PRACTICE QUESTIONS

for SSC-JE : CBT-2

Concrete Technology & Estimating, Costing

Civil Engineering

10 Concrete Technology & Estimating, Costing

Q.1 Most accurate method of estimation is based on
(a) Building cost index estimate
(b) Plinth area estimate
(c) Detailed estimate
(d) Cube rate estimate

Q.2 In straight line method, the annual depreciation of the property is

(a) $\frac{\text{Original cost} - \text{Annual sinking fund}}{\text{Life (in years)}}$

(b) $\frac{\text{Life (in years)}}{\text{Original cost} + \text{Scrap value}}$

(c) $\frac{\text{Original cost} - \text{Scrap value}}{\text{Life (in years)}}$

(d) $\frac{\text{Original cost} + \text{Scrap value}}{\text{Life (in years)}}$

Q.3 The value of the property (without being dismantled) at the end of the useful life period is known as
(a) Scrap value (b) Salvation value
(c) Junk value (d) Book value

Q.4 In the mid-section formula
(a) The mean depth is the average of depths of two consecutive sections
(b) The area of midsections is calculated by using mean depth
(c) The volume of the earth work is calculated by multiplying the midsection area by the distance between the two sections
(d) all of the above

Q.5 In long wall and short wall method, the length of the short wall is the equal to the center to center length of wall minus _____.
(a) half of the width of wall
(b) one fourth of width of wall
(c) twice of the width of wall
(d) width of wall

Q.6 E.M.D. is
(a) Depositing 2% of the contract value
(b) Same as security deposit
(c) Depositing 10% of the contract value
(d) Depositing only 5% of the contract value

Q.7 The security deposit is
(a) Refunded in the middle of the contract
(b) Refunded after the maintenance period
(c) Not refunded
(d) Refunded as soon as the construction is over

Q.8 Jacketing
(a) is a process of fastening a durable material over concrete and filling the gap with grout
(b) increases the section of an existing member by encasement in a new concrete
(c) along with collars can be advantageously used for repairing

deteriorated concrete columns
(d) All of the above

Q.9 For excavating utility trenches with precise control of depth, the excavation equipment used is
(a) hoe (b) shovel
(c) dragline (d) none of these

Q.10 The basic action involved in sheep foot rolling is
(a) kneading (b) pressing
(c) tamping (d) vibration

Q.11 In a tender, letter of intent
1. Is issued to successful tenderer.
2. Is issued after the signing of contract.
3. Letter of intent contents are non-negotiable and strictly binding.

Which of the above statements are correct?
(a) 1 only (b) 1 and 3 only
(c) 2 and 3 only (d) 1, 2 and 3 only

Q.12 In a fixed price contract who has the most risk variable:
(a) Buyer (b) Seller
(c) Both (d) None of these

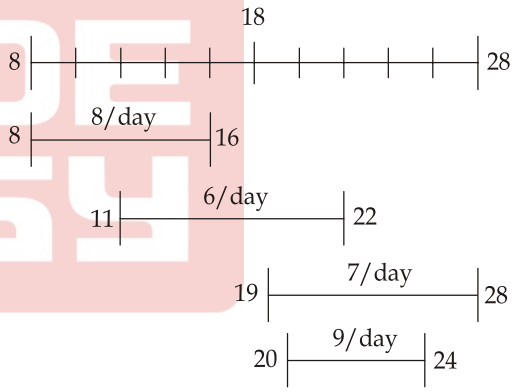
Q.13 A serious limitation of inter-dependence between various activities is generally observed in
(a) Bar charts
(b) Milestone charts
(c) Network analysis
(d) Job layouts

Q.14 What is the significant purpose of monitoring a project throughout its implementation phase?
(a) To fix responsibility for delays.
(b) To retail the project with maximum time over-run.
(c) To retail the project with minimum time over-run.
(d) To retail the project with optimal time and cost over-run.

Q.15 List the following process in their correct sequence
1. Project duration
2. Resource histogram
3. Standardized input/performance for each activity including alternatives
4. WBS
5. Resource optimization considering constraints
6. Activities and their inter-relationships

(a) 2, 1, 3, 5, 6 and 4
(b) 2, 6, 3, 5, 1 and 4
(c) 4, 1, 3, 5, 6 and 2
(d) 4, 6, 3, 5, 1 and 2

Q.16 A bar chart of four activities indicating their scheduled start and finish "end of day" values and the resource requirement per day are given above. What will be the maximum and the minimum resource needed on any of the days?



(a) 22, 6 (b) 21, 6
(c) 21, 8 (d) 20, 8

Q.17 Two events *K* and *L* can cause delay in a construction activity when occurring either each independently both together; but the two events are not statistically independent of each other. The probability that at least one of the event occurs is 0.75 and the probability that each one occurs itself is 0.45. The critical probability for occurrence of

delay in the activity is

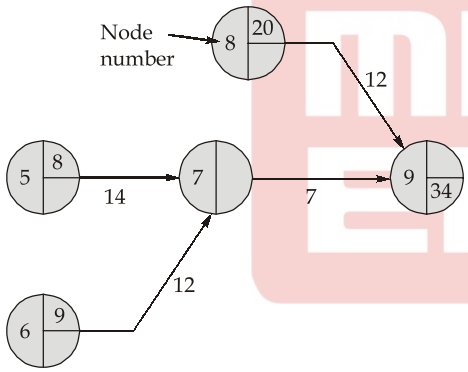
(a) $\frac{0.75}{0.45 + 0.75}$

(b) $\frac{0.75 - 0.45}{0.75}$

(c) $\frac{0.45 \times 2 - 0.75}{0.75}$

(d) $\frac{0.45 \times 2 - 0.75}{0.45}$

Q.18 A part of the network with nomenclature of a typical legend is shown in the given figure. There can be other incoming activities at nodes 5, 6 and 8 but there are no other incoming activities at nodes 7 and 9. There are two outgoing activities at node 9 but no other outgoing activity at any of the other nodes. The total float and free float of activity 6-7 are



(a) 5 and 1 (b) 5 and 0
(c) 6 and 1 (d) 0 and 0

Q.19 Three activities implementable in parallel, have the following time-cost relationship for direct cost component in each.

Activity A: 10 days - 800 unit; 9 days - 900 units; 8 days - 1000 units

Activity B: 11 days - 1200 unit; 10 days - 1250 units; 9 days - 1500 units

Activity C: 7 days - 500 unit; 6 days - 700 units; 5 days - 900 units

The feasible range of total direct cost component for the three activities together is

(a) 2500 to 3400 units
(b) 2650 to 3200 units
(c) 2500 to 2900 units
(d) 2600 to 3100 units

Q.20 The optimum duration is the

(a) summation of normal duration of each activity in the project.
(b) summation of the normal duration of activities or critical path.
(c) one, which gives the minimum total cost for completing the project.
(d) summation of crash time of activities on critical path.

Q.21 A residential building is constructed at a cost of Rs. 7,00,000. The total outgoing including sinking fund is Rs. 24,000 per annum. If the owner desires 6% return on construction, then the gross monthly rent of the property is

(a) Rs. 6000 (b) Rs. 5500
(c) Rs. 4500 (d) Rs. 5000

Q.22 If the payment of annuity begins at some future date after a number of years, it is known as

(a) Perpetual annuity
(b) Annuity certain
(c) Annuity due
(d) Deferred annuity

Q.23 The time by which a particular activity may be delayed without affecting the preceeding and succeeding activities is known as

(a) Total float
(b) Free float
(c) Interfering float
(d) Independent float

Q.24 The present value of a building that was constructed 30 years ago at Rs. 50,000, the estimated life of the building is 50 years, at the end of which will have 10% scrap value of its cost of construction is _____ (Depreciation is to be calculated by straight line method).

(a) Rs. 24000 (b) Rs. 25000
(c) Rs. 23000 (d) Rs. 15000

Q.25 A property fetches a net annual income of Rs. 80,000 after deducting all outgoings, rate of interest is 8% per annum. What is the capitalized value of the property?

(a) Rs. 10,00,000 (b) Rs. 9,60,000
(c) Rs. 16,63,500 (d) Rs. 9,33,900

Q.26 After the curing of 28 days, the concrete gains strength upto

(a) 40% (b) 67%
(c) 100% (d) 122%

Q.27 The workability of concrete by slump test is expressed as

(a) minutes (b) mm/h
(c) mm^2/h (d) mm

Q.28 The ratio of different ingredients (cement, sand and aggregate) in concrete mix of grade M 20 is

(a) 1 : 1 : 2 (b) 1 : 1.5 : 3
(c) 1 : 2 : 4 (d) 1 : 3 : 6

Q.29 To perform the compressive strength test of cement, water is added at the rate of

(a) $0.72P$ + 3% of water
(b) $0.85P$ + 4% of water
(c) $P/4$ + 3% of water
(d) $P/4$ + 4% of water

Q.30 The aggregate is said to be elongated when

(a) its least dimension is three-fifth of its mean dimension
(b) its least dimension is equal to its mean dimension
(c) its length is equal to its mean dimension
(d) its length is equal to 1.8 times its mean dimension

Answer Keys

1.	(c)	2.	(c)	3.	(b)	4.	(d)	5.	(d)	6.	(a)	7.	(b)
8.	(d)	9.	(a)	10.	(a)	11.	(a)	12.	(b)	13.	(a)	14.	(c)
15.	(d)	16.	(a)	17.	(d)	18.	(c)	19.	(c)	20.	(c)	21.	(b)
22.	(d)	23.	(d)	24.	(c)	25.	(a)	26.	(c)	27.	(d)	28.	(d)
29.	(c)	30.	(d)										

Detailed Solutions

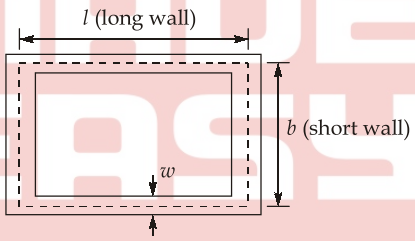
1. (c)

In detailed estimates, a complete schedule of all the possible items which are likely to occur, is prepared and prepared unit costs are applied to these items. Thus, a detailed estimate provides an amount which is very near to the final amount of the structure. Thus the detailed estimates are accurate estimates and they are prepared mainly for the following two purposes viz. Execution processes and obtaining technical sanction.

3. (b)

Book value is the original investment less the depreciation for the period of existence. Salvage value is the value at the end of useful life period without being dismantled. Scrap value is the value of the dismantled material less the cost of dismantling.

5. (d)



$$\text{Length of short wall} = b - 2\times\left(\frac{w}{2}\right)$$

$$= b - w$$

7. (b)

- EMD is generally less than 5% of the tender value.
- Security deposit is generally 10% of the tender value.

9. (a)

Hoe may be used to

(i) excavate below the natural surface of the ground on which the machine rests.

(ii) dig trenches, footings or basements and general grading work which requires precise control of depths.

(iii) penetrate easily into toughest materials to be dug.

10. (a)

The primary action is kneading in sheep foot roller.

11. (a)

Letter of intent (LOI) is a document outlining an agreement between two or more parties before the agreement is finalised. A LOI may be issued during the course of pre-contract negotiating or immediately after their conclusion to clarify the key points of a deal for the convenience of the parties concerned.

13. (a)

In bar charts, inter dependencies between various activities is not shown.

14. (c)

The main purpose of monitoring is to retail the project with minimum time over-run. During monitoring information is analyzed and the project plan is brought upto date with the necessary changes required to keep the project as per schedule.

16. (a)

Minimum number of resources that are needed on 18th day i.e. 6 Nos.

Maximum number of resources that are needed on 20th day i.e. 22 Nos i.e. (6 + 7 + 9) Nos.

17. (d)

$$P(L) = P(K)$$

and $$P\left(\frac{L}{K}\right) = P\left(\frac{K}{L}\right)$$

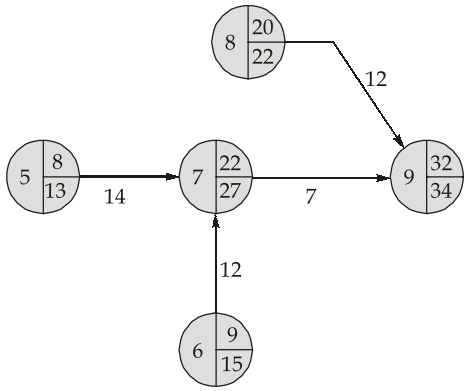
Given, $$P(K \cup L) = 0.75$$

and $$P(K) = P(L) = 0.45$$

$$\Rightarrow \quad P\left(\frac{K}{L}\right) = \frac{-P(K \cup L) + P(K) + P(L)}{P(L)} = \frac{0.45 + 0.45 - 0.75}{0.45}$$

$$\Rightarrow \quad P\left(\frac{K}{L}\right) = \frac{2 \times 0.45 - 0.75}{0.45}$$

18. (c)

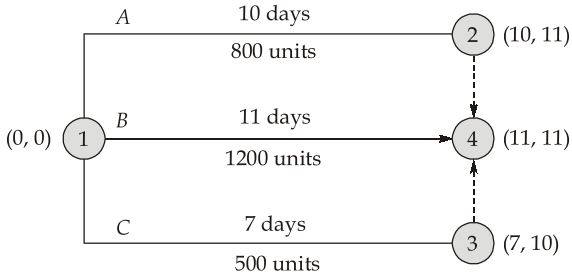


For activity 6-7,

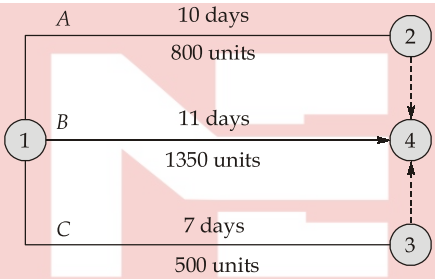
$$F_T = \text{LST} - \text{EST} = 15 - 9 = 6 \text{ units}$$

$$F_F = F_T - S_j = 6 - 5 = 1 \text{ unit}$$

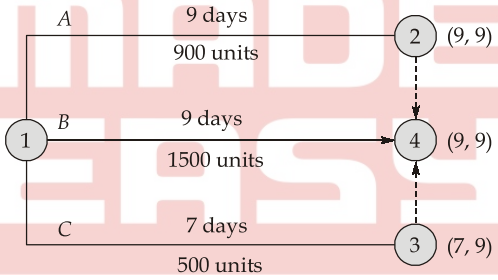
19. (c)



$DC = 800 + 1200 + 500 = 2500$ units



$DC = 800 + 1350 + 500 = 2650$ units



$DC = 900 + 1500 + 500 = 2900$

$\therefore$ Feasible range is 2500 – 2900 units.

20. (c)

Optimum project duration of any project is that time period for which total cost of project is minimum i.e. sum of direct cost and indirect cost, will be the minimum.

21. (b)

Given cost of construction = Rs. 7,00,000

Net return:

@6% on the cost of construction = $7,00,000 \times \frac{6}{100} = \text{Rs. } 42,000$

Gross rent = Net rent + Outgoings

$= 42{,}000 + 24{,}000 = 66{,}000$ per annum

$\therefore$ Gross rent per month $= \dfrac{66{,}000}{12} = \text{Rs. } 55{,}00$

22. (d)

- If the payments of annuity continue for indefinite period, it is known as perpetual annuity.
- If the amount of annuity is paid for a definite number of periods or years, it is known as annuity certain.
- If the amount of annuity is paid at the beginning of each period of year and payments continued for definite number of periods, it is known as annuity due.

23. (d)

- Total float represents the amount of time an activity can be delayed without delaying the overall project duration.
- Free float represents the amount of time that a schedule activity can be delayed without delaying the early start date of any immediate succeeding activity.
- Minimum time by which an activity can be delay without affecting preceeding as well as succeeding activity is known as independent float.
- **Interfering float:** That part of total float which effects the succeeding activity.

24. (c)

Annual depreciation, $D = \dfrac{C - S}{n}$

C = Original cost = 50000

S = Scrap value $= \left(\dfrac{10}{100}\right) \times 50{,}000 = 5000$

n = Life of property = 50 years

$D = \dfrac{50000 - 5000}{50} = 900$

After 30 years of construction of building

Book value/present value = Original cost – $N \times D$

$= 50000 - (30 \times 900)$

= Rs. 23000

25. (a)

Capitalized value = Net annual income × Years' purchase

$= 80{,}000 \times \dfrac{100}{8}$

= Rs. 10,00,000

26. (c)

It is assumed that after curing of 28 days, the concrete gains strength upto 100%, though it is progressive in nature and make developed upto a year.

27. (d)

Unit of workability in slump test is mm.

28. (d)

For M 20 grade of concrete mix cement : sand : aggregate = 1 : 1.5 : 3.

29. (c)

Far compressive strength test of concrete, water is added in the mortar in the preparation of $\left(\frac{P}{4}+3\right)\%$. (where $P\%$ is the water required to prepare the cement past of standard consistency).

30. (d)

Aggregate is said to be elongated when their greatest dimension size greater than 1.8 times of their mean size.

■■■■

JE and AE
1 Year Foundation Course

JUNIOR ENGINEER EXAMS • ASSISTANT ENGINEER EXAMS

Civil Engineering | Mechanical Engineering | Electrical Engineering

These foundation batches are taught comprehensively which cover the requirements of technical and non-technical syllabus of Junior Engineer and Assistant Engineer level exams.

Features

1 Year Foundation Course

Mode: Live Online

Admissions open in seperate batches for SSC-JE (Online Recorded Course). | Solo Course for Non-technical Section is also available.

Corporate Office: 44-A/1, Kalu Sarai, Near Hauz Khas Metro Station, New Delhi-110016 • Ph: 9021300500, 011-45124612

MADE EASY Centres : Delhi, Hyderabad, Jaipur, Bhopal, Pune, Kolkata | **www.madeeasyprime.com**