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073-BGE - 512

Project Engineering  
Assignment

2074 CHAITRA

1(a) Define project. Describe Joint venture project & possibility of technology transfer through it.

Ans: → Project is a great technology / opportunity for an organization & individual to achieve their business & non business objectives more efficiently through implementing change.

A joint venture project is a project arrangement in which foreign & local parties agree to pool their resources for the purpose of accomplishing a specific task. In a joint venture each of the participant is responsible for profit, losses & costs associated with it.

(b) What is project environment? How does political environment affect project in Nepal?

Ans: → Project Environment is the collection of elements which each affects the project's performance.

The political factor take country's current political situation. It also send the global political cond<sup>n</sup>. Effect of the country of business. The political factors

that affect project external environment are:-

- (i) Government policies
- (ii) Taxes law & Tariff
- (iii) Stability of government
- IV) Entry mode regulation.

Q(a) Describe importance of project appraisal.  
Explain the diff. b/w economic appraisal & financial appraisal.

Ans:-

Project appraisal is a systematic and comprehensive review of the economic, environmental, financial, social, technical and other such aspects of a project to determine if it will meet its objective, i.e. overall assessment of the relevancy, feasibility and sustainability of a project likelihood for success and its variable prior to making decision whether to undertake or not. It is the process of assessing and questioning proposals before resources and committed.

→ Difference b/w economic & financial appraisal →

## Economic Appraisal

(i) Profitability/viability or worthlessness of any project is determined or judged from the point of view of Society or nation as a whole.

(ii) Include both direct & indirect cost & benefits.

(iii) Cost & benefits are evaluated at shadow price / accounting price.

(iv) Use social rate of discount.

## Financial Appraisal

(i) Profitability or worthlessness of any project is determined or judged from the point of view of an individual entrepreneur.

(ii) Only direct cost & direct benefits are considered while determining profitability of project.

(iii) Cost & benefit are evaluated at market price.

(iv) Use market rate of discount.

(v) Ans:-

A project proposal is basis document containing all activities to be performed while under taking an investment.

venture.

Technical proposal :- It describes technical detail regarding to the project.

- (1) Statement of problem
- (2) Special reqy
- (3) Test & Inspection if reqd.
- (4) List of equipment facilities, skills etc.
- (5) CV of key pass on with detail.
- (6) ~~Capacity~~ Statement of organization.
- (7) Reporting.

Financial proposal

→ Describes financial part of project.

- (1) statement of work
- (2) cast of basic materials.
- (3) Supporting schedule.
- (4) Cost breakdown & work breakdown
- (5) Cost estimates techniques
- (6) Cost Summary
- (7) profit statement.

Q/N(3a)

Project plan :- It is the course of action to be taken in future planning.

Advantages.

- (1) It streamlines the project management process
- (2) It shows the committed future course of action.
- (3) It provides yard stick for measuring project & evaluating resources.
- (4) It provides simplification and smoothness & enables co-ordinations
- (5) It makes people time & cost conscious and motivates them to achieve targets.

(b)

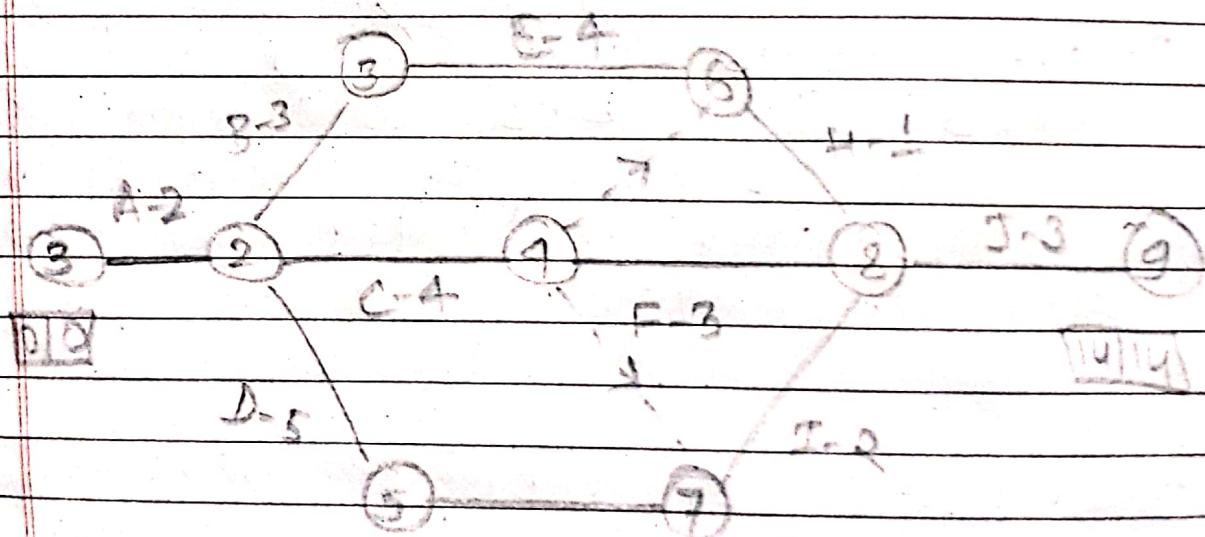
Total float :- It represents max. time by which the completion of an activity can be delayed without affecting the project completion time.

Free float :- It is the delay that can be permitted in an activity to the succeeding activities of the

paths are not affected.

### Independent Float

Independent float of an activity is the spare time available for that activity, if that activity is started as late as possible or finished as early as possible.



Activity	Duration	EST	LST	EFT	LF	TF	FF	IDF	Sft	Remarks
A	2	0	0	2	2	0	0	0	0	Cp
B	3	2	3	5	6	1	0	0	1	
C	4	2	4	6	8	2	0	0	2	
D	3	2	2	7	7	0	0	0	0	Cp.
E	4	5	6	9	10	1	0	0	1	
F	3	6	8	9	11	2	2	0	0	
G	2	7	7	9	9	0	0	0	0	Cp
H	1	10	10	10	11	1	0	0	0	
I	2	9	9	11	11	0	0	0	0	Cp
J	3	11	11	14	14	0	0	0	0	Cp

critical path 1-2-5-7-8-9

critical activities A O G I & J

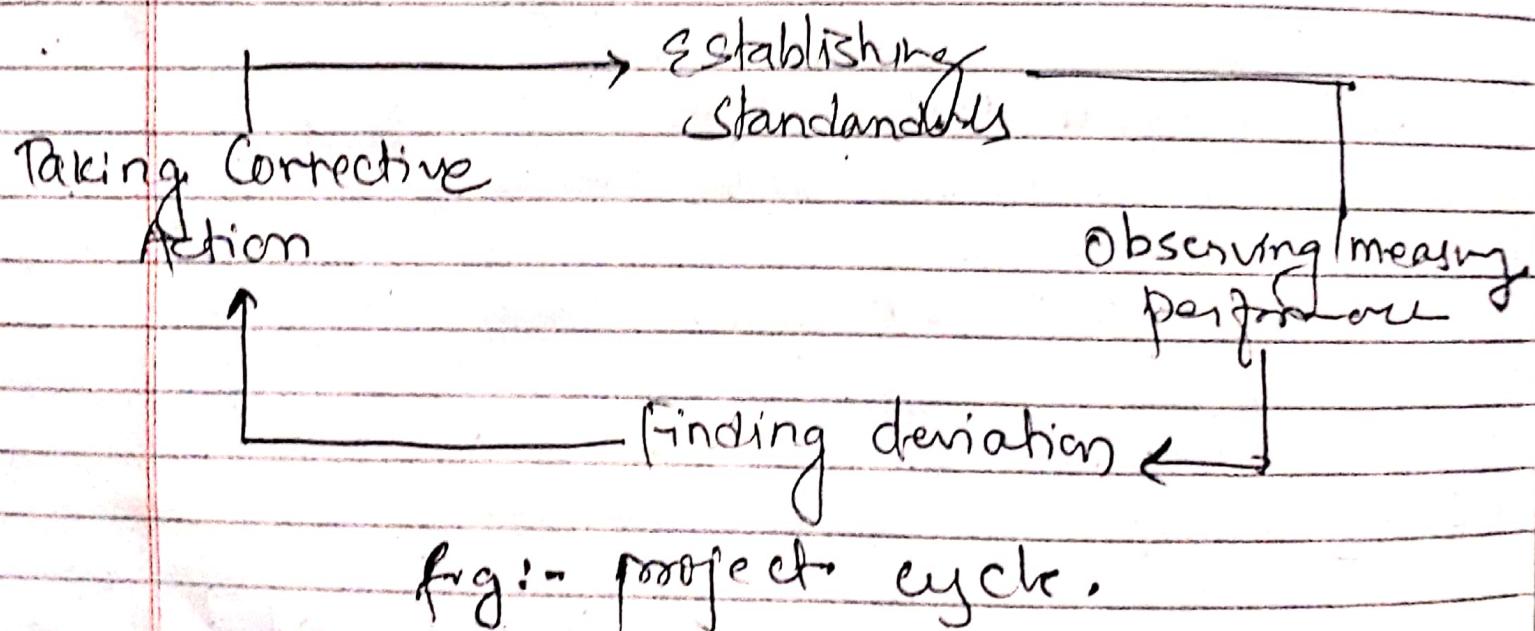
project completion time = 14 days.

#### Q.N4

Monitoring :- It is the management function to guide on the intended direction and to check the performance against predetermined plans.

Evaluating: It is judging, appraising, determining the worth, value or quality of a project to make necessary decision in terms of relevance, effectiveness, efficiency, sustainability & impact.

A Control Cycle is necessarily to conduct a series of arrangement action in loops at regular frequency



(Q.N5)

(a) Project Risk - It is an uncertain event or condition that if occurs has a positive or negative effect on project objective.

Internal risk originate inside the project & project manager and stakeholders holder usually have a measure & control over them whereas external risk include only risk that stem from sources outside the project.

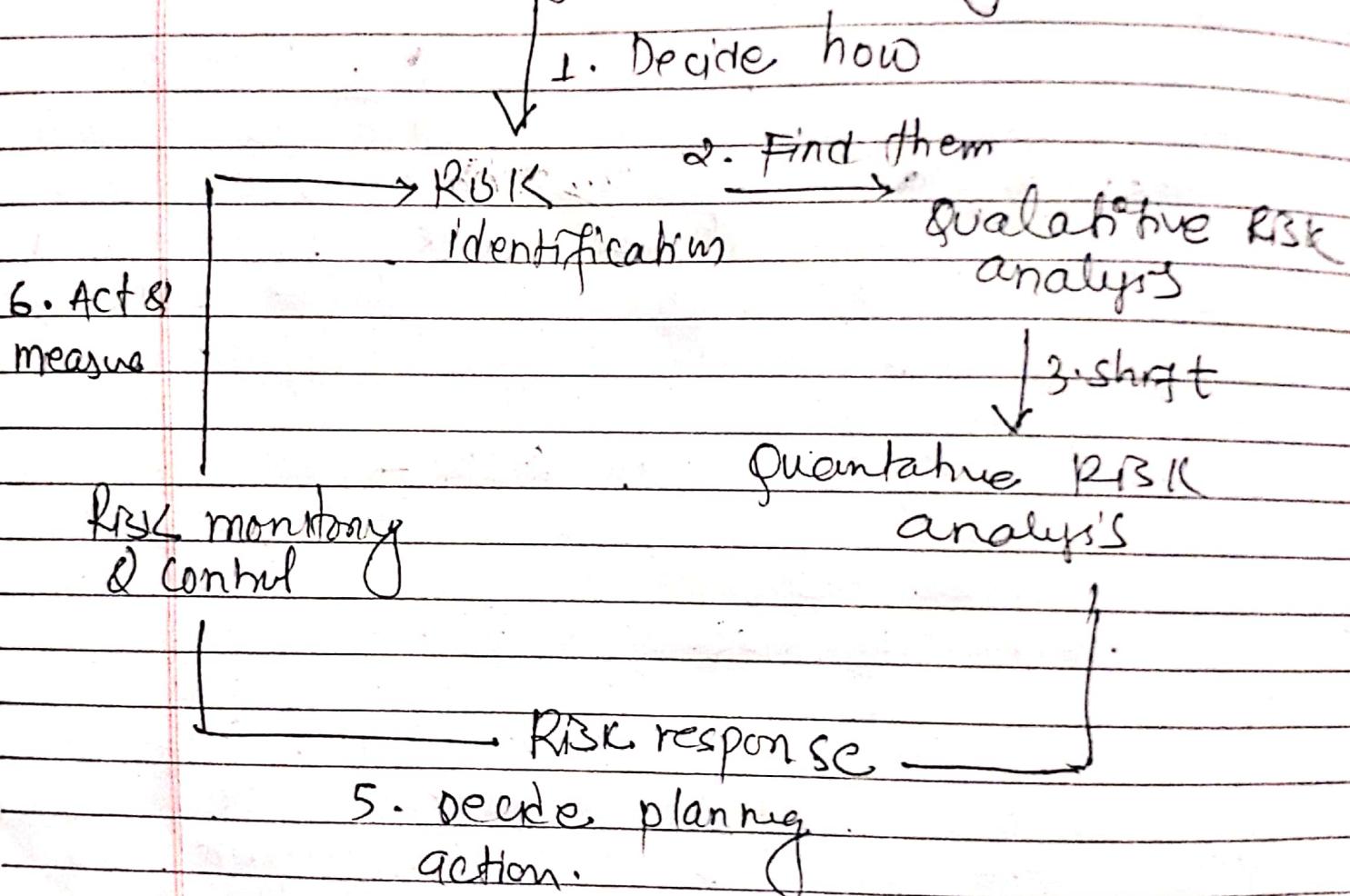
Sources of internal Risk:-

- (1) Market Risk
- (2) Technical Risk.

Hydropower projects in Nepal are carried out with insufficient risk assessment because of which time over run or variants are predominant many projects are struck in preconstruction phase & others in construction phase.

(b) Risk management is the systematic application of the risk management process on a project.

### Risk management planning



Q.6

(a) Ans

Project finance is the long term financing of infrastructure and industrial projects based upon the projected cash flows of the project rather

than the balance sheets of the project sponsors.

Feature of sound and appropriate Capital structure are:

1. Flexibility
2. Profitability
3. Solvency
4. Conservation
5. Control.

$$\text{Total ordinary shares} = 400000$$

$$\text{Preference shares} = \text{Rs } 20000 @ 12\% \text{ p.a.}$$

$$\text{Debt Capital (loan)} = \text{Rs } (150000 - 40000 \\ - 20000) \text{ Rs } 110000$$

$$= \text{Rs } 90000 @ 8\%$$

$$\text{(i) Firm earning before interest and tax} \\ (\text{FBIT}) = \text{Rs } 300000$$

(ii) Earnings after interest before tax

$$= \text{Rs } ② - ①$$

$$= \text{Rs } 228000$$

$$\text{(iii) Tax @ } 20\% \text{ of EBIT} = 20\% \text{ of } 228000 \\ = \text{Rs } 45600$$

$$\text{(iv) Earnings after interest} = \text{(ii)} - \text{(iii)} \\ = \text{Rs } 182400$$

(vii) Interest / dividend to preference share holders = 12% of 200000  
 $= \text{Rs } 24000$

(viii) Dividends to ordinary share holders  
 $= \text{Rs } (v) - (vi)$   
 $= \text{Rs } 158400$

Assume each share contains Rs 100

Ans,

No. of ordinary shares =  $\frac{\text{Rs } 400000}{100}$   
 $= \text{Rs } 4000$

(ix) Earnings per share (EPS)  
 $= \frac{\text{Rs } 158400}{4000}$   
 $= \text{Rs } 39.60$

(b) Ans

Capital Budgeting:

It may be defined as the decision making process by which firm evaluate the purchase of an invest in major fixed asset

Including Building, machinery & equipment

Capital Budgeting & importance.

1. Irreversible decisions

2. Growth

3. Large amount of funds.

4. Risk

5. Complex

6. Natural importance.

### Methodologies

A. Traditional criteria.

(a) Payback period:

(i) Simple pay back period.

(ii) Discounted pay back period.

(b) Accounting rate of return (ARR)

(B) Discounted Cash flow criteria.

a. Net present value / Net future value / Net Annual Rate.

b IRR

c) profitability index or B/C ratio.

## 2075 chapter

Q.N 1(a)

Project :- Already defined,  
Already done.

The dimension are -

1. Efficiency
2. Costumer
3. Business now.
4. Business future.
5. Team success.

The characteristics are -

1. Special objectives
2. Unique.
3. Definite Time units.
4. Constraints
5. Team work.
6. Not repetitive.
7. Life cycle phase.
8. Planning and scheduling.
9. Construction & Sub Contracting.
10. Beneficiaries.
11. Risk and uncertainties.
12. Rapid expenditure.

(b)

The different environmental within which a project need to be conducted are-

• (1) External environment

(2) ~~in~~task environment

(3) Task Environment

(a) Client

(b) contractor

(c) Consultant

(d) Government

(e) Suppliers

(f) Finances

(g) Competitors.

(2)

(a) Ans

As the project appraisal is a systematic & comprehensive review of the economic, environmental, financial, social, technical and other aspects of a project to determine if it will meet its objective i.e. overall assessment of the relevancy.

Feasibility and sustainability of a project likelihood for success & its viability prior to make decision whether to undertake or not.

It is necessary

The various aspects that needed to be considered for carrying out appraisal of hydropower project are:-

1. Financial
2. Technical
3. Economic
4. Market
5. Management
6. Environment

(b) Explain procedure for developing project proposal.

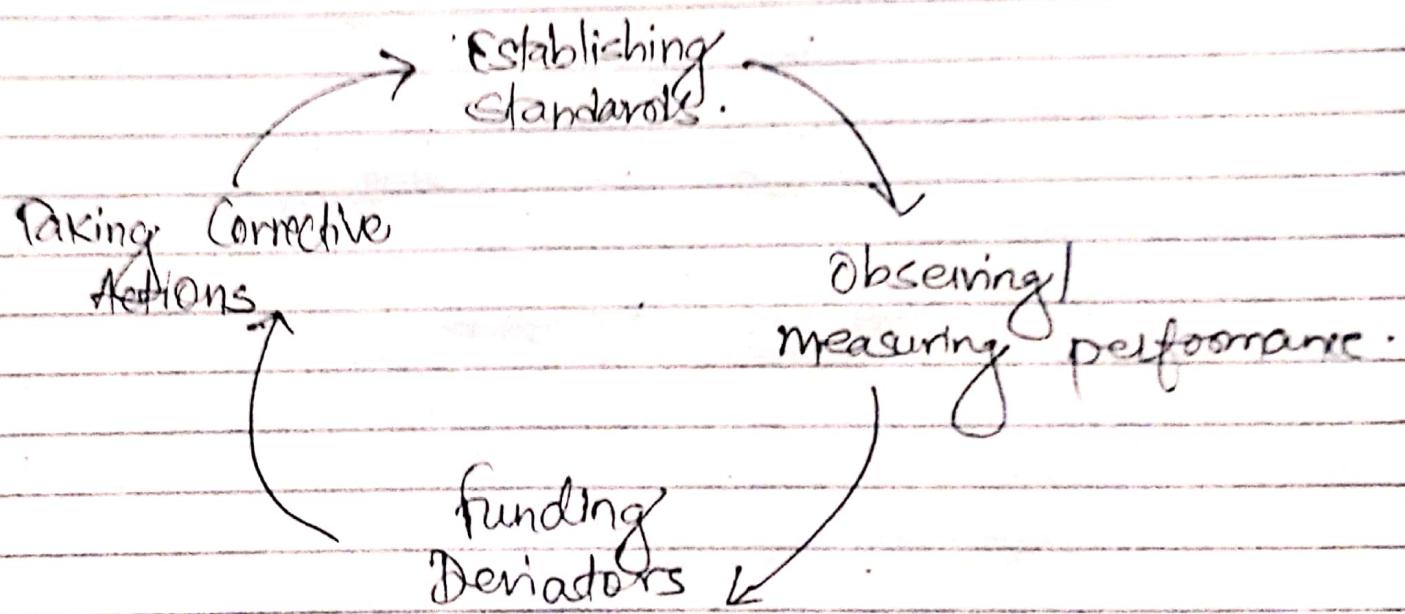
→ The procedure are:-

1. Project Brief
2. Pre-feasibility study
3. Preliminary / Detailed Design
4. Proposal Development

Ques 4(a)

What is project cycle? Explain with elements of control.

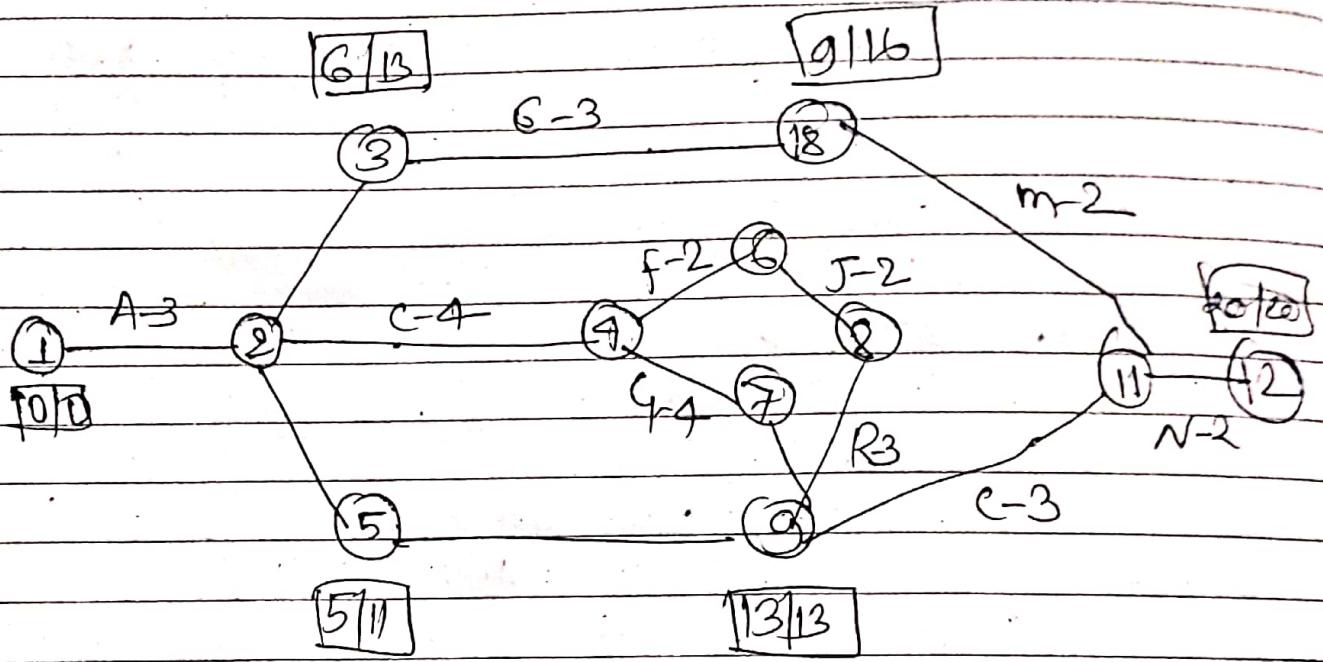
- A control cycle is necessary to conduct a series of management actions in loops at a regular frequency.



Elements of project control.

1. Time Control.
2. Cost Control.
3. Quality Control.

Q.N.3(a)



Network diagram

Activity	Duration	EST	LST	EFT	LFT	TF	FF	IDF	IFF	Remarks
1-2	3	0	0	3	3	0	0	6	0	CP
2-3	3	3	10	7	17	7	0	6	7	
2-4	4	3	13	11	7	0	0	0	0	CD
2-5	2	3	9	16	11	6	6	0	6	
3-10	3	6	13	10	16	1	5	6	7	
4-6	2	7	8	15	10	0	0	0	1	
4-7	4	7	7	12	11	6	6	0	0	CP
5-9	4	5	11	15	15	1	6	0	0	
6-8	2	9	10	15	12	0	0	0	0	CP
7-9	4	11	11	18	15	0	0	0	1	
9-11	3	13	12	18	18	6	1	0	1	
10-11	3	15	15	20	18	7	7	0	0	CP
11-12	2	19	16	20	20	0	0	0	0	

Hence project duration is 20 days

Critical path are: - 1-2, 2-4, 4-7, 7-9, 9-11, 11-12

Q.N (3b)

$$5 \text{ hours} = \$50.00$$

$$1 \text{ hour} = \$10.$$

BCWP

$$1000 \text{ Bricks} = \$0.05 \times 1000 = \$5000$$

$$150 \text{ Bricks} = \$0.05 \times 150 = \$7.50$$

$$ACWP = \$9.00$$

$$SV = BCWP - BCWS = \$7.50 - \$10.00 \\ = -\$2.50$$

(Behind Schedule)

$$SPI = \frac{BCWP}{BCWS}$$

$$= \frac{\$7.5}{\$10} = 0.75 < 1$$

$$\text{Revise schedule} = \frac{5}{0.75} = 6.67 \text{ hrs.}$$

$$CV = BCWP - ACWP \\ = \$1.5 \text{ (over budget)}$$

$$CPI = \frac{BCWP}{ACWP} = \frac{\$7.5}{\$9} = 0.8333 \\ (\text{over budget})$$

$$\text{Revise cost} = \frac{\text{original cost}}{CPI} = \frac{\$50}{0.833} \\ = \$60.00$$

Since  $CPI < 1$ , the project over budget  
since  $SPI < 1$ , it's behind schedule.

∴ corrective action should be taken

Q:N (5a)

RISK :- It is an uncertain event or condition that if occurs has a +ve or -ve effect on project objective.

Types

1. External Risk
2. Cost Risk
3. Schedule Risk
4. Technology Risk
5. Operational Risk

(b) what are the sources of project finances

→ Sources are as follows -

1. Project itself
2. Sponsors
3. Financial advisors
4. Technical advisors
5. Legal advisors
6. Debt finances.
7. Equity Investors
8. Regulatory Agencies.
9. Multilateral Agencies.

5(b). Here,

$$P = \text{RS } 300000$$

$A = \$0000$  for 8 years.

$SV = 10,000$  after 8 years

Assume  $MARR = 10\%$ .

Payback period =  $\frac{\text{Init. investment}}{\text{Annual cash flow}}$

$$= \frac{300000}{50000} = 6 \text{ yrs (8 yrs)}$$

Good to invest

$ARR = \frac{\text{Average income}}{\text{Avg. Investment}}$

Avg. income =  $\frac{\text{Income} - \text{Exp} - \text{Tax}}{\text{No. of yrs}}$   
=  $\$0000$

Avg. Investment =  $\frac{300000 + 10000}{2}$

$$= 155000$$

$$ARR = \frac{50000}{155000} = 0.3226$$
  
$$= 32.26\%$$

$ARR > MARR$  Accept