ACE
Engineering Academy

ESE- 2020 (Prelims) - Offline Test Series   Test- 8

GENERAL STUDIES AND ENGINEERING APTITUDE

SUBJECT: BASICS OF PROJECT MANAGEMENT
SOLUTIONS

01. Ans: (b)
Sol: Carrying cost includes   (i) Storage cost
                                  (ii) Insurance
                                  (iii) Depreciation
                                  (iv) Interest

Ordering cost includes
(i) order preparation cost
(ii) cost of negotiations
(iii) transportation cost
(iv) inspection cost

02. Ans: (d)
Sol: Sum – of – years digit method:

$$SOY = \frac{n(n+1)}{2} = \frac{5(5+1)}{2} = 15$$

Annual depreciation $(D_m) = (P–SV) \times d_m$

$$d_m = \frac{n-(m-1)}{SOY} \Rightarrow d_2 = \frac{4}{15}$$

$$D_2 = (50000 - 5000) \times \frac{4}{15}$$

$$= 45000 \times \frac{4}{15} = 12000/\text{-}$$

03. Ans: (b)
Sol: Planned value (PV)

Week	1	2	3	4	5
PV	2000	2000	2000	2000	2000
Cumulative PV	2000	4000	6000	8000	1000

Planned value after 3 weeks = 6000.
Schedule variance (SV) = EV – PV
$$= 5000 - 6000$$
$$= -1000$$
$\Rightarrow$ Behind the schedule.

04. Ans: (c)
Sol: $D^1 = 2D$ $C_0^{\ 1} = C_0$ $C_C^{\ 1} = 2\,C_C$
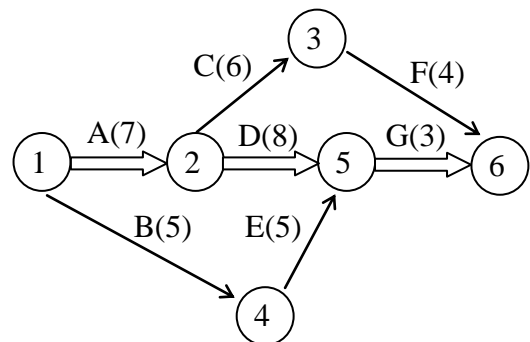
$$EOQ^1 = \sqrt{\frac{2D^1 C_0^{\ 1}}{C_C^{\ 1}}}$$

$$= \sqrt{\frac{2(2D) \times C_0}{2(C_C)}}$$

$$EOQ^1 = EOQ$$

$$\frac{EOQ^1}{EOQ} = 1$$

05. Ans: (b)
Sol:

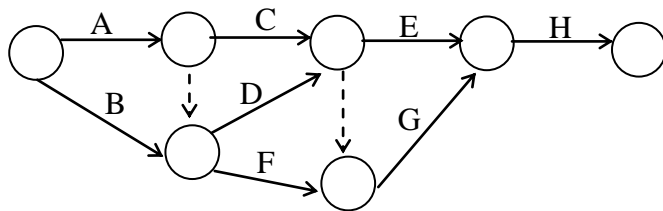| Path	Duration
A – C – F	17
A – D – G	18
B – E – G	13

Critical path duration = 18 days.

06. Ans: (c)
Sol:

07. Ans: (a)
Sol: Length of the bar chart = Project – duration

08. Ans: (b)
Sol: Two different activities cannot be identified by the same beginning and end events.

09. Ans: (b)
Sol: Total float ……. Without affecting the project duration
Free float …….. Without Next activity
Independent ….. Without next & preceding activity

10. Ans: (a)
Sol: $D = 52 \times 20 = 1040$
$C_0 = 200$
$C_c = 2$/unit/month
$= 2 \times 12$ / unit / year $= 24$

$$EOQ = \sqrt{\frac{2DC_0}{C_c}}$$
$$= \sqrt{\frac{2 \times 1040 \times 200}{24}}$$
$$= 131.6 \text{ units.}$$

11. Ans: (c)
Sol: In Internal rate of return, Net present value will become zero for which rate of discount is calculated.

12. Ans: (c)
Sol: WBS will aid the project manager to understand the sequence, which inturn help in rough estimation of time. Cost of each work replacing corresponding work is called cost breakdown structure.

13. Ans: (d)
Sol: For minor works line organisation (Military organisation) is best suitable.

14. Ans: (b)
Sol: In a matrix organisation, functional manager is responsible for skills improvement.

15. Ans: (c)
Sol: Project charter is used for quick reference. It is summary of PEP.

16. Ans: (a)
Sol: A person who is involved in or may be affected by the activities or anyone who has something to gain or lose by the activity of project is stakeholder. Competitor may get affected, but is not main stakeholder.

17. Ans: (d)
Sol: Rate of depreciation

$$R_D = \left(1 - \left(\frac{C_s}{C_i}\right)^{1/n}\right)$$

Initial cost, $C_i = 32,000$
Salvage value, $C_s = 4,000$
$$n = 3$$

$$R_D = 1 - \left(\frac{4000}{32000}\right)^{1/3} = 0.5$$

18. And: (d)
Sol: All the above organisations are suitable for both projects and major projects. Military and lines staff organisation are not suitable.

19. Ans: (b)
Sol: Decision making on procurement of resources is part of scheduling.

20. Ans: (d)
Sol: WBS quantifies scope through tree diagram. It will help as a checklist regarding completeness of project.

21. Ans: (d)
Sol: Brainstorming is qualitative tool used in risk analysis.

22. Ans: (c)
Sol: Each sub-contractor is given weightage based on delivery, quality and other factors.

23. Ans: (d)
Sol: Quality management plan is a document which deals with quality policy. It is part of project execution plan.

24. Ans: (a)
Sol: Trying to know more about the issue will help manager to resolve it. It is management approach.

25. Ans: (b)
Sol: AV can be assessed beyond today but EV can't be assessed beyond today.

26. Ans: (d)
Sol: Regression is suitable for short range forecast. Remaining methods are suitable for long range forecast.

27. Ans: (d)
Sol: Risk avoidance strategy will reduce likelihood of risk.

28. Ans: (c)
Sol: Training will reduce the likelihood of risk. Imposing penalty is passive strategy.

29. Ans: (c)
Sol: By the time termination of project starts execution is completed. Therefore, it is meaningless to do monitoring and risk analysis.

30. Ans: (c)
Sol: In the functional audit, customer will check whether
(i) Installation is done
(ii) Training is provided

31. Ans: (a)
Sol: P/V Ratio = Contribution/sales x 100
$$= (40 - 24)/40 \times 100$$
$$= 16/40 \times 100 \text{ or } 40\%$$
Break even sales = S×P/V Ratio = Fixed Cost (At break even sales, contribution is equal to fixed cost) Putting these values:
S x 40/100 = 16,000
S = 16,000 x 100 / 40
 = 40,000

32. Ans: (c)
Sol: In item rate contract the payment is on basis of the item rate quoted by the contractor in the contract and the actual work done at site.

33. Ans: (c)
Sol: To calculate **Net present value** we discount all values to initial year.
$$NPV = -30 + 13/1.1 + 13/1.1^2 + 13/1.1^3$$
$$= 2.33 \text{ lakhs}$$

34. Ans: (d)
Sol: GERT is a network analysis technique used in project management that allows probabilistic treatment for both network logic and estimation of activity duration and it can be used for research and development projects.

35. Ans: (b)
Sol: Drawback of the milestone chart is that it does not show relation among milestones of different activities.

36. Ans: (c)
Sol: ABC analysis is based on total material cost of items, which is a combination of quantity (Demand) of item and unit cost of the item.

37. Ans: (c)
Sol: In PERT, for an activity β-distribution is used but for entire project normal distribution is used.

38. Ans: (c)

39. Ans: (a)
Sol: The Initiation process (concept phase) is where stakeholders have the greatest ability to influence outcomes of the project and risk is highest during this stage because of the high degree of unknown factors.

40. Ans: (a)

41. Ans: (a)
Sol: From the given figure,
(From plan) Centerline length
$= ((4.6 - 0.3) \times 2 + (5.6 - 0.3) \times 2) = 19.2m$
Quantity of 150 mm thick PCC
$= L \times B \times H$
$= 19.2m \times 0.625m \times 0.15m$
$= 1.8 \text{ m}^3$

42. Ans: (b)
Sol: Economic Order Quantity $= \sqrt{\dfrac{2.C_o.A}{C_i}}$

$Q = \sqrt{\dfrac{2 \times Rs.60 \times 600 \text{ Tons}}{0.2 \times 100}}$
$= 60$ tons approximate
Minimum Stock Level = Safety Stock
$= 40$ tons

Maximum Stock Level = Safety Stock + EOQ
$= 40 + 60$
$= 100$ tons

43. Ans: (b)
Sol: $Z = \dfrac{T_s - T_E}{\sigma}$;
$\sigma = \sqrt{\text{vairance}} = \sqrt{9} = 3$
$1.647 = \dfrac{T_s - 90}{3}$
$T_s = 94.94$ weeks

44. Ans: (a)
Sol: Total float
$= T_L^j - (T_E^i + t^{ij}) = 41 - (12 + 7) = 22$
Independent float
$= T_E^j - (T_L^i + t^{ij}) = 37 - (13 + 7) = 7$
Infering float $= T_L^i - T_E^i = 41 - 37 = 4$

45. Ans: (a)
Sol: $t = \dfrac{t_o + 4 \times t_m + t_p}{6}$
$= \dfrac{5 + 4 \times 25 + 60}{6} = 27.5 \text{ minutes}$

46. Ans: (d)
Sol: The objectives of accident statistics(Frequency Rate, Severity Rate, Incidence Rates etc) are:
1. To help in evaluating the relative need for taking accident prevention measures in different departments of an establishment
2. To help in making an appraisal of the progress of an accident prevention campaign and making people safety-conscious
3. To provide encouragement when methods used for the prevention of accidents are successful
4. To enable comparisons to be made.

47. Ans: (d)

48. Ans: (a)

Sol: There are several techniques when performing qualitative risk analysis to determine the probability and impact of risks, including the following:

- Brainstorming, interviewing, Delphi technique
- Historical data
- Strength, weakness, opportunity, and threats analysis (SWOT analysis)
- Risk rating scales

49. Ans: (d)

50. Ans: (c)