TRIBHUVAN UNIVERSITY

2080 (New Course)

Bachelor / Education /5th Semester — Full Marks: 40

ICT.Ed.456 Data Communication and Networks — Time: 3 hrs.

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

Attempt all questions

Group "B" — 6 X 5 marks =30

1. Define Internet Protocol. Discuss the principles and responsibilities of the five layers in the Internet protocol stack.
2. Suppose end system A wants to send a large file to end system B. At a very high level, describe how end system A creates packets from the file. When one of these packets arrives at a router, what information in the packet does the router use to determine the link onto which the packet is forwarded? Why is packet switching on the Internet analogous to driving from one city to another and asking for directions along the way?
3. Define web and HTTP. Discuss working principles of Non-Persistent HTTP with given example. *(Where user enters URL: www.tu.edu.np/events (containing text, references to 5 jpeg images)).*

   OR

   Explain the purpose and functionality of the Domain Name System in the context of the Internet.
4. Define the concept of the sender and receiver window in Selective Repeat. Discuss the handle situation if an acknowledgment for a specific packet is lost in Selective Repeat.

5. Explain the Distance-Vector routing algorithm. How does it differ from the Link-State algorithm in terms of routing updates and convergence speed?

OR

Describe the Medium Access Control (MAC) protocol used in 802.11 Wireless LANs. Discuss the key features of the 802.11 MAC protocol.

6. Explain the function of Link-Layer switches in a LAN environment. Discourse the basic functionality of a Link-Layer Switch in forwarding data frames within a LAN environment.

TRIBHUVAN UNIVERSITY

2080 (New Course)

Bachelor/ Education /5th Semester — Full Marks: 60

Math Ed. 456 Discrete Mathematics — 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 questions

Group "B" 6 X 5 marks =30

1. Show that $R(3,3) = 3$, where R denotes the Ramsey's number.
2. Show that $c(n,o) + c(n,1) + c(n,2) + \ldots + c(n,n) = 2^n$ for all positive integers n.

OR

Show that the generating function of the sequence $f_n = 3^n, n \geq 0$ is $G(x) = \frac{1}{1-3x}$.

3. Express $E(x,y,z) = x(xy' + x'y + y'z)$ into min-term normal form of sum of products.
4. What letter replaces the letter 'K' when the function $f(p) = 7p + 3$ mod 26 is used for encryption?

OR

Suppose in an RSA cryptosystem, we have $p = 23$ and $q = 31$. Encrypt $M = 572$ to get C and decrypt C to get M back.

5. Which memory locations are assigned by the hashing function $h(k) = k$ mod 101 to the records of an insurance company with the following social security numbers?
6. Let $A = \{0, 11\}$ and $B = \{1, 10, 100\}$. Find AB and BA.

Group "C" 2 X 10 marks =20

7. Solve the recurrence relation $f_n = 3\, f_{n-1}\ for\ n = 1, 2, 3, \ldots$. with the initial condition $f_o = 2$ by using generating function.
8. Produce a finite state machine that adds two integers using their binary expressions.

OR

Define a Turing machine. Find a Turing machine that recognizes the set $\{0^n 1^n | n \geq 1\}$.

TRIBHUVAN UNIVERSITY

2080 (New/Old Course)

Bachelor / Education /5th Semester — Full Marks: 40

ICT.Ed.455 Java Programming Language — Time: 3 hrs.

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

Attempt all questions

Group "B" 6 X 5 marks =30

1. What is a static field in Java, and how is it different from an instance variable?
2. Differentiate between method overloading and method overriding in the context of inheritance.

   OR

   Explain different version of 'For loop' in Java with example.
3. Explain the life cycle of a thread in Java.
4. What is the purpose of the finally block in exception handling?
5. Differentiate between character streams and byte streams in file handling.
6. Discuss the role of Layout Managers in Swing.

   OR

   Create a base class "Vehicle" with attributes model, color, price, maufacturedYear and a method to display vehicle details. Derive two classes, "Car" and "Motorcycle," from the Vehicle class, each with additional specific attributes and methods. Instantiate objects of both derived classes and display their details.

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TRIBHUVAN UNIVERSITY

2080 (New/Old Course)

Bachelor / Education /5th Semester — Full Marks: 40

ICT.Ed.457 Software Engineering & Project Management — Time: 3 hrs.

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

Attempt all questions

Group "B" — 6 X 5 marks =30

1. What is software? What are the major challenges that are faced by software engineers in current? Explain.
2. Which software process model is best to adapt change tolerance strategy? Explain with supportive diagram.

   OR

   List any four agile principles. Explain scrum method of software development.
3. What are the checks that are performed to validate requirements of the software? Explain.
4. Draw use case diagram for Campus management system. Assumption can be made where required.

   OR

   Why repository model is used? Differentiate it with client server architecture.
5. Why testing is done? Explain software evolution process.
6. How people risk is managed? How cost of the software is estimated? Explain different techniques available.

Bachelor/ Education /5th Semester — Full Marks: 60

Ed. 452 Assessment and Evaluation in Education — 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 questions

Group "B" — 6 X 5 marks =30

1. What are types of Evaluation? Describe the purpose and tools of diagnostic evaluation.

   OR

   Which evaluation do you prefer to improve the achievement of students? Why?
2. Show the inter-relationship among test, measurement and evaluation.
3. What are essential qualities of good test? Clarify them in brief.
4. What are the levels of cognitive domain? Explain any one in detail with suitable examples.

   OR

   If you are going to administer a test, what necessary condition will you try to maintain for smooth administration of test? Describe in brief.
5. Calculate the mean from given data and interpret it.

Class interval	10-20	20-30	30-40	40-50	50-60
Frequency	4	8	12	10	6

6. What are importance of CAS in primary level of school education? Explain in brief.

Group "C" — 2 X 10 marks =20

7. Define validity of test. Explain the different types of validity with examples.

   OR

   What are appropriate methods of scoring subjective answer sheet? Explain with examples.

8. What are the strengths, weakness and challenges in existing evaluation system in secondary level of education in our country? Describe with examples.