Q.1 The constraints in case of resource smoothing operation would be
- (a) resources
- (b) project duration time
- (c) both resources and project duration time
- (d) none of the above

Q.2 The resources in a construction project comprise of
- (a) office staff
- (b) construction materials like cement, bricks, etc.
- (c) office space
- (d) skilled and unskilled manpower

Q.3 Updating may result in
- (a) change of critical path
- (b) decrease of project completion time
- (c) increase of project completion time
- (d) All of the above

Q.4 Scheduling helps in
- (a) planning for the project
- (b) financial control of the project
- (c) preparing the estimate for the project
- (o) carrying out the project in an orderly and effective manner

Q.5 Which of the following rules should be followed while doing the resource scheduling?
1. CPM network logic must be maintained.
2. Activities on the critical path must use normal crew size.
3. Activities on the noncritical path must use the minimum crew size.

Select the correct answer using the code given below.
- (a) 1, 2 and 3
- (b) 1 and 2
- (c) 1 and 3
- (d) 2 and 3

Q.6 Assertion (A): incremental analysis using internal rate of return as the basis is the method best preferred by top management.

Reason (R): Selective choice of projects on offer at any point of time can be made as laddered merit by such an analysis.
- (a) both A and R are true and R is the correct explanation of A
- (b) both A and R are true but R is not a correct explanation of A
- (c) A is true but R is false
- (d) A is false but R is true

Q.7 When a CPM network is to be updated, one considers
- (a) only completed jobs to be outside the purviews
- (b) ongoing works to be outside the purviews
- (c) only substituted items
- (d) ongoing works and any other substitutions

Q.8 The activity duration (days) and resource requirements (units) are shown in the figure below. What is the maximum resource required in a day?
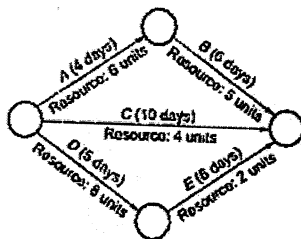
- (a) 14 units
- (b) 11 units
- (c) 19 units
- (d) 18 units

Q.9 The following table contains data on four activities, A, B, C and D.

Activity	Starts at Week number	Ends with Week number	Resource needed per week
A	9th	16th	6
B	11th	20th	4
C	15th	22th	3
D	13th	24th	7

The maximum total resource load in any week will be

(a) 20 (b) 17
(c) 16 (d) 14

Q.10 Consider the following statements:
Resource levelling means

1. economical utilization of resources
2. gradual increase in resources
3. adjustment of resources to have the least variations.
4. complete revamping of resources to suit the requirements
5. validating network depending on resource constraints

Which of these statements are correct?

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

Q.11 The CPM network is updated

(a) at regular intervals
(b) at fixed times
(c) at any time
(d) whenever there is difference in the planned and actual performance

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Explanations. Resource Allocation and CPM Updating

1. **(b)**

(i) Resource Smoothening
The total project duration is not changed, but some of the activity start times are shifted by their available floats so that a uniform demand for the resources is generated. The resources are considered to be unlimited.

(ii) Resource levelling
The activity start time are so rescheduled that the peak demand for a particular resource does not cross the available limit of the resources. Thus the resources are considered to be limited.

4. **(d)**
Scheduling is the determination of timing of the operations comprising the project. It is different from planning. It helps in carrying out the project in an orderly and effective manner.

5. **(c)**
Activities on critical path need maximum resources for their timely completion.
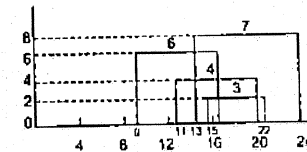
8. **(d)**

Activity	EST	Duration (Days)	EFT = EST +duration
A	0	4	4
B	4	6	10
C	0	10	10
D	0	5	5
E	5	6	11

Resource requirement:

Day	Activities	Resources
1	A + C + D	6 + 4 + 8 = 18
2	A + C + D	6 + 4 + 8 = 18
3	A + C + D	6 + 4 + 8 = 18
4	A + C + D	6 + 4 + 8 = 18
5	B + C + D	5 + 4 + 8 = 17
6	B + C + E	5 + 4 + 2 = 11
7	B + C + E	5 + 4 + 2 = 11
8	B + C + E	5 + 4 + 2 = 11
9	B + C + E	5 + 4 + 2 = 11
10	B + C + E	5 + 4 + 2 = 11
11	E	2

The maximum resources required are 18 on 1st, 2nd, 3rd and 4th day.

9. **(a)**

Maximum = 3 + 4 + 6 + 7 = 20

10. **(c)**
In resource levelling the activities are so rescheduled that the maximum or peak demand for the resources does not exceed the available resources. Thus in resource levelling the main constraint is on the resources. However, the resources cannot be less than the maximum amount needed for any activity of the project.

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