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(CBCS)
(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. BCA-401

(Environment and Ecology)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10

(a) Who wrote the *Origin of Species*, which brought to light the close relationship between habitats and species?

- (i) Ralph Emerson ()
- (ii) E. O. Wilson ()
- (iii) Charles Darwin ()
- (iv) John Muir ()

(b) The lithosphere began as a hot ball of matter which formed the earth about

- (i) 3·2 billion years ago ()
- (ii) 3·6 billion years ago ()
- (iii) 4·2 billion years ago ()
- (iv) 4·6 billion years ago ()

- (c) The Narmada Bachao Andolan in India is an example of a movement against
- (i) large dams ()
 - (ii) small dams ()
 - (iii) large industry ()
 - (iv) small industry ()
- (d) The food pyramid has a large base of plants, which are called
- (i) first-order consumers ()
 - (ii) producers ()
 - (iii) decomposers ()
 - (iv) food chains ()
- (e) The food pyramid has a narrower middle section that depicts the number and biomass of herbivorous animals, which are called
- (i) second-order consumers ()
 - (ii) carnivorous animals ()
 - (iii) producers ()
 - (iv) first-order consumers ()
- (f) At present conservation scientists have been able to identify and categorise a species on earth is about
- (i) 0·8 million ()
 - (ii) 1·8 million ()
 - (iii) 2·8 million ()
 - (iv) 3·8 million ()
- (g) What is the percentage of Indian plants, which are endemic to the country and found nowhere else in the world?
- (i) 2% ()
 - (ii) 8% ()
 - (iii) 12% ()
 - (iv) 18% ()
- (h) The pollutants that are produced in the atmosphere when certain chemical reactions take place among the primary pollutants are called
- (i) single pollutants ()
 - (ii) tertiary pollutants ()
 - (iii) secondary pollutants ()
 - (iv) poly pollutants ()

- (i) The persistent pesticide banned in India for agricultural use is
- (i) DDT () (ii) DOP ()
- (iii) DAP () (iv) KOP ()
- (j) Who believed that humans were 'trustees of the lower animal kingdom'?
- (i) Jawaharlal Nehru ()
- (ii) Mahatma Gandhi ()
- (iii) Karl Marx ()
- (iv) Abraham Lincoln ()

2. Tick (✓) whether the following statements are True (T) or False (F) : 1×5=5

- (a) A predominant commercial energy sources used in India is coal.
(T / F)
- (b) The Cheetah in India are well-known examples of extinct species.
(T / F)
- (c) The top layer of the soil horizon is called a horizon.
(T / F)
- (d) The World Environment Day is celebrated on 5th June.
(T / F)
- (e) When birthrate is lesser than death rate, it is called zero-population growth.
(T / F)

SECTION—B

(Marks : 10)

Write notes on the following :

2×5=10

1. Human development index
2. Land degradation
3. Genetic diversity
4. E-waste
5. Greenhouse effect

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) What are renewable resources? Describe briefly the exploitation of renewable resources. 3+7=10

OR

- (b) Explain sustainable water management. Also explain the overutilization of surface and groundwater. 4+6=10

2. (a) What is ecosystem? Discuss the structure and function of an ecosystem. 3+7=10

OR

- (b) Define energy flow in ecosystem. With the help of diagrams, explain different types of ecological pyramid. 2+8=10

3. (a) What are endemic species? Explain *in-situ* conservation and *ex-situ* conservation of biodiversity. 4+6=10

OR

- (b) Define biodiversity. Classify the hot spot of biodiversity in India. 3+7=10

4. (a) What is water pollution? Explain point source and non-point source of water pollution. 3+7=10

OR

- (b) What are the effective mitigation programmes in disaster management? Discuss the mitigation measures of earthquake. 4+6=10

5. (a) What is meant by population explosion? Explain the effect of population on sustainable development. 3+7=10

OR

- (b) What is shifting cultivation? Write the impacts on land degradation. 4+6=10

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : BCA-401 (OC)

(Object-oriented Programming in C++)

(Old Course)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10

(a) The process of building new classes from existing one is called

(i) encapsulation ()

(ii) inheritance ()

(iii) polymorphism ()

(iv) abstraction ()

(b) In C++, it allows compiler to insert arguments in a function call if it is not specified, it is

(i) pass by value ()

(ii) pass by address ()

(iii) default argument ()

(iv) default function ()

- (c) Which of the following functions is performed by a constructor?
- (i) Construct a new class ()
 - (ii) Construct a new object ()
 - (iii) Construct a new function ()
 - (iv) Initialize an object ()
- (d) Run-time polymorphism is done by
- (i) operator overloading ()
 - (ii) function overriding ()
 - (iii) static binding ()
 - (iv) function overloading ()
- (e) Which of the following operators cannot be overloaded?
- (i) :: ()
 - (ii) [] ()
 - (iii) ()
 - (iv) ~ ()
- (f) A function that is expanded in line when it is invoked is
- (i) 'called' function ()
 - (ii) function definition ()
 - (iii) inline function ()
 - (iv) macrodefinition ()
- (g) Which of the following is not the member of class?
- (i) Static function ()
 - (ii) Virtual function ()
 - (iii) Const function ()
 - (iv) Friend function ()
- (h) An exception is caused by
- (i) a compile time error ()
 - (ii) a run-time error ()
 - (iii) a logical/syntax error ()
 - (iv) a hardware problem ()

- (i) A destructor takes
 - (i) zero argument ()
 - (ii) one argument ()
 - (iii) two arguments ()
 - (iv) All of the above ()
- (j) A pure virtual function is declared by
 - (i) virtual void display () {0}; ()
 - (ii) virtual void display 0; ()
 - (iii) virtual void display (void) 0; ()
 - (iv) void display (void) 0; ()

- 2.** State whether the following statements are True (T) or False (F) by putting a Tick (✓) mark : 1×5=5
- (a) In C++, the operator >> is known as insertion operator. (T/F)
 - (b) When an exception is not caught, the program is aborted. (T/F)
 - (c) We can have virtual destructors but not virtual constructors. (T/F)
 - (d) A variable can have multiple references. (T/F)
 - (e) There are any numbers of instances of an abstract class can be created. (T/F)

SECTION—B

(Marks : 10)

Answer the following questions : 2×5=10

1. What do you mean by dynamic binding? How is it useful in OOP?
2. What is a stream? What are the C++ stream classes?
3. Explain about 'this' pointer.
4. What is function prototype? Give an example.
5. What is an abstract class? When do we make a class virtual?

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Write the characteristics of OOP. 4
(b) Explain the following terms : 6
(i) Namespace
(ii) Scope resolution operator (::)
(iii) Input and output operators

OR

- (c) Describe the major parts of a C++ program. 4
(d) Explain the basic concepts of object-oriented programming. 6
2. (a) Explain the concept of call by reference with a suitable example using class. 6
(b) Explain the storage classes in C++. 4

OR

- (c) Explain the concept of overloaded functions with an example. 6
(d) What is inline function? When will you make a function inline and why? 4
3. (a) What is a constructor? Explain with a suitable example. 1+5
(b) Differentiate between shallow copy and deep copy. 4

OR

- (c) What is operator overloading? Write the general form of an operator function. 1+4
(d) Write a CPP program to illustrate the use of copy constructors. 5
4. (a) What is destructor? Write any three characteristics of destructor. 1+3
(b) Write a program to show how the unary plus operator is overloaded. 6

OR

- (c) Explain different types of inheritance with diagram. 4
(d) Write a CPP program to illustrate the concept multiple inheritance. 6
5. (a) What is friend function? Explain with an example. 1+5
(b) Explain the concept of pointer to object with an example. 4

OR

- (c) What is a template? Write a program to explain function template. 1+5
(d) What is a file? Explain various file mode options in C++. 1+3

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(CBCS)

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : BCA-402

(Database Management Systems)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10

(a) Data are

(i) raw facts and figures ()

(ii) information ()

(iii) electronic representation of facts ()

(iv) All of the above ()

(b) The data model which describes how the data is actually stored is

(i) internal model () (ii) logical model ()

(iii) external model () (iv) All of the above ()

(c) One limitation of E-R model is that, it cannot

(i) use generalization ()

(ii) express relationship among relationship ()

(iii) use single primary key ()

(iv) All of the above ()

- (d) Complex entities can be constructed using which of the following operations?
- (i) Sum ()
 - (ii) Union ()
 - (iii) Aggregation ()
 - (iv) Collection ()
- (e) Which normal form is most desirable?
- (i) Domain key normal form (DKNF) ()
 - (ii) Boyce-Codd normal form (BCNF) ()
 - (iii) Third normal form (3 NF) ()
 - (iv) Fourth normal form (4 NF) ()
- (f) The operation of a relation X , produces Y , such that Y contains only selected attributes of X . Such an operation is
- (i) projection ()
 - (ii) intersection ()
 - (iii) union ()
 - (iv) difference ()
- (g) GRANT is a command from the SQL type
- (i) DDL ()
 - (ii) DML ()
 - (iii) DCL ()
 - (iv) All of the above ()
- (h) Universal quantifier of relational calculus can be implemented in SQL using the keyword
- (i) NOT EXISTS ()
 - (ii) EXISTS ()
 - (iii) FOR ALL ()
 - (iv) All of the above ()
- (i) Rollback of transaction is normally used to
- (i) recover from transaction failure ()
 - (ii) update the transaction ()
 - (iii) retrieve old records ()
 - (iv) repeat a transaction ()
- (j) Primary key of a table enforces which of the following entity constraints?
- (i) Domain ()
 - (ii) Referential ()
 - (iii) Both (i) and (ii) ()
 - (iv) Entity ()

2. Tick (✓) whether the following statements are *True (T)* or *False (F)* : 1×5=5

(a) Referential integrity constraint is enforced with the help of foreign keys.
(T / F)

(b) Aggregate functions are also known as column function.
(T / F)

(c) Tuple relational calculus is declarative and procedure oriented language.
(T / F)

(d) Every weak entity set can be converted into a strong entity set by adding appropriate attributes.
(T / F)

(e) The number of rows associated with the relations is called as the degree.
(T / F)

SECTION—B

(Marks : 10)

Answer the following questions :

2×5=10

1. What is data dictionary?
2. What is denormalization?
3. What is a role? What are its properties?
4. Differentiate between immediate update and deferred update.
5. What are the types of integrity constraints?

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) What is functional dependency? Explain with example. 5
- (b) What are the types of DBMS? 5

OR

- (c) What are the characteristics of data in database? 5

- (d) What are the different types of design constraints? 5
2. (a) What is an attribute? Explain the different types of attributes. 6
- (b) What are the degree and cardinality of a relationship? 4
- OR**
- (c) Explain, in detail, superclasses, subclasses and inheritance. 9
- (d) Define specialization in DBMS. 1
3. (a) Consider the relation :
 Teach (Name, Address, Course)
 Use standard query commands to do the following : 6
- (i) Print all the informations about teachers who are teaching the DBMS course.
- (ii) Print the names and addresses of those teachers who teach 'DBMS'.
- (iii) Select the teacher with name 'Kima' teaching 'MIS' course.
- (b) Explain natural join with example. 4
- OR**
- (c) What are the different types of relationships? 3
- (d) Explain in detail the two operations of relational algebra—union and intersection. 7
4. (a) What is cursor in SQL? What are its types? 4
- (b) Explain with example the statements used to handle cursors. 6
- OR**
- (c) Explain with diagram the three-schema architecture. 7
- (d) What is data independence? 3
5. (a) What are the ACID properties in a transaction? 4
- (b) Explain the different data security risks. 6
- OR**
- (c) What is a database privilege? What are its two categories? 4
- (d) What are the different types of database users? 6

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-402 (OC)

(System Analysis and Design)

(Old Course)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10
- (a) The components that make up any system, constitute a system
- (i) boundary ()
 - (ii) description ()
 - (iii) environment ()
 - (iv) communication ()
- (b) The agent of change and problem solver is called
- (i) system designer ()
 - (ii) communicator ()
 - (iii) system analyst ()
 - (iv) All of the above ()

- (c) 'Backup' refers to
- (i) delays in production of outputs ()
 - (ii) accumulations of programs in memory ()
 - (iii) job scheduling failures ()
 - (iv) None of the above ()
- (d) Online data entry is most suitable in
- (i) entering monthly journal entries ()
 - (ii) payroll master updation ()
 - (iii) processing payment of cheque in a bank ()
 - (iv) processing of monthly salary ()
- (e) A data model presents
- (i) all the types of data and their associations that are relevant to the system ()
 - (ii) a sample set of data ()
 - (iii) all facts related to the existing system ()
 - (iv) all the processes of the system along with the sequence in which they are executed ()
- (f) The first step in the SDLC is
- (i) preliminary investigation and analysis ()
 - (ii) system design ()
 - (iii) database design ()
 - (iv) Both (ii) and (iii) ()
- (g) Pseudocode is
- (i) false logic ()
 - (ii) programming aid ()
 - (iii) Both (i) and (ii) ()
 - (iv) Neither (i) nor (ii) ()
- (h) The way each component of a system functions with the other components of a system is called
- (i) integration ()
 - (ii) interaction ()
 - (iii) interdependence ()
 - (iv) dependence ()

- (i) Choose the odd one.
- (i) Decision tree expresses the logic of IF-THEN-ELSE in pictorial form. ()
 - (ii) Decision tree is useful to express the logic when a value of variable or an action is dependent on nested decision. ()
 - (iii) Decision tree forces analyst to consider the sequence of decision. ()
 - (iv) Decision tree for a complex system with many sequences of steps and combinations of conditions will be unmanageable. ()
- (j) Which of the following are the tools of structures System Analysis and Design?
- (i) HIPO ()
 - (ii) CASE ()
 - (iii) DFD ()
 - (iv) All of the above ()

2. State whether the following statements are True (T) or False (F) by putting a Tick (✓) mark : 1×5=5

- (a) Information is closed system. (T/F)
- (b) Hardware means the instructions or programs that instruct a computer on how to process data. (T/F)
- (c) The word 'system' is derived from the Greek word 'systema'. (T/F)
- (d) A system can be further divided into subsystem. (T/F)
- (e) Information means same as data. (T/F)

SECTION—B

(Marks : 10)

Answer the following questions : 2×5=10

1. What is decision tree?
2. Explain any two types of systems.
3. Differentiate between DFD and ER diagram.
4. Define Inventory/Stock system.
5. Explain Structured English.

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Define system. What are the characteristics of a system? 5
(b) Explain system models. What are different types of system models? 5

OR

- (c) Define system analyst. Explain the role of system analyst. 10
2. (a) What is structured analysis? Explain the elements of structured analysis with a neat diagram. 10

OR

- (b) What is SDLC? Explain various phases of SDLC. 10
3. (a) Explain the role of tools in systems development. 10

OR

- (b) Discuss about the categories of automated tools. 10
4. (a) What is HIPO? Discuss the purpose and its components. 5
(b) What is the purpose of system training? How do user and operator training differ? 5

OR

- (c) Explain about the design of software. 10
5. (a) Explain financial accounting system and payroll system. 10

OR

- (b) Explain library system and billing system. 10

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(CBCS)

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

(Computer Networking)

Paper No. : BCA 403

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10

(a) This network lets users send and receive data as if their devices were connected to the private network.

(i) Enterprise Private Network ()

(ii) System Area Network ()

(iii) Virtual Private Network ()

(iv) Storage Area Network ()

(b) It measures the relative strengths of two signals or one signal at two different points.

(i) Attenuation ()

(ii) Distortion ()

(iii) Noise ()

(iv) All of the above ()

(c) A static route which is set up and pre-established prior to initializing connections to the host, is

(i) Packet Switching ()

(ii) Circuit Switching ()

(iii) Multiplexing ()

(iv) Datagram Network ()

- (d) The process that converts signals, such as a sound picked up by a microphone into a digital signal is
- (i) digital-to-analog converter ()
 - (ii) wave division multiplexing ()
 - (iii) frequency division multiplexing ()
 - (iv) analog-to-digital converter ()
- (e) This sender sends a number of frames specified by a window size even without the need to wait for individual ACK from the receiver.
- (i) Stop-And-Wait ARQ ()
 - (ii) Go-Back-N ARQ ()
 - (iii) Selective Repeat ARQ ()
 - (iv) All of the above ()
- (f) Media Access Control (MAC) sub-layer is found in
- (i) session layer ()
 - (ii) datalink layer ()
 - (iii) application layer ()
 - (iv) network layer ()
- (g) An unreliable and connectionless protocol that requires little overhead and offers fast delivery is
- (i) TCP ()
 - (ii) PPP ()
 - (iii) UDP ()
 - (iv) POP ()
- (h) This protocol does not advertise routes. It advertises links.
- (i) Distance Vector Routing ()
 - (ii) RIP ()
 - (iii) ERP ()
 - (iv) Link State Routing ()
- (i) IEEE standard for Bluetooth and Wi-Fi coexistence mechanism is
- (i) IEEE 802.15.2 ()
 - (ii) IEEE 802.7 ()
 - (iii) IEEE 802 ()
 - (iv) IEEE 830 ()

(j) Bluetooth frequencies lie within what is referred to as the radio frequency region, specifically in the range of

(i) 3.12–5 GHz ()

(ii) 2.40–2.48 GHz ()

(iii) 7.5–8 GHz ()

(iv) 2.50–3 GHz ()

2. Tick (✓) whether the following statements are True (T) or False (F) : 1×5=5

(a) A repeater operates at the physical layer.

(T / F)

(b) A multiplexer is a device that takes a single input line and routes it to one of several digital output lines.

(T / F)

(c) A bit added to a string of binary code to ensure that the total number of 1-bit in the string is even or odd is called check bit.

(T / F)

(d) ICMP (Internet Control Message Protocol) is an error-reporting protocol network device.

(T / F)

(e) A standard network protocol used for the transfer of computer files between a client and server on a computer network is called TELNET.

(T / F)

SECTION—B

(Marks : 10)

Answer the following questions :

2×5=10

1. State the difference between Analog and Digital Signals.

2. What is Multiplexing?

3. What do you understand by checksum?

4. What do you mean by 'Flooding' in network routing algorithm?

5. Explain different protocols involved in e-mail.

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Explain the different models of OSI layer.

6

(b) Explain the different network connecting devices.

4

OR

- (c) Describe the different layers involved in TCP/IP protocol suit. 6
- (d) What is Network Address? What are the different types of Network Addresses? 4
2. (a) Explain the differences among ASK, FSK and PSK shift keys. 6
- (b) What is time division multiplexing? 4

OR

- (c) Explain circuit switching. State the advantages and disadvantages. 5
- (d) Explain datagram network. 5
3. (a) Explain the selective repeat ARQ protocol in detail. 5
- (b) Explain how Hamming distance is used in error detecting and correcting codes. 5

OR

- (c) Using CRC error checking, perform the operation where the divisor is 1011 and the dividend is 1001. Check whether there is any error in the code or not. 5
- (d) Explain Stop-And-Wait ARQ. Under which condition Go-Back-N is inferior to Stop-And-Wait protocol? 5
4. (a) What is IP address? Explain the different classes of IP address. 5
- (b) Explain the workings of Link State Routing with suitable diagram. 5

OR

- (c) Distinguish between IPv4 and IPv6. 4
- (d) Explain the connection establishment and termination process in TCP. 6
5. (a) Explain the different features of TCP/IP application layer. 4
- (b) Explain the following : 2×3=6
- (i) DNS
- (ii) FTP
- (iii) WLAN

OR

- (c) What is Ethernet? Compare and write the differences between 100 Base-T and Gigabit Ethernet. 5
- (d) Write down the architecture layer of Bluetooth. 5

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : BCA-403 (OC)

(UNIX and Shell Programming)

(Old Course)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10

(a) After you have entered text in your file, to save and quit editing mode you will use

(i) Shift ZZ () (ii) Esc Shift YY ()

(iii) Esc :wq () (iv) Exit ()

(b) The directory containing all device files is

(i) /etc () (ii) /temp ()

(iii) /dev () (iv) /usr/bin ()

(c) If the file needs to be executed only by the user, the expression required is

(i) chmod u+x () (ii) chmod a+x ()

(iii) chmod h+r () (iv) chmod i+j ()

- (d) The command 'comm' performs
- (i) comparing two files ()
 - (ii) compressing file ()
 - (iii) copying file ()
 - (iv) communication ()
- (e) The df command reports
- (i) amount of free space available ()
 - (ii) the difference of two files ()
 - (iii) defragmentation ()
 - (iv) current time ()
- (f) The exit command with a value 0 is used when
- (i) something went wrong ()
 - (ii) everything went fine ()
 - (iii) debugging ()
 - (iv) in execution ()
- (g) The output redirection operator is
- (i) < ()
 - (ii) <= ()
 - (iii) > ()
 - (iv) >= ()
- (h) Which command is used to remove a file?
- (i) remove ()
 - (ii) rm ()
 - (iii) mv ()
 - (iv) del ()
- (i) To count the line, word and character in a file, we use
- (i) wc ()
 - (ii) lwc ()
 - (iii) count ()
 - (iv) wlc ()
- (j) The command which is used for text-based calculator is
- (i) bc ()
 - (ii) calc ()
 - (iii) cb ()
 - (iv) xcalc ()

2. State whether the following statements are *True* or *False* by putting a Tick (✓) mark in the brackets provided : 1×5=5

(a) Head is the command used to display the top of the file.

True () / *False* ()

(b) The while loop gets executed so long as the exit status of the test command is 1.

True () / *False* ()

(c) The command ps is used to display the characteristics of UNIX.

True () / *False* ()

(d) The /dev/null does not add any space in the hard disk.

True () / *False* ()

(e) The kernel interacts with the machine's hardware and the shell with the user.

True () / *False* ()

SECTION—B

(Marks : 10)

Answer the following questions : 2×5=10

- 1.** What are internal and external commands? Give one example each.
- 2.** What is the purpose of system calls?
- 3.** What do you mean by access permission?
- 4.** What is the function of eval?
- 5.** What are the privileges of superuser?

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Explain the parent-child relationship with a suitable diagram. 4
(b) Explain the following commands with example : 6

(i) cp (ii) echo (iii) who

OR

- (c) Describe the architecture of UNIX system with a suitable diagram. 10
2. (a) Explain each column of the output of ls-l command. 10

OR

- (b) Briefly explain the three modes of vi editor. 10
3. (a) Describe the mechanism of process creation. 10

OR

- (b) What are the activities performed by the shell in its interpretive cycle? 6
(c) Write a short note on /dev/tty and pipe. 2+2=4

4. (a) Briefly explain the following filters : 2×5=10

(i) Pr (ii) head
(iii) tail (iv) sort
(v) tr

OR

- (b) Mention the usage of any four options of grep command with example. 10
5. (a) What are the three types of UNIX file system? 10

OR

- (b) How do you handle a signal with trap in shell programming? 4
(c) How does while and for loop function in shell programming? 3+3=6

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2 0 1 8

(CBCS)

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

(Software Engineering)

Paper No. : BCA-404

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10

(a) The waterfall model of software development is

- (i) a reasonable approach, when requirements are well-defined ()
- (ii) a good approach, when a working program is required quickly ()
- (iii) the best approach to use for projects with large development teams ()
- (iv) an old-fashioned model that is rarely used any more ()

(b) Prototyping aims at

- (i) end user understanding and approval ()
- (ii) program logic ()
- (iii) planning and dataflow organization ()
- (iv) product ()

(c) Which one of the following is not identified by SQA plan?

- (i) Evaluation to be performed ()
- (ii) End user's knowledge ()
- (iii) Procedure for error reporting and tracking ()
- (iv) Amount of feedback provided to the software project team ()

- (d) We can view the quality of a software product as having
- (i) better performance of hardware ()
 - (ii) error-free software ()
 - (iii) reusable software ()
 - (iv) quality software product ()
- (e) A module is said to have logical cohesion, if
- (i) it performs a set of tasks that relate to each other very loosely ()
 - (ii) all the functions of the module are executed within the same time span ()
 - (iii) all elements of the module perform similar operations, e.g., error handling, data input, data output, etc. ()
 - (iv) All of the above ()
- (f) If you were a lead developer of a software company and you are asked to submit a project/product within a stipulated time-frame with no cost barriers, which model would you select?
- (i) Waterfall ()
 - (ii) Spiral ()
 - (iii) RAD ()
 - (iv) Incremental ()
- (g) Which one of the following is not a requirement elicitation technique?
- (i) Interviews ()
 - (ii) Dataflow diagram ()
 - (iii) The use-case approach ()
 - (iv) FAST ()
- (h) Milestones are used to know the
- (i) cost of the project ()
 - (ii) user expectations ()
 - (iii) status of the project ()
 - (iv) None of the above ()
- (i) Effort is measured in terms of
- (i) rupees ()
 - (ii) person-months ()
 - (iii) persons ()
 - (iv) months ()
- (j) Which is not a software characteristic?
- (i) Software is always correct ()
 - (ii) Software does not wear out ()
 - (iii) Software is flexible ()
 - (iv) Software is not manufactured ()

2. Tick (✓) whether the following statements are *True (T)* or *False (F)* : 1×5=5

(a) Units and stubs are not needed for unit testing because the modules are tested independently of one another.

(T / F)

(b) System implementation should begin only after system acceptance.

(T / F)

(c) Project-risk factor is considered in prototyping model only.

(T / F)

(d) 'Lines of Code' (LOC) is used as estimation variable to size each element of the software.

(T / F)

(e) The goal of quality assurance is to provide management with the data needed to determine which software engineers are producing the most defects.

(T / F)

SECTION—B

(Marks : 10)

Answer the following questions :

2×5=10

1. What are software myths in software engineering?
2. What is meant by requirement analysis?
3. Define modularity. Why is it important?
4. Why do we need to estimate the size of a software?
5. What is meant by software reliability?

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Explain the waterfall model of software development with diagram. 5
- (b) Define software engineering. What are the characteristics of software in software engineering? 5
- OR**
- (c) Explain increment process model of software development with diagram. 5
- (d) Explain the spiral model in detail. 5
2. (a) Explain different types of requirement elicitation technique in detail. 10

OR

(b) What is requirement engineering? Explain its types. 5

(c) What is ER diagram? How is it useful in software requirement analysis? 5

3. (a) Explain the function-oriented design in detail. 5

(b) Differentiate between cohesion and coupling. 5

OR

(c) Explain the object-oriented design in software design. 5

(d) Explain in detail the hybrid design in software development. 5

4. (a) Explain the function count estimation in detail. 5

(b) What are the major risks that can be encountered in software development? 5

OR

(c) What is token count? How do we measure the size of a software using token count? 5

(d) Define software metrics. Explain the method of information flow metrics. 5

5. (a) Write a short note on system testing. 5

(b) What are the important factors that determine the quality of a software? 5

OR

(c) Write a short note on white box testing. 5

(d) Define software maintenance. Explain the software re-engineering method in detail. 5

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper : BCA-404 (OC)

(Networking—I)

(Old Course)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10

(a) Which topology requires a central controller or hub?

(i) Mesh ()

(ii) Star ()

(iii) Bus ()

(iv) Ring ()

(b) Transmission media are usually categorized as

(i) fixed or unfixed ()

(ii) guided or unguided ()

(iii) digital and analog ()

(iv) metallic or non-metallic ()

(c) Data signals can be

(i) analog only ()

(ii) digital only ()

(iii) both analog and digital ()

(iv) All of the above ()

(d) _____ is the set of techniques that allows the simultaneous transmission of multiple signals across a single data link.

- (i) Modulating () (ii) Compressing ()
(iii) Digitizing () (iv) Multiplexing ()

(e) ARQ stands for

- (i) Automatic Repeat Quantization ()
(ii) Automatic Repeat reQuest ()
(iii) Automatic Retransmission reQuest ()
(iv) Acknowledge Repeat reQuest ()

(f) The OSI model consists of _____ layers.

- (i) 2 () (ii) 3 ()
(iii) 5 () (iv) 7 ()

(g) _____ are used for cellular phone, satellite, and wireless LAN communications.

- (i) Radio waves () (ii) Infrared waves ()
(iii) Microwaves () (iv) Ultraviolet waves ()

(h) _____ is a type of transmission impairment in which the signal loses strength due to the resistance of the transmission medium.

- (i) Attenuation () (ii) Distortion ()
(iii) Noise () (iv) Decibel ()

(i) Which multiplexing technique transmits digital signals?

- (i) WDM () (ii) FDM ()
(iii) TDM () (iv) All of the above ()

(j) Which error detection method uses one's complement arithmetic?

- (i) Simple parity check ()
(ii) Two-dimensional parity check ()
(iii) CRC ()
(iv) Checksum ()

2. State whether the following statements are *True* or *False* by putting a Tick (✓) mark in the brackets provided : 1×5=5

(a) Communication between a computer and a keyboard is full-duplex transmission.

True () / *False* ()

(b) The most common twisted-pair cable used in communications is unshielded twisted-pair (UTP).

True () / False ()

(c) Increasing the levels of a signal increases the reliability of the system.

True () / False ()

(d) The simplest type of switching fabric is the crossbar switch.

True () / False ()

(e) HDLC is an acronym for high-level data link control.

True () / False ()

SECTION—B

(Marks : 10)

Answer the following questions :

2×5=10

1. Differentiate between half duplex and full duplex.
2. Give two advantages of optical fiber cable.
3. How is digital signal differing from analog signal?
4. What is virtual circuit network?
5. Define CRC.

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Explain the layers of TCP/IP protocol suite by giving suitable diagram. 5
- (b) What is protocol? Why do we need protocols and standards? 5

OR

- (c) Explain the different categories of networks giving a suitable diagram. 5
- (d) What is IP address? Define briefly the physical address, logical address, port address and specific address. 5
2. (a) What are infrared waves? Write their advantages and disadvantages. 5

- (b) Define twisted-pair cable. Explain the categories and applications of twisted-pair cables. 5

OR

- (c) Define microwaves. Write any three characteristics of microwaves. 2+3=5
- (d) Write the advantages and disadvantages of a fiber-optic cable. 5
3. (a) What is transmission impairment? What are the causes of transmission impairment? 5
- (b) Explain the pulse code modulation technique by giving a suitable diagram. 5

OR

- (c) Explain NRZ line coding scheme with suitable diagram. 5
- (d) Explain various methods for measuring the performance of a network. 5
4. (a) Explain frequency division multiplexing. How is it used in AM and FM radio broadcasting? 5
- (b) Describe with neat diagram, the multiplexing and demultiplexing processes of FDM. 5

OR

- (c) Write any five differences between circuit-switched network and datagram network. 5
- (d) Explain circuit switching. What are the different phases of circuit-switched network? 5
5. (a) Explain Go-Back-N ARQ method. 5
- (b) What is HDLC? Explain the different frame formats of HDLC. 5

OR

- (c) What are Hamming code and Hamming distance? Explain the process to determine the position of parity bits for 7-bit Hamming code. 2+2+6=10

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(CBCS)

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-405

(GUI Programming)

Full Marks : 75

Time : 3 hours

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—A

(Marks : 15)

1. Tick (✓) the correct answer in the brackets provided : 1×10=10

(a) Now() returns the current system

(i) date () (ii) time ()

(iii) date and time () (iv) year ()

(b) Correct order of precedence of an operators from higher to lower is

(i) (^), (, /), (<>, <, >,), (<<, >>) ()

(ii) (^), (<<, >>), (<>, <, >,), (, /) ()

(iii) (^), (, /), (<<, >>), (<>, <, >,) ()

(iv) (^), (<>, <, >,), (, /), (<<, >>) ()

- (c) What does IDE stand for?
- (i) Integrated Development Environment ()
 - (ii) Integrated Design Environment ()
 - (iii) Interior Development Environment ()
 - (iv) Interior Design Environment ()
- (d) ADO stands for
- (i) Active Data Object ()
 - (ii) ActiveX Data Object ()
 - (iii) Actual Data Object ()
 - (iv) Active Date Object ()
- (e) Which of the following is not a property of Timer?
- (i) Name ()
 - (ii) Enable ()
 - (iii) Interval ()
 - (iv) Time ()
- (f) The wrapping up of data and operations/functions (that operate on the data) into a single unit is known as
- (i) abstraction ()
 - (ii) polymorphism ()
 - (iii) encapsulation ()
 - (iv) inheritance ()
- (g) The Data Provider in ADO.NET does not include
- (i) connection ()
 - (ii) command ()
 - (iii) data table ()
 - (iv) All of the above ()
- (h) Which of the following is not the property of ASP.NET?
- (i) Easily works with ADO.NET using data-binding and page formatting features ()
 - (ii) Being language-dependent ()
 - (iii) Based on server side scripting technology ()
 - (iv) Easily works with ADO.NET using data-binding ()
- (i) _____ pop ups when a user clicks the right mouse button on a control or window.
- (i) Menu bar ()
 - (ii) Menu editor ()
 - (iii) PopUp menu ()
 - (iv) Context menu ()
- (j) The ASP.NET application codes can be written in which of the following languages?
- (i) C# ()
 - (ii) Jscript ()
 - (iii) Visual Basic.Net ()
 - (iv) All of the above ()

2. State whether the following statements are *True (T)* or *False (F)* by putting a Tick (✓) mark in the brackets provided : 1×5=5

- (a) The user can select one radio button in a group. (T / F)
- (b) ASP.NET works on the top of the HTTP protocol, and uses the HTTP commands. (T / F)
- (c) MSIL stands for Microsoft Integrated Language. (T / F)
- (d) Variable name must begin and end with a letter. (T / F)
- (e) The exit statement allows you to exit permanently from the block of statements in a control structure, from loop, or from procedure. (T / F)

SECTION—B

(Marks : 10)

Answer the following questions : 2×5=10

1. What is event driven programming?
2. Define constant variable. Give example.
3. Define methods and properties.
4. What is DataGridViewControl?
5. Define RequiredField Validator and Validation Summary.

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Define operator. Explain in detail the different types of operators with example. 7
 - (b) Define scope and lifetime of a variable. 3
- OR**
- (c) Differentiate between function and sub-procedure. 4
 - (d) Explain different components of Visual Studio 2010 IDE. 6

- 2. (a)** Write the properties and events of the following : 6
 (i) Combo box
 (ii) Text box
 (iii) Picture box
(b) What is exception? How do you handle exception in Visual Basic? 4

OR

- (c)** What is menustrip? Write the steps of creating menu in Window application. 5
(d) Define forms. Write the properties and events of form. 5
3. (a) Define access modifier. Explain the different types of access modifier in VB.NET. 4
(b) Differentiate between overloading and overriding in an object-oriented programming concept. 6

OR

- (c)** Define constructor in VB.NET. Explain with example. 4
(d) Define the concept of inheritance and polymorphism in detail. 6
4. (a) Explain different types of ADO.NET connection object. 6
(b) How do you bind data to a text box control? 4

OR

- (c)** Explain the following : 6
 (i) Data set
 (ii) Data view
 (iii) Data adapter
(d) Explain the two types of ADO.NET command object. 4
5. (a) Explain different application pieces in ASP.NET pages. 5
(b) Describe the step-by-step deployment of a window application. 5

OR

- (c)** Explain global.asa and web.config website files. 4
(b) Using Gridview, how do you build a data driven webform? 6

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-406 (OC)

(UNIX and Shell Programming)

(Practical)

(Old Course)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

SECTION—A

Answer *any two* questions

1. Write a program to calculate the sum of five-digit numbers. 15
2. Write a shell script which displays information about a given file in proper format. 15
3. Write a shell script which displays a list of all files in the current directory to which you have read, write and execute permission. 15

SECTION—B

Answer *any* **one** question

4. Write a shell script if an argument is one display it in bold, if it is two display it in underline, if it is three display it in blinking. 20
5. Write a script to search files containing PID as an extension and rename them such that they do not contain the extension. 20

SECTION—C

6. Viva voce. 15
7. Practical record book. 10

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