KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

Hiranya Kumar Bhuyan School of Science & Technology

Home Assignment

Master of Computer Application

Discrete Mathematics

3rd Semester, 2019

Total Marks 50

Assignments are required to be written in your own lanquage, copying in toto from the learning material will carry less score.

A. Answer the following questions- **(2 X 3= 6)**

1. Find the power set of the following sets : (a) $A=\{a,b,c\}$ (b) $A=\{1,2\}$

2. When is a statement formula said to be in the normal form ?

3. What is chain of inference ?

B. Answer the following questions- (4 X 3= 12)

1. Determine whether each of the following form is a tautology or a contradiction or neither :
   (a) $(P\wedge Q)\rightarrow(P\vee Q)$
   (b) $(P\rightarrow Q)\wedge(P\wedge\sim Q)$

2. Find (i) fog (ii) gof (iii) fof (iv) gog where $f(x)=x^2+3x+2$; $g(x)=2x-3$ are functions from R to R.

3. How many combinations and permutations can be made with the letters of the word PARABOLA, taken three at a time.

C. Answer the following questions- (6 X 2= 12)

1. Test whether the set of all non zero real numbers namely $R-\{0\}$ forms an abelian group with respect to '$*$' defined by $a*b=\frac{ab}{2}\quad\forall a,b\in R-\{0\}$

2.Find the graph whose adjancy matrix is $\begin{bmatrix} 1 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 1 & 0 \\ 1 & 1 & 0 & 0 \end{bmatrix}$

D. Answer the following questions-

(10 X 2= 20)

1. Determine whether the following set together with the binary operation is a semigroup, a monoid or neither. If it is a monoid, specify the identity. If it is a semi group or a monoid determine whether it is commutative.

(a) Set $S = \{1,2,3,6,9,18\}$ where $a * b = LCM(a,b)$.

(b)Z,the set of integers,where $a * b = a + b - ab$.

2.(a)Show that the maximum number of edges in a simple undirected graph with n vertices is n(n-1)/2.

(b) Explain the Operations on graphs.

*** ***** ***

COURSE: OPERATING SYSTEM

(MCA-10/ M.Sc.IT-10)

Total Marks: 50

[Assignments *are required to be written in your own language. Copying in toto from the learning materials will carry less score*]

A. Answer the following three questions: 2 X 3 = 6

Q1. What is an operating system? Mention three objectives of operating system.

Q2. What is process scheduling? What do you mean by Non-pre-emptive and Pre-emptive scheduling?

Q3. What do you mean by a semaphore variable? Give the atomic operations of wait and signal.

B. Answer the following three questions: 4 X 3 = 12

Q1. What is a process? Mention the different states of a process and their functions in brief.

Q2. What is segmentation? What are best fit, first fit and worst fit techniques?

Q3. How is the implementation of virtual memory done? Define demand paging.

C. Answer the following two questions: 6 X 2=12

Q1. Draw and explain in brief the following directory structures:

i. Two level structure and

ii. Tree structure.

Q2. What is a page fault? Give the steps for handling a page fault.

D. Answer the following two questions: 10 X 2 = 20

Q1. What is the need of the DMA techniques? Describe the advantages and disadvantages of memory-mapped I/O.

Q2. Explain the difference between FIFO and LRU page replacement algorithms using example.

*****

COURSE: FORMAL LANGUAGES AND AUTOMATA

(MCA-11/M.Sc.IT-11)

Total Marks: 50

[Assignments *are required to be written in your own language. Copying in toto from the learning materials will carry less score*]

A. Answer the following three questions: 2 X 3 = 6

Q1.What is the difference between NFA and DFA?

Q2.Define regular expression and regular grammar.

Q3. What do you mean by closure of a language? Give suitable examples.

B. Answer the following three questions: 4 X 3 = 12

Q1. Define Chomsky hierarchy.

Q2. Design a DFA to accept the following language:

L = { w | w is of even length and begins with 01 }

Q3. What is the difference between Turing machines and modern computers? What problems cannot be solved by Turing machines?

C. Answer the following two questions: 6 X 2 = 12

Q1.What do you mean by equivalence of two finite automata?

Q2.Define ambiguity of grammar. Prove that S →S|S, S→a is ambiguous.

D. Answer the following two questions: 10 X 2 = 20

Q1. Design a Turing Machine that can concatenate two strings.

Q2. What is parse tree? Show that the following grammar is ambiguous:

S→ aB | ab

A→ aAB| a

B→ ABb | b

*****

COURSE: COMPUTER GRAPHICS

(MCA-12/ M.Sc.IT-12)

Total Marks: 50

[Assignments *are required to be written in your own language. Copying in to from the learning materials will carry less score*]

A. Answer the following three questions: 2 X 3 = 6

Q1. What do you understand by computer graphics? Give the main difference between random scan system and raster scan system.
Q2. What are clipping algorithms?
Q3. What is spline? Give two applications of spline.

B. Answer the following three questions: 4 X 3 = 12

Q1. What is aspect ratio? Give the difference between spatial redundancy and temporal redundancy.
Q2. What are virtual reality environments? Explain the three main phases in brief.
Q3. Explain the concept of anti aliasing.

C. Answer the following two questions: 6 X 2=12

Q1. A triangle is having the vertices A(0,0), B(1,2) and C(5,2). Magnify the triangle to thrice its size while keeping C(5,2) fixed.
Q2. Give the matrix representation of scaling, rotation and translation transformation

D. Answer the following two questions: 10 X 2 = 20

Q1. Explain the DDA line drawing algorithm.
Q2. Explain the various types of Bezier curves and surfaces.

*****

Assignment Guidelines

A. Guidelines to Co-ordinators:

1. Assignments are parts of teaching-learning process and compulsory.

2. The spirit behind this is to help learners to understand the subject and prepare themselves better for the term-end examination.

3. Assignment responses are to be evaluated and feedbacks are required to be communicated to the learners, by giving back the assignments with evaluator's comments. Such assignments are to be collected at the time of issuing admit cards and be stored in the centre's office till the end of next semester.

4. Assignment marks are to be sent to the Controller of Examinations as soon as the examination routines are published.

5. Keeping the above points in mind Co-ordinators will fix the time/date of submission of assignments by the learners as may be convenient to follow the guidelines in true spirits.

B. Guidelines to learners:

1. As soon as the SLMs are received the learners will write the assignments in their own handwriting (assignment questions may be downloaded from the website, if necessary) to be submitted to Co-ordinators as per the dates fixed for the purpose. Timely submission of assignments at the Study Centres will help in quick processing of results of respective learners. Otherwise this will create unnecessary delay in declaration of results.

2. Writing of assignment (work) and submission of the same in time is compulsory.

Registrar

N.B. The learners will have to collect receipt after submitting the assignment with the signature and seal of the collector of study centre and will have to keep with him/her till the declaration of result.

✂ ……

Receipt

Received the assignment from Mr/Ms …….Enrollment number ……of **3rd Semester MCA** on ……2019.

Date: Signature of collector with seal

::: ::::: :::

(FOR BACK CANDIDATES)

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

Hiranya Kumar Bhuyan School of Science and Technology

HOME ASSIGNMENT FOR

MASTER OF COMPUTER APPLICATION (MCA)

and

MASTER OF INFORMATION TECHNOLOGY (M.Sc.IT)

THIRD SEMESTER, 2019

COURSE: OPERATING SYSTEM

(MCA-10/ M.Sc.IT-10)

Total Marks: 50

[Assignments *are required to be written in your own language. Copying in toto from the learning materials will carry less score*]

A. Answer the following three questions: 2 X 3 = 6

Q1. What is an operating system? Mention three objectives of operating system.

Q2. What is process scheduling? What do you mean by Non-pre-emptive and Pre-emptive scheduling?

Q3. What do you mean by a semaphore variable? Give the atomic operations of wait and signal.

B. Answer the following three questions: 4 X 3 = 12

Q1. What is a process? Mention the different states of a process and their functions in brief.

Q2. What is segmentation? What are best fit, first fit and worst fit techniques?

Q3. How is the implementation of virtual memory done? Define demand paging.

C. Answer the following two questions: 6 X 2=12

Q1. Draw and explain in brief the following directory structures:

i. Two level structure and

ii. Tree structure.

Q2. What is a page fault? Give the steps for handling a page fault.

D. Answer the following two questions: 10 X 2 = 20

Q1. What is the need of the DMA techniques? Describe the advantages and disadvantages of memory-mapped I/O.

Q2. Explain the difference between FIFO and LRU page replacement algorithms using example.

*****

COURSE: FORMAL LANGUAGES AND AUTOMATA

(MCA-11/M.Sc.IT-11)

Total Marks: 50

[Assignments *are required to be written in your own language. Copying in toto from the learning materials will carry less score*]

A. Answer the following three questions: 2 X 3 = 6

Q1.What is the difference between NFA and DFA?

Q2.Define regular expression and regular grammar.

Q3. What do you mean by closure of a language? Give suitable examples.

B. Answer the following three questions: 4 X 3 = 12

Q1. Define Chomsky hierarchy.

Q2. Design a DFA to accept the following language:

L = { w | w is of even length and begins with 01 }

Q3. What is the difference between Turing machines and modern computers? What problems cannot be solved by Turing machines?

C. Answer the following two questions: 6 X 2 = 12

Q1.What do you mean by equivalence of two finite automata?

Q2.Define ambiguity of grammar. Prove that S →S|S, S→a is ambiguous.

D. Answer the following two questions: 10 X 2 = 20

Q1. Design a Turing Machine that can concatenate two strings.

Q2. What is parse tree? Show that the following grammar is ambiguous:

S→ aB | ab

A→ aAB| a

B→ ABb | b

*****

COURSE: COMPUTER GRAPHICS

(MCA-12/ M.Sc.IT-12)

Total Marks: 50

[Assignments *are required to be written in your own language. Copying in to from the learning materials will carry less score*]

A. Answer the following three questions: 2 X 3 = 6

Q1. What do you understand by computer graphics? Give the main difference between random scan system and raster scan system.
Q2. What are clipping algorithms?
Q3. What is spline? Give two applications of spline.

B. Answer the following three questions: 4 X 3 = 12

Q1. What is aspect ratio? Give the difference between spatial redundancy and temporal redundancy.
Q2. What are virtual reality environments? Explain the three main phases in brief.
Q3. Explain the concept of anti aliasing.

C. Answer the following two questions: 6 X 2=12

Q1. A triangle is having the vertices A(0,0), B(1,2) and C(5,2). Magnify the triangle to thrice its size while keeping C(5,2) fixed.
Q2. Give the matrix representation of scaling, rotation and translation transformation

D. Answer the following two questions: 10 X 2 = 20

Q1. Explain the DDA line drawing algorithm.
Q2. Explain the various types of Bezier curves and surfaces.

*****

Assignment Guidelines

A. Guidelines to Co-ordinators:

1. Assignments are parts of teaching-learning process and compulsory.

2. The spirit behind this is to help learners to understand the subject and prepare themselves better for the term-end examination.

3. Assignment responses are to be evaluated and feedbacks are required to be communicated to the learners, by giving back the assignments with evaluator's comments. Such assignments are to be collected at the time of issuing admit cards and be stored in the centre's office till the end of next semester.

4. Assignment marks are to be sent to the Controller of Examinations as soon as the examination routines are published.

5. Keeping the above points in mind Co-ordinators will fix the time/date of submission of assignments by the learners as may be convenient to follow the guidelines in true spirits.

B. Guidelines to learners:

1. As soon as the SLMs are received the learners will write the assignments in their own handwriting (assignment questions may be downloaded from the website, if necessary) to be submitted to Co-ordinators as per the dates fixed for the purpose. Timely submission of assignments at the Study Centres will help in quick processing of results of respective learners. Otherwise this will create unnecessary delay in declaration of results.

2. Writing of assignment (work) and submission of the same in time is compulsory.

Registrar

N.B. The learners will have to collect receipt after submitting the assignment with the signature and seal of the collector of study centre and will have to keep with him/her till the declaration of result.

✂ ……

Receipt

Received the assignment from Mr/Ms …….Enrollment number ……of **3rd Semester MCA** on ……2019.

Date: Signature of collector with seal

::: ::::: :::