United College

Kumari Pati, Lalitpur
Mid-term Exam 2024(Set A)

Bachelor in Computer Application — Full marks: 60
Course Title: Probability and Statistics — Pass Marks: 50
Code no. CAST 202 — Time: 3 hours
Semester: III

Candidates are required to answer the questions in their own words as far as possible.

Group A

Attempt all the questions. [10*1=10]

1. Circle(O) the correct answer.

(i). Correlation analysis aims at
a. Predicting one variable for a given value of the other variable
b. Establishing a relation between two variables c. Measuring the extent of relation to two variables d. Both (b) and (c)

(ii) Marks secured by students in a college were 12,9,14,10,16. What is the quartile deviation of marks?

(a) 2 (b) 4 (c) 10 (d) 14

(iii) Which measure of location will be suitable to compare the intelligence of students?

(a) AM (b) GM (c) Md (d) Mo

(iii) If r lies between 0.70 to 0.999 then what is a type of correlation?
(a) the high degree of positive (b) the moderate degree of positive
(c) the low degree of negative (d) none

(iv) What is the first stage in Statistics?
(a)Collection of data (b) presentation of data (c) analysis of data (d) Interpretation of data

(v) What is the range of probability?
(a) -1 to 1 (b) -1 to 0 (c) 0 to 1 (d) None

(vi) The mean of the binomial distribution is 25. If binomial distribution tends to Poisson distribution, what is the mean of Poisson distribution?
(a) 12.5 (b) 25 (c) 50 (d) 100

(vii)The correlation between the speed of an automobile and the distance traveled by it after applying the brakes is
a. Negative b. Zero c. Positive d. None of these.

(viii). In case of Normal distribution
a. Mean > Median b. Mean = Median c. Mean <= Median d. Mean >= Median

(ix) If TSS =234.6, SSR= 161.4, then what is the value of
SSE? (a) 395(b) 73.2 (c) 321.8 (d) None

(x) What is the probability distribution that has a standard deviation of 1 and a mean 0?
(a) Binomial (b) Poisson (c) Standard normal variate (d) normal

Group 'B' (6*5=30)

Attempt any Six questions:

2. Calculate the mean,S.D., and coefficient of skewness from the following data.

Size	6	9	12	15	18
Frequency	7	12	19	10	2

3. Two fair dice are thrown at random. What is the probability that the faces turn up show (i) a sum of 7 (ii) a sum of 8 or 9 (iii) a sum less than 5 (iv)the number 6 in the first die (v) an odd number in the second die (vi) the same faces (vii) different face?.

4. The average marks secured in the BCA exam in the year 2078 by College A and College B are 78 and 80 with variances of 100 and 81 respectively. The number of students who appeared in the BCA exam from College A is 100 and from College B is 150. Compute the combined mean and combined variance of marks secured by the two groups.

5. From the following data between yearly turnover and profits. Find regression equation of profit and yearly turnover and estimate profit when yearly turnover is 30 million units.

Profit in thousand $	18	20	22	23	27	28	30
Yearly turnover in million units	23	25	27	30	32	31	35

6. The mean and variance of Binomial distribution are 3 and 2 respectively. Find the probability of (i) less than or equal to 2 (ii) greater than or equal to 7.

7. Given a standard Normal distribution, determine the following probabilities: (i) P(Z<1.96) (ii) P(Z<-1.64) (iii) P(Z> -0.34) (iv) P(0.17<Z< 1.64) (v) Probability that Z is less than-0.84 or greater than 2.08.

8. A student calculates the value of the correlation coefficient between study hour and marks secured as 0.795 when the number of items is 100 and concludes that r is highly significant. Is the conclusion correct? Also, determine the limit of the population correlation coefficient.

Group C

Attempt any TWO questions [2*10=20]

9. The staff body of an IT company is composed of 60% male and 40% female. 40% of males and 60% of females show interest in sports. What is the probability that a staff selected at random shows interest in sports given that the staff is female?

10. Given a normal distribution with a of mean 200 and a standard deviation of 20, find the probability that

(a) P(X>180) (b) P(X<220)

(c) P(160<X<240) (d) P(X>220)

(e) P(X<180 or X>220)

11. A chemical company wishing to study the effect of extraction time on the efficiency of an extraction operation obtained the data as follows

Time(X)	27	45	41	19	35	39	19
Efficiency(Y)	57	64	80	46	62	72	52

(a) Fit a straight line to the given data by the method of least square and use it to predict the extraction efficiency one can expect when the extraction time is 35 minutes.

(b) Determine the coefficient of determination and intercept its meaning.

Best of Luck

United College

Kumaripati, Lalitpur

MID-TERM EXAM 2080

Level: BCA (**III[rd] Semester**) F.M.: 60

Time: 3:00 hrs. P.M. 24

Course Title: System Analysis and Design (SET A)

Date: 2080/12/26

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

Name:	**Roll no.:**

Group A

Attempt all the questions.

Tick (✓) the correct answer: [10x1=10]

1. ……. is an important factor of management informati on system.

   A) System B) Data C) Process D) All

2. ……. level supply information to strategic tier for the use of top management.

   A) Operational B) Environmental
   C) Competitive D) Tactical

3. In a DFD external entities are represented by a …….

   A) Rectangle B) Ellipse
   C) Diamond shaped box D) Circle

4. After the design phase the document prepared is known as …….

   A) system B) performance specification
   C) design specification D) None of these

5. The data Flow Diagram is the basic component of …… …. system

   A) Conceptual B) Logical
   C) Physical D) None of the above

6. Use the new system as the same time as the old system to co mpare the results. This is known as …….

   A) Procedure Writing B) Simultaneous processing
   C) Parallel Operation D) File Conversion

7. ……. is a computerized information system used to support decision-making in an organization.

   A)MSS B)OSS
   C)OSS D) HSS

8. …….
   can be defined as most recent and perhaps the most comprehe nsive technique for solving computer problems.

   A) System Analysis B) System Data
   C) System Procedure D) System Record

9. Which of the following is / are the Characteristics of informat ion?

   A) Accuracy and Relevance
   B) Form of information and Timeliness
   C) Completeness and Purpose
   D) All A, B & C

10. The data Flow Diagram is the basic component of …… …. system

    A) Conceptual B) Logical
    C) Physical D) None of the above

United College
Kumaripati, Lalitpur
MID-TERM EXAM 2080

Level: BCA (**IIIrd Semester**) F.M.: 60
Time: 3:00 hrs. P.M. 24
Course Title: System Analysis and Design (SET A)
Date: 2080/12/26

Group B

Attempt any six questions: [6*5=30]

11. What is DFD? What are its components? Draw DFD of Library Information system.
12. Define case tools? Explain its features.
13. What is form and report? Explain guidelines for creating form and report.
14. Define Structured English. Draw decision table of employee payroll system.
15. Draw E-R diagram of employee management system.
16. What is project charter? Explain deliverables and outcomes with example.
17. A system costs Rs. 200000 to install and Rs. 10000 per month as recurring expenses.
    The benefit per year is 150000. Assuming an interest rate 15%.What is the payback period of the investment?

Group C

Attempt ANY two questions [2*10=20]

18. What is information system? Explain different types of information system in detail.
19. Draw E-R diagram of banking system.
20. Explain reuse in component based development.

ALL THE BEST

United College
Kumaripati, Lalitpur
MID-TERM EXAM 2080

Level: BCA (**IIIrd Semester**) F.M.: 60
Time: 3:00 hrs. P.M. 24
Course Title: System Analysis and Design (SET B)
Date: 2080/12/26

Group B

Attempt any six questions: [6*5=30]

11. Explain prototyping model with block diagram in detail.
12. Explain the components of DFD? Draw Level-1 diagram of Hoosier's Burger
    Food ordering system.
13. Explain database design technique.
14. Explain 4 pieces of project management.
15. What is feasibility analysis? Explain different levels of feasibility analysis.
16. Define Structured English. Draw decision table of employee payroll system.
17. What is form and report? Explain procedure of creating form and report.

Group C

Attempt ANY two questions [2*10=20]

18. Explain system development life cycle (SDLC) with block diagram.
19. Draw E-R diagram of Library Information System.
20. Explain reuse in component based development

ALL THE BEST

United College

Kumaripati, Lalitpur

MID-TERM EXAM 2080

Level: BCA (**IIIrd Semester**) F.M.: 60

Time: 3:00 hrs. P.M. 24

Course Title: System Analysis and Design (SET B)

Date: 2080/12/26

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

Name:	**Roll no.:**

Group A

Attempt all the questions.

Tick (✓) the correct answer: **[10x1=10]**

1. ..... refers to the collection of information pertinent to systems project.
   A) Data gathering
   B) Data Exporting
   C) Data Embedding
   D) Data importing
2. A physical DFD
   A) has no means of showing material flow
   B) does not concern itself with material flow
   C) can show only stored material
   D) can show the flow of material
3. Development costs for a computer based information system include/s .....
   A) Salaries of the system analysis
   B) Cost of converting and preparing data
   C) Cost of testing and documenting
   D) All A, B, C
4. Before developing a logical DFD it is a good idea to
   A) develop a physical DFD
   B) develop a system flow chart
   C) determine the contents of all data stores
   D) find out user's preferences
5. A data store in a DFD represents
   A) a sequential file
   B) a disk store
   C) a repository of data
   D) a random access memory
6. Which of the following is/are major step/s of system design?
   A) Specification of system output
   B) Development of system flowchart
   C) Development of program specifications
   D) All A, B, C
7. A data flow can
   A) only enter a data store
   B) only leave a data store
   C) enter or leave data store
   D) either enter or leave a data store but not both
8. ..... means coordinated effort, to communicate the information of the system in written form.
   A) System Documentation
   B) System Storage
   C) System Record
   D) System Share
9. Some of the tools which are available with the system analysis are .....
   A) Review of Documentation & Observation of the situation
   B) Conducting Interviews & Questionnaire Administration
   C) Both A & B
   D) Review of Procedure & Conducting Interviews
10. Data cannot flow between two data stores because
    A) it is not allowed in DFD
    B) a data store is a passive repository of data
    C) data can get corrupted
    D) they will get merged

United College

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MID-TERM EXAM 2080

Level: BCA (**III[rd] Semester**) F.M.: 60

Time: 3:00 hrs. P.M. 24

Course Title: Probability and Statistics (SET A)

Date: 2080/12/21

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

Name:	**Roll no.:**

Group A

Attempt all the questions.

1. Tick (✓) the correct answer: [10x1=10]

i. Correlation analysis aims at
   a. Predicting one variable for a given value of the other variable
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ii. Marks secured by students in a college were 12,9,14,10,16. What is the quartile deviation of marks?

(a) 2 (b) 4 (c) 10 (d) 14

iii. Which measure of location will be suitable to compare the intelligence of students?

(a) AM (b) GM (c) Md (d) Mo

iv. If r lies between 0.70 to 0.999 then what is a type of correlation?
   (a) the high degree of positive
   (b) the moderate degree of positive
   (c) the low degree of negative
   (d) none

v. What is the first stage in Statistics?
   (a) Collection of data (c) presentation of data
   (b) analysis of data (d) Interpretation of data

vi. What is the range of probability?

(a) -1 to 1 (b) -1 to 0 (c) 0 to 1 (d) None

vii. The mean of the binomial distribution is 25. If binomial distribution tends to Poisson distribution, what is the mean of Poisson distribution?

(a) 12.5 (b) 25 (c) 50 (d) 100

viii. The correlation between the speed of an automobile and the distance traveled by it after applying the brakes is
   (a) Negative
   (b) Zero
   (c) Positive
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ix. If TSS =234.6, SSR= 161.4, then what is the value of SSE?

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(a) Binomial (b) Poisson
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Kumaripati, Lalitpur

MID-TERM EXAM 2080

Level: BCA (**IIIrd Semester**) F.M.: 60

Time: 3:00 hrs. P.M. 24

Course Title: Probability and Statistics (SET A)

Date: 2080/12/21

Group B

Attempt any six questions: [6*5=30]

2. Calculate the mean, S.D., and coefficient of skewness from the following data.

Size	6	9	12	15	18
Frequency	7	12	19	10	2

3. Two fair dice are thrown at random. What is the probability that the faces turn up
show (i) a sum of 7 (ii) a sum of 8 or 9 (iii) a sum less than 5
(iv)the number 6 in the first die
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4. The average marks secured in the BCA exam in the year 2078 by College A and College B are 78 and 80 with variances of 100 and 81 respectively. The number of students who appeared in the BCA exam from College A is 100 and from College B is 150. Compute the combined mean and combined variance of marks secured by the two groups.

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8. A student calculates the value of the correlation coefficient between study hour and marks secured as 0.795 when the number of items is 100 and concludes that r is highly significant. Is the conclusion correct? Also, determine the limit of the population correlation coefficient.

Group C

Attempt ANY two questions [2*10=20]

9. The staff body of an IT company is composed of 60% male and 40% female. 40% of males and 60% of females show interest in sports. What is the probability that a staff selected at random shows interest in sports given that the staff is female?

10. Given a normal distribution with a of mean 200 and a standard deviation of 20, find the probability that
(a) P(X>180) (b) P(X<220)
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11. A chemical company wishing to study the effect of extraction time on the efficiency of an extraction operation obtained the data as follows

Time(X)	27	45	41	19	35	39	19
Efficiency(Y)	57	64	80	46	62	72	52

(a) Fit a straight line to the given data by the method of least square and use it to predict the extraction efficiency one can expect when the extraction time is 35 minutes.
(b) Determine the coefficient of determination and intercept its meaning.

ALL THE BEST

United College

Kumaripati, Lalitpur

MID-TERM EXAM 2080

Level: BCA (**III[rd] Semester**) F.M.: 60

Time: 3:00 hrs. P.M. 24

Course Title: Probability and Statistics (SET B)

Date: 2080/12/21

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

Name:	**Roll no.:**

Group A

Attempt all the questions.

1. Tick (✓) the correct answer: [10x1=10]

i. Mean of the binomial distribution is 25. If binomial distribution tends to Poisson distribution, what is the mean of Poisson distribution?

(a) 12.5 (b) 25 (c) 50 (d) 100

ii. The process of constructing a mathematical model that can be used to predict one variable using another variable is called

(a) correlation (b) regression (c) residual (d) outlines

iii. If The mean of a distribution is 14 and the standard deviation is 5 then what is the value of the coefficient of variation?

(a) 28.2% (b) 35.71% (c) 31.6% (d) 2.8%

iv. What is the empirical relationship between Mean, Median, and Mode?

(a) Mean =3Median-2Mean (b) Median =3Mean-2Mode

(c) Mode=3Median -2Mean (d) Mean=(Median+Mode)/2

v. What is the main objective of the sample about the population from which the sample is selected?

(a) conclude (b) draw inference

(c) draw parameter (d) draw characteristic

vi. A pen is selected from a bag containing 5 red pens, 4 blue pens and 3 black pens, what is the probability that the selected pen is blue?

(a) 1/3 (b) 5/12 (c) 3 /12 (d) ¼

vii. For a symmetrical distribution arithmetic mean is 20.33, find the values of the median and mode of the distribution.

(a) 2.033 (b) 36.77 (c) 3.934 (d) 20.33

viii. If r lies between 0.70 to 0.999 then what is a type of correlation?

(a) high degree of positive (b) moderate degree of positive

(c) low degree of negative (d) none

ix. What is the first stage in Statistics?

(a) Collection of data (c) presentation of data

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x. What is range of probability?

(a) -1 to 1 (b) -1 to 0 (c) 0 to 1 (d) None

United College

Kumaripati, Lalitpur

MID-TERM EXAM 2080

Level: BCA (**IIIrd Semester**) F.M.: 60

Time: 3:00 hrs. P.M. 24

Course Title: Probability and Statistics (SET B)

Date: 2080/12/21

Group B

Attempt any six questions: [6*5=30]

2. Two fair dice are thrown at random. What is the probability that the faces turn up to show (i) a sum of 7 (ii) a sum of 8 or 9 (iii) a sum less than 5 (iv)the number 6 in the first die (v) odd number in the second die (vi) same faces (vii) different face?
3. The average number of network errors experienced in a day on a local area network (LAN) is distributed with an average of 2.4. What is the probability that on any given day:
   (a) zero network errors will occur?
   (b) exactly one network error will occur?
   (c) at least one network error will occur.
4. Given a standard Normal distribution, determine the following probabilities:
   (i) P(Z<1.96) (ii) P(Z<-1.64) (iii) P(Z> -0.34) (iv) P(0.17<Z< 1.64) (v) Probability that Z is less than-0.84 or greater than 2.08 .
5. It is found that 3% of the keyboards produced by a computer manufacturing company are defective. They are sold in a box of 100 and guarantee that not more than 3 keyboards will be defective. What is the probability that the box selected at random fails to meet the guarantee?
6. The advertisement expenses and the sales of a new product are recorded as below:

Adv. exp. (Rs.'000)	1	5	6	8	10
Sales (Rs.'000)	50	60	80	100	110

Estimate the sales when the advertising expense is Rs.15000 and find the correlation coefficient.

7. In a binomial distribution mean and variance are 3 and 2 respectively. Find the probability of (i) less than or equal to 2 (ii) greater than or equal to 7.
8. The mean and standard deviation of 200 items are found to be 60 and 20 respectively. If at the time of calculation, two items were wrongly taken as 3 and 67 instead of 13 and 17, find the correct mean and standard deviation. What is the correct coefficient of variation?

Group C

Attempt ANY two questions [2*10=20]

9. The staff body of an IT company is composed of 60% male and 40% female. 40% of males and 60% of females show interest in sports. What is the probability that a staff selected at random shows interest in sports given that the staff is female?
10. Given a normal distribution with a of mean 200 and a standard deviation of 20, find the probability that
    (a) P(X>180) (b) P(X<220)
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   (b) Determine the coefficient of determination and intercept its meaning.

ALL THE BEST

United College,
Kumaripati, Lalitpur
Mid-term Exam 2024 (Set B)

Bachelor in Computer Application — Full marks: 60
Course Title: Probability and Statistics — Pass Marks: 50
Code no. CAST 202 — Time: 3 hours
Semester: III

Candidates are required to answer the questions in their own words as far as possible.

Group "A"

Attempt all the questions. [10*1=10]

1. Circle (O) the correct answer, attempt only four questions.

(i) Mean of the binomial distribution is 25. If binomial distribution tends to Poisson distribution, what is the mean of Poisson distribution?
(a) 12.5 (b) 25 (c) 50 (d) 100

(ii) The process of constructing a mathematical model that can be used to predict one variable using another variable is called
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(iii) If The mean of a distribution is 14 and the standard deviation is 5 then what is the value of the coefficient of variation? (a) 28.2% (b) 35.71% (c) 31.6% (d) 2.8%

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(v) What is the main objective of the sample about the population from which the sample is selected?
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(viii) If r lies between 0.70 to 0.999 then what is a type of correlation?
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(a)Collection of data (b) presentation of data (c) analysis of data (d) Interpretation of data

(x) What is range of probability?
(a) -1 to 1 (b) -1 to 0 (c) 0 to 1 (d) None

Group B

Attempt six questions. [6*5=30]

Q.N.2. Two fair dice are thrown at random. What is the probability that the faces turn up to show (i) a sum of 7 (ii) a sum of 8 or 9 (iii) a sum less than 5 (iv)the number 6 in the first die (v) odd number in the second die (vi) same faces (vii) different face?.

Q.N. 3. The average number of network errors experienced in a day on a local area network (LAN) is distributed with an average of 2.4. What is the probability that on any given day:

(a) zero network errors will occur?

(b) exactly one network error will occur?

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Q.N.4. Given a standard Normal distribution, determine the following probabilities:

(i) $P(Z<1.96)$ (ii) $P(Z<-1.64)$ (iii) $P(Z> -0.34)$ (iv) $P(0.17<Z< 1.64)$ (v) Probability that Z is less than-0.84 or greater than 2.08 .

Q.N.5. It is found that 3% of the keyboards produced by a computer manufacturing company are defective. They are sold in a box of 100 and guarantee that not more than 3 keyboards will be defective. What is the probability that the box selected at random fails to meet the guarantee?

Q.N.6. The advertisement expenses and the sales of a new product are recorded as below:

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Q.N.7. In a binomial distribution mean and variance are 3 and 2 respectively. Find the probability of (i) less than or equal to 2 (ii) greater than or equal to 7.

Q.N.8 The mean and standard deviation of 200 items are found to be 60 and 20 respectively. If at the time of calculation, two items were wrongly taken as 3 and 67 instead of 13 and 17, find the correct mean and standard deviation. What is the correct coefficient of variation?

Group "C"

Attempt any TWO questions 10*2=20

Q.N. 10. Given a normal distribution with an of mean 200 and a standard deviation of 20, find the probability that

(a) $P(X>180)$ (b) $P(X<220)$

(c) $P(160<X<240)$ (d) $P(X>220)$

(e) $P(X<180 \text{ or } X>220)$

Q.N.11. The staff body of an IT company is composed of 60% male and 40% female. 40% of males and 60% of females show interest in sports. What is the probability that a staff selected at random shows interest in sports given that the staff is female?

Q.N.12. Calculate the coefficient of kurtosis from the following frequency distribution and interpret the result.

Remuneration (Rs.)	Below 150	Below 200	Below 250	Below 300	Below 350	Below 400	Below 450
No.of workers	8	22	40	64	80	92	100

ALL THE BEST

United College

Kumaripati, Lalitpur

MID-TERM EXAM 2080

Level: BCA (3rd Semester) **Set "A"** F.M.: 60

Time: 3:00 hrs. P.M. 24

Course Title: Data Structure and Algorithm

Date: 2080/12/19

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

Group A

Attempt all the questions.

Tick (✓) the correct answer: [10x1=10]

1. **Which of the following is the linear data structureidely?**
   i. Array ii. Queue
   iii Stack iv. All of above
2. **The time complexity for push operation in stack is …….**
   i. O(n) ii. O(1)
   iii. O (logn) iv. None of above
3. **What will be the prefix expression of A+B*C-D?**

   i. +B*AC*D ii -+A*BCD
   iii. +-*ABCD iv none

4. **The condition to check the full queue in circular queue is front=……..**
   i. (MAXSIZE-1) ii) (front+1)%MAXSIZE
   iii. (Rear+1)%MAXSIZE iv) Front=Rear=-1
5. **Syntax to to create a node dynamically is**
   i. (Nodetype*)malloc(Nodetype
   ii. (Nodetype)malloc(sizeof(Nodetype)
   iii. (Nodetype*) malloc(sizeof(Nodetype)
   iv. None
6. **Pointer is used to store …..**
   i. integer value ii) float value
   iii. Memory address iv) char
7. **Time complexity to insert element in linked list is**
   i) O (1) ii) O(n) iii)O(n2) iv)O(logn)
8. **Stack follows ……..**
   i. LIFO
   ii. FIFO
   iii. FCFS
   iv. NONE
9. **In circular linked list, the link part of the last node points to**
   i. Null ii) Previous Node
   ii. first node iv)None
10. **In Queue the insertion is done from ……..and deletion is done from …….**
    i. Rear front iii)between,rear
    ii. Front rear iv)None

United College
Kumaripati, Lalitpur
MID-TERM 2080

Level: BCA (3rd Semester) **Set-"A"** F.M.: 60
Time: 3:00 hrs. P.M. 24

Course Title: Data Structure and Algorithm
Date: 2080/12/19

Group B

Attempt any six questions: [6*5=30]

11. What is data structure? Explain different operations to be performed in data structures.
12. What is linear queue? Write an algorithm to insert and delete the element in linear queue.
13. What is Array? Differentiate between linked list and Array
14. Define doubly linked list? Write an algorithm to delete the node at the beginning and end of the doubly linked list.
15. Implement Stack using linked list and write algorithm or function for Push and peek operation using linked list.
16. Write the function to calculate the nth element of the Fibonacci series using recursion?
17. What is recursion? Write down the condition for recursion.
18. Write the steps to convert infix to prefix expression using stack.

Group C

Attempt ANY two questions [2*10=20]

19. 1)Trace the algorithm to convert infix to postfix using stack with following infix expression (A-(B+C))*D)$(E+F) and evaluate the obtained postfix expression with following values A=1, B=2, C=1, D=1, E=2. F=1
20. 2)Define Circular linked list? How does it differ from linear linked list? Write an algorithm or function to add a node at specific position and in the beginning of the circular singly linked list.
21. 3)What do you mean by asymptotic notation? Describe big Oh, Big Omega and Big theta notation

United College
Kumaripati, Lalitpur
Mid-Term exam 2080

Level: BCA (3rd Semester) **Set-"B"** F.M.: 60
Time: 3:00 hrs. P.M. 24

Course Title: Data Structure and Algorithm
Date: 2080/12/19

Group B

Attempt any six questions: [6*5=30]

11. What is data structure? Differentiate between linear and non-linear data structure.
12. How circular queue overcomes the disadvantage of linear queue. Write an algorithm to insert and delete the element in Circular Queue.
13. Define Linked list. Write down the advantages of linked list over Array.
14. What is doubly linked list? Write an algorithm to insert the node at the end and beginning of the linked list.
15. How to implement linked list as stack. Write algorithm or function for Pop and peek operation in stack using linked list.
16. Write down the function for calculating factorial using recursion?
17. What is divide and conquer algorithm? Write an algorithm to solve the tower of Hanoi problem.
18. Write the steps or algorithm to convert infix to postfix expression using stack.

Group C

Attempt ANY two questions [2*10=20]

19. Trace the algorithm to convert infix to postfix using stack with following infix expression A+(B*C-(D/E-F)*G)*H and evaluate the obtained postfix expression with following values A=1,B=2, C=3, D=4, E=2, F=1, G=2, H=3
20. Define Doubly linked list? How does it differ from singly linked list?
21. What do you mean by asymptotic notation? Describe big Oh, Big Omega and Big theta notation.

United College

Kumaripati, Lalitpur

MID-TERM-EXAM 2080

Level: BCA (3rd Semester) **Set "B"** F.M.: 60

Time: 3:00 hrs. P.M. 24

Course Title: Data Structure and Algorithm

Date: 2080/12/19

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

Group A

Attempt all the questions.

Tick (✓) the correct answer: [10x1=10]

1. **In Queue the insertion is done from ……..and deletion is done from …….**
   i. Rear front iii) between,rear
   ii. **Front rear** **iv) None**
2. **The time complexity for POP operation in stack is…...**
   i. 1)O(1) ii)O(n) iii)O(logn) iv. None
3. **What will be the prefix expression of A+B*C-D?**
   i. +B*AC*D ii -+A*BCD
   iii. +-*ABCD iv none
4. **The condition to check the full queue in linear Queue is rear=……..**
   j._____(MAXSIZE-1) ii) (front+1)%MAXSIZE
   iii. (Rear+1)%MAXSIZE iv) Front=Rear=-1
5. **Syntax to to create a node dynamically is**
   i. (Nodetype*)malloc(Nodetype
   ii) (Nodetype)malloc(sizeof(Nodetype)
   iii) (Nodetype*)malloc(sizeof(Nodetype)
   iv) None
6. **Pointer is used to store …..**
   i. integer value ii) float value
   iii. Memory address iv) char
7. **Time complexity to insert element in linked list is**
   ii) O(1) ii) O(n) iii)O(n2) iv)O(logn)
8. **Queue follows**
   i. LIFO
   ii. FIFO
   iii. FCFS
   iv. NONE
9. **In linked list, the link part of the last node points to**
   i. Null ii) Previous Node
   ii. first node iv) None
10. **Which of the following is the Non-linear data structure?**
    i. Linked list ii) Tree iii)stack iv)None

United College

Kumaripati, Lalitpur
Pre-board 2080

Level: BCA (3rd semester) **Set "A"** F.M.: 60
Time: 3:00 hrs. P.M. 24

Course Title:Data Structure and algorithm
Date: 2080/12/05

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

SET-"A"

Group A

Attempt all the questions.

Tick (✓) the correct answer: [10x1=10]

1. **Which of the following is the linear data structure ?**
   i. Graph ii.tree
   iii Stack iv. Binary tree
2. **if the element A,B,C,D are placed in queue one at a time from left to right,in which order will they be removed**
   i. ABCD ii.BCDA iii.DCAB iv. DABC
3. **In linked list ,among two fields One field is to store data and second field is**
   i. Pointer to integer ii pointer to character
   iii. Pointer to node iv node
4. **Objectives of hash function is to produce a search that takes__time**
   i. O(1) ii)O(logn) iii)O(n) iv)O(n^2)
5. **Syntax to to create a node dynamically is**
   i. (Nodetype*)malloc(Nodetype
   ii)(Nodetype)malloc(sizeof(Nodetype)
   iii)(Nodetype*)malloc(sizeof(Nodetype)
   iv)None
6. **The worst time complexity taken by merge sort is**
   I) O(nlogn) ii)O(logn) iii)O(n) iv)none
7. **Perfect binary tree of height 4 contains total __nodes.**
   i) 30 ii) 31 iii)32 iv)33
8. **The number of edges from the root to the node is called__.**
   i)Height ii)Depth iii)length iv)width
9. **In circular linked list, the link part of the last node points to**
   i. Null ii) Previous Node
   ii. first node iv)None
10. **The prefix form of A*B+C/D is ?**
    i. AB/CD+ iii)ABCD/+
    ii. ABC+/D iv)ABCD+/

United College
Kumaripati, Lalitpur
Pre-Board 2080

Level: BCA (3rd semester) **Set-"A"** F.M.: 60
Time: 3:00 hrs. P.M. 24

Course Title: Data Structure and algorithm
Date: 2080/12/05

Group B

Attempt any six questions: [6*5=30]

1. What is data structure?Explain different operations to be performed in data structures.
2. Define greedy algorithm. Explain divide and conquer algorithm.
3. How AVL tree differs from BST?Construct AVL tree from following data: 63,9,19,27,18,108,99,81
4. What is B-tree:Illustrate the growth of B-tree of Order 5 inserting the keys: 3,1,4,5,9,2,6,8,7,11,13, 19,21,23
5. Trace and sort the following data items using Quick Sort. 5,3,2,6,4,1,3,7
6. What is minimum spanning tree of a graph?Explain DFS with example
7. What is recursion?Write down the condition for recursion.
8. Define Graph?Explain Kruskal's algorithm to construct minimum spanning tree with example.

Group C

Attempt ANY two questions [2*10=20]

1)Trace the algorithm to convert infix to postfix using stack with following infix expression (A+B*C$D)/((E+F-G)*H)$I/J and evaluate the obtained postfix expression with following values A=1, B=2, C=1, D=1, E=2. F=1 G=1 H=2 I=2 J=1

2)What is the limitation of linear queue?Write the algorithm for Enqueue and dequeue operations of Circular Queue.

3)what are the different types of linked list?Write an algorithm to insert element in the specific position of linked list.

United College
Kumaripati, Lalitpur
Pre-Board exam 2080

Level: BCA (3rd semester) **Set-"B"** F.M.: 60
Time: 3:00 hrs. P.M. 24

Course Title: Scripting Language
Date: 2080/12/05

Group B

Attempt any six questions: [6*5=30]

11. What is data structure?Differentiate between linear and non-linear data structure.
12. Define greedy algorithm, deterministic and non-deterministic algorithm. .
13. How AVL tree differ from BST?Construct AVL tree from following data:3,5,11,8,4,1,12,7,2,6,10
14. Define B-tree. Illustrate the growth of B-tree of order 4 inserting the keys: 6,4,22,10,2,14,3,8,11,13,5,9
15. Trace and sort the following data items using Merge Sort: 4,7,2,6,1,4,7,3,5,6
16. What is divide and conquer algorithm?Write an algorithm to solve the tower of Hanoi problem.
17. What is spanning tree of the graph ?Explain BFS with example.
18. Define graph. Explain Dijkstra's algorithm with example.

Group C

Attempt ANY two questions [2*10=20]

1)1)Trace the algorithm to convert infix to postfix using stack with following infix expression (A+B*C$D)/((E+F-G)*H)$I/J and evaluate the obtained postfix expression with following values A=1, B=2, C=1, D=1, E=2. F=1 G=1 H=2 I=2 J=1

2)What is the limitation of linear queue?Write the algorithm for Enqueue and dequeue operations of Circular Queue.

3)What are different types of linked list?Write an algorithm to insert element in the specific position of doubly linked list

United College
Kumaripati, Lalitpur
Pre-Board-exam 2080

Level: BCA (3rd semester **Set "B"** F.M.: 60
Time: 3:00 hrs. P.M. 24

Course Title:Data Structure and algorithm
Date: 2080/12/05

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

Group A

Attempt all the questions.
Tick (✓) the correct answer: [10x1=10]

11. which of the following is non-linear data structure…….

i. Graph iii)stack

ii. queue iv)linkedlist

12. **if the element A,B,C,D are placed in stack one at a time from left to right,in which order will they be removed.**

i)ABCD ii)BCAD iii)DCBA iv)ADBC

13. Objectives of hash function is to produce a search that takes__time

O(1) ii)O(logn) iii)O(n) iv)O(n^2)

14. **In linked list ,among two fields One field is to store data and second field is**

i. node ii pointer to character
iii. Pointer to node iv Pointer to integer

15. Syntax to to create a node dynamically is

i. (Nodetype*)malloc(Nodetype

ii)(Nodetype)malloc(sizeof(Nodetype)

iii)(Nodetype*)malloc(sizeof(Nodetype)

iv)None

16. Perfect binary tree of height 5 contains total __nodes.

i)62 ii) 63 iii)67 iv)68

17. The worst time complexity taken by merge sort is

i) O(nlogn) ii)O(logn) iii)O(n) iv)none

18. The number of edges from the node to the leaf node is called__.

i)Height ii)Depth iii)length iv)width

19. In linked list, the link part of the last node points to

iii. Null ii) Previous Node

iv. first node iv)None

20. The prefix form of A*B+C/D-E is ?

i. AB/CD+ iii)ABCD/+

ii. **ABC+/D** **iv)None**