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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-401

(**Environment and Ecology**)*Full Marks : 75**Time : 3 hours*

(PART : B—DESCRIPTIVE)

(*Marks : 50*)*The figures in the margin indicate full marks for the questions*

1. (a) What are forest resources? Discuss the major causes of deforestation. 3+7=10

Or

- (b) Explain land resources. Define soil erosion. Write the various practices for preventing soil erosion. 3+3+4=10

2. (a) Explain ecosystem. What do you understand by the terms producers, consumers and decomposers? Give examples. 3+7=10

Or

- (b) What are ecological pyramids? Discuss energy flow and food chain in an ecosystem. 3+7=10

3. (a) Define biodiversity. Explain hot spots of biodiversity of India. 3+7=10

Or

- (b) What are endangered species? Explain *in situ* and *ex situ* conservation of biodiversity. 3+7=10

4. (a) What is air pollution? Explain the sources and effects of noise pollution. 3+7=10

Or

- (b) What is disaster management? Discuss the problem and control measures of landslides. 3+7=10

5. (a) Define sustainable development. What is rainwater harvesting? Explain the importance of rainwater harvesting. 2+2+6=10

Or

- (b) What is population explosion? Explain greenhouse effect and global warming. 3+7=10

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Booklet No. **A**

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Booklet No. B

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IV/BCA/401

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-401

(Environment and Ecology)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

- 1.** Choose the correct alternative by putting a Tick (✓) mark in the brackets provided : $1 \times 10 = 10$

(a) 5th June is observed as

(i) World Forest Day ()

(ii) World Environmental Day ()

(iii) World Wildlife Day ()

(iv) World Population Day ()

(2)

(b) Red Data Book provides data on

- (i) red-flower plants ()
- (ii) red-colored fishes ()
- (iii) list of plants and animals ()
- (iv) endangered plants and animals ()

(c) The organisms which feed on dead organism, waste of living organisms are called

- (i) chemotrophs ()
- (ii) carnivores ()
- (iii) detritivores ()
- (iv) decomposers ()

(d) Dissolved oxygen in water comes from

- (i) photosynthesis of aquatic plants ()
- (ii) atmosphere ()
- (iii) None of the above ()
- (iv) Both of the above ()

(3)

(e) The present world population has just crossed

(i) 5 billion ()

(ii) 6 billion ()

(iii) 7 billion ()

(iv) 8 billion ()

(f) During photosynthesis, trees produce

(i) oxygen ()

(ii) carbon dioxide ()

(iii) nitrogen ()

(iv) carbon monoxide ()

(g) The progressive accumulation of some non-biodegradable chemicals through the food chain is known as

(i) ecological balance ()

(ii) biological magnification ()

(iii) trophic structure ()

(iv) biodegradation ()

(4)

(h) Illegal killing of prohibited endangered animals is called

(i) poaching ()

(ii) habitat loss ()

(iii) conflicts ()

(iv) All of the above ()

(i) Industrial waste may contain toxic

(i) chemicals ()

(ii) phenols ()

(iii) acids ()

(iv) All of the above ()

(j) Which State in India has the lowest birthrate?

(i) Kerala ()

(ii) Bihar ()

(iii) Jammu and Kashmir ()

(iv) Himachal Pradesh ()

(5)

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

(a) Surface water is more in quantity than the groundwater.

(T / F)

(b) Pyramid of energy is always upright.

(T / F)

(c) Maximum global biodiversity is found in tropical rain forest.

(T / F)

(d) Groundwater is free of contamination.

(T / F)

(e) Total fertility rate and infant mortality rate are higher in developed countries.

(T / F)

(6)

SECTION—II

(Marks : 10)

3. Answer the following questions :

2×5=10

(a) What is desertification?

(7)

(b) Explain food chain.

(c) Explain endemic species.

(8)

(d) What do you mean by E-waste?

(9)

(e) Write a note on ozone layer depletion.

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-401(OC)

(Object-Oriented Programming in C++)

(Old Course)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. Answer the following questions :

- (a) Define OOP. Write the applications of OOP. 4
- (b) Define the following terms : 6
- (i) Data abstraction
 - (ii) Inheritance
 - (iii) Polymorphism

Or

- (c) Describe the basic structure of C++ program. 4
- (d) Write notes on the following : 6
- (i) Data types in C++
 - (ii) Token and Identifier
 - (iii) Object and Class

2. (a) Explain the concept of default arguments with an example. 5
- (b) Explain the concept of nesting of member functions with an example. 5

Or

- (c) Write a program to illustrate the use of static data member. 5
- (d) What is friend function? Explain with an example. 5

3. (a) What is parameterized constructor? Explain with an example. 6
- (b) Explain the concept of function overloading with an example. 4

Or

- (c) What is destructor? Write the characteristics of constructor. 4
- (d) Write a program to illustrate the use of objects as function arguments. 6

(3)

4. (a) What is copy constructor? Explain with an example. 5
- (b) Write a program to show how the unary minus operator is overloaded. 5

Or

- (c) Describe the syntax of multiple inheritances. When do we use such an inheritance? 4
- (d) Explain the concept of protected inheritance with an example. 6
5. (a) Why do we need virtual function? Explain with an example. 6
- (b) What is a file mode? Explain various file mode options in C++. 4

Or

- (c) What is an exception? How is it handled in C++? 5
- (d) Describe various classes available for file operations. 5

Subject Code : IV/BCA/401(OC)

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Booklet No. **A**

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2 0 1 7
(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-401(OC)

(Object-Oriented Programming in C++)

(Old Course)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

1. Choose the correct alternative by putting a Tick (✓) mark in the brackets provided : $1 \times 10 = 10$

(a) The function overloading is a part of

(i) encapsulation ()

(ii) inheritance ()

(iii) polymorphism ()

(iv) All of the above ()

(2)

(b) In C++, by default, the members of a class definition is

(i) private ()

(ii) public ()

(iii) void ()

(iv) None of the above ()

(c) The static member variables must be defined

(i) inside the class ()

(ii) outside the class ()

(iii) inside the main ()

(iv) All of the above ()

(d) Run-time polymorphism is done by

(i) function overloading ()

(ii) function overriding ()

(iii) static binding ()

(iv) operator overloading ()

(3)

(e) The operator >> is known as

- (i) insertion ()
- (ii) get from ()
- (iii) extraction ()
- (iv) Both (ii) and (iii) ()

(f) A function that is expanded in line when it is invoked is

- (i) called function ()
- (ii) calling function ()
- (iii) inline function ()
- (iv) macro definition ()

(g) Which of the following is not the member of class?

- (i) Static function ()
- (ii) Virtual function ()
- (iii) Const function ()
- (iv) Friend function ()

(4)

(h) The legal way to access a class data member using this pointer is

(i) (this).x ()

(ii) (this.x) ()

(iii) (this.x) ()

(iv) this.x ()

(i) A destructor takes

(i) zero argument ()

(ii) one argument ()

(iii) many arguments ()

(iv) All of the above ()

(j) Which of the following is the correct class of the object cout?

(i) istream ()

(ii) ostream ()

(iii) iostream ()

(iv) ifstream ()

(5)

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

(a) Like any other operator, new and delete can be overloaded.

(T / F)

(b) When an exception is not caught, the program is not aborted.

(T / F)

(c) We can have virtual constructors but not virtual destructors.

(T / F)

(d) In multiple inheritances, the constructors are executed in the order of inheritance.

(T / F)

(e) The overloading operator must have at least one operand that is of user-defined type.

(T / F)

(6)

SECTION—II

(Marks : 10)

3. Answer the following questions :

2×5=10

(a) What is inline function?

(7)

(b) Differentiate between C and C++ in two points.

(8)

(c) What is the importance of destructor?

(9)

(d) What is the need of dynamic initialization of objects?

(10)

(e) What is pure virtual function?

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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 : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) Explain the phases of System Development Life Cycle (SDLC). 6
- (b) Write a short note on decision table. 4
- Or*
- (c) What is DFD? Write the advantages of DFD. Explain the different symbols used in DFD. 2+3+5=10

2. (a) Explain fact-finding techniques in detail. What is decision tree? How is it different from a decision table? 6+2+2=10

Or

- (b) What is HIPO? Discuss the purpose and its component. 2+4=6
- (c) What is the purpose of system training? How do user and operator training differ? 4

3. (a) Discuss the different types of testing. 6
- (b) What is a form? Write three types of form design. 4

Or

- (c) What are the roles and responsibilities of a system analyst? What are the purposes and applications of CASE tools in system analysis and design? 5+5=10

4. (a) Draw DFD and data dictionary for a library system. 10

Or

- (b) Draw DFD and data dictionary for an inventory system. 10

(3)

5. (a) Describe the principles of system design. Discuss the elements of design. 5+5=10

Or

- (b) Elaborate the different system development strategies. 10

Subject Code : IV/BCA/402 (OC)

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-402(OC)

(System Analysis and Design)

(Old Course)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

I. Put a Tick (✓) mark against the correct answer in the brackets provided : 1×10=10

1. A set of components that interacts to accomplish some purpose is

- (a) system ()
- (b) structure design ()
- (c) decision rule ()
- (d) None of the above ()

(2)

2. Which of the following is not a fact-finding technique?

(a) Third party enquiry ()

(b) Interview ()

(c) Observation ()

(d) Questionnaire ()

3. Which one of the following is not an internal document?

(a) Code indentation ()

(b) Use of constant identifier ()

(c) Code structuring ()

(d) SRS ()

4. A data store in a DFD represents

(a) a sequential file ()

(b) a disk store ()

(c) a repository of data ()

(d) None of the above ()

(3)

5. _____ refers to the collection of information pertinent to systems project.
- (a) Data transfer ()
 - (b) Data gathering ()
 - (c) Both (a) and (b) ()
 - (d) None of the above ()
6. Which of the following is/are the level(s) of documentation?
- (a) Documentation for management ()
 - (b) Documentation for user ()
 - (c) Documentation for data processing department ()
 - (d) All of the above ()
7. _____ includes review of the existing procedure and information flow.
- (a) Feasibility study ()
 - (b) Feasibility report ()
 - (c) System design ()
 - (d) System analysis ()

(4)

8. A rectangle in a DFD represents

- (a) a process ()
- (b) data store ()
- (c) external entities ()
- (d) input ()

9. _____ system is no more than idea.

- (a) Conceptual ()
- (b) Logical ()
- (c) Physical ()
- (d) None of the above ()

10. In DFD, a circle represents

- (a) Input/Output ()
- (b) Function/Process ()
- (c) Database ()
- (d) None of the above ()

(5)

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

1. Types of maintenance include corrective,
adaptive, perfective.

(T / F)

2. Cost-benefit analysis is performed during
analysis phase.

(T / F)

3. Data dictionary documents system features.

(T / F)

4. Data cannot flow between two data stores.

(T / F)

5. Verification is also called beta testing.

(T / F)

(6)

III. Answer the following questions :

2×5=10

1. Give two differences between open system and close system.

(7)

2. What is data dictionary?

(8)

3. Discuss the different stages of payroll processing.

(9)

4. What is the importance of DFD in a library system?

(10)

5. What are the categories of information system?

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2017

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-402

(Database Management Systems)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) Describe the relational database model with the advantages and disadvantages. 10

Or

- (b) Explain logical and physical data independence and their importance in the database design. 6

- (c) Differentiate between type constraint and range constraint. 4

2. (a) What is generalization? Explain superclass and subclass entities with the help of diagram. 2+8=10

Or

- (b) Explain the entity relationship diagram conventions with the help of a neat sketch. 5

- (c) With the help of diagram, explain different concepts of a relationship. 5

3. (a) Define normal form. Discuss different types of normalization in DBMS. 2+8=10

Or

- (b) What are the main characteristics of functional dependencies? 6

- (c) Why is denormalization needed? 4

4. (a) What are different arithmetic operators in SQL? Explain with examples. 2+8=10

Or

- (b) Explain how views are created using an example. 6

- (c) Give the syntax of the UPDATE statement. Explain with an example. 4

(3)

5. (a) What is shadow paging? Explain how it is performed. 2+8=10

Or

- (b) What is the syntax of the GRANT command? Explain with some examples. 5
- (c) How are roles and privileges granted and revoked? 5

Subject Code : IV/BCA/402

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-402

(Database Management Systems)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

1. Choose the correct answer by putting a Tick (✓) mark in the brackets provided : 1×10=10

(a) A collection of data to be used by different people is called

- (i) DBMS ()
- (ii) RDBMS ()
- (iii) Database ()
- (iv) All of the above ()

(b) Which database level is the one closest to the physical storage?

- (i) External ()
- (ii) Internal ()
- (iii) Conceptual ()
- (iv) All of the above ()

(2)

(c) Which model combines the connectivity and cardinality information in a single symbol?

(i) Crow's foot ()

(ii) Rein85 ()

(iii) INDEFIX ()

(iv) IDEF1 ()

(d) Which of the following is a bottom-up approach?

(i) Specialization ()

(ii) Categorization ()

(iii) Participation ()

(iv) Generalization ()

(e) The tuple relational calculus is based on specific number of

(i) existential quantifier ()

(ii) universal quantifier ()

(iii) domain variables ()

(iv) tuple variables ()

(f) Degree of a table means the number of _____ in a table.

(i) rows ()

(ii) columns ()

(iii) domain ()

(iv) table ()

(g) Primary key and foreign key specification can be added to or removed from a table using the _____ statement.

- (i) SELECT ()
- (ii) UPDATE ()
- (iii) ALTER TABLE ()
- (iv) DROP ()

(h) Which of the following is not a data definition language statement?

- (i) ALTER ()
- (ii) DELETE ()
- (iii) DROP ()
- (iv) CREATE ()

(i) Which of the following is not a transaction management SQL command?

- (i) SELECT ()
- (ii) COMMIT ()
- (iii) ROLLBACK ()
- (iv) SAVEPOINT ()

(j) Which of the following is a volatile storage media?

- (i) Magnetic disk ()
- (ii) Optical disk ()
- (iii) Magnetic tape ()
- (iv) Main memory ()

(4)

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

(a) The primary key value of each row in a table need not be unique.

(T / F)

(b) The GROUP BY clause is usually used with aggregate functions like SUM, AVG, MAX, MIN, etc.

(T / F)

(c) Relational algebra is not a procedural language.

(T / F)

(d) Simple attributes can be further subdivided.

(T / F)

(e) The conceptual model is dependent on both software and hardware.

(T / F)

(5)

3. Answer the following questions : 2×5=10

(a) Differentiate between IN and BETWEEN clauses.

(6)

(b) What is project operation? Give an example.

(7)

(c) Why are backups important?

(8)

(d) What is entity integrity?

(9)

(e) What are the advantages of Database Management Systems?

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-402 P

(Oracle Laboratory)

(Practical)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Consider the insurance database given below.
The primary keys are underlined and the data types are specified :

PERSON (driver_id : string, name : string, address : string)
CAR (Regno : string, model : string, year : int)
ACCIDENT (report_number : int, date : date, location : string)
OWNS (driver_id : string, regno : string)
PARTICIPATED (driver_id : string, regno : string, report_number : int, damage_amount : int)

- (a) Create the above tables by properly specifying the primary keys and the foreign keys. 4
- (b) Enter at least five tuples for each relation. 4

- (c) Demonstrate the following : 6
- (i) Update the damage amount for the car with a specific regno in accident with report number 12 to 25000
- (ii) Add a new accident to the database
- (d) Find the total number of people who owned cars that were involved in accidents in 2002. 3
- (e) Find the number of accidents in which cars belonging to a specific model were involved. 3
- (f) Create a VIEW called OWNERSHIP that will show the following : 5
- Driver name, address, registration and location

OR

2. Consider the following relations for an order processing database applications in a company :

CUSTOMER (cust : int, cname : string, city : string)
ORDER (order : int, odate : date, cust : int, ord_amt : int)
ORDER_ITEM (order : int, item : int, qty : int)
ITEM (item : int, unitprice : int)
SHIPMENT (order : int, warehouse : int, ship_date : date)
WAREHOUSE (warehouse : int, city : string)

- (a) Create the above tables by properly specifying the primary keys and the foreign keys. 4

(3)

- (b) Enter at least five tuples for each relation. 4
- (c) Produce a listing : CUSTNAME, # of orders, AVG_ORDER_AMT, where the middle column is the total number of orders by the customers and the last column is the average order amount for that customer. 4
- (d) List the order # for orders that were shipped from all warehouses that the company has in a specified city. 4
- (e) Demonstrate how you delete item # 10 from ITEM table and make the field null in the ORDER_ITEM table. 4
- (f) Create a VIEW called BIG ORDER which shows all orders larger than 2000. 5

3. Consider the following database of student enrollment in courses and books adopted for each course :

STUDENT (regno : string, name : string, major : string, bdate : date)
COURSE (course : int, cname : string, dept :string)
ENROLL (regno : string, course : int, marks : int)
BOOK_ADOPTION (course : int, sem : int, book_ISBN : int)
TEXT (book_ISBN : int, book_title : string, publisher : string, author : string)

- (a) Create the above tables by properly specifying the primary keys and foreign keys. 4
- (b) Enter five tuples for each relation. 4

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- (c) Produce a list of textbooks in alphabetical order for courses offered by BCA department that uses more than twobooks. 4
- (d) List any department that has all its adopted books published by a specific publisher. 4
- (e) List out student marks in ascending order. 4
- (f) Create a view Black Market that gives the count of number of publishers. 5

OR

4. Consider the following database for a banking enterprise :

BRANCH (branch_name : string, branch_city : string, asset : real)
ACCOUNT (accno : int, branch_name : string, balance : real)
DEPOSITOR (customer_name : string, accno : int)
CUSTOMER (customer_name : string, customer_street : string, city : string)
LOAN (loan_number : int, branch_name : string, loan_number : int)
BORROWER (customer_name : string, customer_street : string, city : string)

- (a) Create the above tables by properly specifying the primary and foreign keys. 4
- (b) Enter five tuples for each relation. 4
- (c) Find all the customers who have at least two accounts at the main branch. 4
- (d) Find all the customers who have an account at all the branches located in a specified city. 4

G7/471

(Continued)

(5)

- (e) Find the lowest and the highest balance in account table. 5
- (f) Create a VIEW called Personal Loan that shows customer name, account number and loan. 4
- 5. Viva voce. 15
- 6. Record book. 10

2 0 1 7

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-403 (OC)

(UNIX and Shell Programming)

(Old Course)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) Describe the architecture of UNIX system with suitable diagram. 10
- Or*
- (b) Explain the following commands with example : 10
- (i) cat
- (ii) mv
- (iii) mkdir

2. (a) What are the different modes in the vi editor? Explain each of them. 10

Or

- (b) Explain how to change basic file permission with example. 10

3. (a) Describe the mechanism of process creation. 10

Or

- (b) What are the differences between process state and zombies? 4

- (c) Write short notes on /dev/tty and pipe. 6

4. (a) What are the activities performed by the shell in its interpretive cycle? 10

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) Write a shell program to find the HRA, DA and net pay of an employee where the HRA is 12% of basic, DA is 110% of basic and net pay is the sum of HRA, DA and basic pay. 10

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-403 (OC)

(UNIX and Shell Programming)

(Old Course)

(PART : A—OBJECTIVE)

(Marks : 25)

*The figures in the margin indicate full marks
for the questions*

SECTION—I

(Marks : 15)

I. Put a Tick (✓) mark against the correct answer in the
brackets provided : 1×10=10

1. The logical operator symbol in shell
programming is

(a) ()

(b) \$! ()

(c) && ()

(d) \$& ()

(2)

2. The exit command with a value 0 is used

(a) when something went wrong ()

(b) when everything went fine ()

(c) in debugging ()

(d) in execution ()

3. The output redirection operator is

(a) ()

(b) ()

(c) ()

(d) ()

4. To count the line, word and character in a file,
we use

(a) wc ()

(b) lwc ()

(c) count ()

(d) wlc ()

(3)

5. The directory containing all device files is
- (a) /etc ()
 - (b) /dev ()
 - (c) /temp ()
 - (d) /usr/bin ()
6. What is the task of the UNIX operating system?
- (a) Provides a link between the system components and the applications ()
 - (b) Provides a link between the kernel and the applications ()
 - (c) Provides a link between the user and the applications ()
 - (d) Provides a link between the user and the system ()
7. Which of the following is used to display the directory attributes rather than its contents?
- (a) ls-l-d ()
 - (b) ls-l ()
 - (c) ls-x ()
 - (d) ls-f ()

(4)

8. The father of all processes is

(a) sh ()

(b) init ()

(c) root ()

(d) sched ()

9. Which command is used to remove a file?

(a) remove ()

(b) rm ()

(c) mv ()

(d) del ()

10. Which of the following commands is used to get directory one level up?

(a) cd.. ()

(b) cd ()

(c) cd/ ()

(d) chdir ()

(5)

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

1. The kernel interacts with the machine's hardware and the shell with the user.

(T / F)

2. The process cannot be changed by the user.

(T / F)

3. The dev/null does not add any space in the hard disk.

(T / F)

4. UNIX is a multiprogramming system.

(T / F)

5. If there are number of file systems, then each one will have its own boot block.

(T / F)

(6)

SECTION—II

(Marks : 10)

III. Answer the following questions :

2×5=10

1. What is extended regular expression?

(7)

2. What are internal and external commands? Give two examples for each.

(8)

3. What is the function of eval?

4. What are the privileges of superuser?

(9)

5. Mention four contents of inode.

2 0 1 7

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-403

(**Computer Networking**)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) What is topology? Explain different types of topology with diagram. 1+5=6
- (b) Define networking. Explain different components of network. 1+3=4
- Or*
- (c) Explain the four levels of addresses that are used in an Internet employing TCP/IP protocols. 4

- (d) What is transmission impairment? Explain the common types of transmission impairment in data communication with suitable diagram. 1+5=6

2. (a) What is multiplexing? Write the difference between frequency division multiplexing (FDM) and time division multiplexing (TDM). 1+5=6
- (b) Explain the propagation modes of fiber optic cable. 4

Or

- (c) What is circuit-switch network? Explain different phases involved in circuit switching with diagram. 1+3=4
- (d) Write notes on the following : 3+3=6
- (i) Radio waves
- (ii) Microwaves
3. (a) Explain the following : 2×5=10
- (i) Redundancy
- (ii) Checksum
- (iii) Humming code
- (iv) Cyclic redundancy check (CRC)
- (v) Parity check bit

(3)

Or

- (b) (i) Differentiate between error detection and error correction. 2+2=4
- (ii) Write two functions of data-link layer. 2
- (iii) What will be the humming distance of d(10101, 11110)? 2
- (iv) What will be the minimum humming distance of d(000, 011), d(001, 110), d(011, 100)? 2

4. (a) (i) What is IP address? Explain the difference between IPv4 and IPv6. 1+4=5
- (ii) Write the functions of transport layer. 5

Or

- (b) (i) Explain the three-way handshaking method of TCP for connection termination with diagram. 5
- (ii) Explain the distance vector routing with suitable diagram. 5

5. (a) Mention one area where you can find the use of HTTP. In what way HTTP is similar to FTP and SMTP? Explain the working mechanism of HTTP protocol. 1+2+3=6

(4)

- (b) What do you mean by FTP? Explain two types of FTP connections. 2+2=4

Or

- (c) What is wireless LAN? Explain the two promising wireless technologies for LANs. 1+6=7
- (d) What is Domain Name System? Briefly explain the generic domains and country domains by giving example. 1+2=3

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-403

(Computer Networking)

(PART : A—OBJECTIVE)

(Marks : 25)

*The figures in the margin indicate full marks
for the questions*

I. Put a Tick (✓) mark against the correct answer in the
brackets provided : 1×10=10

1. Which of the following is a framework for
defining standard for linking heterogeneous
computers in a network?

(a) ISO ()

(b) OSI ()

(c) TCP/IP ()

(d) All of the above ()

(2)

2. Which of the following is a connecting device in which it broadcasts data to every computer in a network?

(a) HUB ()

(b) Switch ()

(c) Router ()

(d) Gateway ()

3. Anything that can carry information from source to destination is

(a) guided medium ()

(b) unguided medium ()

(c) transmission medium ()

(d) twisted pair ()

4. In optical fiber, signal is transmitted in the form of

(a) electrical signal ()

(b) magnetic signal ()

(c) electromagnetic signal ()

(d) light signal ()

(3)

5. Data-link layer is responsible for moving frames from
- (a) node-to-node ()
 - (b) host-to-host ()
 - (c) application to transport layer ()
 - (d) None of the above ()
6. The mechanism to detect and retransmit damage or loss frames is
- (a) flow control ()
 - (b) error control ()
 - (c) humming distance ()
 - (d) humming code ()
7. In which of the following each node in the domain has the entire topology of the domain, the list of nodes and links, etc?
- (a) Distance vector routing ()
 - (b) Link-state routing ()
 - (c) Shortest path tree ()
 - (d) Flooding ()

8. The connection establishment procedure in TCP is susceptible to a serious security problem called

(a) denial of service attack ()

(b) SYN flooding attack ()

(c) FIN flooding attack ()

(d) ACK flooding attack ()

9. The well-known port number of HTTP is

(a) 20 ()

(b) 21 ()

(c) 61 ()

(d) 80 ()

10. Which of the following requires a unique user-name and password to access the FTP directory?

(a) Anonymous FTP ()

(b) Non-anonymous FTP ()

(c) Telnet ()

(d) None of the above ()

(5)

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

1. TCP and UDP are the protocols operating at the application layer.

True () *False* ()

2. Sine wave is defined by three characteristics—amplitude, frequency and phase.

True () *False* ()

3. ACK and NAK can flow in opposite direction for flow control and error control purposes.

True () *False* ()

4. Dissemination of link state packet (LSP) to every other node is called flooding.

True () *False* ()

5. IEEE Committee calls the gigabit ethernet under the name 802.3u.

True () *False* ()

(6)

III. Answer the following questions : 2×5=10

1. What is sine wave? Explain its characteristics.

(7)

2. Why do they twist the UTP cable?

(8)

3. What is stop-and-wait ARQ?

4. What are the services offered by TCP?

(9)

5. What is telnet?

2 0 1 7

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-404 (OC)

(**Networking—I**)

(Old Course)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) What is Networking? Explain the different components of Network. 1+5=6
- (b) Write four advantages of computer networking. 4
- Or*
- (c) What do you mean by Topology? Explain the different types of topologies by providing suitable diagram. 1+5=6
- (d) Explain the four levels of Addresses that are used in an Internet employing TCP/IP protocols. 4

2. (a) What is Guided Media? Explain with diagram the characteristics of twisted-pair cable. 2+4=6
- (b) Write four advantages of fiber-optic cable. 4

Or

- (c) Differentiate between Radiowaves and Microwaves. 2+2=4
- (d) Explain the propagation modes of fiber-optic cable. Write three disadvantages of fiber-optic cable. 3+3=6
3. (a) What is Sine Wave? Explain its characteristics by giving suitable diagram. 2+3=5

- (b) What do you mean by transmission impairment? Explain the different types of transmission impairment. 2+3=5

Or

- (c) What is the difference between Unipolar, Polar and Bipolar schemes of encoding with diagram? 5
- (d) What is digital-to-analog conversion? Bring out the difference between ASK, FSK and PSK. 5

(3)

4. (a) What is Multiplexing? Explain the processes of Frequency Division Multiplexing with a neat diagram. 2+4=6

(b) Write the differences between Pulse stuffing and Frame stuffing. 2+2=4

Or

(c) Explain Time Division multiplexing. Write the differences between Synchronous TDM and Statistical TDM. 2+4=6

(d) What is Circuit Switching? Explain the different phases that are involved in circuit switching. 1+3=4

5. (a) What are the functions of Data Link Layer? 4

(b) How are error control and error detection different? Discuss the role of hamming code and parity bit in checking error. 2+4=6

Or

(c) Write notes on the following : 5×2=10

(i) Cyclic Redundancy Check (CRC)

(ii) Stop-and-wait ARQ

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-404 (OC)

(Networking—I)

(Old Course)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

I. Tick (✓) the correct answer in the brackets provided :

1×10=10

1. It is a communication system that transmits data in both directions, but in only one direction at a time.

(a) Simplex ()

(b) Half-duplex ()

(c) Full-duplex ()

(d) All of the above ()

(2)

2. It is a standard that has not been approved by an organized body but has been adopted as a standard.

- (a) Protocol ()
- (b) De facto ()
- (c) De jure ()
- (d) None of the above ()

3. If the angle of incidence θ is less than the critical angle, the ray _____ and moves closer to the surface.

- (a) refracts ()
- (b) reflects ()
- (c) bends ()
- (d) None of the above ()

4. Which signal can penetrate walls

- (a) radiowave ()
- (b) microwave ()
- (c) infrared wave ()
- (d) All of the above ()

(3)

5. The number of bits per second that a channel can transmit is called

- (a) speed ()
- (b) jitter ()
- (c) bandwidth ()
- (d) throughput ()

6. A noise caused by a spike on the power lines, lightning, etc., is called

- (a) thermal noise ()
- (b) induced noise ()
- (c) crosstalk ()
- (d) impulse noise ()

7. Datagram network is normally done at

- (a) physical layer ()
- (b) data link layer ()
- (c) network layer ()
- (d) transport layer ()

(4)

8. It is an analog multiplexing technique in which multiple signals are combined for simultaneous transmission.

(a) FDM ()

(b) TDM ()

(c) CDM ()

(d) STDM ()

9. The hamming distance of $d(10101, 11110)$ is

(a) 1 ()

(b) 2 ()

(c) 3 ()

(d) 4 ()

10. It is an error-detecting method formed by adding data units using one's complement arithmetic and then complementing the result.

(a) CRC ()

(b) Checksum ()

(c) Parity bit ()

(d) One's complement ()

(5)

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

1. HUB is a connecting device more advanced over the SWITCH.

True () *False* ()

2. Infrared cannot be used outside the building because the sun's ray contains infrared.

True () *False* ()

3. The most common technique to change analog signal to digital data (digitization) is called Pulse Code Modulation.

True () *False* ()

4. A very common application of Time Division Multiplexing (TDM) is AM and FM radio broadcasting.

True () *False* ()

5. HDLC is byte-oriented protocol for communication over point-to-point and multipoint.

True () *False* ()

(6)

III. Answer the following questions :

2×5=10

1. What is Telnet?

(7)

2. Distinguish between OSI model and TCP/IP model.

3. What is Infrared?

(8)

4. How MODEM works in computer networking?

(9)

5. What do you mean by Datagram?

2 0 1 7

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-404

(**Software Engineering**)

Full Marks : 75

Time : 3 hours

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) Define the term 'software engineering'. State characteristics of a well-engineered software. Explain the classical life-cycle paradigm for software engineering. 5
- (b) What do you understand by build-and-fix model of a software development? Identify at least four major problems that would be faced if a larged product development work is undertaken using the build-and-fix model of software development. 5

Or

- (c) Increasing interest is being taken in the use of rapid application development. Why is this and are there any dangers associated with the RAD approach? 5
- (d) Define software process. What are the fundamental activities of a software process? 5

2. (a) Define the term 'feasibility study'. Explain requirement of three feasibility studies during software development. 5
- (b) What do you mean by the term Data Dictionary in the context of software analysis and specification? How is the data dictionary useful during software development and maintenance? 5

Or

- (c) What is the importance of properly documentation during the software development? Explain three commonly used requirement elicitation techniques for software analysis. 4
- (d) What is the importance of SRS? List the characteristics of a good quality SRS. What kind of information should an SRS include? 6

(3)

3. (a) How are cohesion and coupling related? Give an example of where cohesion increases and coupling decreases. 5
- (b) Differentiate between top-down and bottom-up approaches in respect to software design. 5

Or

- (c) Define three types of module cohesion and coupling with suitable examples. What problems arise if two modules have high coupling? 6
- (d) Differentiate between technical design and conceptual design. 4

4. (a) What are meant by measures and metrics? Explain the role of metrics in software engineering. 5
- (b) What are activities during the entail stage of software project planning? What are the difficulties faced in measuring the software costs? 5

Or

- (c) What is risk analysis? Explain three activities of risk assessment. 5
- (d) Discuss various types of COCOMO model and its phasewise effort distribution. 5

(4)

5. (a) Discuss the important objectives of testing software system. Do you agree with the statement, "System testing can be considered as a pure black-box test"? Justify your answer. 4
- (b) Explain the steps of software maintenance with the help of a diagram. 6

Or

- (c) Differentiate between the following (any two) : 5×2=10
- (i) Verification and Validation
- (ii) Reverse engineering and Re-engineering
- (iii) Functional testing and Integration testing

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(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-404

(Software Engineering)

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

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

(a) System specification is mainly concerned with

(i) how the functions are performed ()

(ii) what functions are to be performed ()

(iii) Both (i) and (ii) ()

(iv) None of the above ()

(b) Which one of the following is not internal document?

(i) Code indentation ()

(ii) Use of constant identifier ()

(iii) Code structuring ()

(iv) SRS ()

(2)

(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 quality of a software product as having

- (i) product operation ()
- (ii) product revision ()
- (iii) product transition ()
- (iv) All of the above ()

(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 ()

(3)

(f) Usability can be measured in terms of

- (i) intellectual skill to learn the system ()
- (ii) time required to become moderately efficient in system usage ()
- (iii) net increase in productivity ()
- (iv) All of the above ()

(g) Modular design of a system means

- (i) delivering a complex system to the customer one piece at a time ()
- (ii) divide the whole system into a number of units, each of which is quite cohesive within itself and is not too dependent on others, and to design and develop the units separately ()
- (iii) using models at its phase of system life cycle ()
- (iv) using subroutine libraries ()

(4)

(h) In object-oriented design

(i) operations and methods are identical ()

(ii) methods specify algorithms whereas operations only state what is to be done ()

(iii) methods do not change values of attributes ()

(iv) methods and constructors are same ()

(i) Find the odd one out :

(i) Interview ()

(ii) Examination ()

(iii) Record review ()

(iv) Observation ()

(j) Which of the following does not affect the software quality and organizational performance?

(i) Market ()

(ii) Product ()

(iii) Technology ()

(iv) People ()

(5)

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

(a) In bottom-up testing, each subsystem is tested separately and then the full system is tested.

True () *False* ()

(b) The most fundamental calculation in the COCOMO model is the use of the effort equation to estimate the number of Person-Months required to develop a project.

True () *False* ()

(c) Lines of Code (LOC) is used as estimation variable to size each element of the software. It requires considerable level of detail.

True () *False* ()

(d) Quality assurance is the activity that leads to 'fitness of purpose'.

True () *False* ()

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

True () *False* ()

(6)

SECTION—II

(Marks : 10)

3. Answer the following questions : 2×5=10

(a) What problems may be encountered when top-down integration is chosen?

(7)

- (b) How might the completion times and costs be estimated for a new software engineering contract?

(8)

- (c) Briefly explain how algorithmic cost can be used for estimating software cost.

(9)

- (d) Which of the software engineering paradigms would be most effective for a developing customized software of a small organization and why? State your own opinion.

(10)

(e) What are different measures for measuring software quality?

2 0 1 7

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-405 (OC)

(**Object-Oriented Programming in C++**)

(**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 C++ program that demonstrates the use of static data member. 15
2. Write a C++ program of swapping private data members belonging to two different classes. 15

3. Write a C++ program to demonstrate the use of a copy constructor. 15

SECTION—B

Answer *any one* question

4. Write a C++ program which explains the concept of run-time polymorphism. 20
5. Write a C++ program to write and read from a file. 20

SECTION—C

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

2 0 1 7

(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-405

**[Graphical User Interface Programming
(Visual Basic)]***Full Marks : 75**Time : 3 hours*

(PART : B—DESCRIPTIVE)

(Marks : 50)

*The figures in the margin indicate full marks
for the questions*

1. (a) Explain the salient features of Visual Basic. 5
- (b) Explain how to create an ASP.NET Web page using suitable example. 5
- Or*
- (c) What are different data types in Visual Basic? Explain with suitable example how to declare different variables in VB. 5
- (d) Explain thin-client architecture and server side processing. 5

2. (a) Define Dialog boxes. Write the uses and properties of FontDialog box and ColorDialog box with suitable example. 5
- (b) Define Class and Object. Create a simple program to demonstrate the use of Class and Object. 5

Or

- (c) What are syntax error and logical error in GUI programming? Write down how to handle exception. 5
- (d) What are public and private access modifiers? Give a suitable example to demonstrate the difference between them. 5
3. (a) What do you mean by ADO? Explain how to connect database using ADO in VB. 5
- (b) What are branching and looping control statements in VB? Write the syntax of the following control structures with suitable example : 5
- (i) Select Case...End Select
- (ii) If...Then...Else Statements

Or

- (c) Define Web form and Windows form with their advantages and disadvantages. 5
- (d) Explain how to connect MS-Access database in VB with suitable example. 5

(3)

4. (a) What is OOP? Explain the different characteristics of OOP. 5
- (b) What is report? Explain with example how to create report using Report wizard. 5

Or

- (c) Write the function of the following commonly used controls with simple example : 10
- (i) CheckBox
 - (ii) DateTimePicker
 - (iii) StatusBar
 - (iv) TextBox
 - (v) RadioButton

5. (a) Explain the following access modifiers with simple example : 4
- (i) Imports statement
 - (ii) Name space
- (b) What is form in GUI programming? Design a suitable form to demonstrate the uses of different form components like TextBox, Label, Button, ListBox. 2+4=6

(4)

Or

- (c) Define DataSet and DataReader. 4
- (d) Explain the following : 6
- (i) Common Language Runtime
 - (ii) Common Type System
 - (iii) Common Language Specification

Subject Code : IV/BCA/405

.....

Booklet No. A

Date Stamp

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To be filled in by the Candidate

DEGREE 4th Semester
(Arts / Science / Commerce /
.....) Exam., **2017**
Subject
Paper

To be filled in by the Candidate

DEGREE 4th Semester
(Arts / Science / Commerce /
.....) Exam., **2017**
Roll No.
Regn. No.
Subject
Paper
Descriptive Type
Booklet No. B

INSTRUCTIONS TO CANDIDATES

- 1. **The Booklet No. of this script should be quoted in the answer script meant for descriptive type questions and vice versa.**
- 2. **This paper should be ANSWERED FIRST and submitted within 1 (one) Hour of the commencement of the Examination.**
- 3. **While answering the questions of this booklet, any cutting, erasing, overwriting or furnishing more than one answer is prohibited. Any rough work, if required, should be done only on the main Answer Book. Instructions given in each question should be followed for answering that question only.**

*Signature of
Scrutiniser(s)*

*Signature of
Examiner(s)*

*Signature of
Invigilator(s)*

2 0 1 7
(4th Semester)

BACHELOR OF COMPUTER APPLICATIONS

Paper No. : BCA-405

[Graphical User Interface Programming (Visual Basic)]

(PART : A—OBJECTIVE)

(Marks : 25)

The figures in the margin indicate full marks for the questions

SECTION—I

(Marks : 15)

I. Choose the correct answer by putting a Tick (✓) mark
in the brackets provided : 1×10=10

1. A GUI

- (a) uses buttons, menus and icons ()
- (b) should not be too easy for a user to
manipulate ()
- (c) stands for Graphic Use Interaction ()
- (d) stands for Graphic Use Internet ()

(2)

2. What does IDE stand for?
- (a) Interior Design Environment ()
 - (b) Integrated Design Environment ()
 - (c) Interior Development Environment ()
 - (d) Integrated Development Environment ()
3. Which is not a main component of the Visual Studio IDE?
- (a) Solution Explorer ()
 - (b) Toolbox ()
 - (c) Start Menu ()
 - (d) Properties Window ()
4. Which database is the ADO.NET SqlConnection object designed for?
- (a) Access ()
 - (b) Microsoft SQL Server ()
 - (c) MySQL ()
 - (d) Oracle ()
5. Which is a valid statement for declaring a variable?
- (a) Const Form As Integer ()
 - (b) Const myForm As Integer ()
 - (c) Dim Form As Integer ()
 - (d) Dim myForm As Integer ()

(3)

6. Which selection process is an example of multiple branches from a single expression?
- (a) If...Then ()
 - (b) Select Case ()
 - (c) Do...Loop ()
 - (d) For...Next ()
7. A method in a class is
- (a) a subprocedure ()
 - (b) statement ()
 - (c) an event ()
 - (d) variable ()
8. What is the extension for a Visual Basic Web form code file?
- (a) .aspx.vb ()
 - (b) .asp ()
 - (c) .asp.vb ()
 - (d) .aspx ()
9. A constructor is a special type of
- (a) method ()
 - (b) field ()
 - (c) class ()
 - (d) property ()

(4)

10. Which HTML tag creates a link to another browser page?

(a) A href ()

(b) A ref ()

(c) An href ()

(d) An ref ()

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

1. A derived class inherits all of the properties of a base class.

(T / F)

2. Anything in VB.NET that has a property or method is an object.

(T / F)

3. Methods are used to represent actions.

(T / F)

4. Visual Basic is not used to create an ASP.NET code file.

(T / F)

5. The test expression of a Select Case evaluated only 1.

(T / F)

(5)

SECTION—II

(Marks : 10)

III. Answer the following questions :

2×5=10

1. What is FOR loop? Write its syntax.

(6)

2. What are methods and events?

(7)

3. What is the difference between DataColumnns and DataRows?

(8)

4. What is enumerator? Give suitable example.

(9)

5. What are the benefits of ASP.NET Web pages?

2 0 1 7

(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 determine whether the year is leap or not.
(Use the logical operators `-a` and `-o`) 15
2. Write a program to find the factorial value of a given number. 15

3. 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. 15

SECTION—B

Answer *any one* question

4. Write a shell script which receives two file names as an argument, checking whether the two file's contents are same or not. If same, the second file should be deleted. 20
5. Write a shell script to check whether the given argument is file or directory and display the number of lines if it is a file. 20

SECTION—C

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

★ ★ ★