

# Old Questions Collection

## B.E. Software 6th Sem.

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## POKHARA UNIVERSITY

Level: Bachelor  
Programme: B E  
Course: Principles of Programming Language

Semester: Fall

Year : 2020  
Full Marks: 100  
Pass Marks: 45  
Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |   |     |
|----|---|-----|
| 1. | a) What are phenomenology of programming language? Explain about the "Fascination and fear are common to new tools".  | 8   |
|    | b) "Pass by reference has dangerous consequences in FORTRAN". Justify it with suitable example.   | 7   |
| 2. | a) Illustrate looping in FORTRAN by writing a program to find out the square root of the first ten natural numbers.<br>b) Describe Name structure of FORTRAN.   | 8   |
| 3. | a) ALGOL follows "zero-one-infinity" principle. Verify it comparing with FORTRAN.<br>b) How ALGOL has changes the way of programming in efficient way? Explain. | 8   |
| 4. | a) Describe different forms of for loop in ALGOL.<br>b) What are different searching techniques in LISP? Explain them with the help of walking down diagram.    | 8   |
| 5. | a) How cases are handled while implementing recursive list processor?<br>b) What is LISP? Define the structural Organization of LISP program with example.      | 7   |
| 6. | a) Explain Message Passing and Returning mechanism in Smalltalk<br>b) Describe three forms of message template in SMALLTALK.                                    | 7   |
| 7. | a) Write short notes on: (Any two)<br>a) Class representation<br>b) Pseudocode design and Implementation.<br>c) EBNF VS BNF With Examples.                      | 2×5 |

POKHARA UNIVERSITY

Level: Bachelor Semester: Fall Year : 2019  
Programme: BE Full Marks: 100  
Course: Principles of Programming Languages Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |   |     |
|----|---|-----|
| 1. | a) "The complexity of programming led to the development of program design notations". If this is true explain with reference of Pseudocode.  | 8   |
|    | b) What are phenomenology of programming language? Explain about the "Fascination and fear are common to new tools".  | 7   |
| 2. | a) What is the significance of dynamic chain of activation record?<br>Explain with the help of examples.<br>b) Illustrate looping in FORTRAN by writing a program to find out the square root of the first ten natural numbers. | 7   |
| 3. | a) How the enhanced features of EBNF is efficient as compare to BNF with the help of examples.<br>b) How ALGOL has changes the way of programming in efficient way?<br>Explain.   | 8   |
| 4. | a) What are different searching techniques in LISP? Explain them with the help of walking down diagram.<br>b) What is LISP? Define the structural organization of LISP program with example.                                    | 8   |
| 5. | a) "Optional variables declarations are dangerous in FORTRAN programming". Justify the statement.<br>b) Explain Recursive interpreters and storage Reclamation in LISP.   | 7   |
| 6. | a) Explain Message Passing and Returning mechanism in Smalltalk.<br>b) What are different forms of message template in SMALLTALK?<br>Explain them.  | 8   |
| 7. | Write short notes on: (Any two)<br>a) Assigned GOTO<br>b) Block and scope<br>c) Lambda Expression<br>d) Contour Diagram   | 2×5 |

## POKHARA UNIVERSITY

Level: Bachelor	Semester: Spring	Year : 2019
Programme: BE		Full Marks: 100
Course: Principles of programming language		Pass Marks: 45
		Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What are the importance and objectives of principles of programming Languages? 7
- b) Explain the design of a pseudo code and its implementation. Highlight the functional enhancements brought by the Pseudo code. 8
2. a) "Subprograms are implemented using Activation records in Fortran". Explain with the help of examples. 7
- b) Illustrate looping in FORTRAN by writing a program to find out the sum and average of first ten odd natural numbers. 8
3. a) Explain the History and Motivation of ALGOL programming .Also Explain and mention its failure factors. 7
- b) Prepare a lecture note of control structure. Data structure, Name structure and Syntactic structure in ALGOL. 8
4. a) What is LISP? Explain about car and cdr indicators with examples.. 7
- b) How LISP has maintained the simplicity principle? Explain the searching techniques provided by it. 8
5. a) What are different forms of message template in SMALLTALK? Explain them. 8
- b) "Smalltalk belongs to new programming paradigm". Explain in reference to class, object and object oriented Extensions. 7
6. a) Translate the following expressions into LISP 8
  - i)  $(-1)^k k^{1/k}$
  - ii)  $\frac{n!}{r!(n-r)!}$
- b) "COMMON permits aliasing, which is dangerous in FORTAN". Justify the statement. 7
7. Write short notes on: (Any two) 2×5
  - a) Recursive Interpreters and storage Reclamation in LISP
  - b) Descriptive tools in ALGOL
  - c) Nested scope in BLOCK
  - d) Phenomenology of programming languages

# POKHARA UNIVERSITY

Level: Bachelor

Semester: Fall

Year : 2018

Programme: BE

Full Marks: 100

Course: Principles of Programming Languages

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What are the programming domains? How logical programming is differing with functional programming? 8  
b) "The complexity of programming led to the development of program design notations". If this is true explain with reference of Pseudo code. 7
2. a) What do you mean by dynamic chain of activation record? Explain the control structure of FORTRAN. 8  
b) Pass by reference is a dangerous proposition in FORTRAN". Justify this statement with suitable example. 7
3. a) Differentiate BNF with EBNF with the help of syntactic structure of ALGOL - 60. 8  
b) "ALGOL was a major milestone in programming languages". Justify this statement. 7
4. a) Differentiate among pass by value, pass by reference and pass by name with suitable example. 5  
b) What is property list? Differentiate between car and cdr. 5  
c) Why does a programming language need syntactic structure? Explain with reference by ALGOL-60. 5
5. a) What is polish notation? How hierarchical structures are processed in LISP? 7  
b) Translate the following expressions into LISP. 8

$$\text{i. } \frac{-b \pm \sqrt{b^2 - 4ac}}{\frac{1}{2} \sqrt{4a^2 - b^2}}$$

$$\text{ii. } \frac{(abc)^2}{\sqrt[3]{s(s-a)(s-b)(s-c)}}$$

6. a) Explain an object and class specification in SMALLTALK. How does class and object are represented diagrammatically in SMALLTALK? 8

b) Explain Message Passing and Returning mechanism in Smalltalk. 7

7. Write short notes on: (Any two) 2×5

a) Block and scope

b) Characteristics of good programming language

c) Zero-one infinity principle

d) Lambda expressions

## POKHARA UNIVERSITY

Level: Bachelor	Semester: Spring	Year : 2018
Programme: BE		Full Marks: 100
Course: Principles of Programming Language		Pass Marks: 45
		Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

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*Attempt all the questions.*

- i. a) What are the characteristics of good programming language? How pseudocode interpreter can simplify programming? 7
- b) Describe the control structure of FORTRAN. 8
2. a) Mention looping in FORTRAN by writing the program to find out the cube root of first 20 natural numbers? 8
- b) Give specific examples where FORTRAN-IV violates the principles of programming languages. 7
3. a) Why are naming structures essential for programming? Explain the name Structure of ALGOL-60. 8
- b) How are Context-free and regular grammars used in the describing programming languages? 7
4. a) Translate the following expressions into LISP 8
 
$$\frac{1}{2} \sqrt{\pi r^2 - l^2} \quad \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$
- b) Write assoc function in LISP to access the value of a-list. How would you handle the case where the requested attribute is not associated by a-list? 7
5. a) Briefly explain the following structures in LISP 7
  - i. The conditional expression
  - ii. The logical connectives
  - iii. Mapcar and reduce functions
- b) Compare and Contrast object oriented programming facilities in C++ and Java. 8
6. a) Describe three forms of message template in SMALLTALK. 7
- b) How is Activation Record represented in SMALLTALK.? 8

7. Write short notes on: (Any two) 2x5

- a) Pseudocode
- b) User defined function in LISP
- c) Contour Diagrams

## **POKHARA UNIVERSITY**

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*Attempt all the questions.*

- |    |                                 |   |     |
|----|---------------------------------|---|-----|
| 1. | a)                              | What are the characteristics of good programming language? How pseudo code interpreter can simplify programming?                      | 8   |
|    | b)                              | Do you think that it is necessary to learn principal of programming language for software engineering students? Justify your opinion. | 7   |
| 2. | a)                              | What do you mean by dynamic chain of activation record? Explain the control structure of FORTRAN.                                     | 7   |
|    | b)                              | Illustrate looping in FORTRAN by writing a program to find out the square root of the first 20 natural numbers.                       | 8   |
| 3. | a)                              | Why naming structure is essential for programming? Explain the name of ALGOL-60.  | 8   |
|    | b)                              | Explain the enhanced features of EBNF as compare to BNF with the help of examples.  | 7   |
| 4. | a)                              | Differentiate among pass by value, pass by reference and pass by name with suitable example.  | 5   |
|    | b)                              | How does CAR and CDR help in searching the data elements? Explain with the help of walking down diagram.                              | 5   |
|    | c)                              | How did ALGOL solve the problem of FORTRAN lexics?  | 5   |
| 5. | a)                              | What is LISP? Define the structural organization of LISP program with example.  | 7   |
|    | b)                              | Differentiate between Association list and property list in LISP. Give relevant examples.   | 8   |
| 6. | a)                              | Describe three forms of message Template in Small Talk.   | 8   |
|    | b)                              | Explain how Small Talk represents the object oriented paradigm with suitable examples.  | 7   |
| 7. | Write short notes on: (Any two) |   | 2×5 |
|    | a)                              | Contour diagram .   |     |
|    | b)                              | Programming Paradigm  |     |
|    | c)                              | Message passing and returning in Small talk   |     |

POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Principles of Programming Languages

Semester: Fall

Year : 2016

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |                                 |  |    |
|----|---------------------------------|--|----|
| 1. | a)                              | What are the characteristics of good programming language? Why is it important for software engineers to study principles of programming languages? Explain. | 8  |
|    | b)                              | What are the major programming language domains? Explain the application of pseudo-code in programming.  | 7  |
| 2. | a)                              | "Fortran has been revised several times." Explain this statement with successive history of Fortran.   | 7  |
|    | b)                              | How are data represented in Fortran? Differentiate the roles of arrays from scalar data types of Fortran data structure.                                     | 8  |
| 3. | a)                              | Describe the modes of passing parameters in FORTRAN with examples.   | 7  |
|    | b)                              | Why is "Pass-by-name" in Algol-60 considered as a dangerous and expensive method? Explain with a suitable example.   | 8  |
| 4. | a)                              | Explain the extended features of EBNF compared to BNF with the help of examples.   | 8  |
|    | b)                              | "Algol was a major milestone in programming languages". Justify. Also explain how Algol-60 became as its final version.                                      | 7  |
| 5. | a)                              | What is Lisp? Explain the structural organization of Lisp with a suitable example.   | 8  |
|    | b)                              | How is information represented by property list and association list in Lisp?  | 7  |
| 6. | a)                              | How do classes allow multiple representations of data types in the SmallTalk? Explain with the help of orthogonal classification.                            | 8  |
|    | b)                              | Describe three forms of message templates in SmallTalk.  | 7  |
| 7. | Write short notes on: (Any two) |  | 2x |
|    | a)                              | car and cdr function   |    |
|    | b)                              | Garbage collection   |    |
|    | c)                              | Contour diagram  |    |

## POKHARA UNIVERSITY.

Level: Bachelor  
Programme: BE  
Course: Principles of Programming Languages

Semester: Fall

Year : 2014  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |  |     |
|----|--|-----|
| 1. | a) Define programming language. What is the importance of studying programming language for software managers, language designer and implementers?                 | 8   |
|    | b) Briefly discuss the phenomenology of programming languages.   | 7   |
| 2. | a) Describe the Name structure of FORTRAN language.  | 7   |
|    | b) Write a FORTRAN program to find sum of all even numbers between 1 to 50.  | 8   |
| 3. | a) Explain the data structures of Alogl-60.  | 8   |
|    | b) Define the terms BNF and EBNF. What are the significant uses of Context-free and regular grammars?  | 7   |
| 4. | a) Write a function assoc in LISP that search a property from a- list.   | 8   |
|    | b) Explain the control structural of LISP.   | 7   |
| 5. | a) Explain how class and objects are represented in SMALLTALK.   | 8   |
|    | b) Write down the steps for Message Sending and returning to an object.  | 7   |
| 6. | a) "Programming languages needs name structure, syntactic structure and control structure." Why? How does machine independence support better syntactic structure? | 8   |
|    | b) Explain how subprograms in FORTRAN are implemented.   | 7   |
| 7. | Write short notes on: (Any Two)  | 2x5 |
|    | a) Pass by value Vs pass by name   |     |
|    | b) Storage Reclamation   |     |
|    | c) Activation Record.  |     |

## POKHARA UNIVERSITY

Level: Bachelor

Semester: Fall

Year : 2020

Programme: BE

Full Marks: 100

Course: Object Oriented Software Development

Pass Marks: 45

Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

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*Attempt all the questions.*

1. a) Discuss about the importance of object oriented Analysis and object oriented Design in object-oriented paradigm? 7
- b) What is UML? Explain about flow-oriented modelling, using DFD of library management system as an example. 8
2. a) Explain Iterative and Incremental Development Process, of software development using examples of each. 8
- b) Explain 4 P's of software project management. 7
3. a) What is Unified Process? Explain its characteristics. 8
- b) Explain the models evolution through the iterations during software development. 7
4. a) What is Design Pattern? Write about importance of Design Patterns. 7
- b) Explain about Interpreter pattern along with its UML representation. 8
5. a) Write about structure and documentation of pattern. 7
- b) Explain about concurrency pattern. 8
6. a) What do you mean by architectural pattern? Explain about Model View Controller (MVC) architectural pattern. 7
- b) Explain Message Oriented Architecture Pattern with design principles. 8
7. Write short notes on: (Any two) 2×
  - a) Life Cycle of Unified Software Development Process.
  - b) Real time pattern
  - c) Architecture Centric process

## POKHARA UNIVERSITY

Level: Bachelor

Semester: Fall

Year : 2019

Programme: BE

Full Marks: 100

Course: Object Oriented Software Development

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What is an Object Oriented Paradigm? Explain about Object Oriented Analysis and Design. 8
- b) What is UML? Explain briefly about behavioural modelling using use-case diagram as an example. 7
2. a) Explain Iterative and Incremental Development Process. 7
- b) Explain different phases of unified software development process. 8
3. a) What is Unified Process? Explain its characteristics. 8
- b) What is Design Pattern? Write about importance of Design Patterns. 7
4. a) Explain about Behavioral pattern. 7
- b) Explain about concurrency pattern. 8
5. a) Write about structure and documentation of pattern. 8
- b) What is Software Architecture? Describe an architecture using UML. 7
6. a) What do you mean by architectural pattern? Explain about Model View Controller (MVC) architectural pattern. 8
- b) Explain Message Oriented Architecture Pattern with design principles. 7
7. Write short notes on: (Any two) 2×5
  - a) Configuration and change management
  - b) Analysis Model Vs Design Model
  - c) Real-Time patterns

## POKHARA UNIVERSITY

Level: Bachelor

Semester: Spring

Year : 2019

Programme: BE

Full Marks: 100

Course: Object Oriented Software Development

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

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*Attempt all the questions.*

- |    |  |     |
|----|--|-----|
| 1. | a) What is UML? Explain Use Case Diagram with an appropriate example.  | 8   |
|    | b) Define software process. Explain two process models based on iterative and incremental developments, briefly. | 7   |
| 2. | a) What is Unified Process? Explain different phases of unified process.   | 8   |
|    | b) Discuss on different variations of unified process.   | 7   |
| 3. | a) What is Design Pattern? Write about importance of Design Patterns.  | 8   |
|    | b) Explain different models evolutions during Iterative and Incremental Development of software.                 | 7   |
| 4. | a) Explain Singleton pattern along with its UML class diagram.   | 7   |
|    | b) Explain advantages and uses of Façade design pattern with its UML representation.                             | 8   |
| 5. | a) Explain Observer pattern along with its UML class diagram.  | 8   |
|    | b) What is Software Architecture? Describe an architecture using UML.  | 7   |
| 6. | a) What do you mean by architectural pattern? Explain about Model View Controller (MVC) architectural pattern.   | 8   |
|    | b) Explain Message Oriented Architecture Pattern with design principles.   | 7   |
| 7. | Write short notes on: (Any two)  | 2×5 |
|    | a) Object Oriented Analysis and Design   |     |
|    | b) Real-Time Patterns  |     |
|    | c) SOA Pattern   |     |

## POKHARA UNIVERSITY

Level: Bachelor                      Semester: Fall                      Year : 2018  
Programme: BE                      Full Marks: 100  
Course: Object Oriented Software Development                      Pass Marks: 45  
    Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |  |     |
|----|--|-----|
| 1. | a) Explain about Object Oriented Analysis and Design with suitable examples.                                   | 7   |
|    | b) What is UML? Explain different UML Diagrams with an appropriate example.                                    | 8   |
| 2. | a) Explain Iterative and Incremental Development Process.  | 7   |
|    | b) What is requirement analysis? Explain the different roles of project Manager.                               | 8   |
| 3. | a) Define model evolution. With example, explain about implementation model.                                   | 7   |
|    | b) What do you mean by use case driven process? Explain role and responsibility of people.                     | 8   |
| 4. | a) What is Design Pattern? Write about importance of Design Patterns.  | 7   |
|    | b) Describe Structural design pattern with example.  | 8   |
| 5. | a) Write about structure and documentation of pattern.   | 7   |
|    | b) Compare and contrast enterprise pattern with real-time pattern.   | 8   |
| 6. | a) What is Software Architecture? Describe an architecture using UML.  | 7   |
|    | b) What do you mean by architectural pattern? Explain about Model View Controller (MVC) architectural pattern. | 8   |
| 7. | Write short notes on: (Any two)  | 2×5 |
|    | a) SOA   |     |
|    | b) Criticism   |     |
|    | c) Change Management   |     |

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Object Oriented Software Development

Semester: Spring

Year : 2018  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

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*Attempt all the questions.*

1. a) Describe the Object Oriented Analysis and Design process with example. 8  
b) Change management is very important in Iterative and Incremental Development. Why and how is it done? 7
2. a) Explain 4 P's of software development. 8  
b) What is Unified Process? Explain its characteristics. 7
3. a) Define software quality. How can you assure quality in software you develop? Give your answer from the prospect of Software System Analyst. 8  
b) What do you mean by Creational Patterns? Explain any one of its type with DCD and source code snippet. 7
4. a) What is Design Pattern? Write about importance of Design Patterns. 7  
b) What are the difficulties and risks while using design pattern? Discuss in brief. 8
5. a) Explain about concurrency pattern. 7  
b) What is Software Architecture? Describe an architecture using UML. 8
6. a) What do you mean by architectural pattern? Explain about Model View Controller (MVC) architectural pattern. 8  
b) Explain Message Oriented Architecture Pattern with design principles. 7
7. Write short notes on: (Any two) 2×5  
a) Architecture centric process  
b) Interaction Diagram  
c) Message Oriented Architecture

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Object Oriented Software Development

Semester: Spring

Year : 2017  
Full Marks: 100.  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |  |     |
|----|--|-----|
| 1. | a) Explain about Object Oriented Analysis and Design with suitable examples.                                   | 7   |
|    | b) What is UML? Explain different UML Diagrams with an appropriate example.                                    | 8   |
| 2. | a) Explain Iterative and Incremental Development Process.  | 7   |
|    | b) Explain 4 P's of software development.  | 8   |
| 3. | a) What is Unified Software Development Process? Explain its characteristics.                                  | 8   |
|    | b) What is Design Pattern? Write about importance of Design Patterns.  | 7   |
| 4. | a) Describe Structural design pattern.   | 7   |
|    | b) Write about structure and documentation of pattern.   | 8   |
| 5. | a) Explain about Singleton pattern along with code in any suitable programming language (c++ or java or c#).   | 8   |
|    | b) What is Software Architecture? Describe an architecture using UML.  | 7   |
| 6. | a) What do you mean by architectural pattern? Explain about Model View Controller (MVC) architectural pattern. | 8   |
|    | b) Explain Message Oriented Architecture Pattern with design principles.                                       | 7   |
| 7. | Write short notes on: (Any two)  | 2x5 |
|    | a) Life Cycle of Unified Software Development Process  |     |
|    | b) Observer Pattern  |     |
|    | c) Worker, Activity, Artifact and Workflow   |     |

## POKHARA UNIVERSITY

Level: Bachelor

Semester: Fall

Year : 2016

Programme: BE

Full Marks: 100

Course: Object Oriented Software Development

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What is object-oriented analysis and design? Support your answer with suitable example. 8  
b) What are the phases of Unified Process? Describe in short. 7
2. a) "System development is model development." Do you agree? Justify your answer. 7  
b) Discuss the strength and weakness of Object-Oriented and procedural programming with the help of Banking transaction example. 8
3. a) Describe workflow for capturing requirement as use cases, including the participating workers and their activities. 7  
b) Design is four dimensional view of a system. Justify along with design concepts. 8
4. a) Define design pattern. How is design pattern important? Is software development possible without applying design pattern? 7  
b) Describe a suitable design pattern for following problem. 8  
"What is the best way to represent related objects (occurrence) in a class diagram?"
5. a) Define design principle, design concept and design pattern. What are the disadvantages of design patterns? 8  
b) What is software architecture? Why do we need it? 7
6. a) Describe Service oriented architecture and design principles it helps to adhere. 7  
b) Discuss in short about MVC Architecture with suitable diagram. 8
7. Write short notes on: (Any two) 2×
  - a) Player-Role design pattern
  - b) Reuse vs Reusability
  - c) Class Diagram

**POKHARA UNIVERSITY**

Level: Bachelor

Semester: Fall

Year : 2015

Programme: BE

Full Marks: 100

Course: Object Oriented Software Development

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Describe the Object Oriented Analysis and Design process with example. 8
- b) Why is Iterative and Incremental Development advantageous over Waterfall approach? Give your reasons. 7
2. a) What are the key ideas to be considered in Inception phase and what artifacts may start in this phase? 8
- b) Define Use case realization. What do you mean by use case driven software development process? 7
3. a) Definition of quality varies according to users. Justify the statement. 7
- b) Define design pattern. Differentiate programming paradigm and design pattern. 8
4. a) Describe Abstraction-Occurrence pattern. 7
- b) Suppose you are designing a dice game. The dice game needs only one instance of dice. Which design patterns do you think will help you to design the game. 8
5. a) What are the difficulties and risks while using design pattern? Discuss in brief. 7
- b) List and describe the principles that leads to good design in brief. 8
6. a) Compare and contrast design patterns and architectural patterns. 7
- b) Describe MVC architectural pattern with the design principles it helps to adhere. 8
7. Write short notes on: (Any two) 2x:
  - a) Use case driven design
  - b) Class Diagram
  - c) Importance of design pattern

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE

Semester: Spring

Year : 2014

Course: Object Oriented Software Development

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What are main attributes of an object oriented Analysis and design? How is this approach different from the other approach? Explain with a relevant example 8
- b) Differentiate Analysis and Design model. Explain taking an example. 7
2. a) What are artifacts that may be initiated in elaboration phase? Explain the role of use cases in analysis and design phase. 7
- b) Compare programming paradigm with design patterns and draw your conclusion. Discuss, what are the difficulties that arise while mapping design patterns to a particular programming language. Also list the advantages of a design pattern. 8
3. a) What do you understand by use case drawn software development process? Explain use case realization taking a concrete example (The example must show the realization of a use case in the s/w development process) 10
- b) Describe the importance of documenting and describing patterns 5
4. a) What is software quality? What are the parameters of a software quality? Discuss the roles of user, customer developer and manager in establishing the s/w quality 8
- b) What is a good design? Describe principles that leads to a good design in software developments 7
5. a) What are different structural patterns? Explain any three structural patterns taking an example into consideration. 10
- b) Write in short about Real Time Patterns. 5
6. a) Describe SOA architectural pattern with the design principles it helps to adhere 8

- b) Compare and contrast design and architectural pattern.
- 7
- 7.
- Write short notes on: (Any two)
- 2×5
- a) Architecture centric process Interaction Diagram
  - b) Interaction Diagram
  - c) MVC architectural pattern

**POKHARA UNIVERSITY**

Level: Bachelor  
Programme: BE  
Course: Engineering Economics

Semester: Fall

Year : 2021  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Why should an Engineer study Economics? Write instances where and how it can be applied at work. 7
- b) Find IRR and ERR of the following cash flow. Draw investment balance diagram based on IRR value. 8

*MARR = 12%*

EOY	0	1	2	3	4
Net Cash flow	-550000	-50000	+125000	+1350000	+625,000

2. a) What do you mean by marginal cost & opportunities cost. Explain about the life cycle of cost. 7
- b) ER. Ram Prasad deposited Rs 1,00,000 in his bank account on 1 January 2022. The bank pay 9% simple interest, how much will he accumulate in his account on 30 Dec 2032? 8
3. a) What do you mean by payback period? Find simple and discounted payback periods and justify investment with the given cash flow information; 8

Initial investment      Rs. 3,00,000

Annual revenue      Rs. 1,50,000

Annual cost      Rs. 30,000

Salvage value      Rs. 1,00,000

Useful life year      5

MARR      10%

- b) Yeti Airline company planning to purchase from different two company A & B, because it was based on estimation using Co-Terminated assumption & recommend the best project taking study 5 years & 8 year respectively? 7

	Investment	Revenue	Expenses	Salvage value
Plain A	350000000	13000000	1500000	3500000
Plain B	500000000	17500000	2500000	5000000

4. a) Perform sensitivity analysis of the following project over the range of ±30% in i) Initial investment ii) Annual revenue iii) Useful life. 8
- Initial investment = 14,500  
 Annual revenue = 4,000  
 Salvage value = 1,000  
 Useful life = 6 years  
 MARR = 20% 7
- b) Explain in detail the Economic theory and Ecological limit, what do you understand about Ecological footprint? 7
5. a) A construction equipment has initial cost & annual saving per year are of Rs 40000 & Rs 20000 respectively with annual operation & maintenance cost of 7000. It will depreciate by MACRS method & will have no salvage value. The useful life of equipment is 5 years. Estimate before & after tax cash flow. The company pays income tax @40%. Evaluate after tax by FW method. 8
- b) Discuss the different funding mechanism in which we manage the money to the project? 7
6. a) Prepare accounting equation on the basis of following transactions. 8
- i. Ram starts business with Rs 40000 as capital.
  - ii. The business purchases equipment for Rs. 5000.
  - iii. Purchased goods of worth Rs. 2000 for cash.
  - iv. The business purchases goods for Rs 4000 in credit. 7
- b) Describe the different ratios to make decision or to identify the company strong or weak? 7
7. Write short notes on: (Any two) 2×5
- a) Balance sheet
  - b) Benefit-cost ratio
  - c) Tax system of Nepal

**POKHARA UNIVERSITY**

Level: Bachelor	Semester: Chance	Year : 2020
Programme: BE		Full Marks: 100
Course: Engineering Economics		Pass Marks: 45
		Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) How you justify the statement "Demand creates supply"? Describe seven principles of Engineering economics. 7
  - b) If you deposit Rs. 5,000 per month for two years, what will be the amount at the end of five years if bank interest rate is 5% in every six month? 8
  2. a) Calculate Discount payback of following given cash flow of the Engineering project, when MAAR is 20% 8
- | End of year(EoY) | 0      | 1     | 2     | 3     | 4     | 5      |
|------------------|--------|-------|-------|-------|-------|--------|
| Net cashflow(Rs) | -25000 | +8000 | +8000 | +8000 | +8000 | +13000 |
- b) Select the best project by using IRR method when MARR is 8%. 7
- |                    | Project A | Project B |
|--------------------|-----------|-----------|
| Initial investment | 3,00,000  | 5,00,000  |
| Annual revenue     | 90,000    | 1,75,000  |
| Life Year          | 6         | 6         |
| Salvage value      | 10,000    | 1,00,000  |
3. a) Evaluate the following two projects A and B having different useful lives, if MARR is 15% per year. Use PW method with repeatability assumptions. 8

	Project A (Rs.)	Project B (Rs.)
Initial Investment	540000	650000
Annual revenue	250000	280000
Annual cost	50000	60000
Salvage value	100000	120000
Useful life	4 years	6 years

- b) Explain manufacturing cost non-manufacturing cost and opportunity cost in Engineering economics. 7
4. a) Select the best project by using IRR method when MARR is 8%. 7  
Use incremental analysis if necessary.
- |                    | Project A | Project B |
|--------------------|-----------|-----------|
| Initial investment | 1,00,000  | 5,00,000  |
| Annual revenue     | 50,000    | 1,75,000  |
| Life Year          | 6         | 6         |
| Salvage value      | 10,000    | 1,00,000  |
- b) Flower shopkeeper want to a bunch of rose on Rs 100, the shop need to pay Rs 10,000 for rent and Rs 15000 for the helper, 98 he could sold the bunch of rose on Rs 125, How much quality the bunch of flowers need to sold to meet break-even point? 8
5. a) Define ecological limit and sustainable development. 7  
b) An organization wants to purchase of Rs.10,00,000 machine that is assigned to 5 years useful life and expected salvage Rs. 2,00,000. Compute depreciation by SOYD and MACRS methods for each year. 8
6. a) What do you mean by financing and method of financing and explain debt ratio, current ratio, cost of equity and cost of debt. 7  
b) Fill up the following data on standard balance sheet cash, \$2000 inventory \$5000, Account receivable \$3000, Land and Building \$13000, Equipment \$7000, Depreciation \$1000 Bank overdraft \$500, Account payable \$1000 & Retained earning \$6500.00? 8
7. Write short notes on: (Any two) 2×5  
 a) Asset & liabilities  
 b) Economic Internal rate of return (EIRR) and Financial Internal rate of return  
 c) Depreciation by sinking fund method

**POKHARA UNIVERSITY**

Level: Bachelor  
 Programme: BE  
 Course: Engineering Economics

Semester: Spring

Year: 2020  
 Full Marks: 70  
 Pass Marks: 31.5  
 Time : 2 hrs.

*Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. In the current COVID pandemic context, you are required to do economic analysis of one engineering project. Take any one specific example of the engineering project (e.g.: hydropower, mobile app, hospital, canal, etc.) and discuss the steps of engineering economics process (principles) for making investment decision for that project. Also, explain four different cost concepts for engineering decision making and how they can be related in the process of engineering economic evaluation in your above project. 6+4
2. Which interest is used in engineering economic analysis and how do you differentiate between simple, compound, nominal and effective interest rate with suitable example? 4+6
- Binayak has taken home loan of Rs. X5 million from a bank, which is to be repaid in equal end of the month installment for 5 years with nominal interest rate of 12 percent compounded monthly. Calculate: (i) the amount of each installment, (ii) effective rate of interest of loan, and (iii) the amount of each installment, if installment is repaid in the beginning of the month installment. Assume X is the last digit of your PU Examination Roll Number. (For example, if the last digit of your PU Examination Roll Number is 7, then consider loan as 75 million and if last digit is 0, consider your loan as 05 or 5 million).
3. Compare PW of following projects and select best alternatives using repeatability assumption. MARR rate is 1X.5%. Assume X is the last digit of your PU Examination Roll Number. (For example, if the last digit of your PU Examination Roll Number is 9, then consider interest rate as 19.5% and if last digit is 0, consider your interest rate as 10.5%). 10

Project	A	B	C
Initial Investment	3000	5500	7000
Annual Revenue	2500	3000	3000
Annual Cost	500	800	1200
Useful Life, Years	2	3	4
Salvage Value	25% of initial investment		

4. "Taxes are voluntary payments to governments without expectations of any benefit to the tax payer." Is this statement correct? Discuss different types of taxes that Nepal government levy. 3+7

Equipment is purchased for Rs 500000 and having estimated salvage value and useful life Rs 80000 and 10 years, interest rate= 1X%; Assume X is the last digit of your PU Examination

Roll Number (For example, if the last digit of your PU Examination Roll Number is 9, then consider interest rate as 19% and if last digit is 0, consider your interest rate as 10%). Calculate the depreciation amount and book value of each year of the equipment from the following methods.

- SOYD depreciation method
- Sinking fund depreciation method.

**OR**

"It's not an investment if it's destroying the planet. Engineers can contribute in the development of technologically and environmentally-feasible solutions to overcome ecological limits of the planet." Explain the above statements. Discuss different risk analysis methods. Which methods do you think most effective in the context of Covid pandemic situation? Discuss with example.

5. Explain why financial statements are prepared in business organization? Explain types of financial statements and their need for the business organizations. 5+5

Discuss importance of financial ratios in engineering economics. Calculate debt ratio, current ratio and quick ratio of Kathmandu Bakery and interpret their results.

6. The following are proposed projects, their relationships and respective cash flows for the coming budgeting period. Some of the projects are mutually exclusive noted below, and B1 and B2 are independent of C1 and C2. Also, certain projects are dependent of others as mentioned below. 20

Project B1 and B2: Mutually exclusive

Project C1 and C2: Mutually exclusive and dependent on the acceptance of B2

Project D: Contingent on the acceptance of C1

Cash Flows (Rs. 000s) for the end of year

Project	Initial Investment	Annual Revenue	Annual Cost	SV at the end of 3 <sup>rd</sup> year
B1	-55	43	20	20
B2	-32	24	10	12
C1	-16	10	5	4
C2	-15	11	5	5
D	-12	9	4	6

Using the PW and MARR=10%, determine what combination of projects is best if the capital to be invested is a) limited to Rs. 50,000 and b) unlimited.

Assume MARR is 1X.5%. X is the last digit of your PU registration number. (For example, if the last digit of your PU registration number is 9, then consider interest rate as 19% and if last digit is 0, consider your interest rate as 10%).

## Appendix – A

### Old and Model Questions of PU

**POKHARA UNIVERSITY**

**Level:** Bachelor  
**Programme:** BE  
**Course:** Engineering Economics

Semester – Spring

**Year:** 2019  
**Full Marks:** 100  
**Pass Marks:** 45  
**Time:** 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) What do you understand by engineering economics? Explain its seven principles and importance in business or engineering projects. [7]
- (b) Define interest and time value of money. How does compound interest differ with simple interest? Why does bank use concept of compound interest instead of simple interest? What is the interest rate if your amount will be double in 5 years? [8]
2. (a) What is depreciation? A photocopy machine is costing of Rs.4,60,000 with estimated salvage value Rs. 12,000 at the end of 6<sup>th</sup> year. Find yearly depreciation amount and book value by (i) Double declining balance conversion to straight line method (ii) Sum of year digit (SOYD) method. [8]
- (b) Consider an investment project with the following cash flow. [7]

End of year	Net cash flow
0	-2,30,000
1	-70,000
2	0
3	80,000
4	1,20,000
5	1,70,000

Compute the IRR for this investment and determine its acceptability at MARR = 10% and draw also an investment balance diagram.

3. (a) Define cost-benefit analysis. Find out both types of B/C ratios using present worth and annual worth method. [8]
 

Initial investment = Rs. 5,00,000  
 Annual benefit = Rs. 1,50,000  
 Annual cost = Rs. 30,000  
 Salvage value = Rs. 40,000  
 MARR = 12%  
 Useful life = 6 years
- (b) Define ecological limit and sustainable development. Discuss ways for sustainable development. [7]
4. (a) Perform sensitivity analysis using PW method over a range of +/- 20% in i) initial investment ii) net annual revenue and iii) salvage value. [8]
 

Initial investment = Rs. 2,00,000

Annual benefit = Rs. 50,000

Annual cost = Rs. 5,000

Salvage value = Rs. 25,000

MARR = 12%

Useful life = 10 years

Draw also sensitivity graph.

- (b) What are the sources of project finance? Explain the advantages of Debt financing. If interest on debt is 12%, dividends to share holders are 15%. Calculate weighted average cost of capital if Debt is 70% and equity is 30%, tax rate is 20%. [7]
5. (a) What is the taxation system in Nepal? Describe in brief.  
(b) Describe income statement and balance sheet with their format. How are they related to each other? [8]
6. (a) Evaluate the following two projects A and B having different useful lives if MARR is 15% per year. Use PW method with co-terminated assumption when MARR is 10% per year. [8]

Items	Project A	Project B
Initial investment (Rs.)	40,00,000	50,00,000
Annual revenue (Rs.)	15,00,000	20,00,000
Annual cost (Rs.)	5,00,000	7,00,000
Salvage value (Rs.)	5,00,000	6,00,000
Life year	5	7

- (b) What is financial ratio? Explain major financial ratios that can be applied in decision making process in business. [7]
7. Write short notes on: (Any two) [2×5]

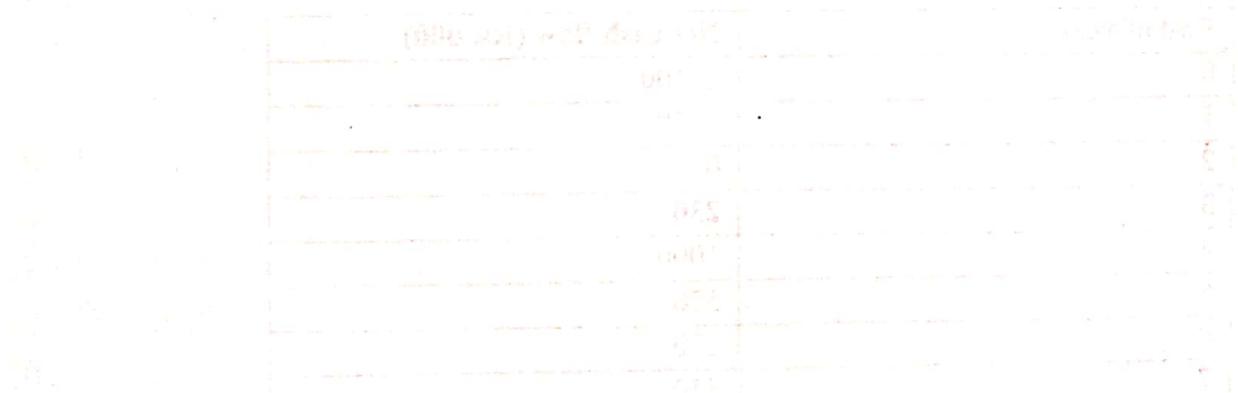
(a) Ecological footprint

(b) Quick Acid Test

(c) Benefit-Cost Ratio

Project Management and Cost Control by Dr. K. P. Singh and Dr. S. K. Singh

B



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# POKHARA UNIVERSITY

Level: Bachelor

Semester – Spring

Year: 2019

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) What do you understand by engineering economics? Explain its seven principles and importance in business or engineering projects. [7]
- (b) Explain marginal, differential, sunk and opportunity cost with suitable examples. [8]
2. (a) You have taken an auto loan of Rs. 2,20,000 from a bank, which is to be repaid in equal end of month installment for 3 years with nominal interest rate of 15% compounded monthly. calculate: (i) the amount of each installment and (ii) effective rate of interest of loan. [8]
- (b) Consider an investment project with the following cash flow. [7]

End of year	Net cash flow
0	-2,30,000
1	-70,000
2	0
3	80,000
4	1,20,000
5	1,70,000

Compute the IRR for this investment and determine its acceptability at MARR = 10% and draw also an investment balance diagram.

3. (a) Your college is considering to purchase a new machine costing Rs. 4,00,000 that will have salvage value of Rs. 50,000 at the end of 8<sup>th</sup> year generates annual income of Rs. 1,20,000 that needs Rs. 40,000 operating cost for each year where MARR=11%. Find both types of B/C ratio using AW formulation. [8]
- (b) Calculate PW and FW form the following cash flow if MARR is 15% per year. [7]

End of year	Net cash flow (Rs. 000)
0	-1100
1	-550
2	0
3	230
4	1000
5	520
6	120
7	450

4. (a) What is depreciation? A photocopy machine is costing of Rs.4,60,000 with estimated salvage value Rs. 12,000 at the end of 6<sup>th</sup> year. Find yearly depreciation amount and book value by (i) Double declining balance conversion to straight line method (ii) Sum of year digit (SOYD) method. [8]

(b) What is project risk? Describe sensitivity analysis and Break-even analysis with suitable example. [7]

5. (a) A new electric saw for cutting small pieces of lumber in a furniture manufacturing plant has a cost basis of Rs. 5,000 and a 8 year depreciable life. The estimated salvage value of the saw is zero at the end of 10 years. Determine the depreciation charge at the end of 4<sup>th</sup> year, cumulative depreciation charge of 7<sup>th</sup> year and book value of 6<sup>th</sup> year using double declining balance method. [8]

(b) Define ecological limit and sustainable development. Discuss ways for sustainable development. [7]

6. (a) What is cost of capital and why identifying is important in engineering economics? Explain procedure to calculate weighted average cost of capital. [8]

(b) What is financial ratio? Explain major financial ratios that can be applied in decision making process in business. [7]

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

(a) Capitalized worth method

(b) Ecological limit and ecological footprint

(c) Balance sheet and profit & loss account

# POKHARA UNIVERSITY

Level: Bachelor

Semester – Fall

Year: 2019

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) What do you mean by demand, elasticity of demand and types of elasticity of demand? [7]
- (b) Explain manufacturing cost, non-manufacturing cost, opportunity cost and marginal cost with suitable examples. [8]
2. (a) Suppose a farmer wants to save money semi-annually in a financial company for the engineering education of his daughter of 2 years old. How much money does he need to save per period if she will need 20,00,000 when her age will be 18 years old? The company compounded money semi-annually and interest rate is 12%. [8]
- (b) An investment of Rs. 1,00,000 can be made in a project that will produce uniform annual revenue of Rs. 50,000 for five years with annual cost of Rs. 20,000 and then have a market (salvage) value of Rs. 5,000. If company has policy to accept any project that will earn 10% per year or more, on all invested capital. Calculate the discounted payback period and show whether this is a desirable investment by using the Present worth method. [7]
3. (a) Compute discounted payback period and modified B/C ratio form the following data. [8]

Initial investment	Rs. 10,00,000
Annual revenue	Rs. 1,80,000
Annual cost	Rs. 60,000
Salvage value	Rs. 1,50,000
Useful life year	10
MARR	5%

- (b) Select best project using IRR when MARR is 8%. Use incremental analysis if necessary. [7]

Items	Project A	Project B
Initial investment	3,00,000	5,00,000
Annual revenue	1,50,000	1,75,000
Life year	6	6
Salvage value	70,000	1,00,000

4. (a) Form the following information select the best project using co-terminated assumption. Useful life = 5 years. [7]

Items	X	Y	Z
Initial investment	50,000	40,000	30,000
Annual revenue	20,000	15,000	14,000
Annual expenses	15,000	10,000	8,000
Useful life year	5	7	9
Salvage value	1,000	500	0
MARR	10%		

(b) A company is considering purchase of second-hand computers at a cost of Rs. 10,500 each with an estimated salvage value of Rs. 500 and a projected useful life of four years. Determine the annual depreciation and book values using double declining balance with conversion to straight line depreciation method. [8]

5. (a) Which motor would you select if you have to operate 12 hours a day? [7]

	Motor A	Motor B
Purchase price	Rs. 3,00,000	4,00,000
Capacity	2HP	2 HP
Efficiency	75%	90%
Annual cost	Rs. 30,000	Rs.25,500
Electricity cost	Rs. 10 per kwh	Rs. 10 per kwh
Life in years	5	7

(b) Explain analytically the following ratios: [8]

- (i) Debt ratio
- (ii) Current ratio
- (iii) Quick ratio / acid test ratio iv– Cost of capital

6. (a) Briefly explain about ecological limit, overcoming ecological limit and sustainable development. [7]

(b) What do you mean by income statement and balance sheet? Develop their formats and discuss the relationship and differences between them? [8]

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

- (a) FIRR and EIRR
- (b) VAT
- (c) Ratio analysis for decision making

**POKHARA UNIVERSITY**

Semester – Spring

Level: Bachelor

Programme: BE

Course: Engineering Economics

Time: 3hrs

Year: 2018

Full Marks: 100

Pass Marks: 45

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

1. (a) What is engineering economics? Why do you think studying this course is important for engineering student? Justify. [8]
- (b) Explain manufacturing, non-manufacturing, sunk cost and opportunity costs with suitable example. [7]
2. (a) Ramesh an Engineer is planning to place 20% of his salary, which is Rs. 2,50,000 per year present, each year in mutual fund. He expects 7% of his salary increase each year for next 15 years. If the mutual fund will average 10% annual return, what will be the sum-amount at the end of 15 years? If salary increases by Rs. 25,000 per year, what will be the amount? [8]
- (b) A multipurpose hydroelectricity project under consideration of the government, whose estimated benefits and costs expected to be derived from the project are listed as below;

	<b>Annual cash flow (Rs.)</b>
Initial cost	18,00,00,000
Annual power sales	1,20,00,000
Annual flood control saving	50,00,000
Annual irrigation benefits	80,00,000
Annual recreation benefits	40,00,000
Annual operating and maintenance costs	50,00,000

Suggest, based on B/C ratio, the government about implementing the project of life 40 years. MARR = 15%. [7]

3. (a) An investment of Rs. 1,00,000 can be made in a project that will produce uniform annual benefit of Rs. 62,100 for 5 years and then have market salvage value of Rs. 20,000. Annual expenses will be Rs. 30,000 each year. Company accepts project that earns 10% or more. Evaluate IRR of this project and suggest whether the project is feasible or not? Also draw an investment balance diagram. [7]
- (b) Recommend the best project from the following two projects assume repeatability. [8]

Project	A	B
Initial investment Rs.	4,00,000	7,00,000
Annual revenue Rs.	1,75,000	2,50,00
Annual cost Rs.	25,000	35,000
Salvage value Rs.	40,000	70,000
Useful life yr	6	8
MARR	12%	12%

4. (a) Consider the following three sets of mutually exclusive alternatives;

[8]

Alternatives				
EOY	D <sub>1</sub> (Rs.)	D <sub>2</sub> (Rs.)	D <sub>3</sub> (Rs.)	
0	- 2,000	- 1,000	- 3000	
1	1,500	800	1,500	
2	1,000	500	2,000	
3	800	500	1,000	

Which project would you select based on BCR method on incremental investment assuming that MARR = 15%.

- (b) Form the following information, conduct scenario analysis based on FW formulation. Assume I= 2,25,000; MARR = 13.5%; and life of project is 5 years. Also give your remarks based on result of different scenarios.

[7]

Variable considered	Worst case scenario	Most likely scenario	Best case scenario
Annual sales	86,000	1,10,000	1,37,000
Annual variable cost	37,000	40,000	38,000
Annual fixed cost	21,000	20,000	18,000
Salvage value	40,000	50,000	60,000

5. (a) Define ecological limit and sustainable development. Discuss ways for sustainable development.

[8]

- (b) A company has purchased equipment whose first cost is Rs. 10,000 with an estimated life is 5 years. The estimated salvage value of the equipment at the end of its life time is Rs. 2,000. Determine the depreciation charge and book value at 3 and 4 years using the straight line and sum of year digits (SOYD) method of depreciation.

[7]

6. (a) Describe income statement and balance sheet with their format. How are they related to each other?

[8]

- (b) What is financial ratio? Explain major financial ratios that can be applied indecision making process in business.

[7]

7. Write short notes on (Any two):

[2×5]

(a) Nominal rate versus Effective rate

(b) Sources of project risk

(c) Corporate tax

Level: Bachelor

Semester – Fall

Year: 2018

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

- (a) What is Demand? What are the factors affecting demand of a commodity? Describe the law of Diminishing Utility with neat sketches. [1+2+4]
- (b) Define Prime cost, Overhead cost, Fixed cost, Variable cost, Opportunity cost, Sunk cost, Marginal cost and differential cost. [8]
- (a) Define interest and time value of money. How does Compound interest differ with simple interest? Why does bank use concept of compound interest instead of simple interest? What is the interest rate if your amount will be double in 5 years? [2+2+2+2]
- (b) Define nominal and effective interest rates. If you have Rs. 10,00,000 loan now from a bank, how much Rs. should you pay as installment per two month for 5 years if bank interest rate is 12% per year? [2+5]
- (a) A machine costs Rs. 12,00,000 now and its useful life is 5 years. Its salvage value is expected to be Rs. 5,00,000. Calculate depreciation in each year and corresponding salvage values using sinking fund method and double declining balance method. [8]
- (b) Differentiate between IRR and ERR. Calculate both IRR and ERR of the following cash flow. Explain why these values are different. [2+5]

Year	0	1	2	3	4	5
Cash flow	-1,100	250	-300	400	500	600

- (a) Find both type of BCR using FW formulation where initial investment is Rs. 5,00,000; Annual income is Rs. 1,00,000 and decrease by Rs. 10,000 per year; annual cost is Rs. 20,000 and increases by Rs. 2,000 per year; useful life is 10 years and salvage value is Rs. 1,50,000; MARR = 11%. [8]
- (b) How many hours per day would the following motors have to be operated at full load for a motor of capacity 2 hp for break even? MARR = 10%. [7]

	<b>Motor A</b>	<b>Motor B</b>
Purchase price	3,50,000	5,00,000
Efficiency	75%	90%
Life-year	5	7
Maintenance cost/year	25,000	15,000
Tax and insurance/year	5,000	10,500

- (a) Use repeatability assumption to select the best project. MARR = 10%. [8]

Project	Initial investment	Annual income	Life	Salvage value
A	2,000	1,000	3	20% of initial investment
B	3,000	1,200	5	
C	4,000	1,500	7	

- (b) What are the sources of Project Finance? Explain the advantages of Debt Financing. If interest on debt is 12%, dividends to share holders are 15%. Calculate weighted average cost of capital if Debt is 70% and Equity is 30%. Tax is 20%. [7]
6. (a) Differentiate between net profit and gross profit. From the following trial balance prepare P/L account and balance sheet. [2+6]

**Trial Balance**

<b>Names of Accounts</b>	<b>Dr. Amount</b>	<b>Cr. Amount</b>
Closing stock	30,000	
Capital		2,50,000
Sundry Debtors	50,000	
Plant & Machinery	2,25,000	
Goodwill	14,500	
Land & Building	1,35,000	
Gross profit		1,22,000
Dividend Received		1,250
Interest Received		750
Salary & Wages	27,500	
Rent	7,500	
Selling Expenses	12,500	
Sundry Creditors		39,000
Reserve fund		50,000
Cash at Bank	10,000	
Deposit with custom office	7,500	
Advertisement suspense	5,000	
Investment	12,000	
Bank loan (secured)		50,000
Bank overdraft (unsecured)		23,500
Total	5,36,500	5,36,500

- (b) Perform sensitivity analysis of the following project over a range of - 10% to +30% in initial investment; -10% to +10% in useful life and -20% to +20% in MARR. Draw sensitivity diagram and decide the most sensitive parameter. [7]

Initial cost	Annual income	Useful life	Salvage value	MARR
20 crore	3 crore	30 years	0	10%

7. Write short notes on: (Any two) [2×5]
- (a) Payback period
  - (b) Causes of depreciation
  - (c) Concept of sustainable development
  - (d) Ecological limit

Level: Bachelor

Programme: BE

Course: Engineering Economics

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

1. (a) 'Hydropower is known as demandable project to the Nepal'. What are the factors affecting the demand? [5]

(b) You wish to study your son in medical college after 20 years. Recently, government has fixed total 35lakhs to complete MBBS studies. How much you need to deposit on each year to meet your desire? If bank providing 10% interest rate per year for your fixed account. [5]

(c) Define terms as cost and revenue with example of cash flow diagram. Ram invested at high yield account aimed to get the double of his investment at the end of 10 years. Compute the effective interest rate he received on the account. [5]

2. (a) Find IRR and unrecovered value. [8]

Investment = Rs. 2,50,000; Salvage value=Rs. 50,000;

Net annual revenue = Rs. 70,000; Number of years = 5 years

- (b) A project has following cash flows; [5+2]

Years	Cash flows (Rs.)
0	-500
1	202
2	X
3	196
4	350
5	451

MARR = 10% and ERR = 14.14%. Find the value of X. Also describe what the factors to be considered to determine the time value of money.

3. (a) Find the B/C ratio by both conventional and modified method. Use AW method. [7]

Investment = Rs. 2,50,000; Annual benefits = Rs. 75,000;

Annual cost = Rs. 15,000; Salvage value = Rs. 25,000;

MARR = 12%; Number of years = 10

- (b) What are the methods used to analyze the projects of same useful life and different useful life. [2+6]

Assuming infinite project life, recommend one of the following mutually exclusive projects if MARR = 10%.

Projects	A	B
First investment cost Rs.	7,50,000	18,00,000
Salvage value Rs.	1,50,000	2,70,000
Annual costs Rs.	1,35,000	90,000
Useful life (yr)	30	75

4. (a) Define the sensitivity analysis. Analyze the sensitivity of Present worth to  $\pm 40\%$  deviation change of the project having Investment = Rs. 11,500; Revenue = Rs. 5,000; Expenses = Rs.2,000; Salvage = Rs. 1,000; Useful life = 10 years; MARR = 10% on; [2 + 6]  
i. interest  
ii. life
- (b) Define ecological footprint. What environmental cost needs to be considered for sustainable development? Sales = Rs. 80,000 Fixed cost = Rs. 15,000 Variable cost = Rs. 35,000. Find profit and break even volume. [4+3]
5. (a) A company has purchased an equipment whose first cost is Rs. 1,00,000 with an estimated life of eight years. The estimated salvage value of the equipment at the end of its lifetime is Rs. 20,000. Determine the depreciation using; [8]  
i. Double declining methods of depreciation  
ii. Sum of year digit method of depreciation
- (b) What are the factors to be considered while determining the cost of debt? Calculate the after tax cost of debt while the interest rate=10% and tax rate=40%. [3+4]
6. (a) Define the ratios and their important for financing. Prepare one sample of Balance sheet including the components of Assets and Liability. [4+4]  
(b) Define funding and financing with example. What is the difference between the general accounting and cost accounting? [3+4]
7. Write short notes on: (Any two) [2×5]  
(a) Life cycle cost  
(b) Mutually exclusive projects and its combinations  
(c) Capital structure

# POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Engineering Economics

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) What are the principles of engineering economics? Explain the importance of engineering economics in business projects. [7]

**OR**

What do you mean by utility, marginal utility and diminishing law of marginal utility?

- (b) Define manufacturing cost, non-manufacturing cost and differential cost and differential revenues with suitable example. [8]

2. (a) How many deposits of Rs. 25,000 each should Mr. A make each month so that the final accumulated amount will be Rs. 10,00,000 if interest rate is 12% per year. [8]

- (b) Suppose we have a project with the following cash flows; Outgoing Rs. 1,50,000 at beginning of year 1, Rs. 2,50,000 at beginning of year 2, and some more Rs. 2,50,000 at the beginning of year 3; income Rs. 1 million at end of year 3. [7]

Find IRR of the project (If MARR = 20%). Is the project feasible?

3. (a) Compare the ERR with PW method of selecting the project with suitable example that you know which one is the superior and why? [8]

- (b) Determine both type of B/C ratios using present and annual worth method for the given project if MARR is 12% and make a decision whether you select or reject the project. [7]

Investment	10,00,000
Life	12 yr
Annual revenue	1,80,000
Annual cost	40,000
Salvage value	1,20,000

4. (a) For the project with cash flow given below find the sensitive factor among annual benefit, annual cost and salvage value if they changes by  $\pm 20\%$ . [8]

Investment	2,00,000
Life	5 yr
Annual revenue	1,00,000
Annual cost	40,000
Salvage value	50,000
MARR	10%

- (b) What do you mean by ecological footprint? How ecological limits can be overcome to attain sustainable development? [7]

5. (a) Select which project is best to invest among following two feasible investments A and B having different useful lives, if MARR is 10% per year. Use PW method with repeatability assumption. [9]

	Investment of A (Rs.)	Investment of B (Rs.)
Investment	5,50,000	6,50,000
Net annual revenue	2,25,000	2,70,000
Net annual cost	30,000	50,000
Salvage value	70,000	80,000
Useful life	5 yr	8 yr

- (b) A machine costing of Rs. 2,00,000 is estimated to have life of 10 years. The salvage value of the machine at the end of life is Rs. 50,000. Find depreciation charge and book value of each year and tabulate it. Use SOYD method. [6]
6. (a) What are the methods that are used in calculating the depreciation in economics? Write their advantages and disadvantages. [8]
- (b) What do you mean by ratio analysis? Explain in detail the types of ratios that are used in engineering economics. [7]
7. Write short notes on (Any two): [2x5]
- (a) VAT
  - (b) Cost of capital, cost of equity and cost of debt
  - (c) Dependent project, independent project and contingent project.

# POKHARA UNIVERSITY

Level: Bachelor

Semester – Fall

Year: 2017

Full Marks: 100

Pass Marks: 45

Programme: BE

Course: Engineering Economics

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) What do you mean by engineering economics? Explain the importance of engineering economics in business projects. [7]
- (b) Explain opportunity cost, marginal cost and sunk cost with example. [8]
2. (a) Calculate the future worth of the following cash flows deposited at 8% compounded continuously for 5 years. [7]
  - (i) Rs. 50,000 at the beginning of each year
  - (ii) Rs. 50,000 at the end of each year.
- (b) A company is investing the purchase of new equipment. Interest rate is 9%. The cash flow for the equipment is as follows: Initial investment Rs. 50,000, annual operating cost Rs. 2,000, annual income Rs. 9,000 and salvage value Rs. 10,000, life 10 years. [8]
  - (i) Is this investment worth undertaking?
  - (ii) What should be the minimum annual benefit for making it a worthy of investment at 9% rate of return?
3. (a) Evaluate the following project whose cash flows are given below. Use simple payback period, present worth and future worth method. MARR is 10% per year. [8]

End of year	Net cash flows (Rs.)
0	-600
1	-500
2	125
3	300
4	1,000
5	220
6	320

- (b) Select which project is feasible to invest among two alternative projects whose cash flows are as follows. MARR is 12% per year. Use IRR method and incremental analysis. [7]

Particulars	Project A	Project B
Initial investment	6,50,000	5,00,000
Net annual revenue	2,50,000	2,00,000
Net annual cost	50,000	40,000
Salvage value	75,000	50,000
Useful life	8 years	8 years

4. (a) What do you mean by project risk? Explain briefly about the methods of project risk management. [7]
- (b) What do you mean by payback period? Find simple and discounted payback periods and justify invested with the given cash flow information;  
Initial investment: Rs. 4,00,000 [8]

Annual revenue: Rs. 1,50,000

Annual cost: Rs. 30,000

Salvage value: Rs. 1,00,000

Useful life year: 5

MARR: 10%

5. (a) Pokhara Photocopy Centre is considered to purchase a new photocopy machine costing Rs. 1,00,000 and expected salvage value Rs. 30,000 at the end of 10<sup>th</sup> year. The machine will save Rs. 20,000 by consuming electricity of Rs. 6,000 per year. Find IRR and interpret your result when MARR is 8% per year. [7]
- (b) A construction equipment has initial cost and annual saving per year are of Rs. 40,000 and Rs. 20,000 respectively with depreciate by MACRS method and will have no salvage value. The useful life of equipment is 5 years. Estimate before and after tax cash flow. The company pays income tax @ 40%. [8]
6. (a) What do you know about equity financing and debt financing? Explain ways to project funding mechanisms by giving example. [6]
- (b) Define accounting. How do you formulate an accounting equation? What are the major ratios that can be applied in decision making process? [9]
7. Write short notes on (Any two): [2×5]
- (a) Ecological limit and sustainable development
  - (b) Project funding mechanism
  - (c) Balance sheet

Level: Bachelor

Semester – Spring

Year: 2016

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

1. (a) Define engineering economics. Explain its principles. [7]
- (b) Explain manufacturing, non-manufacturing cost and, opportunity cost. [8]
2. (a) What do you mean by time value of money? Point out the difference between Nominal and Effective interest rate with example. [7]
- (b) A man age of 40 years now had borrowed Rs. 5, 00,000 form bank for his further studies at the age of 20 years. Interest was charged at 11% per year compounded quarterly. He wishes to pay loan in semiannual equal installments with the first installment beginning 5 year after receiving the loan. He has just clear his loan now what amount did he pay in each installments? [8]
3. (a) Explain with example why the decision criteria of present worth (i.e. PW or net present value NPV) conflicts with decision criteria of IRR and how this can be overcome? [8]
- (b) Determine both types of B/C ratio using present and annual worth method for the given project if interest rate is 12%. [7]

Investment	6,00,000
Life	8 yr
Annual revenue	2,00,000
Annual cost	60,000
Salvage value	2,00,000

4. (a) Use repeatability assumptions to recommend the best project from following information; [7]

Project	A	B
Initial investment (Rs.)	40,000	50,000
Net annual revenue (Rs.)	15,000	20,000
Salvage value (Rs.)	5,000	6,000
Life yr	3	5
MARR	15%	

- (b) Find the IRR, ERR, discounted payback period of the following project. Assume MARR = 10%. [8]

Year	0	1	2	3	4	5
Amount	15,000	1,000	2,000	4,000	5,000	8,000

5. (a) What are the significance of financial statements in business? Explain the financial statement with its type. [7]
- (b) Form the following information finds the annual depreciation and the book value of each year by straight line, declining balance, SOYD and sinking fund method. [8]  
Initial cost = Rs. 7,000; Salvage value = Rs. 2,000;  
Useful life = 5 yr and MARR = 10%.

6. (a) Explain the golden rule of accounting. Define the term ratio analysis what are its types explain in brief. [7]

(b) Perform the sensitivity analysis using PW method in initial investment, annual revenue and useful life and draw graph (choose the suitable range that you prefer). [8]

Initial investment = 1,00,000; Annual revenue = 40,000;

Annual expenses = 5,000; Salvage value = 1,000; Life year = 6

and MARR = 12%.

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

(a) Mutually exclusive, contingent and independent project

(b) Ecological limit and ecological footprint

(c) Project funding mechanism.

mutually exclusive projects

contingent projects

independent projects

Ecological footprint

Project funding mechanism

equity

bonds

loans

equity

debt

Level: Bachelor

Semester – Fall

Year: 2016

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

- (a) Define demand, supply and utility. Explain about elasticity of demand. [7]
- (b) What are the principles of Engineering Economics? Explain why studying Engineering Economics is useful to engineering student. [8]
- (a) Sabina deposits a sum of Rs. 10,00,000 in a bank account at an interest rate of 12% per year. What will be the future amount after 5 years? [6]  
If compounded  
(i) Weekly      (ii) Quarterly and      (iii) Annually
- (b) Evaluate the following project by the simple payback period, present worth and future worth method. The cash flows of the project are as follows; if the MARR is 12% per year. [9]

End of year	Net cash flows (Rs.)
0	-700
1	-400
2	125
3	200
4	800
5	220
6	320

- (a) Evaluate the following two feasible investments A and B having different useful lives, if MARR is 10% per year. Use PW method with repeatability assumptions. [8]

	Investment of A (Rs.)	Investment of B (Rs.)
Investment	50,000	1,50,000
Net annual revenue	25,000	70,000
Net annual cost	3,000	2,000
Salvage value	15,000	40,000
Useful life	3 years	5 years

- (b) Evaluate IRR of the following project and identify whether the project is feasible or not. [7]

Initial investment	Rs. 6,00,000
Annual revenue	Rs. 2,50,000
Annual cost	Rs. 50,000
Useful life	10 years
Repair and maintenance cost at 4 <sup>th</sup> and 8 <sup>th</sup> years	Rs. 30,000
MARR	10% per year

- (a) A machine costing of Rs. 1,00,000 is estimated to have life of 10 years. The salvage value of the machine at the end of life is Rs. 20,000. Find depreciation charge and book value of each year and tabulate it. Use straight line and sum of year digit (SOYD) method. [7]

- (b) Find out the B/C ratios using present worth and annual worth method. [8]

Initial investment	Rs. 6,00,000
Annual revenue	Rs. 2,50,000
Annual cost	Rs. 30,000
Salvage value	Rs. 40,000
MARR	12% per year
Useful life	8 years

5. (a) What are the advantages of company? What are the features of partnership firms? [7]  
 (b) What is life cycle cost? What are the differences between financial accounting and cost accounting? [8]
6. (a) Select which project is feasible to invest among other alternative projects whose cash flows are as follows: if MARR is 10% per year. Use IRR method and incremental analysis if necessary. [10]

	Investment of A (Rs.)	Investment of B (Rs.)
Investment	50,000	1,50,000
Net annual revenue	25,000	70,000
Net annual cost	3,000	2,000
Salvage value	15,000	40,000
Useful life	7 years	7 years
Repair and maintenance cost at 3 <sup>rd</sup> and 5 <sup>th</sup> year	10,000	15,000

- (b) What do you mean by independent, dependent and mutually exclusive project? Explain with suitable example. [5]
7. Write short notes on (Any two): [2×5]
- (a) Methods of financing
  - (b) VAT
  - (c) Stock and Bond
  - (d) Types of cost

Level: Bachelor

Semester – Spring

Year: 2015

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

- (a) What is meant by Engineering Economics? Describe its importance in engineering field. [7]  
 (b) What is meant by cross elasticity of demand? Describe all types of cross elasticity of demand with suitable figures. [8]
- (a) Mr. Sharma is planning for her retired life and has 10 more years of service. She would like to deposit 20% of her salary, which is Rs. 4,000 at the end of first year and thereafter she wishes to deposit the amount with an annual increase of Rs. 1,000 for the next 9 years with an interest of 10%. Find the total amount at the end of 10<sup>th</sup> year. [8]  
 (b) The first investment cost for a project is 5,00,000. The net annual revenue from the end of first year onwards are; 300000, 250000, 200000, 150000 and 50000 for five years. Determine whether the above investment is feasible or not if MARR = 15%. [7]
- (a) Find out the B/C ratio using present worth and annual worth method. [8]

Initial investment	Rs. 6,00,000
Annual revenue	Rs. 2,50,000
Annual cost	Rs. 30,000
Salvage value	Rs.40,000
MARR	12% per year
Useful life	8 years

- (b) Calculate simple and discounted payback periods of the following project. [7]

Initial investment = Rs. 50,000

Life of the project = 8 years

Annual revenue = Rs. 15,000

Operating cost = Rs. 2,000

MARR = 10%

Salvage value = Rs. 5,000

- (a) Evaluate the following two feasible investments A and B having different useful lives, if MARR is 10% per year. Use PW method with repeatability assumptions. [8]

	Investment of A (Rs.)	Investment of B (Rs.)
Investment	50,000	1,50,000
Net annual revenue	25,000	70,000
Net annual cost	3,000	2,000
Salvage value	15,000	40,000
Useful life	3 years	5 years

- (b) Evaluate IRR of the following project and identity whether the project is feasible or not. [7]

Initial investment	Rs. 6,00,000
Annual revenue	Rs. 2,50,000

Annual cost	Rs. 50,000
Useful life	10 years
Repair and maintenance cost at 4 <sup>th</sup> and 8 <sup>th</sup> years	Rs. 30,000
MARR	10% per year

5. (a) A machine costing of Rs. 1,00,000 is estimated to have life of 10 years. The salvage value of the machine at the end of life is Rs. 20,000. Find depreciation charge and book value of each year and tabulate it. Use straight line and sum of year digit (SOYD) method. [7]
- (b) Explain analytically the following ratios; [8]
- Debt ratio
  - Current ratio and
  - Quick ratio / acid test ratio

**OR**

- What do you mean by balance sheet, income statement and cash flow? Explain.
6. (a) What do you mean by independent, dependent and mutually exclusive project? Develop the combination of each project with suitable example. [7]
- (b) Following information has been obtained regarding two motors. [8]

	Standard motor	New motor
Size	100 hp	100 hp
Cost	1,30,000	1,56,000
Life	20	20
Salvage	0	0
Efficiency	89%	93%
Annual maintenance cost	8,000	2,500
Annual tax / insurance	2% of investment for each	
MARR	10% per year	

Find at what operating hours are they equivalent?

7. Write short notes on (Any two): [2×5]
- (a) Corporate tax
  - (b) Methods of financing
  - (c) Ecological limit and ecological footprint
  - (d) Ledger and journal.

Level: Bachelor

Semester – Spring

Year: 2015

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

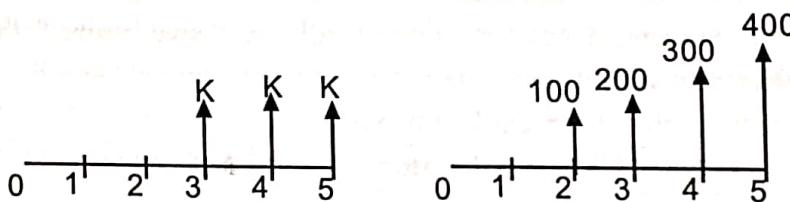
Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) Define engineering economics. What are the basic principles of engineering economics? [8]
- (b) Explain the different types of cost involved in manufacturing products with suitable example. [7]
2. (a) For a cash flow given below what should be the value of K on left hand side cash flow diagram to be equal to right hand cash flow diagram if  $i = 12\%$ ? [7]



- (b) Calculate simple and discounted payback periods assuming MARR = 15%. [8]

Period	Cash flow
0	- 85,000
1	15,000
2	25,000
3	35,000
4	45,000
5	45,000
6	35,000

3. (a) For a project given below:

Investment	90,000
Life of project	6 years
Annual benefits	27,000
Annual, Costs	8,000
Salvage value	10,000

- (i) What is IRR for the project?
- (ii) If MARR = 15%; is the project feasible?
- (b) Following are the two independent projects; determine which project is worthwhile by using B/C ratio. Assume MARR = 10% [8]

Items	Project A	Project B
I	3,50,000	4,50,000
AR	1,50,000	1,75,000
O & M	30,000	40,000
S	50,000	75,000
N (year)	4	5

4. (a) A company needs a machine and has found two quotations with cash flow shown below. Select the best quotation using PW methods. [7]

Items	<u>Quotation A</u>	<u>Quotation B</u>
Purchase	12,500	15,000
O & M	5,000	4,000
S	2,000	1,500
N (year)	3	4
MARR	10%	

- (b) Describe project risk. Explain the sensitivity analysis method of describing project risk. [8]
5. (a) Define ecological footprint. Explain the concept of sustainable development. [7]
- (b) Consider the following accounting information for a computer system. [8]

Cost basis of the asset (I) = 10,000

Useful life (N) = 5 years

Salvage value (S) = 0

Use double rate declining balance method to compute annual depreciation allowances & resulting book value.

6. (a) Explain cost of capital. Briefly explain the equity financing and debt financing. [7]

- (b) What is income statement and balance sheet? How are they related to each other? [8]

7. Write short notes on (any two): [2×5=10]

(a) Direct and Indirect Tax.

(b) FIRR and EIRR

(c) Fundamental equation of accounting.

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

1. (a) Define Engineering Economics. Discuss about principles of engineering economics in project formulation and selection. [8]

- (b) Following are the cost data for the production of a 100 badminton racquets: [7]

Labour rate: Rs. 40/hr

Leather: 50m at Rs. 200/meter

Gut: 300 m at Rs. 50/meter.

Graphite: 100 kg at Rs. 200 /kg

Total annual factory overhead: Rs. 5,00,000

Total annual direct labour hours: 25,000 hrs.

Labour hours needed: 200 hrs.

Show the cost breakdown and calculate the total cost for per racquet.

2. (a) Explain time value of money. What will be the effective interest rate if nominal rate is 9% per year, and the compounding period is (a) yearly (b) quarterly (c) daily (d) hourly (e) continuously? [8]

- (b) Determine the internal rate of return of the following project. Also present unrecovered investment balance in graph & table. [7]

Initial investment = Rs. 1,50,000

Life span of project = 5 years

Annual revenue = Rs. 5,000

Operation cost = Rs. 3,000

Salvage value = 2,000

MARR = 8%

3. (a) Find both types of B/C ratios using PW formulation for a project having first investment cost Rs. 1,00,000; project life 10 years; Salvage value Rs. 20,000; annual benefit Rs. 75,000; annual O&M cost Rs. 15,000 & MARR = 10%. [7]

- (b) Compare the following two mutually exclusive projects by using Co-terminated assumption when MARR is 10%. [8]

	Project A	Project B
Initial cost Rs.	1,50,000	2,00,000
Annual revenue Rs.	90,000	1,00,000
Annual O & M cost Rs.	20,000	22,000
Useful life year	5	8
Salvage value Rs.	50,000	1,00,000

4. (a) Perform sensitivity analysis of the following project over the range of  $\pm 25\%$  in (i) Initial investment (ii) Annual revenue (iii) Useful life. [8]

Initial investment = 11,500

Annual revenue = 3,000

Salvage value = 1,000

Useful life = 6 years

MARR = 20%

- (b) What are the causes for depreciation? A machine is costing of Rs. 5,00,000 with estimated salvage value Rs. 5,000 at the end of 5<sup>th</sup> year. Find depreciation amount by (i) Straight line (ii) Declining balance methods for each year.
5. (a) The following is trial balance of Acharya company. [7]

Particular	Debit (Rs.)	Credit (Rs.)
Capitals		2,00,000
Plant & Machinery	50,000	
Furniture & fitting	75,000	
Motor van	24,000	
Sundry Debtors	40,000	
Cash at bank	7,000	
Wages	1,50,000	
Purchase & sales	2,13,000	4,00,000
Bills receivables & payables	35,000	15,000
Sundry creditors		20,000
Salaries	36,000	
Drawing	20,000	
Discount received		10,000
Bank loan		30,000
General reserve		20,000
Opening stock	40,000	
Bad debt	5,000	
	6,95,000	6,95,000

Value of closing stock = 52,000

Net profit = 18,000

Required: Balance sheet

- (b) From the following cash flow information, calculation PW, AW and FW by assuming rate of interest is 7% per year that compounds semi annually; [7]

EOY	0	1	2	3	4	5
Cash flow	- 3,00,000	80,000	90,000	90,000	90,000	1,20,000

6. (a) Define debt & equity financing. What is there difference between them? If Asian Electric company presently pays a dividend of Rs. 12 per share & has a share price of Rs. 110. The expected growth was 8% for ever, and then what is the required return on equity? [7]
- (b) What do you mean by payback period? Find simple and discounted payback periods and justify investment with the given cash flow information; [8]

Initial investment	Rs. 4,00,000
Annual revenue	Rs. 1,50,000
Annual cost	Rs. 30,000
Salvage value	Rs. 1,00,000
Useful life year	5
MARR	10%

[2×5]

7. Write short notes on (Any two):

(a) VAT

(b) Financial Ratios

(c) Effective Interest rate

Level: Bachelor

Semester – Spring

Programme: BE

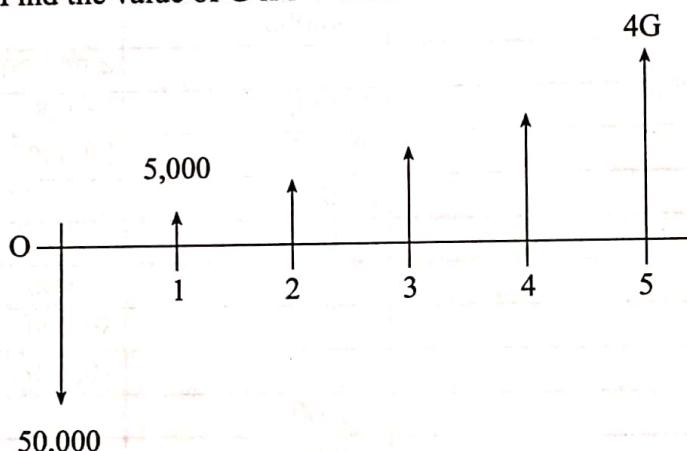
Course: Engineering Economics

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

- (a) Define Engineering Economics. Explain its principles. [8]
- (b) What is meant by elasticity of demand? Describe all types of price elasticity of demand with suitable figures. [7]
- (a) Find the value of G if  $i = 12\%$ . [7]



- (b) Describe manufacturing cost and non manufacturing cost with examples. [8]
- (a) Evaluate IRR of the following project, identify whether the project is feasible or not? Also draw investment Balance Diagram. [8]
 

Initial investment	Rs. 10,00,000
Annual Revenues	Rs. 2,40,000
Annual Cost	Rs. 60,000
Useful life year	10 years
MARR	10%

 (b) A new machine costing Rs. 2,50,000 is estimated to have life of 10 years and expected annual revenue is Rs. 50,000 with annual cost Rs. 12,500. Determine the investment decision based on PW formulation to this machine, if salvage value is Rs. 70,000 and MARR is 10% per year make also cash flow diagram. [7]
- (a) Find both types of B/C ratio (Conventional and Modified) using AW formulation of the following projects and find whether the project is feasible or not. [7]
 

Initial investment	Rs. 5,00,000
Annual Revenue	Rs. 80,000
Annual O&M Cost	Rs. 15,000
Salvage value	Rs. 10,000
Life	20 years
MARR	10%

Initial investment	Rs. 5,00,000
Annual Revenue	Rs. 80,000
Annual O&M Cost	Rs. 15,000
Salvage value	Rs. 10,000
Life	20 years
MARR	10%

- (b) Make a selection from the following two mutually exclusive alternatives.

[8]

Alternative	A	B
Capital Investment (Rs.)	4,50,000	6,00,000
Annual Revenue (Rs.)	22,000	26,000
Annual Expenses (Rs.)	7,450	11,020
Useful Life (Yr.)	6	8
Market Value (Rs.)	25,000	28,000
MARR	10%	10%

Make repeatability assumption method.

5. (a) Consider following accounting information for a computer system.

[7]

Cost basis of the asset = Rs. 40,000

Useful life = 5 years.

Estimated salvage value = Rs. 2,500

Compute the annual depreciation and resulting book value using double declining balance method.

- (b) Prepare balance sheet of ABC Company from the following information as on 31<sup>st</sup> December 2014.

[8]

Capital	40,000	Building	30,000
Sundry debtors	15,000	Furniture	12,500
Cash in hand	4,000	Cash at bank	7,500
Bank overdraft	8,500	Bills receivable	4,500
Sundry creditors	3,500	Closing stock	3,500
Reserve funds	4,500	Net profit	20,500

6. (a) Write the fundamental equation of accounting. Explain general accounting and cost accounting.

[8]

- (b) What do you mean by tax? Explain the term Personal tax and corporate tax.

[7]

7. Write short notes on (Any two):

[2×5=10]

(a) Types of depreciation.

(b) Public Private Partnership.

(c) Value added tax (VAT).

Level: Bachelor

Semester – Fall

Year: 2014

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

- (a) Define demand, supply and utility. Explain about elasticity of demand. [7]
- (b) What are the principles of Engineering Economics? Explain why studying Engineering Economics is fruitful to engineering student. [8]
- (a) Find present equivalent from the cash flow given if interest rate is 11% per year using uniform gradient method. [5]

End of year	Cash Flow
1	400
2	600
3	800
4	1000
5	1200
6	1400

- (b) A father deposits a sum of Rs. 1,00,000 in a bank for his son's education who will be admitted to a professional course after 5 years. The bank pays 12% interest rate per year, compounded monthly. Find the future amount of the deposited money at the time of admitting his son in the professional course. [5]
- (c) How many deposits of Rs. 5,000 each should make per month so that the final accumulation amount will be Rs. 1,00,000 if the bank interest rate is 12% per year? [5]
- (a) What are the causes for depreciation? If a machine costing of Rs. 4,00,000 is estimated 10 years useful life and Rs. 50,000 salvage value. Find depreciation amount for each year by using declining balance and sinking fund methods. [7]
- (b) Evaluate IRR for the following project and decide whether the project is acceptable or not? Also draw the unrecovered investment balance diagram. [8]

Initial investment	Rs. 5,00,000
Annual revenue	Rs. 1,20,000
Salvage value	Rs. 30,000
Useful life year	10
MARR	8%

- (a) Define cost benefit cost analysis. Find out the both types of B/C ratio using present worth and annual worth method. [10]
  - Initial investment = Rs. 4,00,000
  - Annual benefit = Rs. 1,50,000
  - Annual cost = Rs. 30,000
  - Salvage value = Rs. 50,000
  - MARR = 12% per year
  - Useful life = 8 years

5. (b) What is business organization? Explain the characteristics of partnership business. [5]
- (a) What is accounting? Write the rules for Debit and Credit. [8]
- (b) What are the differences between trading account and profit and loss account? What are the elements used in balance sheet? [7]
6. (a) Calculate PW of the following two mutually exclusive projects by using repeatability assumption when MARR is 10%. [8]

	A	B
Initial cost Rs.	4,00,000	6,00,000
Annual revenue Rs.	30,000	35,000
Annual O&M cost Rs.	3,000	4,000
Useful life year	3	9
Salvage value Rs.	4,000	7,000

- (b) What do you mean by cost? Explain the elements of cost. [7]
7. Write short notes on any two: [2×5]
- (a) Bond
- (b) Corporate tax and VAT
- (c) Breakeven analysis.

- (d) Net Present Value Method
- (e) Internal Rate of Return Method

# POKHARA UNIVERSITY

Level: Bachelor

Semester – Spring

Year: 2013

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) What are the principles of engineering economics? Explain how the engineering economics and decision making are interrelated. [5]
- (b) Suppose that you make a series of annual deposits into a bank account that pays 10% interest. The initial deposit at the end of first year is Rs. 1,200. The deposit amounts decline by Rs. 200 in each of the next 4 years. How much would you have immediately after the 5<sup>th</sup> deposit? [5]
- (c) An individual makes five annual deposits of Rs. 2,000 in a saving account that pays interest at a rate of 4% per year. One year after making the last deposit, the interest rate changes to 6% per year. Five years after the last deposit the accumulated money is withdrawn from the account. How much is withdrawn? [5]

2. (a) Determine conventional and modified B/C ratio for the given project. [8]

Initial cost	5,00,000
Life yr	10
Salvage value	1,00,000
Annual benefit	75,000
Annual O & M	25,000
Interest rate	10%

Whether the project is feasible or not?

- (b) Evaluate IRR of the following project, identify whether the project is feasible or not? Also draw investment balance diagram. [7]

Initial cost	2,50,000
Life yr	10
Annual revenue	60,000
Annual cost	15,000
Interest rate	10%

3. (a) Determine the depreciation for years using 200% declining balance and SOYD method. [8]  
Initial cost = 50,00,000; Life= 10 yr; Salvage value = 20,00,000.
- (b) Find the both types of payback period of the project with the following cash flow status. [7]

EOY	Cash flow (Rs.)
1	3,00,000
2	70,000
3	80,000
4	85,000
5	90,000
6	1,00,000
7	1,20,000
8	1,30,000

4. (a) Define bond and stock. Explain their features in brief. [7]  
 (b) Two mutually exclusive projects are shown below; [8]

	M	N
Capital investment	5,00,000	7,00,000
Net annual revenue	1,10,000	1,10,000
Salvage value	40,000	40,000
Useful life	3	4
MARR	10%	

Select the best project by using PW method.

5. (a) What do you mean by Journal and Ledger? Describe briefly the relationship between the journal and ledger. [8]  
 (b) Define business organization. Explain briefly the characteristics of private limited company and public limited company. [7]
6. (a) State law of demand and supply. Describe different types of elasticity of demand. [7]  
 (b) Explain the application of cost accounting concept in engineering decisions. [8]
7. Write short notes on (Any two): [2x5]
- (a) VAT  
 (b) Taxation structure in Nepal  
 (c) Balance sheet.

# POKHARA UNIVERSITY

Level: Bachelor

Semester – Fall

Year: 2013

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) What is Engineering Economics? Why do you think studying this course is important for engineering students? Justify. [8]
- (b) What do you mean by demand and elasticity of demand? Describe three kinds of elasticity of demand. [7]
2. (a) Sarita wants to deposit Rs. 15000 in every year into a bank at an interest rate of 12% per year, compounded semi annually. What will be the maturity amount after 5 years? [7]

Or

- What is time value of money? Explain nominal interest rate and effective interest rate.
- (b) Calculate Present Worth, Future Worth and Annual Worth from the following net cash flows. [8]
- The MARR is 12% per year.

End of year	Net cash flows (Rs.)
0	- 5,000
1	- 500
2	0
3	1,200
4	1,200
5	1,220
6	1,320

3. (a) Explain What do you understand by Break-even analysis with a suitable example. [7]
- (b) Evaluate IRR of the following project, Identify whether the project is feasible or not? Also draw investment Balance Diagram. [8]

Initial Investment – Rs. 25,000

Annual revenue – Rs. 8,000

Salvage value – Rs. 5,000

Useful life – 5 years

MARR – 20%

Or

What do you mean by VAT? Explain the importance of VAT system in Nepal.

4. (a) Bond issued by Everest Bank Ltd. has a coupon rate of 8 percent. Interest is paid quarterly and the bond matures in 5 years. The face value of the bond is Rs. 1,000. What is the present value of the bond if market interest rate is 7.5 percent? [7]
- (b) Find out the both types of B/C ratio using present worth and annual worth method using the following information. [8]

Initial investment = Rs. 15,00,000

Annual benefit = Rs. 5,50,000

Annual cost = Rs. 50,000  
Salvage value = Rs. 40,000  
MARR = 12% per year  
Useful life = 8 years.

5. (a) We have just purchased a minicomputer at a cost of Rs. 20,000 with an estimated salvage value of Rs. 1,000 and a projected useful life of 6 years. If interest is 12% per year, determine. [8]
- Sum of the year digit (SOYD) depreciation.
  - Double rate declining balance depreciation.
- (b) Define asset and liability. Explain how balance sheet is prepared and its use with the help of a suitable example. [7]
6. (a) Briefly explain sole proprietorship, partnership, private limited and public company. [7]  
(b) Explain sunk cost, opportunity cost, fixed cost and variable cost with relevant examples. [8]
7. Write short notes on any two: [2×5]
- Relationship between journal and ledger
  - Personal tax and corporate tax
  - Common stock and preferred stock.

# POKHARA UNIVERSITY

Level: Bachelor

Semester – Spring

Year: 2012

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) What do you mean by law of demand and supply? Explain the factors influencing the demand. [8]
- (b) Explain the law of diminishing marginal utility with suitable example. [7]
2. (a) A 30 years old person is planning for his retired life. He plans to invest an equal sum of Rs. 25,000 at the end of every year. The bank gives 6% interest rate compounded semi annually. How much money can be withdrawn from his account when he is 60 years old? [5]
- (b) A person deposits a sum of Rs. 3,00,000 in a bank for his son's education who will be admitted to a professional course after 8 years. The bank pays 12% interest compounded annually. Find the future amount of the deposited money at the time of admitting his son in the professional course. [5]
- (c) Rabindra deposits Rs. 1,00,000 at a bank account that provides 12% interest for 5 years. How much bank balance will Rabindra have at the end of fifth year, if bank calculates interest on simple interest basis? How much will he have if interest is compounded annually? Why is future value under compound interest system always higher than that of simple interest system? Explain. [5]
3. (a) A machine was bought for manufacturing plant in Rs. 5,00,000 having 5 years depreciable life. The estimated salvage value of the machine is zero. Find annual depreciation and cumulative depreciation cost at the end of each year using 150% declining balance method and (SOYD) method. [8]
- (b) Calculate the simple payback period and discounted payback period form the following cash flows, if the MARR is 12% per year. [7]

EOY	Net cash flows (Rs.)
0	-1,000
1	-500
2	0
3	200
4	1,200
5	220
6	320

4. (a) Define cost benefit analysis. Find out the both types of B/C ratio using present worth and annual worth method. [10]
- (b) What is business organization? Explain the differences between partnership and joint stock company. [5]

5. (a) Evaluate the following two feasible investment using PW method with repeatability assumptions.  
If MARR is 15% per year.

[8]

	Investment of A (\$)	Investment of B (\$)
Investment	40,000	50,000
Net annual revenue	15,000	20,000
Salvage value	5,000	6,000
Useful life year	3	5

- (b) Define bond and explain its major features in brief. Also calculate the value of 10%, 15 years, Rs.1,000 per bond. The current market interest rate is 12%. [7]
6. (a) List out the major financial statements (final account). Explain the main purpose of preparing the profit and loss a/c along with providing its appropriate format. [8]
- (b) What do you mean by cost? Explain the elements of cost. [7]
7. Write short notes on (Any two): [2x5]
- (a) Difference between common stock and preferred stock
  - (b) VAT and its importance
  - (c) Double entry book keeping.

# POKHARA UNIVERSITY

Level: Bachelor

Semester – Fall

Year: 2012

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) Define Engineering Economics? Why it is important to study engineers?  
Enlist the principles of engineering economics. [8]
- (b) What is utility? State and explain about the law of diminishing marginal utility with a suitable example and figure. [7]
2. (a) A man aged 40 years now had borrowed Rs. 500,000 from a bank for his further studies at the age of 20 years. Interest was charged at 11% per year compounded quarterly. He wished to pay loan in semiannual equal installments with the first installment beginning 5 years after receiving the loan. He has just cleared the loan now. What amount did he pay in each installment? [8]
- (b) What do you mean by depreciation? If a Machine costing of Rs. 4,00,000 is estimated to have useful life 10 years and Rs. 50,000 salvage value. Find depreciation amount for each year by using straight line and sum of the year digit (SOYD) depreciation. [7]
3. (a) Evaluate IRR of the following project and identify whether the project is feasible or not. [8]

Initial Investment	Rs. 35, 00,000
Annual revenue	Rs. 7, 00,000
Annual Cost	Rs. 2, 00,000
Useful life	Rs. 10 year
Salvage Value	Rs. 10, 00,000
MARR	10% per year

- (b) Find both types of B/C ratio (Conventional and Modified) using AW formulation of the following project and find whether the project is feasible or not. [7]

Initial Investment	Rs. 5,00,000
Annual Revenue	Rs. 80,000
Annual O & M Cost	Rs. 15,000
Salvage value	Rs. 10,000
Life	20 yrs
MARR	10%

OR

Following information has been obtained regarding two motors.

	<u>A Motor</u>	<u>B Motor</u>
Size	100hp	120hp
Cost (\$)	130,000	156,000
Life (yrs)	20	20
Salvage Value (\$)	0	0
Efficiency	89.5%	93%
Annual Maintenance cost	\$8000	\$250
Electricity cost	\$ 6/Kwh	\$6/Kwh

- Annual tax and insurance 2% of investment  
At what operating hour are they equivalent?
- i. If the motor have to be operated 50hrs a year, which one should be selected?  
Take MARR = 10% per year.
4. a. Define business organization. What are the main features of Joint Stock Company and Public corporations? [8]
- b. What is the difference between stock and bond? How do you calculate economic value of a maturity bond? [7]
- OR
- Nepal Rastra Bank has just issued a 10 year bond with face value of Rs. 1,000. The bond pays 9% coupon interest annually. The market interest rate is currently 11%. Calculate the value of bond. [5]
- a. What is journal? Describe the relationship between journal and ledger. [8]
- b. What do you mean by profit & loss A/C and Balance Sheet? Describe briefly the relationship between the profit & Loss A/C and Balance Sheet. [7]
6. a. Explain what do you understand by element of cost and explain them. [7]
- b. What is value added tax? Explain briefly the effectiveness of VAT implementation in Nepal. [7]
7. Write short notes on any two: [2×5]
- Payback period
  - Break even analysis
  - Real and Nominal Interest Rates

Level: Bachelor

Semester – Fall

Year: 2011

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

The figures in the margin indicate full marks.

**Attempt all the questions.**

1. (a) Describe about the principles of Engineering Economics. [7]
- (b) What do you mean by demand and elasticity of demand? Describe three kinds of elasticity of demand. [8]
2. (a) What is the future equivalent of Rs 40,00,000 per year that flows continuously for 11 years if nominal interest is 12% compounded continuously. [7]
- (b) Find present equivalent from the cash flow given if interest rate is 11% per year using uniform gradient method. [8]

**End of Year Cash Flow**

1	-	40000
2	-	50000
3	-	60000
4	-	70000
5	-	80000
6	-	100000

3. (a) We are considering the purchase of Motorcycle at a cost of Rs. 1,10,000 with an estimated salvage value of Rs. 2000 and a project useful life of 5 years. Interest is 10%, determine: [8]
  - (i) Sum of years digits (SOYD) depreciation
  - (ii) Double Decline Balance with conversion to straight line depreciation.
- (b) Evaluate IRR of the following project, Identify whether the project is feasible or not? Also draw investment Balance Diagram. [7]

Initial investment	Rs.5,00,000
Annual Revenues	Rs. 1,20,000
Annual cost	Rs. 30,000
Useful life year	10
MARR	10%

4. (a) From the following information, find that how many hours/per year would the motors have to be operated at full load for annual cost to be equal? [7]

	<b>Motor A</b>	<b>Motor B</b>
Purchase cost	Rs. 125000	Rs.160000
Efficiency	74%	92%
Life	10 yrs	10 yrs
Maintenance cost	Rs. 5000/Year	Rs. 2500 /Year

Annual tax and insurance: 1.5% of investment for both motors and electricity cost Rs. 5/Kw hr.  
Power of both motors = 100hp

- (b) Determine conventional and modified B/C ratio for the given project if interest rate is 11%. [8]

Investment	Rs 10,000
Life of project	8 Years
Annual benefits	4,600
Annual, Costs	3,000
Salvage value	2,500

5. (a) Briefly explain sole proprietorship, partnership, private limited and public company. [7]
- (b) If a bond issue of Rs 1,00,000 in 10 years bonds, in Rs. 1000 units paying 10% nominal interest in semiannual payments must be retired by use of sinking fund that earns 8% compounded semiannually. Find the total cost for interest and retirement of the entire bond issue over 10 years. [8]
6. (a) What is journal? Explain the Golden rules for Debit and Credit.
- (b) What are the elements used in Debit and Credit side of Trading account and profit and loss account. [7]
7. Write shorts notes on any two: [2×5]
- (a) VAT
  - (b) Cost accounting and general accounting
  - (c) Personal tax and corporate tax

Level: Bachelor

Semester – Fall

Year: 2010

Programme: BE

Full Marks: 100

Course: Engineering Economics

Pass Marks: 45

Time: 3hrs

Candidates are required to give their answer in their own words as far as practicable.

*The figures in the margin indicate full marks.***Attempt all the questions.**

1. (a) What do you mean by utility and marginal utility? Describe law of diminishing utility with example. [8]

OR

What do you mean by demand and elasticity of demand. Describe three kinds of elasticity of demand.

- (b) Describe usages of engineering economic for engineers. [7]
2. (a) Describe lifecycle cost showing different components. [5]
- (b) Ram invested Rs.15000 in a high yield account. At the end of 30years, he closed the account and received Rs.539250. Compute the effective interest rate he received on the account. [5]
- (c) Find the compound amount, if the investment is done Rs.5000 with the interest rate 12% per year and compounded weekly for 2 years. [5]
3. (a) A company has purchased equipment whose first cost is Rs.100,000 with an estimated life of eight years. The estimated salvage of the equipment at the end of its time is Rs. 20,000. Determine the depreciation charge and book value at the 4 and 5 years using the sum of digital number method of depreciation. [8]
- (b) Find the net present value (NPV) of the cash receipts shown below when effective interest rate is 10% compounded annually: [7]

Cash Flow details	
End of year	Net Amount (in thousands)
0	-500
1	-100
2	0
3	600
4	100
5	400
6	150

4. (a) Evaluate IRR of the flowing project, Identify whether the projects is feasible or not ? Also draw investment Balance Diagram. [8]

Initial investment	Rs.5,00,000
Annual Revenue	Rs.1,20,000
Annual cost	30,000
Useful life	10 year
MARR	10%

- (b) What are the types of business organization? Explain briefly about Private Limited Company.[7]

5. (a) Find the IRR of the project the following information.

Initial investment	Rs.5,00,000
Annual Revenue	Rs.1,20,000
Annual cost	30,000
Useful life	10 year
MARR	10%

[8]

Also draw the investment balance diagram.

- (b) Define Bound and share. Explain their features in brief.

6. (a) Find both types of B/C ratio using present worth and annual worth method.

[7]

Initial investment	Rs.4,00,000
Annual Revenue	Rs.1,75,000
Annual cost	25,000
MARR	10%
Salvage value	Rs. 40,000

[8]

- (b) Hari wants to have 1,50,000 for saving plan after the period of 12 years. How much rupees he needs to deposit each year in the saving accounts that earns 10% interest annually? Draw its cash flow diagram also.

[7]

7. Write short notes on (Any Two)

[2 × 5]

- (a) Cost accounting and general accounting  
(b) Breakeven Point  
(c) Taxation system of Nepal

## MODEL QUESTION – 1 (New Course)

POKHARA UNIVERSITY

Level: Bachelor

Time: 3 hrs

Full Marks : 100

Pass Marks: 45

Programme : BE

Course: Engineering Economics

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

**Attempt all the questions.**

1. (a) Resource scarcity is the fundamental economic problem for every society. Discuss its solution by applying engineering principles [8]  
(b) What is utility? Explain about the law of diminishing returns with focusing its stages. [7]
2. (a) What do you mean by nominal and effective interest? If monthly interest rate is 1.5%, find effective and nominal rate of interest per year. [5]  
(b) A person deposits Rs. 4, 00,000 now by expecting interest rate 12 % per year for 8 years. Find the maturity of the deposit when the interest is compounding quarterly. [5]  
(c) How many deposits of Rs. 5,000 each should make per month so that the final accumulation amount will be Rs. 1, 00,000 if the bank interest rate is 12% per year? [5]
3. (a) What are the causes for depreciation? If a machine costing of Rs. 4, 00,000 is estimated 10 years useful life and Rs.50, 000 salvage value. Find depreciation amount for each year by using declining balance and sinking fund methods. [7]  
(b) Evaluate IRR for the following project and decide whether the project is acceptable or not? [8]  
Initial investment Rs. 5,00,000  
Annual revenue Rs. 1,20,000  
Salvage value Rs. 30,000  
Useful life year 10  
MARR 8%
4. (a) If the cost of 20 watt CFL bulb is Rs. 275 whereas cost of 100 watt filament bulb is Rs.25, but these bulbs have equal lighting power. Which bulb do you use in your house? When electricity cost is Rs. 10 per unit. [7]  
(b) Calculate PW of the following two mutually exclusive projects by using repeatability assumption when MARR is 10%. [8]

	A	B
Initial cost Rs.	4,00,000	6,00,000
Annual revenue Rs.	30,000	35,000
Annual O &M cost Rs.	3,000	4,000
Useful life Year	3	9
Salvage value Rs.	4,000	7,000

OR

Determine B/C ratio by both conventional and modified methods using PW formulation for the given project.

Initial investment Rs. 1, 00,000  
Annual revenue Rs. 40,000  
Annual cost Rs. 19,000

- |               |            |
|---------------|------------|
| Salvage value | Rs. 20,000 |
| Useful life   | 10 years   |
| MARR          | 10%        |
5. (a) Define types of business organization. What are the features of Joint Stock Company? Explain. [8]  
 (b) What is stock and bond security? How do you calculate present value of a maturity bond? Justify with a suitable example. [7]
6. (a) Define accounting equation. Explain the relation between income statement & balance sheet. [7]  
 (b) Briefly explain about the rules for debit and credit with example. [8]
7. Write short notes on any two: [2×5=10]
- Life cycle of cost
  - Cost accounting and general accounting
  - Corporate and Personal tax

## **MODEL QUESTION – 2**

### **POKHARA UNIVERSITY**

**Level: Bachelor**      **Programme : BE**

Full Marks : 100

Course: Engineering Economics

**Pass Marks: 45**

Time: 3 hrs.

**Candidates are required to give their answers in their own words as far as practicable.**

**The figures in the margin indicate full marks.**

**Attempt all the questions.**

1. (a) Resource scarcity is the basic economic problem for engineering. Discuss this issue by applying principles of engineering economy. [8]  
(b) Define cost. Explain the concept of manufacturing and non-manufacturing cost with suitable example. [7]
  2. (a) What do you mean by time value of money? How do you distinguish nominal and effective rate of interest? [7]  
(b) From the following cash flow information, calculate PW, AW and FW by assuming rate of interest is 7% per year that compounds quarterly; [8]

EOY	0	1	2	3	4	5	6
Cash flow	-400000	80000	90000	90000	80000	90000	120000

3. (a) Richmond college is considering to purchase a new photocopy machine costing of Rs 1000000 expecting salvage value Rs 30000 at the end of 10<sup>th</sup> year. The machine will save Rs 20000 by consuming electricity of Rs 6000 per year. Find IRR and interpret your result when MARR is 8% per year. [7]

(b) Compute both types of B/C ratios by AW formulation from the following data. [8]

Initial investment	Rs. 3,00,000
--------------------	--------------

Initial investment	Rs. 3,00,000
Annual revenue	Rs. 80,000
Annual cost	Rs. 20,000
Salvage value	Rs. 50,000
Useful life	year 10
MARR	10%

4. (a) What do you mean by payback period? Find simple and discounted payback periods and justify investment with the given cash flow information; [7]

Initial investment	Rs. 4,00,000
Annual revenue	Rs. 1,50,000
Annual cost	Rs. 30,000
Salvage value	Rs.1,00,000
Useful life	year 5
MARR	10%

- (b) Compare the following two mutually exclusive projects by using Co-terminated assumption when MARR is 10%. [8]

	<b>Project A</b>	<b>Project B</b>
Initial cost Rs.	1,50,000	2,00,000
Annual revenue Rs.	90,000	1,00,000
Annual O & M cost Rs.	20,000	22,000
Useful life Year	4	8
Salvage value Rs.	50,000	1,00,000

5. (a) Perform sensitivity analysis of the following project over the range of  $\pm 25\%$  in  
(i) Initial investment    (ii) Annual revenue    (iii) Useful life. [7]
- Initial investment = 11,500
- Annual revenue = 3,000
- Salvage value = 1,000
- Useful life = 6 years
- MARR = 20%
- (b) What are the causes for depreciation? A machine is costing of Rs 10,500 with estimated salvage value Rs 500 at the end of 6<sup>th</sup> year. Find depreciation by  
(i) Straight line    (ii) Declining balance and    (iii) SOYD methods. [8]
6. (a) What do you know about equity financing and debt financing? Explain way to project funding mechanisms by giving example. [7]
- (b) Define accounting. How do you formulate an accounting equation? What are the major ratios that can be applied in decision making process? [8]

7. Write short notes on any two: [2×5=10]

- (a) Mutually exclusive, independent and contingent project.
- (b) Ecological limit and sustainable
- (c) Balance sheet and cash flow statement

**MODEL QUESTION – 3**  
**POKHARA UNIVERSITY**

Level: Bachelor

Course: Engineering Economics

Pass Marks: 45

Time: 3 hrs.

Programme : BE  
Full Marks : 100

**Candidates are required to give their answers in their own words as far as practicable.**

**The figures in the margin indicate full marks.**

**Attempt all the questions.**

1. (a) "Demand creates its own supply" justify this statement. Enlist principles of engineering economy. [8]
- (b) Define opportunity cost, sunk cost and marginal cost. Explain the difference between manufacturing and non-manufacturing cost with suitable example. [7]
2. (a) What do you mean by time value of money? How do you distinguish nominal and effective rate of interest with suitable example. [7]
- (b) From the following cash flow information, calculate PW, AW and FW by using gradient formula when rate of interest is 10% per year that compounds quarterly. [8]

EOY	0	1	2	3	4	5	6
Cash flow	-4,00,000	80,000	90,000	1,00,000	1,10,0000	1,00,0000	1,30,000

3. (a) Find IRR and ERR when MARR =  $\varepsilon = 8\%$  per year [7]
 

Initial investment	Rs. 1, 00,000
Annual revenue	Rs. 20,000
Annual cost	Rs. 6,000
Salvage value	Rs. 30,000
Useful life	year 10 years
- (b) Compute both types of B/C ratios by AW formulation from the following data. [8]
 

Initial investment	Rs. 3, 00,000
Annual revenue	Rs. 80,000
Annual cost	Rs. 20,000
Salvage value	Rs. 50,000
Useful life	year 10
MARR	10%

4. (a) What do you mean by payback period? Find simple and discounted payback periods and justify investment with the given cash flow information. [7]
 

Initial investment	Rs. 4, 00,000
Annual revenue	Rs. 1, 50,000
Annual cost	Rs. 30,000
Salvage value	Rs.1, 00,000
Useful life	year 5
MARR	10%
- (b) Compare the following mutually exclusive projects by using repeatability assumption when MARR is 10%. [8]

	Project A	Project B	Project C
Initial cost Rs.	1,00,000	2,00,000	3,00,000

Annual revenue Rs.	60,000	1,00,000	1,00,000
Annual O & M cost Rs.	20,000	22,000	10,000
Useful life Year	3	5	5
Salvage value Rs.	50,000	1,00,000	80,000



**Initial investment = 1, 00,000**

Annual revenue = 40,000

Salvage value = 1,000

Useful life = 6 years

MARR = 12%

- (b) An estimation of a new model generator has the following information.

Purchase cost	Rs. 3,00,000
Annual maintenance cost	Rs. 8,000
Annual energy generated at full load	12,000 kw
Price of energy generated	Rs. 3/ kwhr
Salvage value	Rs. 60,000
MARR	8% per year

Determine how long will it operate for break-even point?

6. (a) What are the causes for depreciation? A machine is costing of Rs 10,500 with estimated salvage value Rs 500 at the end of 6<sup>th</sup> year. Find depreciation for each years by using i) Straight line ii) Declining balance and iii) Sinking fund methods. [7]

(b) Define accounting. How do you formulate an accounting equation? What are the major ratios that can be applied in decision making process? [8]

7. Write short notes on **any two**: [2×5=10]

  - (a) Ecological limit and sustainable development
  - (b) Project funding mechanism
  - (c) Balance sheet and cash flow statement

**MODEL QUESTION– 4**  
**POKHARA UNIVERSITY**

Level: Bachelor

Programme : BE  
 Full Marks : 100  
 Pass Marks: 45

Course: Engineering Economics

Time: 3 hrs.

**Candidates are required to give their answers in their own words as far as practicable.**

**The figures in the margin indicate full marks.**

**Attempt all the questions.**

- (a) Define Engineering Economics. Discuss about principles of engineering economics in project formulation and selection. [8]
- (b) Explain concept of manufacturing and non-manufacturing cost with suitable example. [7]
- (a) What do you mean by time value of money? How do you derive effective rate of interest on the basis of nominal rate of interest? [7]
- (b) From the following cash flow information, calculate PW, AW and FW by assuming rate of interest is 7% per year that compounds semi annually; [8]

EOY	0	1	2	3	4	5
Cash flow	-3,00,000	80,000	90,000	90,000	90,000	1,20,000

- (a) Nepal Engineering college is considering to purchase a new photocopy machine costing of Rs 1,00,000 expecting salvage value Rs 30,000 at the end of 10<sup>th</sup> year. The machine will save Rs 20,000 by consuming electricity of Rs 6,000 per year. Find IRR and interpret your result when MARR is 8% per year. [7]
- (b) Compute both types of B/C ratios by FW formulation from following data. [8]

Initial investment	Rs. 3, 00,000
Annual revenue	Rs. 80,000
Annual cost	Rs. 20,000
Salvage value	Rs. 50,000
Useful life	year 5
MARR	10%

- (a) What do you mean by payback period? Find simple and discounted payback periods and justify investment with the given cash flow information; [7]

Initial investment	Rs. 4,00,000
Annual revenue	Rs. 1,50,000
Annual cost	Rs. 30,000
Salvage value	Rs.1,00,000
Useful life	year 5
MARR	10%

- (b) Compare the following two mutually exclusive projects by using Co-terminated assumption when MARR is 10%. [8]

	<b>Project A</b>	<b>Project B</b>
Initial cost Rs.	1,50,000	2,00,000
Annual revenue Rs.	90,000	1,00,000
Annual O & M cost Rs.	20,000	22,000
Useful life Year	5	8
Salvage value Rs.	50,000	1,00,000

1

Level: Bachelor  
Programme: BE  
Course: Computer Network

**POKHARA UNIVERSITY**

Semester: Fall

Year : 2021

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define Intranet. Which network model is used for connecting devices within Office and why? Explain with neat diagram along with advantages and disadvantages. 8
- b) Define protocols and standards. Compare TCP/IP and OSI reference model. 7
2. a) Why do we use fiber optics for long distance communication? Explain fiber optics single mode of propagation? Describe about network performance bandwidth and latency. Write a command to check latency to server with IP 4.4.8.8 from your computer with Windows/Linux OS. 8
- b) Differentiate between Distance Vector Routing algorithm and Link State Routing algorithm with example. What are features of IPV6 protocol and provide one example of IPV6. 7
3. a) Define codeword. Explain with example how transmission error is detected and corrected using Hamming code. 7
- b) A company have 3 different departments with 65, 32 and 12 network devices. Explain how you will design network for this company from provided network of 10.10.100.0/24. Provide network address, broadcast address, subnet mask, wildcard mask and usable IP pool for each subnet. 8
4. a) Draw IEEE 802.3 Frame format. Explain random access protocol: ALOHA. 8
- b) What do you mean by Socket Programming? Explain TCP Client/Server Socket flow with suitable diagram. 7
5. a) In your opinion what are the main causes of congestion in network. Explain about closed-loop congestion control. 7
- b) Explain about DNS, its importance, name resolution iterated and recursive query with neat diagram. 8

6. a) What do you mean by symmetric and asymmetric key algorithm ? Explain RSA with suitable algorithm to perform Key generation for public key, private key, encryption and decryption. 8
- b) Differentiate between Switch and Hub. Explain exterior routing protocol. 7
7. Write short notes on: (Any two) 2×5
- a) Firewall
  - b) DHCP
  - c) Proxy Server

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Computer Networks

Semester: Fall

Year : 2020  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Describe the demerits of computer network. Differentiate between client/server and peer-to-peer network models. 7
- b) How are interfaces, protocols and services of layered system related? Discuss the differences between OSI and TCP/IP models. 8
2. a) List the major function of Internetworking device. Briefly explain the design issues of network Layer? 7
- b) What are the metrices of network performances? Describe them in short. 8
3. a) Explain how selective repeat works with figure. 7
- b) Describe framing by character count. How does byte stuffing overcome the disadvantages of character count algorithm? 8
4. a) Why summarization is important? P.U. is planning to design new network for four different departments. Each department consists of 24 hosts with IP address 172.16.1.0/27. Explain the process how you will allocate the IP address, subnet mask for each of the department using above IP address. 8
- b) Explain IPV4 header protocol format and also differentiate between IPV4and IPV6 features. 7
5. a) Describe 4 way TCP handshaking with suitable diagram. 8
- b) Why congestion is prominent in Networks?. Explain Explicit and Implicit control algorithm with a suitable example. 7
6. a) What is SMTP? Differentiate POP and IMAP protocols. 8
- b) What do you mean by Network security? Explain the operation of Data Encryption Standard Algorithm. 7

$2 \times 5$

7. Write short notes on: (Any two)

- a) CSMA/CD
- b) DHCP
- c) Firewall

**Pokhara University**

Level: Bachelor

Semester-Spring

Year: 2020

Programmer: BE

Full Marks: 70

Course: Computer Networks

Pass Marks: 31.5

Time: 2 hrs.

*Candidates are required to give their answers in their own words as far as practicable.  
The figure in the margin indicates full marks.*

Attempt all the questions.

**Section A:  $(5 \times 10 = 50)$**

- Q. No 1 Define Computer Networks. Discuss its merits and demerits and also the area of application in today's world. 10  
Q. No 2 What do you understand by Client server and Peer to Peer architecture? Compare and Contrast between them with suitable diagram. 10

**OR**

- Explain about the operation of CSMA/CD technique with its flowchart. Discuss about Go Back N ARQ and Selective Repeat ARQ in brief 10  
Q. No 3 Show how Hamming code technique will be used to compute error detection and correction with an example. ( Assume a 7-bit number) 10  
Q. No 4 Compare IPv4 and IPv6 header with their header diagrams. 10  
Q. No 5 Define congestion and explain about leaky bucket and token bucket algorithm in brief. 10

**Section B:  $(1 \times 20 = 20)$**

- Q.N 6 a) The existing network of Pokhara university (172.16.0.0/16) is to be subdivided into four different schools located at different states of the country connected with Network Service Provider (NSP). The location details of each school are enlisted below. 10  
i. School of Engineering – Pokhara  
ii. School of Law – Kathmandu  
iii. School of Management – Chitwan  
iv. School of Environment Research and Development – Nepalganj

Design the network with complete IP Address plan for each school.

- b) In RSA cryptosystem, a participant A uses two prime numbers  $p = 13$  and  $q = 17$  to generate her public and private keys. If the public key of A is 35, then what is the private key of A? 10

POKHARA UNIVERSITY

Level: Bachelor Semester: Fall Year : 2019  
Programme: BE Full Marks: 100  
Course: Computer Networks Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |    |   |   |
|----|----|---|---|
| 1. | a) | Define Converged Networks. Discuss the merits and demerits of Computer Networks with a suitable example.  | 7 |
|    | b) | What do you mean by Routing device? Explain design issues of layers.  | 8 |
| 2. | a) | Explain twisted pair cable on basis of Categories, Connector used, Performance and Application along with its suitable diagram.   | 8 |
|    | b) | What are the functions of LLC and MAC sub-layer? Discuss different framing approaches used in data link layer.  | 7 |
| 3. | a) | What is Error Correction? Show how FEC technique will help to detect and correct the error with suitable example.   | 8 |
|    | b) | Explain the frame format of IPV4 with a suitable diagram.   | 7 |
| 4. | a) | Differentiate between adaptive and non-adaptive routing. Explain about any intra-AS routing protocol.   | 8 |
|    | b) | Pokhra University has 3 sub division located at Pokhara as head office, Kathmandu as Examination office and Biratnagar as Contact office with 125, 60 and 29 hosts respectively. Now you as network administrator design the network with below details. <ul style="list-style-type: none"> <li>i. All the LANs must implemented router as default Gateway.</li> <li>ii. Ensure that network is secure from inside and outside the network.</li> <li>iii. Calculate Broadcast, Network, usable address along with subnet and wild card mask</li> <li>iv. ISP provide IP address was 10.0.17.0/24</li> </ul> | 7 |
| 5. | a) | Differentiate TCP and UDP with a suitable example   | 8 |
|    | b) | What do you mean by congestion and source of congestion? Explain  | 7 |

- traffic shaping in detail.
6. a) Discuss the role of DHCP. Explain the operation of DNS in corporate Networks. 8
- b) What do you mean by Network security? Explain the operation of Data Encryption Standard Algorithm. 7
7. Write short notes on: (Any two) 2×5
- a) Integrated Services Digital Network
- b) UDP-Connection less
- c) Virtual Private Networks

## POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Computer Network

Semester: Spring

Year : 2019

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define Computer Network. Briefly explain the different types of network model. 7
- b) Why do you need layered Architecture in network? Compare OSI model with TCP/IP model. 8
2. a) Define transmission media. Explain different types of transmission media in detail. 7
- b) What do you mean by framing? List the different framing technique and illustrate bit stuffing with an examples. 8
3. a) Explain the working principle of selective repeat ARQ and point out the merit and demerit of it over Go-Back -NARQ. 7
- b) You are given IP Address 150.152.0.0. you need to subnet the given IP into five different Departments. Perform the subnetting and find the subnet mask, Network Address, Broadcast address and usable host address in all subnet. 8
4. a) Explain IPV4 Header format? Differentiate between IPV4 and IPV6. 7
- b) What is socket address and communication? Explain the services provided by the transport layer. 8
5. a) What is congestion? Briefly explain different types of technique for Traffic shaping. 7
- b) What is SSL? Explain how a request initiated by a HTTP client is served by a HTTP srever. 8
6. a) What is network security? How can firewalls enhance network security? Explain how firewalls can protect a system. 7
- b) Compare symmetric key encryption method with asymmetric key encryption. Encrypt the message "READ" using RSA algorithm. 8

7. Write short notes on: (Any two).  $2 \times 5$
- a) Circuit switching and packet switching
  - b) Email server protocol: SMTP
  - c) VPN

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Computer Network

Semester: Fall

Year : 2018  
Full Marks: 100  
Pass Marks: 45  
Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) You are assigned to design a network infrastructure for your college. 7  
Recommend a network solution with hardware and software in current trend that can be used in the college. Make necessary assumption and justify your recommendation with logical argument where possible. 8
- b) Discuss the Seven Layer of OSI protocol stack. Also compare TCP/IP and OSI with a suitable example.
2. a) Explain the parameters for analyzing network parameters. How 8  
packet switching differs from circuit switching.
- b) Differentiate between error detection and error correction. A bit string 01101111110011111011111111100000 needs to be transmitted at the data link layer, what is string actually transmitted after bit stuffing, if flag patterns is 0111110? 7
3. a) Explain IPv4 header format. Differentiate between IPv4 and IPv6. 8  
b) Design an algorithm for CSMA/CD with a suitable example. 7
4. a) The APNIC Pool for Pokhara University (103.16.32.0/22) is to be 7  
divided into network of 7 different schools. Among 7 schools 3 schools need to be subdivided into 2 different departments. Provide a complete IP Address Plan which includes Network Address,

- Broadcast Address, Usable IP Pool, Subnet Mask and Wildcard Mask. 8
- b) Differentiate TCP and UDP with a suitable example. 5
5. a) Why congestion occurs in the network? Explain the types of closed loop congestion control mechanism. 7
- b) Define DHCP. Explain the iterative and recursive DNS query for name resolution with suitable figure. 8
6. a) What is SNMP? Explain the advantages of using network management tools. 7
- b) Explain the working principle of RSA algorithm. If  $N = 119$ , public key  $E=5$ , and private key  $D = 77$ , then demonstrate how to send the character plain text  $F=6$  using RSA. 8
7. Write short notes on: (Any two) 2×5
- a) Interior Routing Protocol
- b) Frame Relay
- c) DNS Server

POKHARA UNIVERSITY

Level: Bachelor Semester: Spring Year : 2018  
: Programme: BE Full Marks: 100  
Course: Computer Network Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks*

*Attempt all the questions*

- |    |  |     |
|----|--|-----|
| 1. | a) Define Local Area Network. Discuss on any five applications of Computer Network.  | 7   |
|    | b) Why TCP/IP is called implementation model? Explain in brief about OSI model.  | 8   |
| 2. | a) What are different guided Medias? Explain each in brief.  | 7   |
|    | b) What are the main functions of Data Link Layer? Discuss any two flow control mechanisms.  | 8   |
| 3. | a) Discuss on CRC error detection and Hamming code.  | 8   |
|    | b) What are the special IP addresses used in Classful addressing? A multi-national company is granted a site ip 172.16.0. 15. Design an IP table with its subnets. | 7   |
| 4. | a) Define routed and routing protocol. Explain Distance Vector routing algorithm.  | 8   |
|    | b) What do you understand by port addressing? Explain TCP header format.   | 7   |
| 5. | a) How does congestion occur in computer network? What are the different mechanisms used in closed loop congestion control?  | 8   |
|    | b) Discuss on protocols HTTP and SMTP.   | 7   |
| 6. | a) What is cryptography? Write and explain the RSA algorithm.  | 8   |
|    | b) Discuss on Virtual Private Network with its security issues.  | 7   |
| 7. | Write short notes on: (Any two)  | 2×5 |
|    | a) Peer to Peer Model  |     |
|    | b) Frame Relay   |     |
|    | c) Proxy Server  |     |

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: PE  
Course: Computer Networks

Semester: Fall

Year : 2017  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |  |     |
|----|--|-----|
| 1. | a) Explain different topological models in computer network.   | 8   |
|    | b) Discuss the TCP/IP protocol stack with a suitable example. Also Compare TCP/IP with OSI   | 7   |
| 2. | a) Explain the terms bandwidth, throughput and latency. Explain the working principle of satellite communication system.   | 7   |
|    | b) Compare circuit switching and packet switching. Draw necessary diagram to illustrate.   | 8   |
| 3. | a) Explain channel access mechanism in CSMA/CD.  | 8   |
|    | b) What is Error Control? Show how Forward Error Control (FEC) technique will help to detect and correct the error   | 7   |
| 4. | a) Explain HTTP protocol. Describe the difference between SMTP, POP and IMAP servers   | 7   |
|    | b) The existing network of Pokhara University (172.31.255.0/22) is to be divided into network of 4 different schools. Among 5 schools two schools need to be subdivided into 4 different departments. Provide a complete IP Address Plan which includes Network Address, Broadcast Address, Usable IP Pool, Subnet Mask and Wildcard Mask. | 8   |
| 5. | a) Explain the difference between distance vector routing and link state routing.  | 7   |
|    | b) What is the role of UDP protocol? Discuss TCP and UDP socket in terms of data transmission and security.  | 8   |
| 6. | a) What is Virtual Circuit Switching? Explain how Routers build routing table using RIP.   | 7   |
|    | b) Explain public key cryptography. Explain Diffie-Hallman key exchange.   | 8   |
| 7. | Write short notes on: (Any two)  | 2x5 |
|    | a) Virtual Private Networks  |     |
|    | b) Email Server Protocol: SMTP,POP, IMAP   |     |
|    | c) TCP socket  |     |

## POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Computer Networks

Semester: Spring

Year : 2017

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What is client active network model? How client server architecture is more secure than peer-to-peer networks? 7
- b) Define Protocol Stack. Compare the different types of networking devices hub, bridge, switch and router. 8
2. a) Compare circuit switching, message switching and packet switching. Explain ISDN signaling and architecture 8
- b) Differentiate between error detection and error correction. A bit string 0110111111001111011111111100000 needs to be transmitted at the data link layer, what is string actually transmitted after bit stuffing, if flag patterns is 01111110? 3+4
3. a) Discuss the working principle of CSMA. How is it different from CSMA/CD? Explain with necessary diagram. 7
- b) Define class full and classless Routing. Explain the process of RIP and OSPF. 8
4. a) Define BGP? If the given IP-address of a network is 192.168.10.0/27, then calculate the number of subnets and number of hosts per subnet. 8
- b) Define open loop and closed loop congestion control? Explain Leaky bucket and token bucket traffic shaping 7
5. a) Define DHCP. Explain the iterative and recursive DNS query for name resolution with suitable figure. 8
- b) What is SNMP? Explain the advantages of using network management tools. 7
6. a) Define cryptography. Explain the working principle of RSA. 8
- b) What is hand shaking? Explain TCP and UDP services and header format. 7

7. Write short notes on: (Any two)

2×5

- a) IPSEC
- b) Frame Relay
- c) IPv6

## POKHARA UNIVERSITY

Level: Bachelor Semester: Fall Year : 2016  
Programme: BE Full Marks: 100  
Course: Computer Networks Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |    |  |   |
|----|----|--|---|
| 1. | a) | Explain the merits and demerits of computer network. List the merits of client-server model over peer-to-peer model.   | 7 |
|    | b) | Define interfaces and services. Explain in brief OSI reference model.  | 8 |
| 2. | a) | Why flow control is required in modern communication system? Explain with example. Write about Hamming code.   | 8 |
|    | b) | Explain ISDN architecture. Differentiate circuit and packet switching.   | 7 |
| 3. | a) | Write the functions of data link layer. Design an algorithm for CSMA/CD.   | 7 |
|    | b) | An organization consists of 3 different departments with 20, 24 and 30 computers. Explain how you will design three subnets for the departments by subnetting 192.168.1.0/24 network. Provide network address, broadcast address, subnet mask, wildcard mask and usable IP pool for each subnet. | 8 |
| 4. | a) | What are routing algorithms? Discuss their significance and suitability. Differentiate between classful and classless routing.   | 8 |
|    | b) | What are the services of transport layer? Write about TCP and UDP sockets.   | 7 |
| 5. | a) | Why congestion control is important in communication service networks? Differentiate between Open-loop and Closed-loop congestion control.   | 7 |
|    | b) | "HTTPS is preferred over HTTP for Secured Transaction". Justify. Write about different protocols used while sending and retrieving mails.  | 8 |
| 6. | a) | What is data encryption and decryption? Explain the symmetric key cryptography for ensuring data security.   | 8 |

- b) What is VPN? Explain the importance of Diffie-Hellman key exchange protocol. 7
- 2×5
7. Write short notes on: (Any two)
- a) RSA
  - b) CRC
  - c) Proxy server



## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Computer Networks

Semester: Fall

Year : 2015  
Full Marks: 100  
Pass Marks: 45  
Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What is computer network? Write down the merits and demerits of a computer network. 7
- b) Explain the functions of application, presentation and session layers of OSI model in brief. Explain how a bridge updates its bridge table. 8
2. a) Describe how hamming code works for data of 6 bits. Show that it can detect single bit error using an example. 7
- b) Compare circuit switching and packet switching. Draw necessary diagram to illustrate. 8
3. a) A bit stream 10011101 is transmitted using the standard CRC. The generator polynomial is  $x^3+1$ . Show the actual bit string transmitted. Suppose the third bit from left is inverted during transmission. Show that this error is detected at receiver end. 8
- b) What do you mean by port and socket? Make comparison between TCP socket and UDP socket. 7
4. a) What is unicast and multicast routing? State and explain distance vector routing with an example. 8
- b) What is a firewall? Explain about virtual private network with diagram. Also illustrate the application of VPN in real world scenario. 7
5. a) P.U. affiliated College is planning to design 8 different department for civil, computer, management and so on. Each department consists of 28 computers with IP address 192.168.218.0/27. Explain the process how will you allocate the IP address and subnet for each of the departments using above IP. 8
- b) What is Virtual Circuit Switching? Explain how Routers build routing table using RIP. 7

6. a) Explain the concept of leaky bucket algorithm and explain how does it solve the problem of congestion in network? 8
- b) What is DNS server and Queries? Explain any one email server protocol? 7
7. Write short notes on: (Any two) 2×5
- a) DHCP Principle
  - b) IPSEC
  - c) SMTP

POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Computer Network

Semester: Spring

Year : 2015  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |    |   |     |
|----|----|---|-----|
| 1. | a) | You are appointed as a communication and network security engineer of new multinational company. How you will choose the new Network topology for your organization? Discuss with a suitable example.   | 8   |
|    | b) | Write about bridge and repeater. Differentiate between OSI and TCP/IP model.  | 3+4 |
| 2. | a) | How optical fiber differ from coaxial cable? How packet switching differs from circuit switching? Explain.  | 4+4 |
|    | b) | What are the services of transport layer? Write about TDM and FDM.  | 3+4 |
| 3. | a) | What is Flow Control? How sliding window mechanism is managed through data link layer.  | 7   |
|    | b) | Design an algorithm for CSMA/CD with a suitable example.  | 8   |
| 4. | a) | The existing network of Pokhara University (10.200.100.0/22) is to be divided into network of 4 different schools. Among 4 schools two schools need to be subdivided into 3 different departments. Provide a complete IP Address Plan which includes Network Address, Broadcast Address, Usable IP Pool, Subnet Mask and Wildcard Mask. | 8   |
|    | b) | Differentiate between classful and classless routing. Compare & contrast link-state and Distance-Vector routing algorithm..   | 3+4 |
| 5. | a) | Why congestion occurs in the network? Explain various congestion control algorithm in detail with a suitable example.   | 7   |
|    | b) | Discuss the role of DNS. Explain the operation of FTP in corporate Networks.  | 8   |
| 6. | a) | Explain domain addressing. Write about Network management system with its principle components.   | 3+4 |

- b) What is firewall? Explain its type. Explain the importance of digital signatures. 8
- 2×5
7. Write short notes on: (Any two)
- a) VPN
  - b) Virtual Circuit Switching
  - c) Socket Programming

POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Computer Network

Semester: Fall

Year : 2014  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) An alternative to a LAN is simply a big timesharing system with terminals for all users. Give two advantages of a client-server system using a LAN. 8
- b) Reliability, performance and security are the three essential criteria for a network and an effective and efficient network cannot be designed by ignoring any one of them. Justify your answer. 7
2. a) Define network topology? In what aspects does client server network model varies from peer to peer network model. Justify your answer. 8
- b) List the three reasons for using layered protocols. Mention two advantages and two disadvantages of having international standards for network protocols. 7
3. a) How is hub different than repeater and switch? How does frame relay overcome the limitations of X.25? 8
- b) You have read that the sliding window protocol can be used to implement flow control. You can imagine doing this by having the receiver delay ACKs, that is, not send the ACK until there is free buffer space to hold the next frame. In doing so, each ACK would simultaneously acknowledge the receipt of the last frame and tell the source that there is now free buffer space available to hold the next frame. Explain why implementing flow control in this way is not a good idea. 7
4. a) A large number of consecutive IP addresses are available starting at 192.16.0.0. Let four organizations A, B, C, D request 4000, 2000, 4000 and 8000 addresses respectively. For each of the organizations, give the first IP address assigned and the last IP address assigned and 8

- mask in CIDR notation.
- b) What is choke packet? Explain leaky bucket algorithm with a suitable diagram. 7
5. a) Explain DHCP. Explain the symmetric key cryptography for ensuring data security. 7
- b) What are plain texts and cipher texts? Describe the symmetric key cryptography technique. 8
- a) What are sockets? Describe the three-tier architecture for distributed processing in Client/Server computation. 7
- b) The following character encoding is used in a data link protocol. 8  
A: 01000111 B: 11100011 FLAG: 01111110 ESC: 11100000  
Show the bit sequence transmitted (in binary) for a four-character frame; A B ESC FLAG using 'flag bytes-with stuffing' method.
7. Write short notes on: (Any two) 2×5
- a) Types of Network Attacks
  - b) Distance vector routing
  - c) Frame format.

POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Computer Network

Semester: Spring

Year : 2014  
Full Marks: 100  
Pass Marks: 45  
Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) You are appointed as a Network Engineer of new multinational company. How you will choose the new Network topology for your organization? 7
- b) Write about Hub and repeaters. Differentiate between OSI and TCP/IP. 8
2. a) Illustrate the guided and unguided transmission media for data communication. How base-band cable is differ from broad-band cable? 8
- b) What is Flow Control? How flow control is managed through Data Link Layer. 7
3. a) Design an algorithm for CSMA/CD with a suitable example. 8
- b) If the given IP-address is 192.168.0.0 then first make exactly six subnets and compute number of hosts per subnet. 7
4. a) Why sub-netting is important? A college is planning to design to different departments. Each department consisting of 30 computers with IP address 192.168.218.0/27. Design the subnets. 7
- b) Differentiate TCP and UDP with a suitable example. 8
5. a) Define congestion. Explain leaky Bucket algorithm with suitable diagram. 7
- b) Discuss the role of FTP. Explain the operation of DHCP in corporate Networks. 8
6. a) What do you mean by cryptography? Explain private key and public key cryptography with suitable block diagram. 8
- b) How HTTPS is superior to HTTP? Explain need and scope of virtual private network for modern society. 7
7. Write short notes on: (Any two) 2×5
  - a) Classful and Classless Routing.
  - b) Virtual Circuit Switching.
  - c) ISDN Network.

*22 Aug*

PUKHARA UNIVERSITY

Level: Bachelor

Semester - Fall

Year : 2013

Programme: BE

Full Marks: 100

Course: Computer Network

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define logical and physical topologies with examples. What is a protocol? Why protocol hierarchy is needed in network architecture? 7  
b) Define the areas where LAN set up is important. Mention different modes of transmission used in computer network. 8
2. a) Explain the terms Interface and services with reference to ISO – OSI reference model. Also explain the role of physical layer, data link layer and network layer with necessary figures. 8  
b) What do you understand by logical and physical network architecture? Make comparison between star and mesh topology in terms of design architecture, advantages and disadvantages. 7
3. a) Compare twisted pair cable, Coaxial Cable and Fiber Optic cable on the basis of Bandwidth, Cost, Speed, Attenuation, Cross talk, Implementation 7  
b) What is piggybacking? Explain sliding window protocol with neat figures. 8
4. Nepal Government has decided to connect 5 University of Nepal together for online data sharing. You as network consultant suggest the Design of the network to the government as directed below. 15
  - i. Use IP 192.168.217.0/24, and explain the term "192.168.217.0/24"
  - ii. Each university will have maximum of 30 hosts and not less than 10 hosts.
  - iii. Break the network in appropriate domain to full fill the second requirement. Mention subnet range of each university.
  - iv. Sketch a figure using layer3 device with its subnet network addresses assigned to LAN and WAN.

- v. Explain the no of bit assigned for each subnet and why 8
5. a) What are Network layer design issues? Explain Distance Vector routing algorithm. 7
- b) What is a DHCP server? Describe its role in a Computer Network. Why do HTTP, FTP, SMTP, POP, and IMAP run on top of TCP rather than UDP? Explain.
6. a) How can you say that cryptography protect your data from intruder. 7  
Compare RSA with DES algorithm.
- b) Why socket are called endpoint? Explain TCP Socket call for client and server With example 8
7. Write short notes on any two: 2×5
- a) Shortest path routing algorithm
- b) ISDN services
- c) CSMA/CD

**POKHARA UNIVERSITY**

Level: Bachelor  
Programme: BE  
Course: Computer Network

Semester: Spring

Year : 2013  
Full Marks: 100  
Pass Marks: 45  
Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |   |   |
|----|---|---|
| 1. | a) Define networking? How can you evaluate computer networks?   | 5 |
|    | b) "Extra-Nct is more secure than Internet and Intra-Net" verify this statement.  | 5 |
|    | c) What is client server network architecture? How it is more secure than peer-to-peer networks?  | 5 |
| 2. | a) What are the three reasons for using layered protocols? Also mention two advantages and two disadvantages of having international standards for network protocols. | 7 |
|    | b) List out the services of layer 1, layer 2 and layer 3 of the OSI model.  | 8 |
| 3. | a) Compare and Contrast hubs with repeaters. Discuss the network characteristics of X.25.   | 7 |
|    | b) Discuss about sliding window protocol. How data link layer provides flow control mechanism: Explain giving examples.   | 8 |
| 4. | a) Describe mechanism of CSMA/CD along with its application area.   | 7 |
|    | b) Why we need subnet? If the given IP-address of a network is 192.168.10.0/25, then calculate the number of subnets and number of hosts per subnet.                  | 8 |
| 5. | a) What do you mean by IP? Explain header format of IPV6.   | 7 |
|    | b) What is congestion? How congestion in a network can be controlled? Explain.  | 8 |
| 6. | a) What is routing? State and explain in brief about shortest path routing algorithm.   | 7 |
|    | b) How can you transfer mail over Internet? Differentiate POP from IMAP.  | 8 |

7. Write short notes on: (Any two)

- a) Firewalls
- b) TCP socket calls and UDP socket calls
- c) RSA algorithm

2×5

## POKHARA UNIVERSITY

Level: Bachelor

Semester – Fall

Year : 2012

Programme: BE

Full Marks: 100

Course: Computer Network

Pass Marks: 45

Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) How has computer networks changed the lives of people? Illustrate with proper examples. 7
- b) Describe intra-net, extra-net and inter-net along with their usage, scope and need. 8
2. a) What are the factors that network designer must consider to establish the topologies of a Network? State and explain client server network model. 8
- b) Define services and interface. Explain in brief the types of services provided by network layer to its upper layer. 7
3. a) What are intermediate devices in a network? Specify some of the physical, datalink and network layer devices. Describe how fiber optics cable provides faster, reliable and efficient means for data transmission 7
- b) Discuss the frame format of PPP and provide its significance in Data Link Layer 8
4. a) Differentiate Persistent and Non Persistent carrier sense strategies. Design an algorithm for CSMA/ CD. 7

**OR**

Classify HDLC- stations and state their characteristics. Explain Flag Bytes with byte stuffing framing method. 7

- b) Describe the IPv4 Frame format. 8
5. a) Perform the subnetting of the given IP-address 8

IP-160.11.X.X

Subnet mask-255.255.0.0

No. of subnets-6

सुमन स्टेनरी सप्लायर्स एण्ड फोटोकॉम्पी सर्विस  
बालकुमारी, ललितपुर १८५५९५९२  
NCIT College

**OR**

Decode and define IP-address based internet N/W information center.  
How unicast, broadcast and multicast addresses identify a host.

- b) Define congestion control. Explain Choke Packet and Token bucket algorithm in detail with a suitable example. 7
6. a) Describe the technical aspect of assigning the IP address using DHCP. 8  
Enlist some of the client and server tools used in a network.
- b) What is data encryption? Discuss the role of symmetric and asymmetric key cryptography with a suitable example. 7
7. Write short notes on **any two:** 2×5
- a) TCP and UDP Socket call
  - b) Shortest Path Routing
  - c) X.25
  - d) Virtual Private Networks

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE

## **Programme: BE**

Course: Computer Networks

Semester: Spring

Semester: Spring Year : 2012

Full Marks : 100

Pass Marks: 45

Pass Marks: 15

Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks*

*Attempt all the questions.*

- |    |  |   |
|----|--|---|
| 1. | a) What is a Computer Network? What are the uses of Computer Network? State and explain its necessity.                                       | 8 |
|    | b) You are appointed as a Network Engineer of new multinational company. How you will choose the new network topology for your organization? | 7 |
| 2. | a) State the characteristic of broadband cable and fibre optics. How does PSTN works.  | 8 |
|    | b) Why we need OSI reference model? Explain various similarities and differences between OSI reference model and TCP/IP reference model.     | 7 |
| 3. | a) What is framing. Explain starting and ending flag with bit stuffing with an example.  | 8 |
|    | b) Discuss the frame format of HDLC and provide its significance in Data Link Layer  | 7 |
| 4. | a) State and explain the advantages of IPV6 over IPV4.   | 7 |
|    | b) Compare the public IP-address and private IP address. Consider you have given network IP address 205.105.10.10/28.                        | 8 |

OR

Explain about TCP and UDP header format.

5. a) What do you mean by congestion in a network? How leaky bucket algorithm reduces the congestion in the network? 7  
b) Compare and contrast distance vector and link state routing algorithm. 8

6. a) Discuss the role of DNS. Discuss the role of SMTP and POP in corporate Networks. 8
- b) What is the role of distributed processing in Client/Server Architecture? Discuss TCP Socket Calls with a suitable example. 7
- 5 x 2
7. Write short notes on any two:
- a) Network Management
  - b) PICO-Net
  - c) Virtual Private Networks

**POKHARA UNIVERSITY**

Level: Bachelor

Semester: Fall

Year : 2021

Programme: BE

Full Marks: 100

Course: Multimedia System

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |   |     |
|----|---|-----|
| 1. | a) Define Multimedia System. Explain different types of media used in multimedia.                         | 7   |
|    | b) Explain the various steps involved in sound generation and recognition.                                | 8   |
| 2. | a) What are bitmap images? Explain the advantages and disadvantages of bitmap over vector images.         | 8   |
|    | b) What are the basic steps of animation? Describe the YUV model for video transmission.                  | 7   |
| 3. | a) How can compression be achieved using JPEG compression? Explain in detail with suitable block diagram. | 8   |
|    | b) Why do we need Huffman Coding? Explain it with suitable example.                                       | 7   |
| 4. | a) Mention the evolution of optical storage media in chronological order? Discuss about CIRC in short.    | 7   |
|    | b) What do you mean by Multimedia OS? Explain the design principles of QOS.                               | 8   |
| 5. | a) Define Hypermedia. Differentiate between ODA and SGML architecture.                                    | 7   |
|    | b) Discuss the communication support model for group communication architecture.                          | 8   |
| 6. | a) Explain Document and its architecture with suitable diagram.   | 7   |
|    | b) What is Real Time System? Explain the real time scheduling system models.                              | 8   |
| 7. | Write short notes on: (Any two)   | 2×5 |
|    | a) Animation Languages  |     |
|    | b) USB  |     |
|    | c) Run Length coding  |     |

**POKHARA UNIVERSITY**

Level: Bachelor

Semester: Fall

Year : 2020

Programme: BE

Full Marks: 100

Course: Multimedia Systems

Pass Marks: 45

Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define multimedia system. Explain the main properties of multimedia. 8
- b) State the Nyquist Sampling theorem for lossless digitization. Calculate the file size (in Mb) for 10 seconds of stereo music sampled at CD-quality sampling rate having bit depth of 16 bits. 7
2. a) Define the term speech. Explain the components of speech recognition and understanding. 7
- b) Explain the image recognition steps with suitable diagram. 8
3. a) List out the important measures for visual representation and explain each of the measures in brief. 8
- b) Explain the technique used by Huffman coding. Construct the Huffman coding for the following grey level and calculate the average length. 7

Grey level	0	1	2	3	4	5	6	7
No. of pixels	30	35	38	10	15	10	38	80

4. a) Explain DCT based JPEG image compression technique. 8
- b) What are the differences between CD-ROM (XA) form-1 and CD-ROM (XA) from-2. Illustrate above with a block diagram. 7
5. a) Define real time system. Explain the characteristics of real time OS. 7
- b) Define hypermedia. Differentiate between SGML and ODA. 8

6. a) What is the relationship between hypertext, hypermedia and multimedia? Explain in brief. 7
- b) What do you understand by Quality of Service? Explain its different parameters. 8
7. Write short notes on: (Any two) 2×5 .
- a) Lossless vs Lossy compression
  - b) Computer Video Format
  - c) Data stream characteristics for continuous medium

**POKHARAUNIVERSITY**

Level: Bachelor

Semester – Spring

Year: 2020

Program: BE

Full Marks: 70

Course: Multimedia System

Pass Marks: 31.5

Time: 2 hrs.

*Candidates are required to answer in their own words as far as practicable.  
The figures in the margin indicate full marks.*

Attempt all the questions.

**Group – A (5×10=50)**

- Q. N. 1 Define multimedia system. Explain the building blocks of multimedia system with examples. 10

**OR**

What do you mean by animation? Explain the different types of animation techniques with example.

- Q. N. 2 Define the frequency of sound wave. Explain the MIDI reception modes and MIDI messages. 10

- Q. N. 3 What are the types of Image format? Explain the Image Recognition steps with suitable block diagram. 10

- Q. N. 4 Explain the Huffman coding process to create Huffman code tree with example. Justify how Huffman code reduces the file size? 10

- Q. N. 5 What do you mean by MHEG? Differentiate between SGML and ODA with diagram. 10

**Group – B (1×20=20)**

- Q. N. 6 a) Define Multimedia OS. Explain the main characteristics of Multimedia OS. Explain the basic principle of CD-WO with suitable diagram. 10

- b) Why resource management is required? In multimedia communication, Draw the block diagram of resource management architecture and explain it? 10

POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia

Semester: Fall

Year : 2019

Full Marks: 100

Pass Marks: 45

Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |                                 |  |     |
|----|---------------------------------|--|-----|
| i. | a)                              | Define multimedia. Explain global structure of multimedia.   | 8   |
|    | b)                              | With necessary diagrams explain how the sound is digitized and the sound stored in a multimedia system is played?  | 7   |
| 2. | a)                              | What are the steps involved in Image recognition. Explain with necessary block diagram.  | 8   |
|    | b)                              | Explain the principles of animation.   | 7   |
| 3. | a)                              | How is progressiveness achieved in lossy DCT-mode in JPEG? Explain the different image frames in MPEG.   | 8   |
|    | b)                              | What do you understand by the term data compression? Write its advantages in terms of multimedia computing. Differentiate between lossless and lossy compression techniques. | 7   |
| 4. | a)                              | List out the advantages and limitation of optical disks. Explain data storage mechanism in optical disk.   | 7   |
|    | b)                              | Explain the working principle of the Compact Disk – Magneto Optical (CD-MO).   | 8   |
| 5. | a)                              | What is a resource in terms of multimedia? What are the phases of the resource reservation and management process? Explain different ways of reserving the resources.        | 7   |
|    | b)                              | What is Multimedia and Hypermedia Information Coding Expert Group Techniques? Explain different types of class defined by MHEG.  | 8   |
| 6. | a)                              | Write about the ODA and SGML document architecture.  | 8   |
|    | b)                              | Explain QoS layered model for multimedia communication system.   | 7   |
| 7. | Write short notes on: (Any two) |  | 2×5 |
|    | a)                              | Application subsystem of Multimedia Communication System   |     |
|    | b)                              | Methods of controlling Animation   |     |
|    | c)                              | Dynamics in Graphics   |     |

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia System

Semester: Spring

Year : 2019  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What is data stream? Explain representation value and representation space. 7
- b) What are the types of MIDI messages? Explain different components of speech recognition. 8
2. a) Explain the meaning of the following terms used in image enhancement:  
    Contrast enhancement, Linear and non-linear transformation,  
    Logarithmic transformation, power law transformation and piecewise transformation. 8
- b) What is flicker effect? Explain RGB signal, YUV signal and YIQ signal. 7
3. a) Compare the concept of video and animation. Explain the 2D animation technique with an example of implementation. 8
- b) What are the approaches that are used to transmit animation over computer network? Describe graphical language with an example. 7
4. a) What is entropy coding? Explain the lossy sequential DCT-mode in JPEG. 8
- b) Explain Huffman encoding with an example. 7
5. a) Explain the Form 1 and Form 2 formats of CD-ROM/ Extended Architecture. 8
- b) Define various multimedia workstation. Explain multimedia real time system. 7
6. a) Explain the relationship between hypertext, hypermedia and multimedia. Explain open document architecture (ODA). 8
- b) What are the architectural subsystem of Multimedia Communication System? Explain Quality of Service layered model in Multimedia Communication System. 7

2x5

7. Write short notes on: (Any two)

- a) Color image processing
- b) Multimedia synchronization for quality of Service
- c) SGML

## POKHARA UNIVERSITY

Level: Bachelor

Programme: BE

Course: Multimedia Systems

Semester: Fall

Year : 2018

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |  |     |
|----|--|-----|
| 1. | a) Define multimedia system. Explain the implementation areas of multimedia.   | 7   |
|    | b) Briefly explain the Huffman Coding with example.  | 8   |
| 2. | a) Explain the jpeg compression techniques.  | 7   |
|    | b) How the information is stored in optical disk? Explain the principle of CD-WO with diagram.   | 8   |
| 3. | a) List out the names and their function of Midi Software.   | 7   |
|    | b) Briefly explain the spatial filtering technique for image enhancement.  | 8   |
| 4. | a) Define real time system. Explain the characteristics of real time OS.   | 7   |
|    | b) Describe the various methods for controlling animations.  | 8   |
| 5. | a) Discuss about the hypermedia system architecture with nodes and pointer.  | 8   |
|    | b) Explain the application subsystem of multimedia communication system.   | 7   |
| 6. | a) Differentiate between ODA and MHEG with suitable block diagram.   | 7   |
|    | b) Why quality of service is important for multimedia communication system. Explain QoS layered model for the multimedia communication system. | 8   |
| 7. | Write short notes on: (Any two)  | 2×5 |
|    | a) DVI   |     |
|    | b) USB   |     |
|    | c) Multimedia Workstation  |     |

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia System

Semester: Spring

Year : 2018  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |   |     |
|----|---|-----|
| 1. | a) Explain the different application areas of multimedia system.  | 7   |
|    | b) Explain different types of MIDI messages.  | 8   |
| 2. | a) Explain the methods of controlling animation.  | 8   |
|    | b) What are the application areas of image processing? Explain.   | 7   |
| 3. | a) Explain the JPEG compression technique.  | 8   |
|    | b) What are the approaches that are used to transmit animation over computer network? Describe graphical language with an example.                      | 7   |
| 4. | a) Explain the Form 1 and Form 2 formats of CD-ROM/ Extended Architecture.  | 8   |
|    | b) Explain the arithmetic encoding and decoding technique with suitable example.  | 7   |
| 5. | a) Explain various multimedia workstation? Explain hybrid approach.   | 7   |
|    | b) With suitable examples explain the EDF and RMA Algorithms.   | 8   |
| 6. | a) Explain the relationship between hypertext, hypermedia and multimedia? Explain open document architecture (ODA).                                     | 8   |
|    | b) What are the architectural subsystem of Multimedia Communication System? Explain Quality of Service layered model in Multimedia Communication System | 7   |
| 7. | Write short notes on: (Any two)   | 2×5 |
|    | a) Image Enhancement  |     |
|    | b) SGML   |     |
|    | c) QoS parameters   |     |

POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia System

Semester: Fall

Year : 2017

**Full Marks: 100**

Pass Marks: 45

Pass Marks. 75

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions*

1. a) What do you mean by multimedia computing? Explain the main properties of multimedia. 2+6

b) Define MIDI Message. Discuss the relationship between MIDI and SMPTE timing standard. 2+5

2. a) List out the names and their functions of MIDI software. 7

b) Explain the different image transmission possibilities. 8

3. a) Define Run length Encoding. Construct the Huffman code for. 8

Gray Level	0	1	2	3	4	5	6	7
No.of Pixel	4500	1500	900	750	1200	1300	550	100

b) Explain the major types of computer video format with storage capacities of each. 7

4. a) Discuss the MPEG audio encoding technique with a suitable diagram. 7

b) Explain the CD-ROM (XA) form-1 and CD-ROM (XA) form-2 with block diagram. 8

5. a) Explain the working principle of CD-DA with suitable diagram. 7

b) What are the types of real-time OS? Explain its major characteristics. 8

6. a) Compare and contrast hypertext and hypermedia with suitable examples. 8

b) Explain the Group Communication Architecture with examples. 7

Write short notes on: (Any two) 2×5

a) Animation Language

b) JPEG

c) Xpress Transport Protocol (XTP)

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia Systems

Semester: Spring

Year : 2017  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |                                 |  |     |
|----|---------------------------------|--|-----|
| 1. | a)                              | Explain the global structure of multimedia system.   | 7   |
|    | b)                              | Explain different categories of MIDI software.   | 8   |
| 2. | a)                              | How do you define an image? Explain the various application areas of image processing.   | 8   |
|    | b)                              | Explain the various color encoding approaches for video transmission.  | 7   |
| 3. | a)                              | What do you understand by the term data compression? Write its advantages in terms of multimedia computing. Differentiate between lossless and lossy compression techniques. | 7   |
|    | b)                              | Explain the purpose of the different types of frames used by MPEG compression technique.   | 8   |
| 4. | a)                              | Explain the working principle of the Compact Disk – Magneto Optical (CD-MO).   | 8   |
|    | b)                              | What is a resource in terms of multimedia? What are the phases of the resource reservation and management process? Explain different ways of reserving the resources.        | 7   |
| 5. | a)                              | With suitable examples explain the SCAN-EDF and Group Sweeping Disk Scheduling Algorithms.   | 8   |
|    | b)                              | Explain H.261 (px64) method of compression in detail.  | 7   |
| 6. | a)                              | What do you understand by the term QoS? Explain the various QoS parameters.  | 8   |
|    | b)                              | Define hypermedia. What are the different layers of hypertext system architecture? Explain.  | 7   |
| 7. | Write short notes on: (Any two) |  | 2×5 |
|    | a)                              | Document Architecture  |     |
|    | b)                              | Transport Sub system   |     |
|    | c)                              | Form 1 and Form 2 formats of CD-ROM/XA   |     |
|    | d)                              | Animation  |     |

## POKHARA UNIVERSITY

Level: Bachelor

Semester: Fall

Year : 2015

Programme: BE

Full Marks: 100

Course: Multimedia System

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) What is multimedia in terms of media combination and independence? Explain the building block of multimedia system with block diagram. 8  
b) Explain the need of MIDI standard. List the types of MIDI messages and explain them. 7
2. a) What is speech? Describe the time dependent sound concatenation. 7  
b) How do you represent any image in a computer? Explain briefly about the fundamental steps in image processing. 8
3. a) What is run length coding? Construct the Huffman code for. 8  

Gray Level	0	1	2	3	4	5	6	7
No.of Pixel	4800	1100	550	700	1200	900	500	250

  
b) Discuss briefly about the concept of animation and explain the types of animation languages. 7
4. a) Explain JPEG compression steps in detail with block diagram. 7  
b) Explain the CD-ROM/XA Form 1 and Form 2 with block diagram. 8
5. a) Explain the working principle of CD-DA. 7  
b) Define Real Time multimedia OS? Explain the characteristics of Real Time system. 8
6. a) What is the need of hybrid system? Discuss about the hybrid system for communication architecture. 8  
b) Explain QoS layered model for multimedia communication system (MCS). 7
7. Write short notes on: (Any two) 2×5
  - a) HDTV
  - b) MPEG
  - c) RTP and XTP

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia System

Semester: Fall

Year : 2015

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define multimedia. Explain the application areas of multimedia. 8  
b) List out the names and the functions of MIDI software. 7
2. a) Define the term speech. Describe time dependent sound concatenation. 7  
b) Explain the Image recognition steps. 8
3. a) Explain the principles of animation. 8  
b) Explain the CD-ROM Mode 1 and CD-ROM Mode 2 with block diagram. 7
4. a) Discuss the necessity of data compression. Explain briefly one of the entropy encoding technique with a suitable example. 8  
b) Explain the Form 1 and Form 2 formats of CD-ROM/Extended Architecture. 7
5. a) Differentiate the earliest deadline and rate monotonic process management in terms of resource utilization and context switching with illustrative diagram. 8  
b) Define MCS. Explain the Group Communication Architecture. 7
6. a) Define hypermedia. What are the different layers of hypertext system architecture? Explain. 7  
b) Briefly explain the steps of JPEG compression. 8
7. Write short notes on: (Any two) 2×5
  - a) MPEG audio encoding.
  - b) Necessity of Data Compression.
  - c) QoS.

## POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia System

Semester: Spring

Year : 2015  
Full Marks: 100  
Pass Marks: 45  
Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define Multimedia. Explain different types of medium with reference to multimedia 8
- b) What are formants? Explain how speech can be generated by time-dependent sound concatenation. 7
2. a) What do you mean by digital image? Explain the different types of image formats.
- b) Explain the terms Continuity of Motion and Flicker. Discuss about digitalization of a motion video.
3. a) What is run length coding? Construct the Huffman code for.

Gray Level	0	1	2	3	4	5	6	7
No. of Pixel	5000	900	750	500	1250	850	600	150

- b) What is MPEG? Explain the purpose of different types of frames used by MPEG compression technique.
4. a) Explain the working principle of CD-MO.
- b) Compare earliest deadline first and rate monotonic process management with respect to resource utilization and context switching.
5. a) Define hypermedia. Explain the different layers of Hypertext System Architecture.
- b) Explain QoS Layered Model for the multimedia communication system.
6. a) Explain the CD-ROM/XA Form 1 and Form 2 with block diagram.
- b) List and explain the image recognition steps. Draw necessary figures,

where ever required.

7. Write short notes on: (Any two)
- a) DVI
  - b) Types of Animation language
  - c) RTP & XTP

2×5

**POKHARA UNIVERSITY**

Level: Bachelor  
Programme: BE

Semester: Fall

Course: Multimedia System

Year : 2014

Full Marks: 100

Pass Marks: 45

Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |    |   |   |
|----|---|---|
| 1. | a) What is Multimedia? Explain global structure of multimedia system. | 8 |
|    | b) What are the four MIDI reception modes? Explain.                   | 7 |

- |    |  |   |
|----|--|---|
| 2. | a) Define the term speech. Explain the components of speech recognition and understanding. | 7 |
|----|--|---|

- |  |  |   |
|--|--|---|
|  | b) Explain the Image recognition steps. Draw necessary figure. | 8 |
|--|--|---|

- |    |   |   |
|----|---|---|
| 3. | a) What is run length coding? Construct the Huffman code for. | 8 |
|----|---|---|

Gray Level	0	1	2	3	4	5	6	7
No.of Pixel	5000	1000	500	530	1250	950	860	130

- |    |   |   |
|----|---|---|
| 4. | a) What are the differences between CD-ROM (XA) form-1 and CD-ROM (XA) from-2. Illustrate above with a block diagram. | 8 |
|----|---|---|

- |  |  |   |
|--|--|---|
|  | b) Explain the working principle of CD-WORM. | 7 |
|--|--|---|

- |    |  |   |
|----|--|---|
| 5. | a) What are the types of real time OS? Explain its major characteristics. Illustrate why RTOS id important in context of multimedia. | 8 |
|----|--|---|

- |  |  |   |
|--|--|---|
|  | b) Define hypermedia. What are the different layers of hypertext system architecture? Illustrate | 7 |
|--|--|---|

- |    |   |   |
|----|---|---|
| 6. | a) Differentiate between SGML and ODA document architecture. Draw necessary diagrams. | 8 |
|----|---|---|

- |  |   |   |
|--|---|---|
|  | b) Define animation. Describe the characteristics of animation languages. | 7 |
|--|---|---|

- |    |                                 |              |
|----|---------------------------------|--------------|
| 7. | Write short notes on: (Any two) | $2 \times 5$ |
|----|---------------------------------|--------------|

a) Computer Video Format

b) H.261

c) MHEG.

# POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia System

Semester: Spring

Year : 2014  
Full Marks: 100  
Pass Marks: 45  
Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define multimedia. Explain the application areas of multimedia. 8
  - b) How is speech generated? Explain about speech analysis and transmission. 7
  2. a) Explain different steps of image recognition. 7
  - b) What is flicker effect? Explain the Computer Video Format. 8
  3. a) What is an animation? Describe various types of animation languages. 7
  - b) What is run length coding? Construct the Huffman code for: 8
- | Gray Level   | 0    | 1   | 2   | 3   | 4    | 5   | 6   | 7   |
|--------------|------|-----|-----|-----|------|-----|-----|-----|
| No. of Pixel | 5300 | 750 | 500 | 500 | 1250 | 950 | 850 | 100 |
4. a) Differentiate between lossy and lossless data compression. Is JPEG lossy or lossless, explain. 8
  - b) Explain the working principle of CD-MO. 7
  5. a) Explain the format of CD-ROM (XA) form-1 and CD-ROM (XA) form-2. Illustrate above with a block diagram. 7
  - b) What is the principle of CD-ROM. Differentiate between Flash Drive and USB Storage. 8
  6. a) Define hypermedia. Differentiate between ODA and SGML architecture. 7
  - b) Why is Quality of Service important for multimedia communication system? Explain QoS Layered Model for the multimedia communication system. 8
  7. Write short notes on: (Any two) 2×5
    - a) Multimedia Real Time System.
    - b) Hypermedia System.
    - c) Session Management.

# POKHARA UNIVERSITY

Level: Bachelor  
Programme: BE  
Course: Multimedia System

Semester: Fall

Year : 2013  
Full Marks: 100  
Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define application domain? Explain the different criteria that are used to classify media in the multimedia system. 8
- b) Explain different steps of image recognition. 7
2. a) What do you mean by Omni On/Poly and Omni Off/Mono? Explain the steps of speech recognition and understanding with a diagram. 8
- b) What is an animation? Describe various types of animation languages. 7
3. a) Explain Lossy Sequential DCT-based mode of JPEG after the input image has been prepared for compression. 8
- b) Explain the purpose of different types of frames used by MPEG compression technique. 7
4. a) Explain the format of CD-ROM (XA) form-1 and CD-ROM (XA) form-2. Illustrate above with a block diagram. 8
- b) What is source coding? Explain Huffman coding with an example. 7
5. a) What is multimedia work station? Explain the communication architecture of a multimedia system. 8
- b) Define real time system. Explain the characteristics of real time OS. 7
6. a) Define hypermedia. Differentiate between ODA and SGML. 8
- b) Explain MHEG with a suitable diagram. 7
7. Write short notes on: (Any two) 2×5
  - a) Video disk and other WORMS.
  - b) MIDI
  - c) H.261.

POKHARA UNIVERSITY

Level: Bachelor

Semester: Spring

Year : 2013

Programme: BE

Full Marks: 100

Course: Multimedia System

Pass Marks: 45

Time : 3hrs:

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define multimedia. Explain the different criteria that are used to classify media. 8

- b) Explain data stream characteristics for continuous media with practical examples. 7

2. a) Define the term speech. Explain the Time-dependent and Frequency-dependent Sound Concatenation. 8

- b) Write down the steps of Image Recognition. Explain each step with suitable diagram. 7

3. a) Define source coding. Construct the Huffman code for. 8

Gray Level	0	1	2	3	4	5	6	7
No. of pixel	5320	1000	500	525	1236	965	856	128

- b) Explain various television broadcasting standard formats. 7

4. a) Why we need to compress the data? Explain the major steps for data compression. 8

- b) Explain the working principle of CD\_WO with suitable diagram. 7

5. a) Explain the differences between CD-ROM mode-1 and CD-Rom mode 2 with appropriate diagram. 8

- b) Define Deadline in terms of Multimedia Operating System. What is real time system? Briefly explain the properties of real time system. 7

6. a) Define hypermedia. What are the different layers of hypertext system architecture? 8

- b) Differentiate between SGML and ODA document architecture. 7

7. Write short notes on: (Any two)

- a) Animation Languages
- b) DVI
- c) MPEG.

2×5

# POKHARA UNIVERSITY

Level: Bachelor  
 Programme: BE  
 Course: Multimedia Systems

Semester – Fall

Year : 2012  
 Full Marks: 100  
 Pass Marks: 45  
 Time : 3 hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

- |   |   |
|---|---|
| 1.  | a) Define Multimedia System. Explain properties of Multimedia System. 8 |
| b) What are requirements of speech generation? Explain the problems in time-dependent sound concatenation. 7  |   |
| 2.  | a) Sketch Image recognition steps. 8                                    |
| b) What do you mean by flicker effect? "Enhanced Definition Television System is conventional system modified to offer improved resolution". Justify the statement. 7 |   |
| 3.  | a) Differentiate between JPEG and MPEG Compression Techniques. 7        |
| b) What is run length coding? Construct the Huffman code for. 8   |   |

Gray Level	0	1	2	3	4	5	6	7
No. of Pixel	5320	1000	500	525	1236	956	856	128

- |   |  |
|---|--|
| 4.  | a) Explain Briefly the principle of CD- Magneto 7  |
| b) What is CD-ROM? Explain CD-ROM in terms of Mode 1 and Mode 2. 8  |  |
| 5.  | a) What is MOS? Describe the relevancy of real time for multimedia system and explain congestion avoiding dead line. 8 |
| b) What do you understand by Hybrid Systems. Explain briefly main Components of a multimedia workstations. 7                                  |  |
| 6.  | a) Define hypermedia. What are the different layers of hypertext system architecture? 8                                |
| b) Explain the multimedia document architecture and its elements. How multimedia document is different from text document? Explain briefly. 7 |  |
| 7.  | Write short notes on any two: 2×5  |
| a)  | HDTV   |
| b)  | DVI  |
| c)  | Preemptive and Non-Preemptive Task Schedule  |

POKHARA UNIVERSITY

Level: Bachelor Semester – Spring Year : 2011  
Programme: BE Full Marks: 100  
Course: Multimedia Systems Pass Marks: 45  
Time : 3hrs.

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Attempt all the questions.*

1. a) Define multimedia. In terms of multimedia explain different types of medium. 8  
b) Explain briefly the generation, analysis and transmission of speech. 7

2. a) What do you understand by the term digitization of a picture? How resolution, pixel depth affects the size of an image. Explain with any two necessary calculations. 8  
b) What are the characteristics of EDTV and HDTV system? Explain briefly. 7

3. a) How is animation different from video? What is the general requirement for smooth digital video motion? Mention the various methods for animation control. 8  
b) What are the different roles of data compression in real world? Explain briefly about the different compression standards. 7

4. a) What is MPEG? What are the different types of frames used in a MPEG compression? Explain all four types with necessary diagram. 8  
b) What is the difference between CD-ROM mode 1 and CD-ROM mode 2? Illustrate with a block layout for both types and also calculate the capacity in both modes. 7

5. a) What is a resource in terms of multimedia? Compare earliest deadline and rate monotonic process management in term of resource utilization and context switching. 8  
b) Differentiate digital and hybrid systems. What are the main components of a multimedia workstation? 7

- 
6. a) Illustrate the basic operation of optical storage media. 8
- b) Differentiate between SGML and ODA document architecture. 7
7. Write short notes on **any two:** 2×5
- a) MIDI reception modes
- b) JPEG compression
- c) Hypermedia system