National Academy of Science and Technology

(Affiliated to Pokhara University)

Dhangadhi, Kailali

First Term Examination

Level: Bachelor
Program: B.E. Computer
Course: **Probability & Statistics**

Semester : Fall V

Year : 2025
F.M : 100
P.M : 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) Draw less than and more than an ogive curve of the following

Marks	10-20	20-30	30-40	40-50	50-60	60-70
No.of students	4	6	10	20	18	2

Also locate the median value. [7]

b) The steam and leaf display represent the bounced check fee for sample of 26 banks for direct deposit customers.

Steam	Leaves
1	5 5 8 8
2	0 0 0 0 1 2 2 5 5 5 5 8 8 9
3	4 5 6 7 7
4	1 2

i. What are the two information obtained from this steam and leaf display.

ii. What percentage of items is before 30.

iii. Draw the histogram and frequency polygon. [8]

2.a) The following data represent the income distribution of one hundred workers. [7]

Income(000)	0-20	20-40	40-60	60-80	80-100
No.of persons	6	25	35	25	9

Find :

i) The income limits of middle 30% workers.

ii) The highest income of the poorest 25% of the workers.

An incomplete frequency distribution is given by:

Variable	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	5	7	-	15	25	-	10

Given that median value is 36, determine the missing frequencies when Total frequency is 100 [8]

3.a) The lives of two models (A and B) of refrigerators in a recent survey are shown below: [8]

Life (No. of Years)	No. of refrigerators	
	Model A	Model B
0-2	5	2
2-4	16	7
4-6	13	12
6-8	7	19
8-10	5	9
10-12	4	1

i. What is the average life of each model of these refrigerators?
ii. Which model has greater uniformity?

b) An analysis of monthly wages paid to the workers on two firms A and B belonging to the same industry gives the following results:

	Firm A	Firm B
Number of worker:	560	500
Average monthly wages in $	190	200
Variance of distribution of wage:	81	100

i) Which firm, A or B , has a larger wage bill ?
ii) In which firm, A or B is there greater variability in wage ?
iii) Calculate combined mean and combined variance of wage of Firm A and firm B. [7]

4.a) The weights (in grams) of 10 orange picked at random form a basket are as Follows: 45, 30, 75, 40, 60, 65, 70, 85, 80 and 90
i. List the five number summary
ii. Form the box and whisker plot and describe the shape. [8]

b) State and prove Baye's theorem [7]

5.a) A multiple choice test has 10 questions. Each question has 4 options. What is the probability of getting [7]
i) two questions
ii) at least one question
iii) at most two question.

b) A random variable X has the following probability [8]
Find the value of k and calculate mean, variance, standard deviation.
Also find E(2X+5) and V(3X+4).

Value of X:(x)	-2	-1	0	1	2	3
Probability:P(X)	0.1	k	0.2	2k	0.3	k

6.a) Find the correlation coefficient from the following data: [7]

X	92	89	86	83	77	71	63	53	50
Y	86	88	77	68	85	52	82	37	57

b) The following are the heights in centimeter and weights in kilogram of 8 men:

Height	162	168	174	176	180	180	182	184
Weight	65	65	84	63	75	76	82	65

i) Develop the estimating regression equation of weight on height.
ii) Estimate the weight of men whose height is 175cm. [8]

7. Write short notes on (Any two) [2x5=10]
i) Sources of data
ii) Dependent and independent events.
iii) Properties of correlation coefficient.

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First Term Examinations

Level: Bachelor | Semester: V_Fall | Year : 2025

Program: B.E. Computer | F.M. : 100

Course: **Software Engineering** | P.M. : 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 Software. Explain how Software engineering is different from system engineering. 7
   b) Define Software Myths. Explain 4 P's of Software Project Management. 8
2. a) Define Software metrics with its types. 8
   b) Explain Types and Importances of Software Measurement Indicators. 7
3. a) Explain the types of Empirical Project Estimation Technique in Details. 7
   b) Define SDLC with its Phases in details. 8
4. a) List out and explain any two types of SDLC Methods. 8
   b) Define Xtreme Programming. Explain the Lifecycle of XP. 7
5. a) Why Scrum is important in Agile methods. Explain Lifecycle of scrum. 7
   b) Define Requirement Engineering with its phases in detail. 8
6. a) Define OOA. Explain OOAD in Detail. 8
   b) Explain System Models with its types. 7
7. Write short notes on following **(Any Two)** 5x2
   a) Software Risk Management
   b) Incremental Software Development Model
   c) Software Requirement

Good Luck!!!

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First Term Examinations

Level: Bachelor Semester: VIII/V_Fall Year : 2025

Program: B.E. Computer F.M. : 100

Course: **Digital Signal Analysis &Processing** P.M. : 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) Given the analog signal: $x(t)= 2 \sin 300\pi t + 5 \sin 500\pi$

i) Determine the minimum sampling rate required to avoid aliasing.

ii) Suppose that the signal is sampled at the rate F_s =200 Hz. What is the discrete-time signal obtained after sampling?

iii) What is the frequency $0< F<F_s/2$ of a sinusoid that yields samples identical to those obtained in part (II)? [8]

b) Explain the Basic elements of digital signal processing with the help of block diagram. [7]

2a) What are Discrete-time signals. Explain different elementary signals with its mathematical expression and signal representation. [7]

b) Perform the convolution sum of the following two sequences:
$x_1(n) = \{1, 2, 5, 6\}$ and $x_2(n) = \{2, 1, 0, 2\}$ [8]

3a) What is System. Explain different properties of system. [7]

b) Find the response of given discrete time signals
$x(n)= u(n)$ and $h(n)= a^n u[n]$

4a) Determine the z-transform of the signal
$x[n]=a^n u[n]$, $a>0$; where u[n] is the unit-step function. [7]

b) Determine the z-transform and the region of convergence (ROC) for the signal: $x[n]= \cos(w_o n)\, u[n]$. [8]

5a) Determine the causal signal x[n] having Z-Transform [7]

$$X(z) = 1/\{(1-2z^{-1})\,(1-z^{-1})^2\}.$$

b) Draw the correlation of the two discrete time signals $x_1(n) = \{1, 2, 3, 4\}$ and $x_2(n) = \{0,2,4,6\}$ [8]

6a) Define z-transform. Explain Different properties of Z transform. [8]

b) Determine the z-transform and the region of convergence (ROC) for the signal: $x[n]= n^2 u[n]$ [7]

7. Write short notes on (any two) [2x5=10]

a. Region of Convergence

b. Energy signal and power signal

c. Digital Signal Processor vs Analog Signal Processor

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First Term Examinations

Level: Bachelor | Semester: Fall_V | Year : 2025

Program: B.E. Computer | F.M. : 100

Course: **Artificial Intelligence** | P.M. : 45

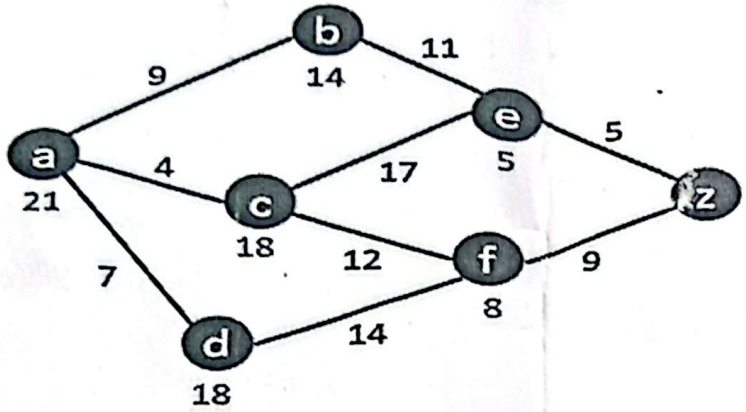
Time : 3 hrs.

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 different types of Intelligence? What is the importance of AI?	8
	b.	AI is replacing a lot of automation tasks that used to be done by humans, do you think AI will replace humans entirely?	7
2	a.	What are different types of Agents. Explain Model based Agent with diagram.	8
	b.	Describe the foundations of AI. How do fields like psychology, philosophy, and computer science contribute to AI development?	7
3	a.	What is the relevance of cognitive modeling in the "Thinking Humanly" approach? Explain with examples	8
	b.	What types of problem are categorized as well-defined problems.	7
4	a.	What do you mean by Turing Test? Explain in detail.	7
	b.	Describe the PEAS (Performance measure, Environment, Actuators, Sensors) representation of a task environment. Provide any real-world examples.	8
5	a.	How do learning agents improve over time? Discuss with a real-world AI system.	7
	b.	What is simulated annealing? Explain how it avoids getting trapped in local maxima?	8

6 a. Solve the following using A* approach. Take A as starting node. 7



b. Write algorithm for both DFS and BFS. What types of data structure is used by them 8

7 Write shorts notes on (any two): 10

a. Hill climbing Algorithm

b. Informed and uninformed search

c. Game Playing

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First Terminal Examination

Level: Bachelor | Semester: V_Fall | Year : 2025

Program: B.E. Computer | F.M. : 100

Course: **Engineering Management** | P. M.: 45

Time : 3 Hrs.

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

Attempt all the questions.

1. a) Define management and explain its key characteristics in detail. [7]
   b) What is the importance of management in the IT sector, and how does it help improve productivity and achieve project goals? [8]
2. a) Explain the levels of management in an organization and describe the responsibilities and functions of each level. [7]
   b) Explain Henri Fayol's 14 principles of management and provide a brief description of each. [8]
3. a) What is organization? Explain the different types of organization. [8]
   b) Define planning and explain the different levels of planning in an organization. [7]
4. a) Define motivation and explain the main types of motivation with suitable examples. [7]
   b) Explain the Abraham Maslow's Need Hierarchy Theory of Motivation. [8]
5. a) Discuss the contemporary issues of motivation in Nepalese organizations. [7]
   b) Define leadership. Explain the types of leadership. [8]
6. a) Explain the different features (characteristics) of planning in an organization. [8]
   b) Define financial and non-financial motivation and give three examples of each. [7]
7. Write short notes on: *[Any Two]* [2 x 5]
   a) Incentives
   b) Expectancy Theory
   c) Organizational Culture

---------- Best of Luck ----------

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First Terminal Examination

Level: Bachelor
Program: B.E. Computer
Course: : **Embedded System**

Semester : V_Fall

Year : 2025
F.M. : 100
P. M. : 45
Time : 3 Hrs.

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

Attempt all the questions.

1. a) Explain the components and application areas of Embedded System. 7
   b) How I/O ports are configured in AVR microcontroller? Write a C program to configure PORT A and PORT B as output port and PORT C and PORT D as input port. Also, receive data from C and D and send them to A and B respectively. 8

2. a) Explain the different types of memory available in AVR microcontrollers. 8
   b) What are the registers associated with Timer0 and how would you use them to create a delay of 10miliseconds. Assume necessary data. 7

3. a) How does deadlock occur? 8
   b) Explain the significance of context switching in RTOS. 7

4. a) Mention the features of VHDL and the advantages associated with them. 8
   b) Write a VHDL program for full adder using two half adder and a or gate. 7

5. a) Write a VHDL program to detect a sequence '1011'. 7
   b) Write a C program for ATmega32 to display "Hello World" in a 16*2 LCD (4-bit mode). 8

6. a) Write differences between UART, I2C and SPI. 8
   b) Write about MQTT protocol used in IoT Communication.

7. Write short notes on **any two**: 7
   a) ATM as embedded system 2×5
   b) PWM
   c) Sensor