Tribhuvan University

Faculty of Humanities & Social Sciences

OFFICE OF THE DEAN

2024

Bachelor in Computer Applications
Course Title: Web Technology
Code No: CACS 205
Semester: III

Full Marks: 60
Pass Marks: 24
Time: 3 hours

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

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. What is CSS? Explain the method of using CSS on the web page. [2+3]
3. What is XML? Write rules to create XML document with example. [1+4]
4. Explain HTML form elements with suitable example. [2+3]
5. What is XPath? Write XSLT code to display your books information (Title, price ISBN, subject code) store into XML. [1+4]
6. Why server side programming is important for web development? Explain with its major features. [5]
7. Why session is important for web development, write a server side script to create, store, retrieve and remove session and cookie. [2+3]
8. Explain multi-tier technology with its advantage and disadvantages. [2+3]

Group C

Attempt any TWO questions. **[2×10 = 20]**

9. Write a server side script for implementing login. Your program should take username and password as input and redirect to home page if validated other wise prints an error try again. [10]
10. Compare XML Schema with DTD. Write XML schema to describe student as root element, name as child element with first_name, middle_name, last_name, city as child elements with its content "KTM","PKR","LPT" and rollno as its's attribute. [3+7]
11. Create web page with following details. [10]
    a) Create basic structure [2]
    b) Add header section to the top of page which contain logo and search bar. [2]
    c) Create two column layout of (25%,75%) width and put unordered list into first one and image gallery into second one. [2]
    d) Add footer section, which includes address of company and copyright information. [2]
    e) Also add some basic CSS using external stylesheet.[2]

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Bachelor in Computer Applications
Course Title: System Analysis and Design | **Full Marks: 60**
Code No: CACS 203 | **Pass Marks: 24**
Semester: III | **Time: 3 hours**

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

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. Define system. Explain components of system including its characteristics. [1+2+2]
3. Define case tool. Explain different types of case tool that can be used in different phases of SDLC. [1+4]
4. Define information system planning. How is top-down planning approach different from bottom-up planning approach? Explain. [1+4]
5. Define JAD? List out different contemporary requirements determining techniques and explain them in comprehensive way. [1+4]
6. Define data modeling. Explain logical data model in detail. [1+4]
7. What are the various types of menu design which can be adopted to meet the system complexity and usability?
8. Why do software project often fails? Explain different types of software testing? [1+4]

Group C

Attempt any TWO questions. **[2×10 = 20]**

9. Explain phases of SDLC, also discuss the role of Project Manager in software project development. [7+3]
10. What is process modeling? Why do we need DFD? Draw up to top level DFD for Online hotel room booking system. [1+2+7]
11. List out different activities that are associated with implementation phase. Explain each of them in detail. What are the different methods of training and supporting users? Explain. [6+4]

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2024

Bachelor in Computer Applications

Course Title: Data Structure and Algorithms | **Full Marks: 60**

Code No: CACS 201 | **Pass Marks: 24**

Semester: III | **Time: 3 hours**

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

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. Differentiate between stack and queue. What are the general applications of a stack? [2+3]
3. What is a linked list? How doubly linked list is different from circular linked list? Explain with example. [1+4]
4. What is recursion and recursive function? Write a recursive function to compute Fibonacci number. [2+3]
5. How does collision occur during hashing? Explain any two hashing functions. [3+2]
6. What is an AVL tree? Create an AVL tree from the following data: [1+4]

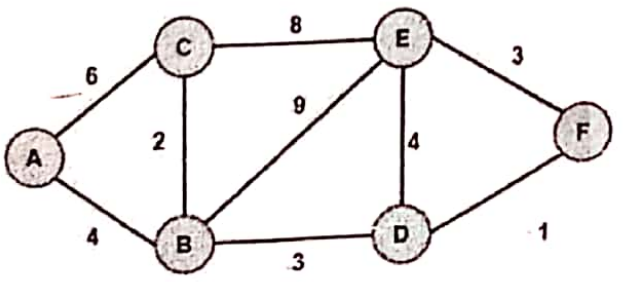
   18, 12, 14, 8, 5, 25, 31, 24, 27
7. What are deterministic and non-deterministic algorithms? Explain the use of Big Oh notation to measure the complexity of an algorithm with an example. [2+3]
8. Implement the quick sort to sort the following data items: [5]

   12, 1, 14, 7, 2, 10, 4, 7, 22, 6, 15

Group C

Attempt any TWO questions. **[2×10 = 20]**

9. What are the differences between linear queue and circular queue? Write an algorithm to enqueue and dequeue data elements in a circular queue. [4+3+3]
10. What is B-tree? How insertions and deletions of elements can be done in a B-tree. [2+8]
11. Explain the different ways to represent a graph. For the following graph use Prim's algorithm to find a minimum spanning tree stating from the node 'A'. [5+5]



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2024

Bachelor in Computer Applications
Course Title: OOP in Java
Code No: CACS 204
Semester: III

Full Marks: 60
Pass Marks: 24
Time: 3 hours

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

Group B

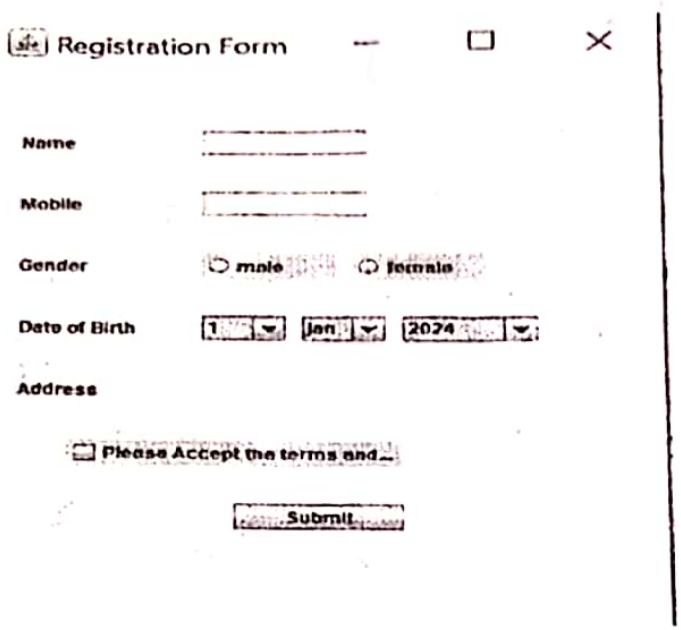
Attempt any SIX questions. **[6×5 = 30]**

2. What is constructor? Explain the role of constructor in Java class by considering a suitable example and also list the type of constructor. [1+3+1]
3. Define inheritance. Explain types of inheritance with suitable example. [1+4]
4. Define Package. Explain steps in creation and implementation of package with example. [1+4]
5. What is multithreading? How does Java support inter-thread communication? Explain with example. [1+4]
6. How to handle multiple catch blocks for a nested try block? Explain with an example.
7. What is difference between String and String buffer and explain 3 methods of String and String Buffer class with example. [2+3]
8. Write short notes on: (any two)
   i. JDBC Driver
   ii. Access Modifiers
   iii. JDK, JRE and JVM

Group C

Attempt any TWO questions. **[2×10 = 20]**

9. Define array and multi dimensional array. Write a program to read two m x n matrices, perform multiplication operation and store result in third matrix. [3+7]
10. Write a program to create the following simple GUI based application. If user press the Submit button, your program should store the information in a file named "exam.txt" only when he accepts the terms and condition otherwise it should display a message "please accept the terms and condition first". [6+3+1]



11. Differentiate between overloading and overriding with suitable example. WAP to Create Set with following value:{"London","NewYork","SanFrancisco","Beijing","NewYork"}.Perform following operation on above Set

- add new element
- get Set size - remove element - Contains element?
- addAll
- removeAll
- retainAll

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2024

Bachelor in Computer Applications
Course Title: Probability and Statistics
Code No: CAST 202
Semester: III

Full Marks: 60
Pass Marks: 24
Time: 3 hours

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

Group B

Attempt any SIX questions. **[6×5 = 30]**

2. Describe the scope and limitations of Statistics.

3. What do you mean by statistics? The following table represents the marks of Probability and Statistics of 100 students.

Marks	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
No. of students	12	16	35	24	13

Find the mean, median and standard deviation of all 100 students.

4. Define correlation. From the following data on marks of 10 students in the two subjects, calculate the Karl Pearson's coefficient of correlation and interpret the result:

Maths	55	70	40	30	90	80	60	80	90	80
Basic Statistics	65	40	30	50	60	70	50	50	60	70

5. Define regression. The following table gives the age of the computers of a certain company and annual maintenance costs:

Age of computers (years)	2	4	6	8	10
Maintenance costs(Rs.00)	10	15	22	32	46

i. Obtain the regression equation for cost related to age.

ii. Estimate the cost of maintenance for 10 yrs old computer.

iii. Interpret the slope.

6. Define Poisson distribution. In certain factory timing out optical lenses, there is a small chance, 1/500 for any lens to be defective. The lenses are supplied in a packet of 10 each. What is the probability that apacket will contain; (i) No defective lens, (ii) At least one defective lenses, and, (iii) At most two defective lenses.

7. A dean of a college wants to use the mean of a random sample to estimate the average amount of time students take to get from one class to the next, and she wants to be able to assert with 95% confidence that error is at most 0.25 minute. If it can be presumed from experience that $\sigma = 1.40$ minutes, how large a sample will she have to take?

8. Define sampling. A population consists of the four numbers 2,8,14 and 20. (i) Write down all possible sample size of two without replacement. (ii) Verify that the sample mean is an unbiased estimate of population mean.

Group C

Attempt any TWO questions. **[2×10 = 20]**

9. Two computer manufacturers A and B compete for profitable and prestigious contract. In their rivalry, each claim that their computer a consistent. For this it was decided to start execution of the same program simultaneously on 50 computers of each company and recorded the time as given below.

Time (in second)	0 – 2	2 – 4	4 – 6	6 – 8	8 – 10	10 – 12
No. of computers manufactured by A	5	16	13	7	5	4
No. of computers manufactured by A	2	7	12	19	9	1

Compute mean and standard deviation of each company's computers. Also, compute which company's computer is more consistent.

10. Define normal distribution and Standard normal distribution. The life time of a certain electronic component in a normal distribution with mean 5000 hours and a standard deviation of 1000 hours, compute the probabilities under the following conditions: (a) Life time of components is less than 5012 hours, (b) Lifetime of components between 4000 to 6000 hours, and, (c) Lifetime of components more than 7000 hours.

11. Write the properties of design of experiment. The lifetime in hours of samples from three different brands of batteries were recorded with the following results:

Brand A	40	30	50	50	30	
Brand B	60	40	55	65		
Brand C	60	50	70	65	75	40

Construct one-way ANOVA table and test whether the three brands have different average life time.

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Group B

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2. What is an image map? Describe the key steps involved in creating a client image map in HTML using necessary tags and attributes. [1+4]
3. What is session? Explain how session works with proper example. [1+4]
4. What is CSS? Explain CSS Box model along with its related properties and example. [1+4]
5. What is tier Architecture? Differentiate two-tier technology with three-tier technology. [1+4]
6. What is web server? Explain different functions of web server. [1+4]
7. What is well formed XML? Explain different ways of DTD implementation for XML documents. [1+4]
8. Define XPath? Explain different elements required to create XSLT document. [1+4]

Group C

Attempt any TWO questions. **[2×10=20]**

9. Design form to accept name, email, phone, gender, country and validate them using server side script with following rules and store them into database called "store" and table "information". [3+4+3]
   - All fields are required.
   - Phone number must contain 10 digit
   - Email must be valid format
10. Write HTML and CSS code to design following layout.

Phone:01-545454545 Address: Kirtipur, Kathmandu	Social Media List (Link)
Logo[Image] Website Name[h1]	
Menu	
Recent Posts • Post1 title • Post2 title • Post3 title • Post4 title • Post5 title	[Image] Description.....(paragraph)
Copyright © Your site name	

11. Write a valid and well-formed xml to store details of visitor list of ABC College with following details and validate record with following information. [4+3+3]
    - Record must include details of name, mobile, department, related contact person, date, entry time, exit time and visitor number as attribute.
    - Mobile must be 10 digit.
    - Visitor may not have any contact person.
    - Record must belongs to Admin, IT, Account and Exam Department.