

Professional Course Examination, 2020

(2nd Semester)

BACHELOR OF COMPUTER APPLICATIONS

(Programming Language Through C)

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)

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

1×10=10

1. How many main () functions we can have in any program?

(a) 1 ()

(b) 2 ()

(c) No limit ()

(d) Depends on compiler ()

6. Value of static storage variable
- (a) changes during different function calls ()
 - (b) persists between different function calls ()
 - (c) increase during different function calls ()
 - (d) decrease during different function calls ()
7. Which of the following is the correct syntax to send an array as a parameter to function?
- (a) func (*array) ()
 - (b) func (array[size]) ()
 - (c) func (&array) ()
 - (d) func (#array) ()
8. Which of the following is correct about the program?
- (a) j is pointer to an int and stores address of i ()
 - (b) j and i are pointers to an int ()
 - (c) i is a pointer to an int and stores address of j ()
 - (d) j is a pointer to pointer to an int and stores address of i ()
9. Which of the following operations is illegal in structure?
- (a) Pointer to a variable of the same structure ()
 - (b) Dynamic allocation of memory for structure ()
 - (c) Typecasting of structure ()
 - (d) Both (a) and (b) ()
10. Choose the right statement for fscanf () and scanf () :
- (a) fscanf () can read from standard input whereas scanf () specifies a stream from which to read ()
 - (b) fscanf () can specifies a stream from which to read whereas scanf () can read only from standard input ()
 - (c) fscanf () and scanf () has no difference in their functions ()
 - (d) fscanf () and scanf () can read from specified stream ()

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

1. Algorithm is the graphical representation of logic. (T / F)
2. It is necessary that a loop counter must only be an integer. It cannot be a float. (T / F)
3. In case of conflict between the names of a local and global variable, global variable is given a priority. (T / F)
4. There are chances of wastage of memory space if elements inserted in an array are lesser than the allocated size. (T / F)
5. In structure, there is separate memory location for each member but union share the same memory. (T / F)

SECTION—B

(Marks : 10)

Answer the following questions :

2×5=10

1. What are local and global variables?
2. Write and explain the general format of loop.
3. What is the difference between actual parameter and formal parameter?
4. Write a short note on multidimensional array.
5. What is the use of nested structure?

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Explain the structure of C program. 6
(b) What are the different data types in C? 4
- OR**
- (c) What are arithmetic, relational and assignment operators? 6
(d) Explain unformatted input/output function in C. 4
2. (a) Explain the working of break and continue with an example. 5
(b) Write the general syntax of else...if ladder. Explain with an example. 5
- OR**
- (c) Explain while loop and do...while loop. Mention its differences. 5
(d) Write a program to print the first n th Fibonacci series using 'for' loop. 5
3. (a) Explain call by value with appropriate program. 4
(b) What is recursive function? Write a program to calculate factorial of a given number by using recursive function. 6
- OR**
- (c) Discuss the different categories of user define functions. Illustrate with example. 10
4. (a) Write the syntax of two-dimensional arrays. How do you declare and initialize in array? 4
(b) Write a C program to find the addition of two matrices. 6
- OR**
- (c) What are the uses of pointer? How do you declare and initialize a pointer? 5
(d) Explain an array of pointer with appropriate example. 5

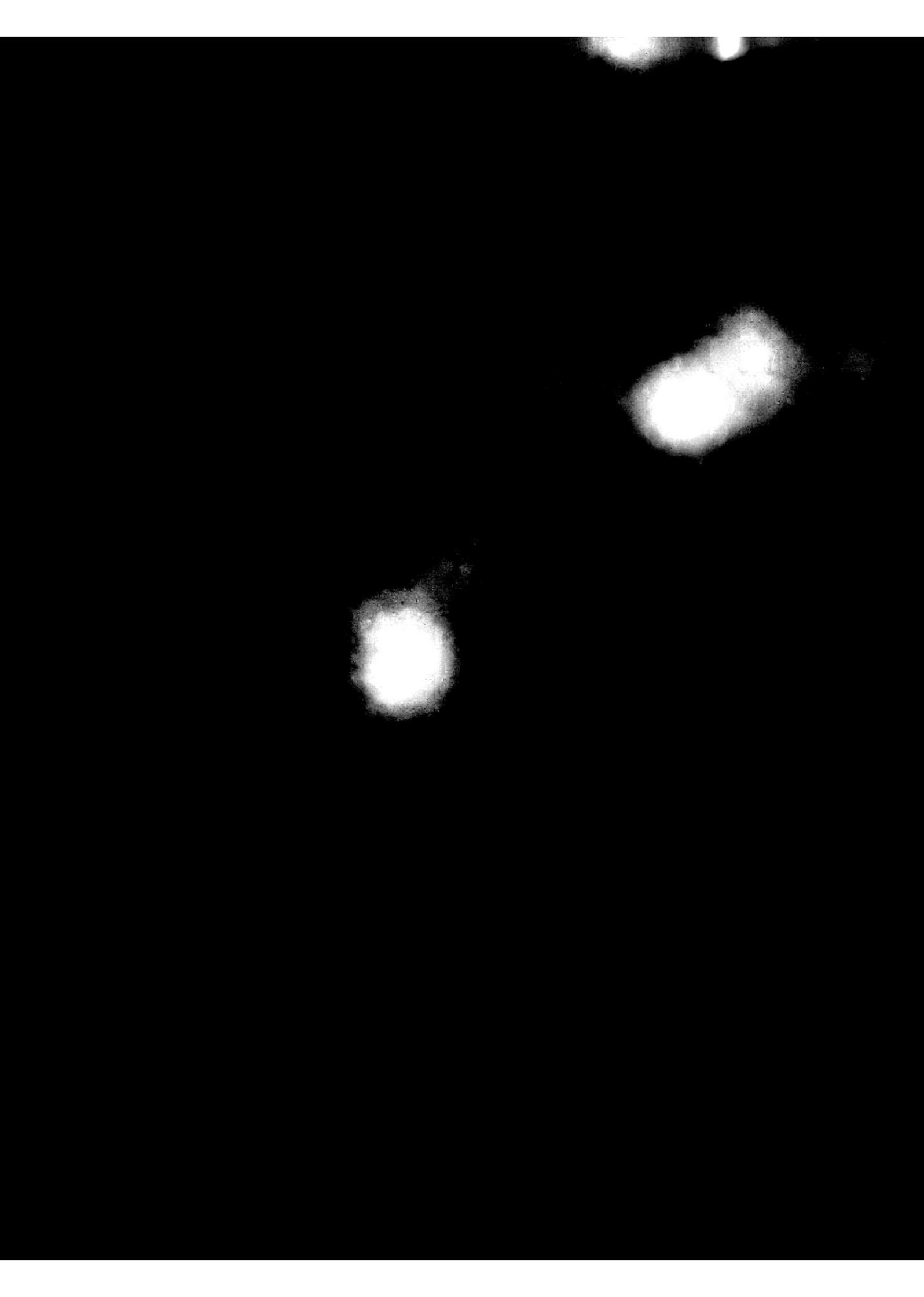
5. (a) What is a structure? How is it different from union? Explain with suitable example. 5

(b) Explain self-referential structure and typedef. 5

OR

(c) What is file? Explain any five various operations on file. 6

(d) Explain different modes of opening a file. 4



Professional Course Examination, 2020

(2nd Semester)

BACHELOR OF COMPUTER APPLICATIONS

(Discrete Mathematics)

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)

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

1×10=10

1. In Boolean algebra B , $\forall x, y \in B$ such that $x(x+y) =$

(a) y ()

(b) x ()

(c) 1 ()

(d) 0 ()

2. Two sets A and B such that $A \cap B = \phi$, then the two sets are called

(a) equivalent sets ()

(b) intersecting sets ()

(c) equal sets ()

(d) disjoint sets ()

3. How many arrangements can be made out of the letters of the word 'ENGINEERING' ?

(a) 277200 ()

(b) 345600 ()

(c) 486300 ()

(d) 354600 ()

4. The 4th term in the expansion of $(x + \frac{1}{x})^5$ is

(a) $10x$ ()

(b) $\frac{10}{x}$ ()

(c) $\frac{5}{x^3}$ ()

(d) $5x^3$ ()

Handwritten truth table for question 4:
 $\neg P \wedge Q$
 T T
 F T
 F F
 F F

5. Which of the following is not statement in logic?

(a) $2+6=9$ ()

(b) Close the door ()

(c) $2+3>4$ ()

(d) London is the capital of India ()

Handwritten truth table for question 5:

$\neg P \vee Q$	$P \wedge Q$	$P \wedge \neg P$	$\neg P$	P	Q	$P \rightarrow Q$	$P \wedge (P \rightarrow Q)$
T	T	F	F	T	T	T	T
F	F	F	T	T	T	F	F
T	F	F	F	T	F	T	T
F	F	F	T	F	F	T	F

6. The conjunctive normal form of $P \wedge (P \rightarrow Q)$ is

(a) $(P \wedge \neg P) \wedge (P \wedge Q)$ ()

(b) $(P \wedge \neg P) \vee (P \wedge Q)$ ()

(c) $P \wedge (\neg P \vee Q)$ ()

(d) $P \vee (\neg P \wedge Q)$ ()

7. A graph having no loops or multiple edges is called _____ graph.

(a) simple ()

(b) finite ()

(c) digraph ()

(d) tree ()

8. The edge connectivity of a tree is

(a) 2 ()

(b) 0 ()

(c) 3 ()

(d) 1 ()

Handwritten notes for question 8:
 $n-1$
 2×5
 $n-1$
 $3 \times 5 \times 5$

9. Let $n = 2$, then $\emptyset(2) =$

(a) 2 ()

(b) 1 ()

(c) 0 ()

(d) 3 ()

10. $[16, 12] =$

(a) 48 ()

(b) 18 ()

(c) 32 ()

(d) 24 ()

Indicate whether the following statements are *True (T)* or *False (F)* by putting a Tick (\checkmark) mark in the brackets provided : 1×5=5

1. $\sim (P \rightarrow Q) \Rightarrow P$ (T / F)
2. In Boolean algebra B , $\forall x, y, z \in B$, then $x \cdot y + y \cdot z + y \cdot z' = x$. (T / F)
3. If $\binom{n}{12} = \binom{n}{3}$, then $n = 9$. (T / F)
4. An open walk in which no vertex appear more than one is called path. (T / F)
5. If a / b and $\neq 0$, then $|b| \leq |a|$. (T / F)

SECTION—B

(Marks : 10)

Answer the following questions :

2×5=10

1. Find the middle term in the expansion of $\left(3x - \frac{x^3}{4}\right)^6$.
2. If A and B are two sets such that $n(A) = 24$, $n(A \cap B) = 8$ and $n(A \cup B) = 38$, then find $n(B - A)$.
3. Define Hamiltonian and Eulerian graphs.
4. Construct the truth table for $\neg(P \wedge Q) \Leftrightarrow (\neg P \vee \neg Q)$.
5. Solve the congruence $3x \equiv 1 \pmod{125}$.

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) In Boolean algebra B , $\forall x, y, z \in B$, prove that

$$x + x' \cdot (x + y) + y \cdot z = x + y$$

5

- (b) Draw the network for the switching function

$$f(x, y) = (x + y') \cdot (x' + y) \cdot (x' + y')$$

Simplify it and draw the simplified network.

5

OR

- (c) Draw the Venn diagram for $\subseteq \mathcal{U}$ $(A \cap B), (A \cap B) = \emptyset$ and $A \subseteq B \subseteq \mathcal{U}$.

5

- (d) In a class, 18 students offered physics, 23 offered chemistry and 24 offered mathematics. Of these, 13 are in both chemistry and mathematics; 12 in physics and chemistry; 11 in mathematics and physics, and 6 in all the three subjects. Find—

(i) how many students are there in the class;

(ii) how many offered mathematics but not chemistry;

(iii) how many are taking exactly one of the three subjects?

5

2. (a) Construct the truth table for $((P \rightarrow Q) \wedge (Q \rightarrow R)) \rightarrow (P \rightarrow R)$.

5

- (b) Prove that, without truth table, $(P \wedge Q) \vee (\neg P \vee (\neg P \vee Q)) \Leftrightarrow (\neg P \vee Q)$.

5

OR

- (c) Obtain the principal disjunctive normal form of $P \rightarrow ((P \rightarrow Q) \wedge \neg(\neg Q \vee \neg P))$.

5

- (d) Show that $(P \rightarrow Q) \wedge (Q \rightarrow R) \Rightarrow P \rightarrow R$.

5

3. (a) How many numbers are there between 100 and 1000, which have exactly one of their digits as 7?

5

(b) A committee of 6 is to be formed out of 6 men and 5 ladies. In how many ways can this be done, when—

(i) at least 2 ladies are included;

(ii) at most 3 ladies are included?

5

OR

(c) Using binomial theorem, expand $\left(\frac{2x}{3} - \frac{3}{2x}\right)^6$.

5

(d) Find the term independent of x in the expansion of $\left(\sqrt{x} + \frac{1}{3x^2}\right)^{10}$.

5

4. (a) Find $(26, 118)$ and express it in the form $(26, 118) = 26x + 118y$ where $x, y \in \mathbb{Z}$.

5

(b) State and prove Euler's theorem.

5

OR

(c) Show that the relation "congruence modulo m " is an equivalence relation in the set of integers.

5

(d) State and prove Euclid's lemma.

5

5. (a) Define degree of the vertex. Show that the sum of the degrees of all vertices in a graph is twice the number of edges in that graph.

5

(b) What is regular graph? Define and draw the graph of 0-regular, 1-regular, 2-regular and 3-regular graphs respectively.

5

OR

(c) Define bipartite graphs. Draw the graph of $K_{2,3}$, $K_{3,3}$ and $K_{4,5}$.

5

(d) Define tree and spanning tree. Show that there is one and only one path between every pair of vertices in a tree.

5

... of G is to be formed ... of n men and 3 ladies. In how ...

(i) at least 3 ladies are included.

(ii) at most 3 ladies are included.

OR

(a) Using binomial theorem, expand $\left(\frac{2x}{3} - \frac{3}{2x}\right)^{15}$ and find the term independent of x in the expansion of $\left(\sqrt{x} + \frac{1}{3\sqrt{x}}\right)^{10}$.

(b) Find (26, 118) and express it in the form $(26, 118) = 26x + 118y$ where x, y are integers.

(c) State and prove Euler's theorem.

(d) Show that the relation "congruence modulo m " is an equivalence relation in the set of integers.

(e) State and prove Jordan's formula.

(f) Define degree of the vertex. Show that the sum of the degrees of all vertices in a graph is twice the number of edges in that graph.

(g) What is regular graph? Define and draw the graph of 0-regular, 1-regular, 2-regular and 3-regular graphs respectively.

OR

(a) Define bipartite graph. Draw the graph of $K_{2,3}$, $K_{3,2}$ and $K_{2,2}$.

(b) Define tree and spanning tree. Show that there is one and only one path between every pair of vertices in a tree.

Professional Course Exam., 2020

(2nd Semester)

BACHELOR OF COMPUTER APPLICATIONS**(Accounting and Financial Management)**

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)

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

1×10=10

1. All the transactions are recorded in

(a) Journal first () (b) Ledger first ()

(c) Debit first () (d) Credit first ()

2. Writing of transaction in the Ledger is called

(a) accounting equation () (b) conventions ()

(c) journalizing () (d) posting ()

SECTION—B

(Marks : 10)

Answer the following questions :

2×5=10

1. What do you mean by Ledger posting?
2. Define Profit and Loss Account.
3. Why is 'ratio analysis' useful?
4. Differentiate between management accounting and cost accounting.
5. What is a budget?

(PART : B—DESCRIPTIVE)

(Marks : 50)

The figures in the margin indicate full marks for the questions

1. (a) Journalize the following transactions in the books of Vijay Bros. : 10

2019			Amount (₹)
March	1	Started business with cash	1,00,000
"	2	Deposited into State Bank of India	40,000
"	7	Goods purchased on credit from Rahul	15,000
"	10	Purchased office machine and paid by cheque	10,000
"	15	Rent paid by cheque	2,500
"	18	Sale of goods to Ramesh	5,000

2019		Amount (₹)
March 21	Return goods to Rahul	1,000
" 23	Cash sales	7,500
" 25	Received a cheque from Ramesh	5,000
" 27	Cash paid to Rahul	14,000
" 29	Salary paid in cash	3,000
" 30	Commission received	2,500

OR

(b) What is accounting? Explain its limitations. Also explain Personal Accounts, Real Accounts and Nominal Accounts. 10

2. (a) The following are the balances extracted from the books of Bharat as on 31st March, 2019. From these balances, prepare his Trading and Profit & Loss Account and Balance Sheet as at that date : 10

Name of Accounts	Debit (₹)	Credit (₹)
Opening Stock	12,000	
Purchases	40,000	
Sales		86,000
Discount		400
Sales Return	6,000	
Buildings	50,000	
Debtors	16,000	
Salaries	2,400	
Office Expenses	1,200	
Wages	10,000	
Purchase Return		4,000
Interest		800

Name of Accounts	Debit (₹)	Credit (₹)
Travelling Expenses	400	
Fire Insurance Premium	800	
Machinery	20,000	
Carriage on Purchases	700	
Commission	400	
Cash in Hand	2,300	
Rent and Taxes	1,800	
Capital		62,000
Creditors		10,800
	<u>1,64,000</u>	<u>1,64,000</u>

Adjustment :

- (i) Closing Stock was valued at ₹ 16,000
- (ii) Wages ₹ 2,000 and Salaries ₹ 1,200 are outstanding
- (iii) Rent for two months at the rate of ₹ 500 per month is outstanding
- (iv) Depreciate buildings by 5% and Machinery by 10%
- (v) Prepaid Insurance—₹ 200

OR

(b) What are the different columns of a Trial Balance? Also explain the special features and objectives of Trial Balance. 10

3. (a) Calculate the following ratios from the details given below: 2×5=10
- (i) Gross Profit Ratio
 - (ii) Operating Ratio

- (iii) Stock Turnover Ratio
- (iv) Liquidity Ratio
- (v) Efficiency Ratio

Details :	₹
Opening Stock	3,00,000
Closing Stock	4,20,000
Purchases	14,00,000
Wages	3,70,000
Carriage Inwards	1,50,000
Administrative Expenses	84,000
Selling Expenses	36,000
Sales	24,00,000

OR

- (b) Give any three objectives and limitations of ratio analysis. Explain briefly quick ratio and current ratio. 10
4. (a) Explain the advantages and limitations of management accounting. 10

OR

- (b) Who is management accountant? Write the roles and responsibilities of management accountant. 10
5. (a) What is zero-base budget? Differentiate between a budget and a forecast. 10

OR

- (b) What is cost sheet? Discuss the components of cost sheet with example. 10

Particulars	Debit	Credit
Opening Stock	2,00,000	
Closing Stock		4,20,000
Purchases	14,00,000	
Wages	3,70,000	
Carriage Inwards	1,50,000	
Administrative Expenses	84,000	
Selling Expenses	38,000	
Sales		24,00,000

- OR
- 4 (b) Give any three objectives and limitations of ratio analysis. Explain briefly quick ratio and current ratio. (10)
- 4 (c) Explain the advantages and limitations of management accounting. (10)
- OR
- 5 (a) Who is management accountant? Write the roles and responsibilities of management accountant. (10)
- 5 (b) What is zero-based budget? Differentiate between a budget and a zero-based budget. (10)
- OR
- 6 (a) What is cost sheet? Discuss the components of cost sheet with an example. (10)