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END TERM EXAMINATION

FOURTH SEMESTER [BCA] MAY 2018

Paper Code: BCA-202 **Subject: Mathematics-IV**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.

Q1 Attempt **any ten** Parts:- **(2.5x10=25)**

(a) From a pack of 52 cards, two are drawn at random. What is the probability that one is a king and the other a queen?

(b) A grade school boy has 5 blue and 4 white marbles in his left pocket and 4 blue and 5 white marbles in his right pocket. If he transfer one marble from his left pocket to right pocket, what is the probability of his then drawing a blue marble from his right pocket?

(c) A coin is tossed three times. What is the probability of occurrence of head and tail alternately?

(d) Show that

(i) $\delta = E^{1/2} + E^{-1/2}$

(ii) $\Delta = \nabla E$

(e) A can solve 75% of the problems and B can solve 70% of the problems. What is the probability that either A or B can solve problem chosen at random?

(f) Find the value of K so that the following function is a probability density function $f(x)=\frac{k}{1+x^2}, -\infty < x < \infty$.

(g) For any positive integers r and n>r, prove that

$$\binom{n-1}{r-1}+\binom{n-1}{r}=\binom{n}{r}.$$

(h) Using Lagrange's interpolation find the interpolation polynomial for the function $y(x)$ for the given values below.

x	0	3	4
$y(x)$	-12	6	8

(i) Find two successive approximation of a real roots of the equation $f(x) = x^3 - x - 1 = 0$ by using Bisection method.

(j) A fire insurance company has 3,840 policyholders. If the probability is 1/1200 that any one of the policyholders will file atleast one claim in any given year. Find the mean of the distribution.

(k) Prove that for any two events A and B

$$P(A \cup B) = P(A) + P(B) - P(A \cap B).$$

Unit-I

Q2 (a) A coin is tossed until a head appears. What is the expectation of the number of tosses? **(3.5)**

(b) A perfect cube die is thrown a large number of times in a set of 8. The occurrence of 5 or 6 is called a success. What is probability of exactly 3 success? **(3.5)**

(c) Out of (2n+1) tickets consecutively numbered, three are drawn at random. What is the probability that the numbers on them are in arithmetic progression (A. P.)? **(5.5)**

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Q3 (a) Find the probability that at most 5 defective fuses will be found in a box of 200 fuses if experience show that 2% of such fuses are defective. **(3.5)**

(b) The four attendants **A**, **B**, **C** and **D** of a company are supposed to wash the windshield of each customer's car. **A**, who service 20% of all cars, fails to wash the windshield one time in 20; **B**, who services 60% of all cars, fails to wash the windshield one time in 10; **C**, who services 15% of all cars, fails to wash the windshield one time in 10; and **D**, who services 5% of all cars, fails to wash the windshield one time in 20. If a customer complains later that his windshield was not washed, what is the probability that his car was serviced by **A**? **(3.5)**

(c) Out of 3n consecutive number 3 numbers are selected at random. What is the probability that their sum is divisible by 3? **(5.5)**

Unit-II

Q4 (a) Prove that the Binomial distribution reduces to Poisson distribution under the conditions that the number of trial n is very large and the probability of success p is small such that $np = \lambda$, a constant. **(6.5)**

(b) If X is normally distributed with mean 2 and variance 1. Find $P[|X-2|] < 1$. **(6)**

Q5 (a) Find the moment generating function of Binomial distribution of random variable X. Hence find its mean and variance. **(6.5)**

(b) It has been claimed that in 60% of all solar heat installations utility bill is reduced by atleast one-third. Accordingly, what are the probability that the utility bill will be reduced by at least one-third in

(i) four of five installation; **(2)**

(ii) at least four of five installation? **(4)**

Unit-III

Q6 (a) Find a real root of the equation $f(x) = x^3 - 2x - 5 = 0$ correct to 3 decimal places using method of False position. **(6)**

(b) From the following table of value of x and $f(x)$.

X	0.20	0.22	0.24	0.26	0.28	0.30
$f(x)$	1.6596	1.6698	1.6804	1.6912	1.7024	1.7139

Determine the value of $f(0.23)$ and $f(0.29)$. **(6.5)**

Q7 (a) Find a real root of the equation $x = e^{-x}$ **using Newton-Raphson method** with an accuracy of 10^{-3}. **(6)**

(b) Give the table of values

x	150	152	154	156
$y = \sqrt{x}$	12.247	12.329	12.410	12.490

Evaluate $\sqrt{155}$ using Lagrange's interpolation and estimate the error. **(6.5)**

Unit-IV

Q8 (a) Consider the system of equations:

$$x_1 + x_2 + x_3 = 3$$
$$2x_1 + 3x_2 + x_3 = 6$$
$$x_1 - x_2 - x_3 = -3$$

Find the inverse of the coefficient matrix of the above system of equations by Gauss-Jordan method. **(6.5)**

(b) A rocket is launched from the ground. Its acceleration $a(t)$ measured in every 5 seconds is tabulated below.

t	0	5	10	15	20	25	30
$a(t)$	40.0	46.50	49.25	52.25	55.75	58.25	60.50

Find the velocity of the rocket at t = 30 second using Simpson's 1/3 rule. **(6)**

Q9 (a) Solve the system of equations:

$$2x_1 - 2x_2 + x_3 = 2$$
$$5x_1 + x_2 - 3x_3 = 0$$
$$3x_1 + 4x_2 + x_3 = 9$$

Using LU decomposition method. **(6.5)**

(b) From the following table find the value of $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at the point $x = 1.5$. **(6)**

x	1.5	2.0	2.5	3.0	3.5	4.0
y	3.375	7.000	13.625	24.000	38.875	59.000

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FOURTH SEMESTER [BCA] MAY 2018

Paper Code: BCA-204 ***Subject: Web Technologies***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt any five questions including Q.no.1 which is compulsory. Select one question from each unit.

Q1 (a) What do you mean by Internet and Intranet? Also explain their merits and demerits.
(b) What do you mean by a web portal? Explain different types of web portals available.
(c) Explain various data types used in Java Script.
(d) Explain how Java is different from Java Script.
(e) Explain the different building blocks of XML document. **(5x5=25)**

Unit-I

Q2 (a) What do you mean by e-mail? Explain POP, IMAP and SMTP protocols in detail. **(8.5)**
(b) Explain the following HTML Tags with their attributes: **(4)**
(i) <meta>
(ii) <img>
(iii)<map>
(iv)<link>

Q3 (a) Explain the differences between frames and i-frame? What are the benefits of using frames in a webpage? **(6.5)**
(b) Design a HTML form for a student registration with fields like name, age, Father's name, address, contact number, course applied for etc. The form should have two buttons for submission and to reset the value. Also set the background color of the form and set its font size to 14 Times New Roman. **(6)**

Unit-II

Q4 (a) What is Java Script? Explain the strengths and weaknesses of Java Script. **(5)**
(b) How arrays are declared in Java. Explain the methods for creating an array in Java Script. Also write any five methods of array object in detail with example. **(7.5)**

Q5 (a) Discuss the different Built-in objects in Java Script by giving a suitable example of each. **(7.5)**
(b) Write a program to accept a phone number from a user and generate an alert message if it contains more than 12 digits. **(5)**

Unit-III

Q6 (a) Explain how DHTML is different from HTML. Also explain the elements of DHTML. **(5)**
(b) What are filters and Transitions in DHTML? Write a program to show a transition effect on an image of your choice. **(7.5)**

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Q7 (a) Explain the structure of Document Object model in detail. **(5)**

(b) What do you mean by event bubbling? Write a program to change the alignment of a text using dynamic HTML. **(7.5)**

Unit-IV

Q8 (a) What is web hosting? Explain different hosting types and components. **(6.5)**

(b) List the differences between HTML and XML. **(6)**

Q9 (a) Explain the difference between external and internal DTD. Write a DTD for student information system including student name, Enrolment Number, Date of Birth, address etc. **(7.5)**

(b) Explain various XML Parsers in detail. **(5)**

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FOURTH SEMESTER [BCA] MAY 2018

Paper Code: BCA-206 ***Subject: Java Programming***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt any five questions including Q.no.1 which is compulsory.

Q1 Explain following in brief:- **(Any five)-** **(5x5=25)**

(a) Explain in detail the features of Java.
(b) How a multidimensional array is represented in Java? Write the program to create a 2 * 2 array.
(c) Differentiate between Socket and Port.
(d) How multithreading is achieved in Java programs. Discuss its advantages and disadvantages.
(e) Differentiate between Swings and Applets.
(f) How the constructor is overloaded in Java?

Q2 (a) What is a private constructor? How we can create the object of the class having private constructor from other class. **(6)**
(b) Explain the logical operator (& & and | |) with example. **(6.5)**

Q3 (a) What is a constructor? Write the program to pass the values to the base class constructor form the sub class. **(6)**
(b) Explain different access modifiers available in Java. **(6.5)**

Q4 (a) Differentiate between checked and unchecked Exception. Give four examples of each type. **(6)**
(b) Explain the life cycle of Thread. Describe any five methods from thread class. **(6.5)**

Q5 (a) Write the program to count the number of words in file. **(6)**
(b) Why String class objects are considered as immutable. Differentiate between length property and length ( ) method with example. **(6.5)**

Q6 (a) What is layout manager? Explain any three layout managers in Java. Which method is used to set the layout manager? **(6)**
(b) Write a program to print the table of any number inside the applet. **(6.5)**

Q7 (a) Explain the two predefined stream variables in and out. **(6)**
(b) Differentiate between ODBC and JDBC. **(6.5)**

Q8 (a) Explain the InetAddress class. Write the program to find the IP address of any website using the methods of InetAddress class. **(6)**
(b) Explain client server communication using sockets. Discuss the use of Server Socket and Socket Class in Java. **(6.5)**

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FOURTH SEMESTER [BCA] MAY 2018

Paper Code: BCA-208 ***Subject: Software Engineering***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.no.1 which is compulsory. Select one question from each unit.

Q1 Answer the following questions briefly: **(2.5x10=25)**

(a) What is software crisis? Was Y2K a software crisis.
(b) Distinguish between generic and customized software product. Which one has larger share of market and why?
(c) What are the characteristics of a good SRS?
(d) Describe any two software size estimation techniques.
(e) Define module cohesion and list down various types of cohesion.
(f) What are the various categories of software metric?
(g) What are the crucial process steps of requirement engineering? Discuss with the help of a suitable diagram.
(h) What are the different levels of testing?
(i) What are the various categories of software maintenance?
(j) What do you mean by Regression testing?

Unit-I

Q2 (a) Explain the spiral model of software development with the help of a diagram. What are the limitations of such a model? **(5)**

(b) Consider the problem of University Result Management System and design the following: **(7.5)**
(i) Use Case Diagram
(ii) Level-1 DFD
(iii) ER Diagram

Q3 (a) What is facilitated application specification technique (FAST) and compare this with brainstorming sessions. **(2.5)**

(b) List out the merits and demerits of various SDLS models. **(10)**

Unit-II

Q4 (a) What are the risk management activities? Is it possible to prioritize the risk? **(5)**

(b) Compare the Walston-Felix model with the SEL model on a software development expected to involve 8 person-years of effort. **(7.5)**
(i) Calculate the number of lines of source code that can be produced.
(ii) Calculate the duration of the development.
(iii) Calculate the productivity in LOC/PY.
(iv) Calculate average manning.

Q5 (a) Describe the role of management in software development with the help of examples. **(5)**

(b) Suppose that a project was estimated to be 600 KLOC. Calculate the effort, development time, average staff size and productivity for each of the three modes i.e. organic, semidetached and embedded. **(7.5)**

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Project	a_b	b_b	c_b	d_b
Organic	2.4	1.05	2.5	0.38
Semidetached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

Unit-III

Q6 (a) Describe the various strategies of design. Which design is most popular and practical? **(6)**

(b) For a program with the number of unique operators $n_1 = 40$ and number of unique operands $n_2 = 60$, compare the followings: **(6.5)**

(i) Program Volume
(ii) Potential Volume
(iii) Program level
(iv) Program Difficulty
(v) Effort
(vi) Time

Q7 (a) Write a short note on the following terms: **(6)**

(i) Liver variables
(ii) Module weakness

(b) Describe the following terms: **(6.5)**

(i) Objects
(ii) Messages
(iii) Abstraction
(iv) Class
(v) Inheritance
(vi) Polymorphism

Unit-IV

Q8 (a) Discuss the structural testing. How is it different from functional testing? **(6)**

(b) Write a short note on the maintenance process with a suitable diagram. **(6.5)**

Q9 (a) Briefly discuss the following: **(6.5)**

(i) Test case design and test suite
(ii) Verification and Validation
(iii) Alpha, Beta and Acceptance testing

(b) Write short note on the following: **(6)**

(i) Re-engineering
(ii) Reverse Engineering

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FOURTH SEMESTER [BCA] MAY 2018

Paper Code: BCA-210 **Subject: Computer Network**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions in all including Q.no.1 which is compulsory. Select one question from each unit.

Q1 Answer the following: (2.5x10=25)

(a) Explain Shannon Capacity Theorem.
(b) What are different components of data communication?
(c) Discuss different types of transmission impairments.
(d) What is Flooding?
(e) Write a short note on DNS.
(f) Define network. Discuss various network criteria.
(g) Explain Piggybacking and its benefits.
(h) What is a datagram?
(i) Discuss Broadband–ISDN.
(j) Write a short note on cable modems.

Unit-I

Q2 (a) Write a short note on guided media. (8.5)
(b) Define throughput, bandwidth, response time, and frequency. (4)

Q3 (a) Draw a neat diagram of OSI model and explain the functioning of each layer. (9.5)
(b) Differentiate between simplex, half duplex and full duplex. (3)

Unit-II

Q4 (a) Define ISDN. What are its various services and layers? (6)
(b) What is multiplexing? Explain various types of multiplexing. (6.5)

Q5 (a) Define Flow Control. Explain any one flow control algorithm. (6.5)
(b) Differentiate between circuit, packet and message switching. (6)

Unit-III

Q6 (a) What is routing? Explain distance vector routing algorithm with an example. (6.5)
(b) Write a short note on following networking devices: (6)
(i) repeaters
(ii) bridges
(iii) gateways
(iv) routers

Q7 (a) Explain static and dynamic routing. (5)
(b) What is forwarding function? Explain link state routing algorithm with an example. (7.5)

Unit-IV

Q8 (a) Explain three-way handshaking connection management in TCP. (7.5)
(b) Compare TCP and UDP Protocols. (5)

Q9 (a) Explain TCP packet format in detail. (8.5)
(b) What are the functions of session and presentation layer? (4)

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