Exam.	Back		
Level	BE	**Full Marks**	80
Programme	BCE, BEL, BGE, B. Agri.	**Pass Marks**	32
Year / Part	IV / I	**Time**	3 hrs.

Subject: - Project Engineering *(CE701)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a) Explain the importance of project appraisal. Differentiate between technique and finance proposal of a project. [8]

   b) Discuss the techniques of project formulation. [8]

2. a) Explain project appraisal and its importance. [8]

   b) Describe the essence of writing a good proposal. [8]

3. a) Draw CPM network diagram and compute ES, EF, LS, TF, FF, Int.F and IF from the information given below. Also compute project duration and mark the critical path. [12]

Activity	A	B	C	D	E	F	G	H	I
Duration (week)	5	4	0	6	7	8	6	3	2
Predecessor	-	-	A	A	B,C	B,C	D,E	F	GH

   b) Write the advantages of Bar chart. [4]

4. a) What would be the impact on project due to unmanaged risk in project? Write down risks in project in different phases of project life cycle. [8]

   b) Explain and justify that risk transfer and risk reduction are techniques of risk response planning in any project. [8]

5. a) Explain project control cycle and write the factors to be considered during quality control of a project. [8]

   b) Describe project finance. Capital structure of a firm consists of 500 ordinary share @ Rs 100/share and 300 preference share @ Rs 100/share at 15% interest per year. Firm has a loan of 30,000 @ 12% per year firms earning before interest and tax is 40,000. Determine earning per share and book value. Tax rate = 40% [8]

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Subject: - Project Engineering (CE701)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a) Describe that the specified job/task is a project? Write the major activities carried out in the implementation phase of a project? [4+4]

   b) Explain in detail the project operates in dynamic environment. [8]

2. a) Write various analysis to be carried out for project appraisal. [8]

   b) Explain in details about the contents of writing a good project proposal. [8]

3. a) Draw CPM network diagram and compute EST, EFT, LST, LFT, TF, FF, Int.F and IF from the information given below. Compute project duration and mark the critical path. [12]

Activity	A	B	C	D	E	F	G	H	I
Duration (week)	3	2	0	4	7	5	8	6	1
Predecessor	-	-	A	A	B,C	B,C	D,E	F	G,H

   b) Explain total float and independent float. [4]

4. a) Explain project control cycle and write the factors that should be considered during the quality control of a project. [4+4]

   b) 50 units of plantation have to be done in 4 weeks period. Per unit cost of plantation is estimated as Rs. 200 of which progress monitoring was done 3 weeks after the work was started. Only 60% work was found completed and the account record showed that the actual expenditure for plantation per unit was Rs. 300. Perform EVA and comment on works. [8]

5. a) Define risk and its types. How could you manage risk in a project effectively? Justify with risk management cycle. [2+6+2]

   b) What are the sources of project finance? A firm has equity capital consisting of 5000 ordinary share@ Rs 100 per share and Rs. 3,00,000 preference share at 12% interest per year and Rs 2,00,000 loan at 10% interest per year. If firm's earning before interest and tax is Rs 3,50,000 and tax rate applicable is 25% determine earning per share and book value. [6]

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Exam.	Back		
Level	BE	Full Marks	80
Programme	BCE, BEL, BGE, B.Agri.	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering *(CE701)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a) Define Project. Describe Joint Venture Project and Possibility of Technology Transfer through it. [1+4]

   b) What is Project Environment? How does political environment affect project in Nepal? [1+4]

2. a) Describe the importance of project appraisal. Explain the difference between Economic Appraisal and Financial Appraisal. [2+4]

   b) Define Project Proposal. Differentiate between Technical Proposal and Financial proposal. How does client evaluate the proposal for awarding the contract of Construction and Consulting works? [1+2+3]

3. a) Define Project plan. Explain the advantages of planning Engineering Projects. [1+3]

   b) Define Total Float, Free Float and independent float. Draw a CPM network and Find EST, EFT, LST, LFT, TF, FF, IntF and IndF. Show critical path also. [16]

Activity	A	B	C	D	E	F	G	H	I	J
Successor	B, C, D	E	F, H, I	G	H	J	I	J	J	
Duration-Days	2	3	4	5	4	3	2	1	2	3

   c) Define resource schedule. Differentiate between resource levelling and resource smoothening. [4]

4. a) Define Monitoring and Evaluating. Explain project control cycle with suitable example. [1+5]

   b) Define quality. Differentiate between quality assurance and quality control. As a site engineer what steps would you follow to control quality? [1+2+3]

5. a) Define project risk. Differentiate between internal and external risks. What are the sources of internal risks in Nepal in the present context? Explain internal risks for the implementation of hydropower project in Nepal. [1+2+2+2]

   b) Define Risk Management. Describe the steps of risk management. [1+4]

6. a) Define Project Finance. What are the features of sound and appropriate capital structure? A company has total Capital of Rs 1500000 which consists of Rs. 400000 shares, Rs. 200,000 preference share issued at 12% interest per year and Remaining loan issued @ 8% interest. Calculate EPS if earnings before interest and tax in a year is Rs 300,000 and tax rate is 20%. [1+2+2]

   b) Define Capital Budgeting and explain its importance. What are the methodologies of evaluating projects financially and Which method is most reliable? [1+2+2]

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Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BCE, BEL, BGE, B. Agri	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering *(CE701)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a) Discuss project phases and life cycle giving examples of activities carried out in different phases and stages of life cycle. [10]

OR

Classify project and discuss its characteristics in detail including the importance of good project environment.

2. Define project proposal. A well prepared project proposal should give answer of what types of question, explain it. Discuss elaborately about different aspect to be considered in feasibility study of a road project. [2+2+5]

3. a) List down planning tools used in any project. Milestones chart is improved version of a bar chart, Justify it, with example. Explain WBS. [2+4+2]

   b) Draw a network diagram and find out EST, EFT, LST, LFT, TF, FF independent float, interfering float, project completion time of a building project having following details. What is the significance of critical path in the network analysis? [13]

Immediate Predecessor	-	-	-	A	A	B	C	C	D	E,F,G	H
Activity	A	B	C	D	E	F	G	H	I	J	K
Duration (Weeks)	10	12	9	8	5	13	6	4	15	7	9

4. a) What is the difference between evaluation and controlling? Discuss about elements of project control. [5]

   b) For a particular project budgeted cost of work schedule was Rs. 9,50,000 and budgeted value of the work performed was Rs.8,00,000 at a point of reporting date i.e at 20 weeks from starting date. But, the actual cost of work performed was Rs. 10,00,000 and the project completion time is 45 weeks. The project having estimated cost of Rs. 50,00,000. Based on above information, draw features of that project and comment on each parameter of earned value analysis. [7]

5. a) How risk can be identified and analyzed for a rural road project. Explain the procedure. [5]

   b) What are the methods that could be used in risk management after identifying major risk. Justify giving suitable example how risk transfer is taken as risk response planning. [5]

6. Define the term project finance and what are the sources of financing in any project? Write down and explain about the determinants of capital structure decision to be undertaken for investment proposal. [3+5]

7. Write short notes on: (any two) [5×2]

   i) Cost-benefit analysis
   ii) Resource leveling
   iii) PMIS
   iv) Project software

Exam.		Regular	
Level	BE	Full Marks	80
Programme	BCE, BEL, BGE, B. Agri.	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering (CE701)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a) Define project. Explain the characteristics of project with appropriate examples. [1+4]

   b) How project goal or objectives are set? Explain goal setting criteria. [5]

2. a) What are the objectives of project appraisal? Explain Financial and Technical Appraisal in detail. [2+4]

   b) Define project proposal. Discuss cost benefit analysis for a road project. [2+4]

3. a) Define planning and scheduling. Prepare a Linked Bar-chart for a construction project with at least 10 activities. [2+4]

   b) Define Critical Activities and Float. Draw a CPM network [AOA or AON] and find EST, EFT, LST, LFT, TF, FF, IntF and IndF. [2+5+6]

Activity	A	B	C	D	E	F	G	H	I	J	K	L
Predecessor	-	-	A	A,B	B	C,D	D	D	E,H	E,H	F,G,I	L
Duration Days	1	3	2	4	3	5	1	2	6	3	2	4

   c) What is WBS? Discuss importance of WBS. [4]

4. a) Define Monitoring and Control. Explain why project controlling is difficult in Nepal. [3+3]

   b) What is EVA? A construction work had to be completed in 10 days with 50 labour days at Rs 1000 per day i.e with total cost of Rs 50,000. At the end of third day, only 25% work was completed with the use of 18 labour days at Rs 800 per day. Perform earned value analysis and comment on the performances. [1+5]

OR

Define quality. Explain how quality can be controlled in construction of urban roads. [6]

5. a) Define Project Risk. How risk can be analysed? Explain with example of hydropower project. [1+4]

   b) How risk can be managed? Explain how you manage three risks in hydropower project you identified above. [5]

6. Define Capital Budgeting decision. Explain its importance. Calculate Explain ARR of a project with initial cost of Rs. 100000 and salvage value of Rs 20000 after 5 years. Stream of income in year 1 to year 5 are Rs. 15,000; 20,000; 25,000; and 20,000 Tax rate is 25%. Assume suitable method of depreciation. [1+2+2]

7. Write short notes on: (any two) [4×2]

   i)   Project life cycle
   ii) Planning software MS project
   iii) Elements of project control
   iv) Environmental analysis for project formulation

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Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BCE, BEL, B.Agri.	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering (CE701)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ **All** questions carry equal marks.
✓ Assume suitable data if necessary.

1. a) Explain Work Breakdown Structure as a tool of project planning and state the importance of project planning.

    b) Draw the CPM network diagram (or Precedence diagram) from the following activity relationships: Compute total minimum project time of completion, critical activities and ES, EF, LS, LF, TF, FF, IntF and IndF.

Activity	A	B	C	D	E	F	G	H	I
Duration	3	5	5	6	2	3	4	2	6
Predecessor	-	A	A	A	B,C	C	D,E,F	D	G,H
Successor	B,C,D	E	E,F	G	G	G	I	I	-

    Also mark the critical path in the network diagram.

2. a) Define project and explain it's characteristics in brief. What are the major differences between project management and traditional management? Explain about the external environment of the project.

    b) Define project formulation and project appraisal. Write the procedure for developing a project proposal. What are the drawbacks of cost-benefit analysis of project formulation?

3. a) Why project planning is necessary to operate any project in dynamic environment? Linked bar chart is one of planning tool in project scheduling, justify this statement with suitable example. Is there limitations of this chart?

    b) Find out the expected time of each contractor to complete a given project having following details. Also, find out which contractor you prefer for operation and why?

Contractor	t_o	t_l	t_p
A	5	7	13
B	6	11	12
C	3	5	7

4. a) Discuss "monitoring, evaluation and control" is a must to succeed in a project. Explain project management information system and justify "the right information at the right time reduces the risk of wrong decision".

    b) Explain the term 'project finance' and describe features of sound capital structures. Write down and explain with example what are the factors to be considered to take capital structure decision.

5. a) Define risk management planning. Explain in details about internal and external risks in project. Justify giving suitable example how risk reduction is taken as risk response planning.

    b) A project has total capacity of $1,000,000 which consists of 4,000 shares @ $100; $300,000 preference shares @ 18% interest; and remaining loan @15% interest. Earning before income and tax in a year is $200,000. Compute the Earning per Share (EPS) and Book Value of Share, if Tax Rate is 20%.

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Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCE, BEL, B.Agri.	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering (CE701)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Define Project. Elaborate Labor intensive, Capital Intensive, Joint Venture and Multilateral projects. Explain various elements of task environment.   [2+4+4]

2. a) What is project appraisal? Explain marketing, management and environmental appraisal.   [2+6]

   b) Define project proposal. Explain in brief about procedure for developing a project proposal.   [2+6]

3. a) Draw the network diagram of the given project having following activities. Obtain project duration, critical path, TF, FF and interfering float. Prepare the resource aggregation chart and allocate the mason using early start schedule.   [8+5]

Activity	Duration (days)	Mason (per day)
1-2	3	1
2-3	3	2
2-4	4	4
2-5	2	2
3-10	3	2
4-6	2	3
4-7	4	3
5-9	4	4
6-8	2	2
7-9	4	1
8-9	3	2
9-11	3	4
10-11	2	2
11-12	2	1

   b) Discuss on Work Breakdown Structure.   [3]

4. a) Define Monitoring and Evaluation. Explain project control cycle.   [2+4]

   b) Why cost control is important? A contractor agreed to build 50 doghouses in 90 days at a price of $1000 per unit. 20 days later, the contractor has finished 10 doghouses with an actual cost of $8500. What is the status of the project?   [2+4]

   c) What is PERT? Discuss with example.   [4]

5. Define Risk. Explain various sources of project risks. Describe important steps of risk management.   [2+5+5]

6. a) What is capital structure planning? Discuss with examples.   [5]

   b) What is capital budgeting decision? Explain its importance. Discuss Net present value used in capital budgeting decision.   [5]

   OR

   What are the sources of financing large projects?

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Exam.		Regular	
Level	BE	Full Marks	80
Programme	BCE, BEL, B.Agri.	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering *(CE701)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Differentiate between labour intensive and capital intensive projects with example? Explain project Goal setting criteria with an aid of suitable example. [3+5]

2. Define project formulation and project appraisal. Describe procedure for developing a project proposal. [2+2+8]

3. a) Explain Bar chart with its advantages and limitations. [8]

   b) Define the term planning and explain the features of good project planning? Find all the components of CPM from the following information: [4+12]

S.N	Activity	Duration	Predecessor	Successor
1	A	3	-	D
2	B	6	-	E,G,I
3	C	2	-	F
4	D	2	A	G
5	E	1	B	H
6	F	3	C	I
7	G	7	B, D	-
8	H	3	E	-
9	I	4	B, F	-

4. a) Justify the statement "quality costs more, but lack of quality costs even more" giving examples of total quality cost included to achieve good quality. [6]

   b) A construction company is planned to fix 100 units of precast window in 20 days with a budget of 25 lakhs. The progress status was reviewed on 10 days from date of start of fixing and only 40 units were fixed with the expenses of 9 lakhs. Find out all the parameters of earned value analysis and comment on its performance. [6]

5. Define risk and risk management. Explain about internal risk of any construction project that is facing by a Nepalese construction company. Explain with suitable example risk transfer. [2+8+2]

6. a) Define Capital Structure. XYZ company has total capital of Rs.10,00,000 which consists of 40% share and 60% loan issued @ 12% interest. It requires Rs.20,00,000 more to invest in a project and is considering for following three options. [1+6]
   i) Rs.8,00,000 share and Rs.12,00,000 loan @14% interest
   ii) Rs.5,00,000 share; Rs.7,00,000 preference share @15% interest and Rs.8,00,000 loan @14% interest and
   iii) Rs.10,00,000 share and Rs.10,00,000 preference share @ 15% interest.
   Which is the best option based on Earning Per Share Calculation if the Earning before interest and tax in a year is Rs.5,00,000 and tax applicable is 30%

   b) Define Capital Budgeting decision. Explain ARR or return on Equity. Recommend appropriate measures that Government should take to attract private sector in Hydropower projects. [1+2+2]

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Exam.	Old Back (2065 & Earlier Batch)		
Level	BE	Full Marks	80
Programme	BCE, BEL,BEX,BCT,BME	Pass Marks	32
Year / Part	IV/ I	Time	3 hrs

Subject: - Project Engineering *(EG706CE)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt any **Five** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a. Define Project. Write five characteristics of a Project and explain any two of them.   [2+3+3]

   b. What is plan? Why planning is important in project? Write systematic process of project planning.   [2+3+3]

2. a. Draw a Gantt Chart of a project having at least 10 activities. Write its advantages.   [6+2]

   b. Define the terms Dummy activity, Total Float, Free Float and independent float.   [2+2+2+2]

3. a. Draw a CPM network. Find EST, EFT, LST, LFT, TF, FF.   [4+6]

Activity	A	B	C	D	E	F	G	H	I
Predecessor	-	-	A	B	B	B, C	D	E	F, G, H
Duration	2	4	5	5	3	4	2	5	3

   b. Explain basic requirements of linear programming.   [6]

4. a. Define Monitoring, Evaluating and Control. Explain Project Control Cycle.   [4+4]

   b. Why cost control is necessary in a project? What is earned value? Explain EVA approach of cost control.   [2+2+4]

5. a. What are the sources of project finance? Explain any four determinants of capital structure planning.   [2+6]

   b. Why capital budgeting is important? Determine the feasibility of the following projects using any two methods. MARR is 15%   [2+6]

Initial investment	Annual Income	Annual O & M	Useful Life	Salvage Value
1,00,00,000	25,00,000	4,50,000	5 years	40,00,000

6. Write Short notes on (Any four)   [4X4]
   a. SMART objectives
   b. Resource leveling
   c. Feedback Control
   d. Types of Budgets
   e. EIA
   f. WBS

***

Subject: - Project Engineering *(CE701)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Differentiate between Bilateral, Multilateral and Joint Venture project with example? Discuss the external environment in which a project is operated. [4+6]

2. Define concept of project appraisal. Explain about contents of technical and financial proposal. Also explain input analysis of project formulation. [2+7+3]

3. a) Construct the CPM network for a project with following activities: [16]

Activities	A	B	C	D	E	F	G	H	I	J
Predecessor	-	-	A,B	B	A	C	E,F	D,F	G,H	I
Days	4	7	4	3	2	1	6	5	8	9

Find:

i) Critical path
ii) Project completion time
iii) EST, EFT, LST, LFT, Total float,
Free float (F_F), independent float (I_dF) and Interferring float (If)

b) Define the terms resource histogram, resource levelling limited resource allocation and work break structure. [2+2+2+2]

4. a) Write the concept of Monitoring, Evaluation and Controlling and also explain project control cycle. [3+4]

b) Why cost control is important in project? 15 houses were to be completed in three months with per unit cost of Rs 25,00,000/-. In one month 4 houses were completed with total expenditure of Rs 96,00,000/- use earn value analysis to find the status of the project. [3+4]

5. Define 'risk'. Explain various sources of project risk. Elaborate risk response planning. [1+5+4]

6. Define the term project financing. Explain features of capital structure planning. A project has total capital of Rs 5,00,000 which consists of 2000 shares @ Rs 100, 1,50,000 preference share 18% interest and remaining loan @ 14% interest. Earning before interest and tax in a year is Rs 1,00,000. Calculate EPS and book value of share if tax rate is 25%. [2+4+4]

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Exam.	Regular / Back		
Level	BE	Full Marks	80
Programme	BCE, BEL, BEX, BCT, BME	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ *Attempt any **Five** questions.*
✓ *The figures in the margin indicate **Full Marks**.*
✓ *Assume suitable data if necessary.*

1. a) Define a project and classify it? Name the characteristics of a project and describe what you mean by temporary team/organization in a project. [8]

   b) Name project life cycle and explain how you set goals in a project by giving example of one goal and verifying the same with the criteria of goal setting. [8]

2. For a project, following durations are given: [16]

SN	Activity	Durations	Precedence	Successor
1	A	5	–	E
2	B	6	–	F
3	C	7	–	G
4	D	8	–	H
5	E	9	A	I, J
6	F	7	B	I, J
7	G	5	C	I, J
8	H	3	D	I, J
9	I	4	E, F, G, H	–
10	J	5	E, F, G, H	–

   Find EST, EFT, LST, LFT, TF, FF. Show critical path and find duration.

3. a) Define PERT and discuss its uses. Project A and B have t_0, t_m and t_p as 5, 8, 12 and 6, 8, 11 respectively. Find Mean and Standard Deviation. Which project is better and more certain? [8]

   b) What are Gantt chart and discuss about resource allocation and smoothing. [8]

4. a) Differentiate Monitoring and Controlling by explaining Project Control Cycle. Explain the concept of Earned Value Analysis used for controlling cost. [8]

   b) Define Work Breakdown Structure? Write its importance and use. [8]

5. a) Explain the importances of Budgeting. Name different types of budgets and explain Capital Budgeting decision and Budgeting process. [8]

   b) Describe Socio Economic survey and also social and ordinary cost benefit analysis. [8]

6. Write short notes on: (any two) [8+8]

   a) Environmental problems and type of impacts
   b) Project Management Information System (PMIS)
   c) Linear Programming
   d) Goal setting in a project

7. Write short notes on: [4×4]

   a) WBS and its uses
   b) Feedback Control System
   c) Manpower Levelling
   d) Cashflowability and Capital Structure

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03   TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division

2067 Ashadh

Exam.	Regular/Back		
Level	BE	Full Marks	80
Programme	BCE, BEL, BEX, BCT, BME	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt any **Five** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a) Explain project family tree with suitable example. Explain also criteria of goal setting in any project. [4+4]

   b) List out different phases of project life cycle. Explain in details what are the activities to be done in implementation phase of project life cycle. [8]

2. Define forward and backward pass in the network analysis. Draw the network diagram and compute EST, EFT, LST, LFT, TF, FF, IF and interferring floats for each activities of the project having precedence relationship as shown below. Also find out critical path. [4+12]

Activity	A	B	C	D	E	F	G	H	I	J	K	L
Duration (days)	10	9	7	9	8	5	11	6	9	12	10	8
Predecessors	—	—	A	A	B	B	D, E	C, G	H	G	G, F	K

3. a) Explain with examples closed system and open system of control. Justify the statement "Quality costs more, but lack of quality costs even more". [8]

   b) Define Project Management Information System (PMIS), stating objectives of PMIS. Explain the various choice of information channel in a project. [8]

4. a) Why project planning is necessary in any project? List out the planning tools used in project management. Write down the limitations of conventional bar chart showing suitable example of a bar chart. [4+4]

   b) Explain earned value analysis graphically showing favourable and unfavourable cases of variance. For a particular project, budgeted cost of work schedule was 9,50,000 and budgeted value of the work actually completed or earned value was 8,00,000 at a point of reporting date i.e. at 20 weeks from starting date. The completion time of project is 45 weeks. Based on above details, draw features of that project and comment on the schedule performance. [4+4]

5. a) List out various errors in drawing a network diagram. Find out the expected time of each engineer mentioned below. Which engineer you will choose and why? Who is more certain in completing the job? [4+4]

Types	t_o	t_m	t_p
NTC Engineer	5	9	12
NCell Engineer	4	5	9

   b) Describe environmental impact analysis. Explain in brief about shadow pricing, market externalities, market imperfection and social cost benefit analysis. [8]

6. a) Define budgeting? List out different types of budget. Explain the essential and purpose of budgeting for a new project. [8]

   b) Define capital structure planning. Explain in brief cash flowability, leverage ratio, flexibility and marketability of the company. [8]

7. Write short notes on: (any four) [4×4]
   a) Environmental problems in Nepal
   b) WBS with example specifying levels
   c) Material scheduling
   d) Linear programming
   e) Resource allocation and smoothing
   f) Budgetary control

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Exam.		Regular / Back	
Level	BE	Full Marks	80
Programme	BCE, BEL, BEX, BCT, BME	Pass Marks	32
Year / Part	IV / I	Time	3 hrs.

Subject: - Project Engineering

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt any **Five** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a) Define project. Explain the different characteristics of project. [8]

   b) Define project life cycle phases. Explain, with example, the typical life cycle phases of a project. [8]

2. A project has the following schedule, construct the network diagram and compute EST, EFT, LST, LFT, TF, FF, IF and interfering floats for each activities and find critical path. [16]

Activities	A	B	C	D	E	F	G	H	I	J	K	L
Predecessors	None	None	A	B	B	C, D	E	E	G, H	H	I, J	E, F
Time	8	2	1	9	4	5	6	3	3	5	2	3

3. a) What do you mean by project planning? Explain the importance of work break down structure for project planning. [6]

   b) Define, monitoring, evaluation and control. Explain briefly quality control, cost control and schedule control in the project. [4+6]

4. a) What are the differences between CPM and PERT? Find the te (time estimates for x and y where t_0, t_m, t_p is 4, 6, 8 for x and 3, 5, 6 for y. Also find which is more certain by using S.D. and variance. [8]

   b) Define E.I.A. What are the environmental problems in Nepal and how do you improve them? [8]

5. a) Why capital structure planning is important for business firm? Explain in brief the determinants of capital structure planning. [2+6]

   b) Rank by using payback method, present worth, IRR and B/C ratio method. [8]

Item	Initial Investment	Annual Cash Flow	Life in years
1	Rs. 60000	12000	15
2	Rs. 88000	22000	22
3	Rs. 2150	1500	3
4	Rs. 20500	4500	10

6. a) Define Project Management Information System (PMIS). Why PMIS is important for effective coordination of project activities? [8]

   b) Define budget, sales budget, production budget, cash budget, fixed budget and flexible budget. [8]

7. Write short notes on any four: [4×4]

   a) Resource allocation and smoothing
   b) Earned value analysis
   c) Steps in capital budgeting
   d) SMART criteria
   e) Socio-economic Analysis (Social Cost Benefit Analysis)

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1. a) Explain project, characteristics of a project. Explain goal setting (SMART). [8]

   b) Explain monitoring, evaluation and controlling and project life cycle. [8]

2. a) Explain CPM and PERT and their uses. [5]

   b) Draw the network. Find EST, EFT, LST, LFT, TF, EF and IF. [11]

SN	Activity	Duration	Predecessor	Successor
1	A	5	—	B, C, D
2	B	4	A	E
3	C	2	A	F, H
4	D	3	A	G
5	E	2	B	H
6	F	1	C	I
7	G	3	D	I
8	H	1	C, E	—
9	I	2	F, G	—

3. a) Describe the purpose of budget, project budget, operation budget, sales budget, cash budget and advantages of budget. [10]

   b) Explain budgetary control, objectives, advantages and essential conditions for applying a budget. [6]

4. a) Describe the elements of cost control, system of control and feed back control system. [8]

   b) Describe in detail the work-break-down structure. [8]

5. a) Explain capital budgeting, needs and importance steps and capital budgeting process. [8]

   b) Explain EIA. Describe different environmental problems and types of environmental impacts and method of identification and comparison by check list method. [8]

6. a) Draw Bar-chart and explain its advantages and disadvantages. Also find t_e, and variance when t_o, t_m and t_p are 6, 8, 12. [8]

   b) Explain earned value analysis. When 125 cub.m. of concrete is to be done in 10 days at the cost of Rs. 1,250,000 at the end of the third day managed to complete 40 cub.m. of concrete with expenses of Rs. 3,75,000. Find EVA and comment the performance. [8]

7. Write short notes on any four: [4×4]

   a) Linear Programming
   b) Socio-economic Survey and SCBA
   c) Capital Structure Planning and Debt Equity Ratio
   d) Resource Allocation and Smoothing
   e) PMIS

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