm -

S shows the Seperation rate -

S_i shows the Seperation of J^{th}

C_i is the coherence of the person J^{th} -

'A' is the J^{th} Settings -

E_i - the position of enemy is the J^{th} -

$$X_{t+1} = x_t + \Delta X_{t+1}$$

$$C_i = \frac{\sum_i^n -1 X_j}{N} \cdots -V$$

$$A_i \Sigma_j^h = \frac{1}{N} V_j$$

$$x_{t+1} = \begin{cases} -, x_t & r < \bar{T} \ (\Delta x_{t+1}) \\ x & r \geq \bar{T} \ (\Delta x_{t+1}) \end{cases}$$

Results :-

We consider a Suitable weight for each dragon fly to adjust their behaviours and to find the appropriate Solution we have considerd 20 nodes in the network for example cost of connecting A to G is 4.5 we can use the longest route with the lowest cost

The process of implempting the proposed algorithm is

step 1 :- Data entry

step 2 :- Determine and define status.

step 3 :- Determine the attributes of communication nodes.

step 4 :- find the best route.

Discussions:-

These methods Support the principals of Socio-psycology-Swarm Intelligence, they observe and understand their envornment and can act to maximize the chances of Success.

This paper provide a new methodology for improving time cost which can be a new Swarm Intelligence technique.

Actually this study uses all the Sensory activity behaviours and intellegence of the dragonfly

CPM Simulation model is valid through the compirson with the classic CPM and is well tried to be much more economical.

Question 1 Solution

Productim	progress	finishing	T.amount
P_1	12	03	1000
P_2	06	08	800
P_3	08	06	400
	3000	15000	

Converting into linear programming

$\Rightarrow 12x_1 + 6x_2 + 8x_3 \leq 3000 \rightarrow (i)$

$\Rightarrow 3x_1 + 8x_2 + 6x_3 \leq 1500 \quad -(ii)$

Maximix $Z = 1000x_1 + 800x_2 + 400x_3$

$\Rightarrow$ put $x_2 = 0$ and $x_3 = 0$

$\Rightarrow 12x_1 + 6x_2 + 8x_3 = 3000$

$\Rightarrow 12x_1 + 6(0) + 8(0) = 3000$

$\Rightarrow x_1 = \frac{3000}{12} = 250$

$\Rightarrow = P_1(250, 0, 0)$

$\Rightarrow$ Now for x_2

put $x_1 = 0, x_3 = 0$

$\Rightarrow 12(0) + 6x_2 + 8(0) = 3000$

$\Rightarrow x_2 = 3000 \quad 500$

~~$= P_2(0, 0, 375)$~~

$\Rightarrow = P_2(0, 500, 0)$ -

Now for x_3

put $x_1 = 0 \quad x_2 = 0$

$3(0) + 8(0) + 6x_3 = 1500$

$x_3 = \frac{1500}{6} = 250$

P_3 (0, 0, 250)

putting all in eqn (2)

$Z = 1000x_1 + 800x_2 + 400x_3$

$Z = 1000(250) + 0 + 0 = 250000$

$Z = 1000 + 800(500) + 0 = 400000$

$Z = 0 + 0 + 400(375) = 15000$

$Z = 1000(500) + 0 + 0 = 50000$

$Z = 0 + 800(187.5) + 0 = 150000$

$Z = 0 + 0 + 400(250) = 100800$

The maximum point

P_4 ~~(0,0,0)~~ (500, 0, 0) = 500000

$Z = 500000$ -