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Engineering Academy

Head Office : Sree Sindhi Guru Sangat Sabha Association, # 4-1-1236/1/A, King Koti, Abids, Hyderabad – 500001.
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ESE- 2019 (Prelims) - Offline Test Series Test- 16

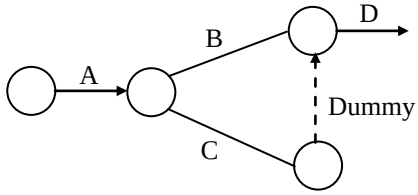
GENERAL STUDIES AND ENGINEERING APTITUDE

SUBJECT: BASICS OF PROJECT MANAGEMENT
SOLUTIONS

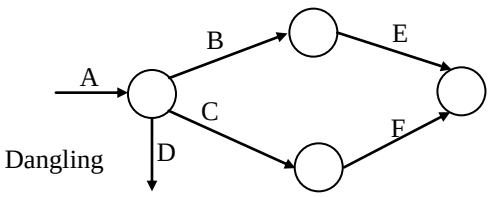
01. Ans: (d)

Sol: During activities

Activities which neither consume time nor resources but are used simply to represent a connection or a link between the events are known as dummies. They maintain proper logic in the network.

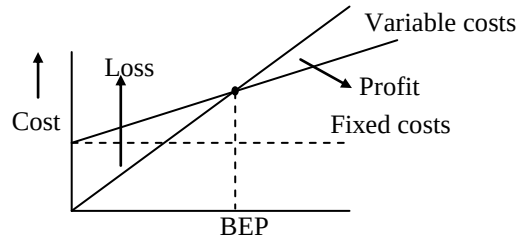


Dangling: To disconnect an activity before the diagram, is known as dangling.



02. Ans: (a)

Sol: Break even analysis is an algebraic /or graphic model for describing the relationship between costs and revenue for different volumes of production. It is especially useful for identifying volume at which operation change from being profit.



The amount by which total contribution exceed total fixed cost is called profit. If fixed cost exceed total contributed a loss included.

If $(P–V) \times >$ TFC {profit}

$(P–V) \times <$ TFC {loss}

When total contribution and fixed costs are equal organization breaks even for the period. The most profitable products are those with the largest difference between total revenue and total variable cost.

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03. Ans: (b)

Sol:

Week	1	2	3	4	5
Planned Value	1000	1000	1000	1000	1000
Cumulative Planned Value	1000	2000	3000	4000	5000

04. Ans: (a)

Sol: Schedule Variance (SV) = EV – PV

= 50,000 – 60,000

= –10,000

Cost Variance (CV) = EV – AC

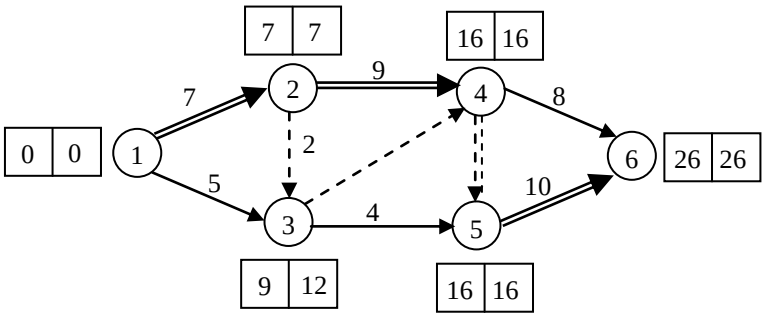
= 50,000 – 80,000

= –30,000

05. Ans: (c)

06. Ans: (d)

Sol:



07. Ans: (a) **08. Ans: (d)**

09. Ans: (a) **10. Ans: (d)**

11. Ans: (b)

Sol: Variance ⇒ Degree of un-certainity

Contractor	$V=\left(\frac{t_p-t_o}{6}\right)^2$
I	$\left(\frac{16-4}{6}\right)^2=4$
II	$\left(\frac{9-3}{6}\right)^2=1$
III	$\left(\frac{15-5}{6}\right)^2=\left(\frac{10}{6}\right)^2$
IV	$\left(\frac{13-6}{6}\right)^2=\left(\frac{7}{6}\right)^2$

Contractor 'II' is more certain.

12. Ans: (b)

Sol: EOQ = $\sqrt{\frac{2DC_0}{C_C}}$

where D = Annual demand

C_O = Order cost/order

C_C = Carrying cost/unit/year

If 'D' is doubled the EOQ′ = $\sqrt{2}(EOQ)$

13. Ans: (c)

Sol: ABC classification is based on annual usage value.

A-Class = High annual usage value

B-Class = Medium annual usage value

C-Class = Low annual usage value

14. Ans: (c)

Sol: Delphi method:

A number of expert's are contracted and each given a questionnaire to complete the replies from questionnaire are analyzed and summarized.

The questionnaire's with summary of all replies is given back to each expert for his/her reconsideration. This is repeated.

15. Ans: (c)

16. Ans: (c)

Sol: $Q^* = \frac{FC}{SP - VC}$

$= \frac{50,000}{25 - 20}$

$= 10,000$ units

Break even sales $= Q^* \times SP$

$= 10000 \times 25 = 2,50,000$

17. Ans: (b)

Sol: Free float

The time by which the completion of an activity can be delayed beyond the earliest finish time, without affecting the earliest start of a subsequence succeeding activity.

FF_{ij} = Total float – Head event & slack.

$= (TF)_{ij} - (L_j - E_j)$

18. Ans: (c)

19. Ans: (d)

20. Ans: (d)

21. Ans: (b)

22. Ans: (c)

23. Ans: (a)

Sol: $RoI = \frac{Net\ profit}{Total\ Investment} \times 100$

$RoI(\%) = \frac{25,000}{1,00,000} \times 100 = 25\%$

24. Ans: (a)

Sol: Project 'A':

Payback period = 3 years

$RoI = \frac{\left(\frac{20000}{5}\right)}{1,00,000} \times 100 = 4\%$

Project 'B':

Payback period = 4 years

$RoI = \frac{\left(\frac{50000}{5}\right)}{1,00,000} \times 100 = 10\%$

- Project 'A' is the best choice w.r.t payback period whereas Project 'B' is the best choice w.r.t RoI%.

25. Ans: (d)

26. Ans: (a)

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27. Ans: (c)

Sol: $t_E = \dfrac{t_0 + 4t_m + t_p}{6}$

$= \dfrac{15 + 4(18) + 27}{6} = 19$

28. Ans: (c) **29. Ans: (b)**

30. Ans: (b) **31. Ans: (b)**

32. Ans: (b)

Sol: Simple moving average method:

It forecast demand by taking most recent value only of demand pattern is steady

$$\left| F_{t+1} = \frac{\sum_{t=1}^{n} D_t}{n} \right| \{\text{average forecast}\}$$

n = number of periods of historic data

t = time period

Dt = demand

Ft+1 = forecast for (t+1)th period

- Applied to forecast for only one period into future.
- This method assigns equal weight to all observations in the average and the weight = 1/n

33. Ans: (d)

Sol: Total annual cost = total ordering cost + total inventory cost + total material cost

$$T = \left(0 \times \frac{D}{Q}\right) + \left(H + \frac{Q}{2}\right) + (C \times D)$$

For minimum annual cost

$$\frac{dT}{dQ} = 0$$

$$\frac{-OD}{Q^2} + \frac{H}{2} = 0$$

$$Q^2 = \frac{2OD}{H}$$

$$Q^2 = EOQ = \sqrt{\frac{2DO}{H}}$$

$\therefore$ Economic order quantity can be calculated by only using procurement and inventory cost.

34. Ans: (d)

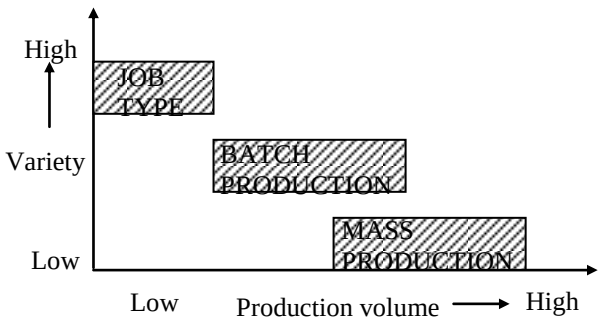
Sol: Economic order quantity (EOQ)

Economic lot size or economic production quantity. It is the quantity of materials ordered at each order point that minimizes the total annual costs for a material in a fixed order quantity inventory system.

35. Ans: (d)

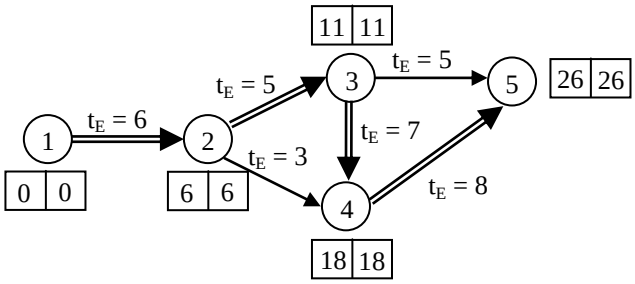
36. Ans: (d)

Sol: Types of production:



37. Ans: (b)

Sol: $t_E = \dfrac{t_o + 4t_m + t_p}{6}$



38. Ans: (c)

39. Ans: (a)

Sol: For the critical activity EST = LST and EFT = LFT

$\therefore$ LFT – EST = EFT – EST

= activity duration

40. Ans: (c)

Sol: Projects constraints are - Scope, Resources, Quality, Time and Budget.

41. Ans: (b) **42. Ans: (b)**

43. Ans: (b) **44. Ans: (b)**

45. Ans: (b) **46. Ans: (a)**

47. Ans: (a) **48. Ans: (a)**

49. Ans: (c) **50. Ans: (a)**

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