GOVERNMENT OF KARNATAKA
KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD
II PU ANNUAL EXAMINATION – MARCH 2023
SCHEME OF VALUATION

SUBJECT : COMPUTER SCIENCE **SUBJECT CODE : 41**

	PART A **I. Select the correct answer from the choices given**	
1	_____ are used to connect external devices like printers, keyboards, scanners to the computer. **b. Port**	1M
2	Involution law states that **a. $\overline{\overline{X}}$ = X**	1M
3	_____ gate is also called an inverter. **c. NOT**	1M
4	_____ is the process of accessing each data item atleast once to perform some operation **a. Traversing**	1M
5	_____ operator is used to define member function outside the class **a. ::**	1M
6	Friend function is a _____ **b. Non-member function**	1M
7	_____ is a special function that is used to initialize the objects of a class automatically. **a. Constructor**	1M
8	Derived class is called _____ **a. Sub class**	1M
9	Which of the following is the correct way to declare a pointer? **a. int *ptr**	1M
10	Row in a table is called _____ **d. Tuple**	1M
11	_____ command is used to delete entire table in SQL **c. Drop**	1M
12	URL stands for _____ **b. Uniform Resource Locator**	1M
13	_____ is a device that connects dissimilar networks. **a. Gateway**	1M
14	_____ is a collection of computer networks all over the world **b. Internet**	1M
15	_____ is a collection of web pages. **d. Website**	1M
II	**Fill in the blanks choosing the appropriate word/words from those given in the brackets**	
16	The structure of data base is called as **Schema**	1M
17	**Diamond** is the symbol used to represent relationship in E-R diagram	1M
18	**Primary key** uniquely identifies each record in a table.	1M
19	Protection of data is the **Security**	1M
20	Data duplication is called as **Redundancy**	1M

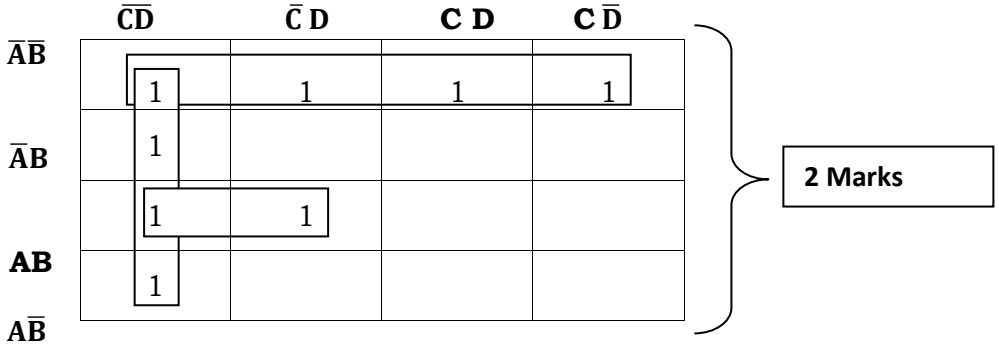
	PART B	
III	**Answer any FOUR questions. Each question caries 2 marks.**	
21	**Prove X + XY = X algebraically** = X + XY = X(1+Y) = X.1 = X	2M
22	**Define minterm and maxterm.** **Minterm :** Minterm is product of all the literals (with or without the bar) within the logic system. **Maxterm :** Maxterm is sum of all the literals (with or without the bar) within the logic system.	2M
23	**Give any two applications of OOP.** • Computer graphic applications • CAD/CAM software • User Interface design such as windows • Real-time systems • Simulation and modeling • Artificial intelligence and expert systems **any two applications, each carries one mark.**	2M
24	**Mention any two features of parametrized constructor.** • The parameterized constructors can be overloaded. • For an object created with one argument, constructor with only one argument is invoked and executed. • The parameterized constructor can have default arguments and default values • Can be used to initialize for more than one value **any two features, each carries one mark.**	2M
25	**Differentiate between read() and write() with respect to files.** **read() :** The read() member function belongs to the class ifstream and which is used to read binary data from a file. **write() :** The write() member function belongs to the class ofstream and which is used to write binary data to a file. **Or any suitable difference, each carries 1 mark.**	2M
26	**Define (a) Data (b) Information.** **Data :** Data is a collection of facts. **Information :** Information is processed data with meaning.	2M

	Or any suitable definition, each carries 1 mark	
27	**Give the syntax and example for UPDATE command is SQL**. **Syntax :** UPDATE table_name SET column1 = value1……..,columnN = valueN WHERE [condition]; Ex : UPDATE employee SET address = 'xxxxx' WHERE id = 6; **Syntax 1 mark, any suitable example 1 mark**	2M
28	**Briefly explain circuit switching technique.** In this technique, first the complete physical connection or dedicated path between two computers is established and then data are transmitted from the source computer to the destination computer. That is, when a computer places a telephone call, the switching equipment within the telephone system seeks out a physical copper path all the way from sender telephone to the receiver's telephone. **Or any 2 suitable points, each carries 1 mark.**	2M
	PART C	
IV	**Answer any four questions. Each question carries 3 marks.**	
29	**Explain cache memory** Cache memory is a high speed memory placed between RAM and CPU.- 1 mark L1 cache : 256 KB L2 cache : 6 MB L3 cache : 12 MB **Or any 3 suitable points, each carries 1 mark.**	3M
30	**What is principle of duality? Give an example** This states that starting with a Boolean relation another Boolean relation can be derived by • Changing each OR sign (+) to an AND sign (.) • Changing each AND sign (.) to an OR sign (+) • Changing each 0 by 1 and each 1 by 0 The derived relation using duality principle is called dual of original expression 0+0=0, 0+1=1, 1.1=1, 1.0=0 Any 2 points 2 marks, suitable example 1 mark	3M
31	**What is a stack? Write an algorithm for PUSH operation** It is a ordered collection of items, where addition and deletion of items takes place at the same end called top. Or any suitable definition – 1 mark Algorithm : Step 1 : If TOP = N-1 then PRINT "Stack is full" Exit End of if	3M

	Step 2 : TOP = TOP + 1 Step 3 : STACK[TOP] = ITEM Step 4 : Return algorithm 2 marks	

32	**What is an array of pointer? Give example**
	An array of pointers means that is a collection addresses. **1 mark**
	Ex : int *iptr[5]
	int i = 10, j = 20, k=30, l = 40 , m=50;
	iptr[0] = &I; *iptr[0] = 10;
	iptr[1] = &j; *iptr[1] =20 ;
	iptr[2] = &k; *iptr[2]=30 ;
	iptr[2] = &l; *iptr[2] = 40;
	iptr[4] = &m; *iptr[4] = 50;
	example 2 marks
		3M

33	**What is a file? Differentiate between text file and binary file** Files are used to store data or information permanently for future use. Or any suitable definition. **1 mark.** **Text File:** It is a file that stores information in ASCII characters seperated by delimeters. **1 mark** **Binary file:**It is file that contains information in the same format as it is held in the memory. **1 mark**	3M
34	**Explain any three features of database management system.** **Centralized data management:** The centralized nature of database system provides several advantages, which overcome the limitations of the conventional file processing system. These advantages are listed here. **Controlled data redundancy:** During database design, various files are integrated and each logical data item is stored at central location. This eliminates replicating(duplication) the data item in different files, and ensures consistency and saves the storage space. **Enforcing data integrity**: In database approach, enforcing data integrity in much easier. Data integrity refers to the validity of data and it can be compromised in a number of ways. **Or any three features** Each carries : 1 mark	3M
35	**Mention any three technologies and services used in e-commerce.** 1) Electronic Data interchange(EDI) 2) E-Mail 3) Electronic Fund Transfer(EFT) 4) Electronic Benefits Transfer(EBT) 5) Electronic Forms 6) Digital Cash 7) Interoperable database access 8) Bulletin Boards(BBs)	3M

	9) Electronic Banking(EB) 10) Bar coding 11) Security Services **Any three services Each carries 1 mark**	
36	**Give the features of DHTML** ➢ An object oriented view of a Web page and its elements ➢ Cascading style sheets and the layering of content ➢ Programming that can address all of most page elements ➢ Dynamic fonts **Any three points each carries 1 mark.**	3M
	PART – D	
V.	**Answer any SIX questions. Each question carries 5 marks.**	
37	**Given the Boolean function f(A. B. C. D) = Σ (0, 1, 2, 3, 4, 8, 12, 13). Reduce it by using K-map.**  Quad 1 → $\bar{A}\bar{B}$ Quad 2 → $\bar{C}\bar{D}$ Pair → $AB\bar{C}$ Reduced form: $\bar{A}\bar{B} + \bar{C}\bar{D} + AB\bar{C}$ **Correct expression 3 marks**	5M

38	**Write an algorithm to SORT elements of an array in ascending order using insertion sort method.**
	Step 1: FOR I = 1 to N-1 — 1 mark
	Step 2 : J = I — 1 mark
	While (J >= 1)
	If (A[J] < A[J-1]
	temp = A[J]
	A[J] = A[J-1]
	A[J-1] = temp — 3 marks
	If end
	J = J-1
	While end
	for end
	Step 3: Exit
		5M

39	**Explain the operations on queue data structure.** **queue()** Creates a new queue that is empty. **enqueue(item):** Adds a new item into the rear of queue. **dequeue()** Removes the front item from the queue. **isempty()** tests to see whether the queue is empty. **size()** Returns the number of items in the queue.	5M

	Each carries 1 mark	
40	**Mention any five advantages of object oriented programming.** ➢ The programs are modularized based on the principle of classes and objects. ➢ Linking code and object allows related objects to share common code. This reduces code duplication and code reusability. ➢ Data is encapsulated along with functions. Therefore external non-member function cannot access or modify data, thus providing data security. ➢ Easier to develop complex software, because complexity can be minimized through inheritance ➢ The concept of data abstraction separates object specification and object implementation ➢ Creation and implementation of OOP code is easy and reduces software development time. ➢ OOP can communicate through message passing which makes interface description with outside system very simple. **Any five advantages each carries 1 mark**	5M

41	**Explain member function outside class definition. Give an example.**
	A function declared as a member of a class is known as member function . Member functions declared within a class must be defined separately outside the class. The definition of member function is similar to normal function. But a member function has an identity label in the header. This label tells the complier which class the function belongs to. The scope of the member function is limited to the class mentioned in the header. Scope resolution operator :: is used to define the member function.
	Example:
	class operation
	{
	private:
	int a, b;
	public:
	int sum();
	};
	int operation::sum()
	{
	return(int y);
	}
	Any suitable explanation 2 marks. Suitable example 3 marks
		5M

42	**Mention the characteristics of friend function.** ➢ A friend function although not a member function has full access right to the private and protected members of the class.	5M

	➢ A friend function cannot be called using the object of that class. It can be invoked like any normal function. ➢ Friend function is declared by the class that is granting access. The friend declaration can be placed anywhere in the class definition. It is not affected by the access control keywords (public, private and protected) ➢ They are normal external functions that are given special access privileges. ➢ It cannot access the member variables directly and has to use an object name member name (Here, is a membership operator). ➢ The function is declared with keyword friend. But while defining friend function it does not use either keyword friend or :: operator. **Any suitable 5 points 5 marks**	

43	**Define destructor. Explain with syntax and example.**
	Destructor is a special member function. It will be called automatically when an object is destroyed. It will have, like constructor, the name same as that of the class but preceded by a tilde(~)
	
	Syntax:
	class classname
	{
	private:
	//data variable
	// method
	public:
	classname(); //constructor
	~classname(); //destructor
	}
	Example:
	class counter
	{
	private:
	int counter
	public:
	counter() //constructor
	{
	counter = 0;
	}
	~counter() //Destructor
	{ }
	};
	Any suitable definition 1 mark, syntax 2 marks, example 2 marks.
		5M

44	**Mention the advantages of inheritance.** 1) Reusing existing code 2) Faster development time 3) Easy to maintain 4) Easy to extend 5) Memory utilization	5M

	Each point carries 1 mark.	
45	**Explain data processing cycle.** **Data Input:** Input data is put into the computer using suitable input device in computer understandable form. **Data processing:** The process of series of operations from the input data to generate outputs. Some of the operations are classifications, calculations, sorting, indexing, accessing, extracting etc. **Storage:** Data and information not currently being used must be stored so it can be accessed later. **Output:** The results obtained after processing the data must be presented to the user in user understandable form. **Communication:** Data is sent through wired or wireless connections. **Any suitable five points each carries 1 mark.**	5M
46	**Explain the following with an example** **a) COUNT( ) b) MAX ( ) c) MIN () d) AVG () e) SUM()** a) **COUNT():** This function returns the number of rows in the table Example: SELECT COUNT(*) FROM employee; b) **MAX():** This function is used to get the maximum value from a column Example: SELECT MAX(salary) FROM employee; c) **MIN():** This function is used to get the minimum value from a column. Example: SELECT MIN(salary) FROM employee; d) **AVG:** This function is used to get the average value of a numeric column Example: SELECT AVG(salary) FROM employee; e) **SUM():** This function is used to get the sum value of a numeric column Example: SELECT SUM(salary) FROM employee; **Any suitable definition or example each carries 1 mark.**	5M
47	**Explain Computer network security in detail.** Network security is to make sure that only legal or authorized user and programs gain access to information resources. Protection methods 1) **Authorization:** Authorisation is performed by asking the user a legal login ID. 2) **Authentication :** It involves accepting credentials from the entity and validating them against an authority. 3) **Encrypted smart cards:** It is a hand held smart card that can generate a token that a computer system can recognize. 4) **Biometric system:** It involves some unique aspects of a person's body such as finger prints, retinal patterns, etc. to establish his or her identity. 5) **Firewall:** A system designed to prevent unauthorized access to or from a private network is called firewall. **Or any five suitable points each carries 1 mark.**	5M

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