**Question No (1)**

A [project](https://www.designingbuildings.co.uk/wiki/Project) is a series of related a tasks which when they are carried in the correct order will [lead](https://www.designingbuildings.co.uk/wiki/Lead) to the [completion](https://www.designingbuildings.co.uk/wiki/Completion) of the [project](https://www.designingbuildings.co.uk/wiki/Project). [Projects](https://www.designingbuildings.co.uk/wiki/Project) are temporary, generally resulting in the creation of a tangible [product](https://www.designingbuildings.co.uk/wiki/Products) or outcome. This is as opposed to a [programme](https://www.designingbuildings.co.uk/wiki/Programme), which is a series of interrelated [projects](https://www.designingbuildings.co.uk/wiki/Project) that may be carried out repeatedly or continuously in order to support an ongoing process. For more [information](https://www.designingbuildings.co.uk/wiki/Information), see [Project v programme](https://www.designingbuildings.co.uk/wiki/Project_v_programme).

A construction project, sometimes just referred to as a ‘[project](https://www.designingbuildings.co.uk/wiki/Project)’, is the organized process of [constructing](https://www.designingbuildings.co.uk/wiki/Constructing), [renovating](https://www.designingbuildings.co.uk/wiki/Renovating), [refurbishing](https://www.designingbuildings.co.uk/wiki/Refurbishing), etc. a [building](https://www.designingbuildings.co.uk/wiki/Building), [structure](https://www.designingbuildings.co.uk/wiki/Structure) or [infrastructure](https://www.designingbuildings.co.uk/wiki/Infrastructure). The [project](https://www.designingbuildings.co.uk/wiki/Project) process typically starts with an overarching requirement which is developed through the creation of a [brief](https://www.designingbuildings.co.uk/wiki/Briefs), [feasibility studies](https://www.designingbuildings.co.uk/wiki/Feasibility_studies), [option studies](https://www.designingbuildings.co.uk/wiki/Options_studies), [design](https://www.designingbuildings.co.uk/wiki/Design), [financing](https://www.designingbuildings.co.uk/wiki/Construction_project_funding) and [construction](https://www.designingbuildings.co.uk/wiki/Construction).

Construction projects are typically one offs. That is, a [project team](https://www.designingbuildings.co.uk/wiki/Project_team), [brief](https://www.designingbuildings.co.uk/wiki/Briefs) and [financing](https://www.designingbuildings.co.uk/wiki/Financing) are put together to produce a unique [design](https://www.designingbuildings.co.uk/wiki/Design) that delivers a single [project](https://www.designingbuildings.co.uk/wiki/Project). Once the [project](https://www.designingbuildings.co.uk/wiki/Project) is [complete](https://www.designingbuildings.co.uk/wiki/Complete) the [team](https://www.designingbuildings.co.uk/wiki/Team) is disbanded and sometimes will not [work](https://www.designingbuildings.co.uk/wiki/Works) together again. This can make it difficult to develop ideas or relationships, and so [lessons learned](https://www.designingbuildings.co.uk/wiki/Lessons_learned) are often not carried forward to the next [project](https://www.designingbuildings.co.uk/wiki/Project). The exceptions to this are repeat [developers](https://www.designingbuildings.co.uk/wiki/Developer) such as supermarket chains, [house builders](https://www.designingbuildings.co.uk/wiki/Housebuilder), and so on.

Typically, a construction project comprises many smaller [projects](https://www.designingbuildings.co.uk/wiki/Project) which require a wide range of different [disciplines](https://www.designingbuildings.co.uk/wiki/Discipline) working in [collaboration](https://www.designingbuildings.co.uk/wiki/Collaboration). Large numbers of people are involved on a typical construction project, with the [structure](https://www.designingbuildings.co.uk/wiki/Structure) and composition of the [project team](https://www.designingbuildings.co.uk/wiki/Project_team) usually changing through its [duration](https://www.designingbuildings.co.uk/wiki/Duration). [Projects](https://www.designingbuildings.co.uk/wiki/Project) may be [coordinated](https://www.designingbuildings.co.uk/wiki/Coordinated) by a [project manager](https://www.designingbuildings.co.uk/wiki/Project_manager) (or by a [lead consultant](https://www.designingbuildings.co.uk/wiki/Lead_consultant)) who is supported by [professionals](https://www.designingbuildings.co.uk/wiki/Professional) such as an [architect](https://www.designingbuildings.co.uk/wiki/Architects), [engineer](https://www.designingbuildings.co.uk/wiki/Engineer), [cost consultant](https://www.designingbuildings.co.uk/wiki/Cost_consultants) and so on. For more [information](https://www.designingbuildings.co.uk/wiki/Information), see [Project team](https://www.designingbuildings.co.uk/wiki/Project_team).

This separation of [project](https://www.designingbuildings.co.uk/wiki/Project) roles into different [disciplines](https://www.designingbuildings.co.uk/wiki/Discipline), and [contractual](https://www.designingbuildings.co.uk/wiki/Contractual) arrangements that further separate the [client](https://www.designingbuildings.co.uk/wiki/Clients), [consultants](https://www.designingbuildings.co.uk/wiki/Consultants), [contractors](https://www.designingbuildings.co.uk/wiki/Contractors) and [subcontractors](https://www.designingbuildings.co.uk/wiki/Subcontractor) can make construction projects [adversarial](https://www.designingbuildings.co.uk/wiki/Adversarial). This can result in conflict, opposition, confrontation, [dispute](https://www.designingbuildings.co.uk/wiki/Disputes) and even hostility.

Solutions that have been put forward to combat the [adversarial](https://www.designingbuildings.co.uk/wiki/Adversarial) nature of construction projects include:

* [Partnering](https://www.designingbuildings.co.uk/wiki/Partnering) and [collaborative](https://www.designingbuildings.co.uk/wiki/Collaborative) [contracts](https://www.designingbuildings.co.uk/wiki/Contract) such as [NEC](https://www.designingbuildings.co.uk/wiki/NEC)
* [Alternative dispute resolution](https://www.designingbuildings.co.uk/wiki/Alternative_Dispute_Resolution).
* Careful [consideration](https://www.designingbuildings.co.uk/wiki/Consideration) of [selection criteria](https://www.designingbuildings.co.uk/wiki/Selection_criteria).
* [Integrated supply teams](https://www.designingbuildings.co.uk/wiki/Integrated_supply_team).
* [Fair payment practices](https://www.designingbuildings.co.uk/wiki/Fair_payment_practices)
* Other [collaborative practices](https://www.designingbuildings.co.uk/wiki/Collaborative_practices).

For more [information](https://www.designingbuildings.co.uk/wiki/Information), see [Adversarial behaviour in the UK construction industry](https://www.designingbuildings.co.uk/wiki/Adversarial_behaviour_in_the_UK_construction_industry).

[Projects](https://www.designingbuildings.co.uk/wiki/Project) may be [public](https://www.designingbuildings.co.uk/wiki/Public), or private:

* a '[public project](https://www.designingbuildings.co.uk/wiki/Public_project)' is one that is financed by the [government](https://www.designingbuildings.co.uk/wiki/Government) and is typically [owned](https://www.designingbuildings.co.uk/wiki/Owned), and may be [operated](https://www.designingbuildings.co.uk/wiki/Operated) by the [government](https://www.designingbuildings.co.uk/wiki/Government). This can include major [infrastructure](https://www.designingbuildings.co.uk/wiki/Infrastructure) [works](https://www.designingbuildings.co.uk/wiki/Works) such as [roads](https://www.designingbuildings.co.uk/wiki/Road), [bridges](https://www.designingbuildings.co.uk/wiki/Bridge), [dams](https://www.designingbuildings.co.uk/wiki/Dam), [railways](https://www.designingbuildings.co.uk/wiki/Railway), [tunnels](https://www.designingbuildings.co.uk/wiki/Tunnel), and so on, or [public](https://www.designingbuildings.co.uk/wiki/Public) [facilities](https://www.designingbuildings.co.uk/wiki/Facility) such as hospitals, [schools](https://www.designingbuildings.co.uk/wiki/School), prisons, [libraries](https://www.designingbuildings.co.uk/wiki/Libraries), leisure centres, and so on. For more [information](https://www.designingbuildings.co.uk/wiki/Information), see [Public project definition](https://www.designingbuildings.co.uk/wiki/Public_project_definition).
* A ‘private [project](https://www.designingbuildings.co.uk/wiki/Project)’ is one that is financed, controlled or commissioned by a private party, i.e. one that is not a [government](https://www.designingbuildings.co.uk/wiki/Government). Private parties can include individuals, corporations, charities, privately-funded [institutions](https://www.designingbuildings.co.uk/wiki/Institution), [schools](https://www.designingbuildings.co.uk/wiki/School), hospitals, and so on.

Some [projects](https://www.designingbuildings.co.uk/wiki/Project) involve both [public](https://www.designingbuildings.co.uk/wiki/Public) and private entities. [Public Private Partnerships](https://www.designingbuildings.co.uk/wiki/Public_private_partnerships) ([PPPs](https://www.designingbuildings.co.uk/wiki/PPP)) are a very broad range of [partnerships](https://www.designingbuildings.co.uk/wiki/Partnership) in which the [public](https://www.designingbuildings.co.uk/wiki/Public) and [private sectors](https://www.designingbuildings.co.uk/wiki/Private_sector) [collaborate](https://www.designingbuildings.co.uk/wiki/Collaborate) for some mutual benefit, which can include the [completion](https://www.designingbuildings.co.uk/wiki/Completion) of a construction project.

In marketing

* Assembly line scheduling,
* Research and development,
* Inventory planning and control,
* Shifting of manufacturing plant from one site to another,
* Launching of new products and advertising campaigns,
* Control of traffic flow in cities,
* Budget and audit procedures,
* Launching space programmes,
* Control of traffic flow in cities,
* 7. Budget and audit procedures,
* 8. Launching space programmes,
* 9. Installation of new equipment’s
* Long-range planning and developing staffing plans, etc.

**(B)**

**Advantages of network scheduling techniques include:**

* They form the basis for all planning and predicting and help management decide how to use its resources to achieve time and cost goals.
* They provide visibility and enable management to control “one-of-a-kind” programs.
* They help management evaluate alternatives by answering such questions as how time delays will influence project completion, where slack exists between elements

**Question No 5**

**Activity:**

**(A)**

The quality or state of being active: behavior or actions of a particular kind physical activity criminal activity economic activity.

**Burst event**

When more than one activity leaves an event such an event is known as burst event.

**Merge event**

When more than one activity comes and joins an **event** such an **event** is known as **merge event**.

**(B)**

**Assumptions of Linear Programming.**

1. **Proportionality:** The basic assumption underlying the linear programming is that any change in the constraint inequalities will have the proportional change in the objective function. This means, if product contributes Rs 20 towards the profit, then the total contribution would be equal to 20x1, where x1 is the number of units of the product.

**For example,** if there are 5 units of the product, then the contribution would be Rs 100 and in the case of 10 units, it would be Rs 200. Thus, if the output (sales) is doubled, the profit would also be doubled.

1. **Additivity:** The assumption of additivity asserts that the total profit of the objective function is determined by the sum of profit contributed by each product separately. Similarly, the total amount of resources used is determined by the sum of resources used by each product separately. This implies, there is no interaction between the decision variables.
2. **Continuity:** Another assumption of linear programming is that the decision variables are continuous. This means a combination of outputs can be used with the fractional values along with the integer values.

**For example**, If 52/3 units of product A and 101/3 units of product B to be produced in a week. In this case, the fractional amount of production will be taken as a work-in-progress and the remaining production part is taken in the following week. Therefore, a production of 17 units of product A and 31 units of product B over a three-week period implies 52/3 units of product A and 101/3 units of product B per week.

1. **Certainty:** Another underlying assumption of linear programming is a certainty, i.e. the parameters of objective function coefficients and the coefficients of constraint inequalities is known with certainty. Such as profit per unit of product, availability of material and labor per unit, requirement of material and labor per unit are known and is given in the linear programming problem.

**Question No 02**

Being an OR manager I will focus on operation 3 because of high dual pricing.

**Question No 03**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Origins** | **Denver** | **Portland** | **Miami** | **Baltimore** | **Supply** |
| **s.fran** | 4 | 2 | 2 | 6 | **8000** |
| **Washin.** | 3 | 6 | 7 | 9 | **6000** |
| **austin** | 1 | 2 | 3 | 9 | **5000** |
| **Demand** | **10000** | **6000** | **4000** | **5000** |  |

**Question No 04**

I

H

G

F

E

D

C

B

A

The path can go by keeping activity D on hold also.

Task B can be done also b skipping task A.

Activity E will be done after completion of activity c and also by skipping activity D.

We would Prefer the path B,C,E,F,H,I because this is the shortest and complete pat of completing the project

The time required for completing the task is 57minutes.