

**FIRST SEMESTER B.A./B.Sc. DEGREE EXAMINATION
NOVEMBER 2020**

(CUCBCSS)

B.C.A.

BCA 1B 01—PROBLEM SOLVING USING C

(2014 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer all questions.
Each question carries 1 mark.*

1. The type specifier _____ indicates that no value is returned from a function.
2. _____ is a directive to the compiler to perform certain things before the actual compilation process begins.
3. The size of a short data type is _____ bytes.
4. To get the exact size of a type or a variable on a particular platform, we can use the _____ operator.
5. The keyword _____ is used to declare a variable at any place.
6. The built-in function in C for concatenating two strings is _____.
7. If a program allows you to call a function inside the same function, then it is called _____.
8. _____ terminates the loop or switch statement and transfers execution to the statement immediately following the loop or switch.
9. By default, C uses call by _____ to pass arguments to a function.
10. The function _____ releases a block of memory block specified by address.

(10 × 1 = 10 marks)

Turn over

Part B

Answer all questions.

Each question carries 2 marks.

11. How will you declare one dimensional array ?
12. What is the purpose of continue statement ?
13. What are formal parameters ?
14. Write the syntax of "switch" statement.
15. Explain a nested for loop.

(5 × 2 = 10 marks)

Part C

Answer any five questions.

Each question carries 4 marks.

16. Define Function. Write the general syntax of a function in C with an example.
17. Write a C program to find whether a given number is odd or even. If even, print its square root.
18. Write a program to check whether a string is a palindrome or not.
19. Explain enumerated data types with an example program.
20. Explain function prototype with an example program and its use.
21. What is a Union? How can it be declared ?
22. What are Macros ? Explain its advantages.
23. What is a Structure ? How does it differ from an array ?

(5 × 4 = 20 marks)

Part D

Answer any five questions.

Each question carries 8 marks.

24. Explain the different control statements in C.
25. Write an algorithm and flow chart to find the smallest from a set of 25 numbers.
26. Explain malloc() and realloc() with example programs.

- 1. **Programs that require students to complete a certain number of credits and courses within the program**
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**FIRST SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020**

B.C.A.

BCA 1B 01—COMPUTER FUNDAMENTALS AND HTML

(2017 Admissions)

Time : Three Hours

Maximum : 80 Marks

Section A

Answer all questions.

Each question carries 1 mark.

1. What is the use of registers in CPU ?
2. Why we use cache memory in computers ?
3. Expand ASCII.
4. Which number system has the base 10 ?
5. What is flowchart ?
6. Define program.
7. What is W3C ?
8. What is the use of anchor tag ?
9. What is HTML forms ?
10. Write the use of <hr> tag.

(10 × 1 = 10 marks)

Section B

Answer all questions.

Each question carries 2 marks.

11. List four secondary storage devices.
12. What is the use of Add-on Cards ?
13. State De Morgan's theorem.
14. What is DHTML ? Explain.

Turn over

15. Obtain octal equivalent of decimal 635.24.
16. What is a web browser ? Give three examples.
17. Write the difference between CSS ID and Class.
18. Explain <textarea> tag.

(8 × 2 = 16 marks)

Section C

*Answer any **six** questions.
Each question carries 4 marks.*

19. Explain adapters and network cables with their functions.
20. Obtain binary equivalent of the decimal 129 and 624.
21. What is excess-3 code? Explain with example.
22. Describe top-down approach in problem solving.
23. Explain minterms and maxterms.
24. Explain some common lists that are used when designing a webpage.
25. Explain WWW and web hosting .
26. Explain the basic table tags with different attributes.
27. Which are the different types of controls in html forms ?

(6 × 4 = 24 marks)

Section D

*Answer any **three** questions.
Each question carries 10 marks.*

28. Draw the basic structure of a computer and explain.
29. What is Karnaugh map ? What are the different steps to solve expression using K-map ? Explain with example.
30. What is an algorithm ? Write an algorithm to find the roots of a quadratic equation.
31. Explain text formatting tags.
32. What is a selector in CSS ? Explain different types of selectors with example.

(3 × 10 = 30 marks)

**FIRST SEMESTER B.A./B.Sc. DEGREE EXAMINATION
NOVEMBER 2020**

(CUCBCSS)

B.C.A.

BCA 1C 02—DISCRETE MATHEMATICS

(Common for 2014 and 2017 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A (Objective Type)

Answer all the ten questions.

Each question carries 1 mark.

1. Let p be "He is tall" and let q be "He is handsome". Write the symbolic form of the statement "He is neither tall nor handsome" using p and q .
2. Determine the truth value of the statement $3 + 2 = 7$ and $4 + 4 = 8$.
3. If $|A| = n$ then $|P(A)| = \text{—————}$.
4. Find y given that $(2x, x + y) = (6, 2)$.
5. What do you mean by a Hamiltonian path ?
6. Draw the graph $K_{2,3}$.
7. What do you mean by an Eulerian path ?
8. Find the number of edges in $K_{m, n}$.
9. What do you mean by a cut vertex ?
10. What do you mean by an incidence matrix ?

(10 × 1 = 10 marks)

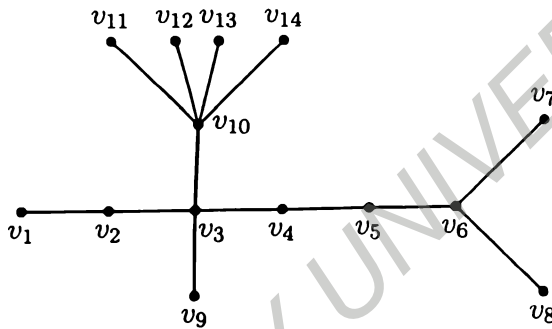
Turn over

Part B (Short Answer Type)

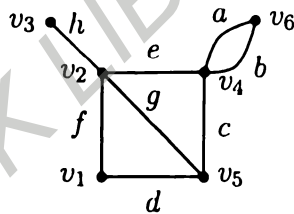
Answer all **five** questions.

Each question carries 2 marks.

11. Find the truth table of $\sim(p \vee \sim q)$.
12. Let R be the set all real numbers and R be a relation on R defined by aRb if and only if $a \leq b$. Determine whether the relation R is partial order on R .
13. Give an example for each of the following :
 - (a) Planar graph.
 - (b) Non-planar graph.
14. Find the center and radius of the tree given below :



15. Find the incidence matrix of the graph shown below :



(5 × 2 = 10 marks)

Part C (Short Essay)

Answer any five questions.

Each question carries 4 marks.

16. Prove that $p \vee (q \wedge r) = (p \vee q) \wedge (p \vee r)$.
17. Let $A = \{a, b\}$, $B = \{2, 3\}$ and $C = \{3, 4\}$. Find $(A \times B) \cup (A \times C)$ and $A \times (B \cap C)$.
18. Define Boolean algebra.
19. Give an example for the following :
- Hamiltonian but non-Eulerian.
 - Eulerian but non-Hamiltonian.
20. Prove that a connected graph G is an Euler graph if and only if it can be decomposed into circuits.
21. Define the following :
- Fundamental cut.
 - Edge connectivity.
 - Vertex connectivity.
 - Separable graph.
22. Prove that a tree with n vertices has $n - 1$ edges.
23. In any simple, connected planar graph with f regions, n vertices and e edges ($e > 2$). Prove that $e \geq \frac{3}{2}f$ and $e \leq 3n - 6$.

(5 × 4 = 20 marks)

Part D

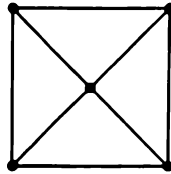
Answer any five questions.

Each question carries 8 marks.

24. Let $N = \{1, 2, 3, \dots\}$ and let R be a relation \cong in $N \times N$ defined by $(a, b) \cong (c, d)$ if and only if $a + d = b + c$. Prove that R is an equivalence relation.
25. State and prove Demorgan's law.
26. State and prove Euler's formula.

Turn over

27. Write a short note on traveling salesman problem.
28. Draw all trees with five or fewer vertices.
29. State and prove max flow min cut theorem.
30. (a) Define dual of a graph. Give any *four* relationship between a planar graph and its dual.
(b) Draw the dual of the graph given below :



31. Prove that a graph G has a dual if and only if it is planar.

(5 × 8 = 40 marks)

**FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020**

B.C.A.

BCA 1B 01—COMPUTER FUNDAMENTALS AND HTML

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)

*Answer at least **eight** questions.*

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. What is Language Translators ? Why it is important in computers ?
2. What are the functions of an input unit ? Explain.
3. Explain the concept of primary storage unit.
4. Explain BCD.
5. Why we use base in number system ? What is the base value of hexadecimal number system ?
6. What are the different precedence rules for Boolean operators ? Explain.
7. Define an algorithm with example.
8. What is top-down design ? Explain with example.
9. Explain what is a Web Browser ?
10. Write the syntax of superscript and font with explanation.
11. List different CSS Properties. Explain any *two*.
12. What is ordered lists ?

(8 × 3 = 24 marks)

Turn over

Section B (Short Essay Type Questions)

Answer at least five questions.

Each question carries 5 marks.

All questions can be attended.

Overall Ceiling 25.

13. Explain Von Neumann architecture. What are the five basic functions performed by a computer system? Explain.
14. What is cache memory? Explain the sequence of actions that takes place in accessing the memory with cache.
15. What is De Morgan's Theorem? Explain.
16. What is Flowchart? What are the different symbols used in flowchart? Draw a flowchart to find prime numbers between two ranges.
17. Explain DHTML and HTTP.
18. What is a Frame? Advantage of using frames in HTML.
19. What are class and CSS ID? Explain.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any one question.

The question carries 11 marks.

20. What is meant by a Secondary Storage Device? List the different secondary storage devices and explain any five with their functioning and storage organization.
21. (a) Explain features of HTML. Generate college admission form using HTML form tag.

(5 marks)

- (b) What are the different steps to Creating Style Sheet in inline and internal? Explain.

(5 marks)

[1 × 11 = 11 marks]

**FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020**

B.C.A.

BCA 1C 01—MATHEMATICAL FOUNDATION FOR COMPUTER APPLICATION

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A

Answer at least eight questions.

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. Find the length of the vector with initial point P : (4, 0, 2) and terminal point Q (6, -1, 2).
2. If $a = [4, 0, 1]$ and $b = [2, -5, 1/3]$. Find $a + b$.
3. Evaluate the characteristic polynomial of the matrix $\begin{bmatrix} -1 & 3 \\ -2 & 4 \end{bmatrix}$.
4. When two non-zero vectors are orthogonal ?
5. Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \end{bmatrix}$.
6. Define linear dependence of vectors.
7. Find $\frac{dy}{dx}$ if $y = \sin^{-1} \sqrt{x}$.
8. Find the derivative of $y = 2 \sin x + 3 \cos x$.
9. Find $\frac{dy}{dx}$ if $y = x \sin x \log x$.

Turn over

**FIRST SEMESTER (CBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020**

B.C.A.

BCA 1C 02—DISCRETE MATHEMATICS

(2019 Admissions)

Time : Two Hours

Maximum : 60 Marks

Section A (Short Answer Type Questions)

*Answer at least **eight** questions.*

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 24.

1. Define proposition with an example.
2. Draw the truth table of conjunction of two statements P and Q
3. Define tautology.
4. Prove that $(P \rightarrow Q) \leftrightarrow \neg P \vee Q$.
5. Define Boolean function.
6. Define least upper bound in Poset.
7. State two forms of De-Morgan's law.
8. Define a Graph.
9. Define pendant vertex of a graph. Give an example.
10. Define path in a graph.
11. What are bipartite graphs ?
12. Write any *two* properties of a tree.

(8 × 3 = 24 marks)

Turn over

Section B (Short Essay Type Questions)

Answer at least **five** questions.

Each question carries 5 marks.

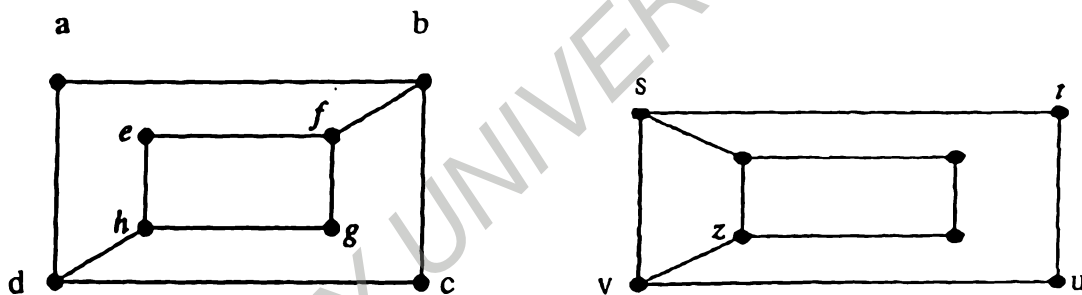
All questions can be attended.

Overall Ceiling 25.

13. Show that $\neg P \wedge (\neg Q \wedge R) \vee (Q \wedge R) \vee (P \wedge R) \Leftrightarrow R$.
14. Show that $(P \vee Q) \wedge \neg(\neg P \wedge (\neg(Q \vee \neg R))) \vee (\neg P \wedge \neg Q) \vee (\neg P \wedge \neg R)$ is a tautology.
15. Let $X = \{1, 2, 3, 4\}$ If $R = \{ \langle x, y \rangle / x - y \text{ is an integral non-zero multiple of } 2, x \text{ \& } y \in X \}$ $S = \{ \langle x, y \rangle / x - y \text{ is an integral non-zero multiple of } 3, x \text{ \& } y \in X \}$.

Then find $R, S, R \cup S$ and $R \cap S$.

16. Show that the following graphs are not isomorphic ?



17. For a directed tree explain the following terms with an example.

(a) Root.

(b) Leaf.

(c) Branch node.

18. In a simple graph, the length of any elementary path is less than or equal to $n - 1$, where n is the number of nodes in the graph.

19. Show that the sum of indegrees of all the nodes of a simple digraph is equal to the sum of outdegrees of all its nodes and this sum is equal to the number of edges of the graph.

(5 × 5 = 25 marks)

Section C (Essay Type Questions)

Answer any one question.

The question carries 11 marks.

20. Define equivalence relation. Show that the congruence relation on the set of integers is an equivalence relation.
21. (a) Define partially ordered set :
- (b) Explain Hasse Diagram.
- (c) Let $X = \{2, 3, 6, 12, 24, 36\}$ and the relation \preceq be such that $x \preceq y$ if x divides y . Draw the hasse diagram of poset $\langle X, \preceq \rangle$.

(1 × 11 = 11 marks)

**FIRST SEMESTER B.A./B.Sc. DEGREE EXAMINATION
NOVEMBER 2020**

(CUCBCSS)

B.C.A.

BCA 1C 01—MATHEMATICAL FOUNDATION OF COMPUTER APPLICATIONS

(2014 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A (Objective Type Questions)

Answer all questions.

Each question carries 1 mark.

1. What is the rank of the matrix $\begin{bmatrix} 1 & 0 & 3 \\ 2 & 0 & 6 \end{bmatrix}$?
2. If $\bar{b} = -\bar{a}$, what is the value of $\bar{a} \times \bar{b}$?
3. State the quotient rule for differentiation.
4. What is the derivative of $\cosh x$.
5. What is the integral of $\tan x$.
6. Evaluate $\int_{-3}^3 (\sin x)^3 dx$.
7. What is the degree of the differential equation : $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^3 - 2y = 0$?
8. What is the solution of the differential equation $xdy + ydx = 0$?
9. What do you mean by complementary function of a non-homogeneous second order ordinary differential equation?
10. Write the general form of linear first order partial differential equation.

(10 × 1 = 10 marks)

Turn over

Part B (Short Answer Type)

Answer **all** questions (11-15).

Each question carries 2 marks.

11. If A and B are two non-singular matrices, show that $(AB)^{-1} = B^{-1}A^{-1}$.

12. If $\bar{a} = a_1\hat{i} + a_2\hat{j} + a_3\hat{k}$ and $\bar{b} = b_1\hat{i} + b_2\hat{j} + b_3\hat{k}$, show that $\bar{a} \times \bar{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \end{vmatrix}$.

13. Evaluate $\int \frac{\cos^3 x + 1}{\cos^2 x} dx$.

14. Solve the initial value problem : $xy' + y = 0$, $y(4) = 6$.

15. Solve : $\frac{d^2y}{dx^2} + 6\frac{dy}{dx} + 8y = 0$.

(5 × 2 = 10 marks)

Part C (Short Essay Type)

Answer any **five** questions (16 - 23).

Each question carries 4 marks.

16. Find the eigen values of the matrix $\begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 2 \\ 1 & 1 & 2 \end{bmatrix}$.

17. If λ is an eigen value of a non-singular matrix A, then show that λ^{-1} is an eigen value of A^{-1} .

18. Find the derivative of $\sin x$ using the first principle.

19. Differentiate $\sqrt{(x^2 + 1)} \sin x$.

20. If u and v are two integrable functions, show that

$$\int [u(x) + v(x)] dx = \int u(x) dx + \int v(x) dx.$$

21. Integrate $\frac{1}{x^2 + 3x + 3}$.

22. Solve : $xy' = y + 3x^4 \cos^2\left(\frac{y}{x}\right)$, $y(1) = 0$.

23. Solve the initial value problem : $y'' - 2y' + 10y = 0$, $y(0) = 4$, $y'(0) = 1$.

(5 × 4 = 20 marks)

Part D (Essay Questions)

Answer any **five** questions (24 - 31).

Each question carries 8 marks.

24. Find the rank of the matrix $\begin{bmatrix} 1 & 2 & 1 & 2 \\ 1 & 3 & 2 & 2 \\ 2 & 4 & 3 & 4 \\ 3 & 7 & 4 & 6 \end{bmatrix}$ by reducing it to the row-echelon form.

25. Solve completely :

$$x + 2y - 3z - 4w = 6$$

$$x + 3y + z - 2w = 4$$

$$2x + 5y - 2z - 5w = 10.$$

26. a) Differentiate : $y = \sin x \sin 2x \sin 3x \sin 4x$

b) Differentiate : $y = \sin^{-1} x$.

27. Evaluate : $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x + \sqrt{\cos x}}} dx.$

28. Solve : $y' - y = 3e^x.$

29. Solve : $2xyy' - y^2 + x^2 = 0.$

30. Solve : $y'' + y = 10e^x \sin x.$

31. Obtain the partial differential equation, which represent the set of all spheres with centers on z-axis.

(5 × 8 = 40 marks)

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**FIRST SEMESTER B.Com./B.B.A. DEGREE EXAMINATION
NOVEMBER 2020****(CBCSS)****B.C.A.****BBA 1B 01—MANAGEMENT THEORY AND PRACTICES****(2019 Admissions)****(Multiple Choice Questions for SDE Candidates)****Time : 15 Minutes****Total No. of Questions : 20****Maximum : 20 Marks****INSTRUCTIONS TO THE CANDIDATE**

1. This Question Paper carries Multiple Choice Questions from 1 to 20.
2. The candidate should check that the question paper supplied to him/her contains all the 20 questions in serial order.
3. Each question is provided with choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and enter it in the main answer-book.
4. The MCQ question paper will be supplied after the completion of the descriptive examination.

BBA 1B 01—MANAGEMENT THEORY AND PRACTICES

(Multiple Choice Questions for SDE Candidates)

1. _____ suggests that each communication going up or coming down must flow through each position in the line of authority.
 - (A) Communication Pattern.
 - (B) Horizontal communications.
 - (C) Scalar chain.
 - (D) None of these.
2. _____ has defined the basic problem of managing as the art of “knowing exactly what you want men to do and then see that they do it in the best and cheapest way”.
 - (A) Henry Fayol.
 - (B) F.W. Taylor.
 - (C) Mary Parker Follet.
 - (D) None of these.
3. According to _____ principle, each group of activities with the same objective must have one head and one plan.
 - (A) Unity of Direction.
 - (B) Unity of command.
 - (C) Either of these.
 - (D) None.
4. The Book “Functions of Executive” was written by _____.
 - (A) P.F. Drucker.
 - (B) Chester Barnard.
 - (C) Herbert Simon.
 - (D) None.
5. The author of the famous book “General and Industrial Management” is _____.
 - (A) Henry Fayol.
 - (B) F.W. Taylor.
 - (C) Henry Gantt.
 - (D) None.
6. Authority and responsibility are _____ to each other.
 - (A) Supplementary.
 - (B) Complementary.
 - (C) Contradictory.
 - (D) None.
7. _____ is highly suitable for large organizations having large number of managerial personnel at different levels.
 - (A) Centralization.
 - (B) Decentralization.
 - (C) Departmentalization.
 - (D) All of these.

8. Koontz and O'Donnel are advocates of _____ approach to management.
- (A) Empirical. (B) Management science.
(C) Contingency. (D) Operational.
9. The advocates of _____ approach view management as the direction of the activities of a group of people towards the accomplishment of common objectives.
- (A) Empirical. (B) Management science.
(C) Contingency. (D) Human behavior.
10. _____ believed that leaders are not born but also developed through proper training in human behavior.
- (A) Mary Parker Follet. (B) F.W.Taylor.
(C) C.K. Prahlad. (D) Peter F. Drucker.
11. MBO stands for ?
- (A) Management of Business Objectives.
(B) Management By Objectives.
(C) Managing Business Operations.
(D) None of these.
12. Operational guides to action is known as :
- (A) Policies. (B) Procedures.
(C) Plan. (D) None of these.
13. Organisation arises voluntarily or due to social interaction of people :
- (A) Formal. (B) Informal.
(C) Line organization. (D) All of these.
14. A superior cannot delegate :
- (A) Authority. (B) Responsibility.
(C) Duty. (D) None of these.
15. Authority flows from :
- (A) Top to Bottom. (B) Bottom to top.
(C) Horizontally. (D) All of these.

16. Military type of organization is also called :
- (A) Informal organization. (B) Line organization.
(C) Line and Staff. (D) Functional.
17. _____ aims at visualizing and identifying deviation before they actually occur.
- (A) Predictive control. (B) Concurrent control.
(C) Operational Control. (D) All of these.
18. _____ is an example of internal source of recruitment.
- (A) Advertisement. (B) Trade unions.
(C) Employment exchange. (D) Promotion.
19. _____ means issuing orders, instructions and commands.
- (A) Directing. (B) Unity of command.
(C) Authority. (D) All of these.
20. Leadership is also referred as fatherly leadership :
- (A) Autocratic. (B) Participative.
(C) Free rein. (D) Paternalistic.

**FIRST SEMESTER B.Com./B.B.A. DEGREE EXAMINATION
NOVEMBER 2020**

(CBCSS)

B.C.A.

BBA 1B 01—MANAGEMENT THEORY AND PRACTICES

(2019 Admissions)

Time : Two Hours and a Half

Maximum : 80 Marks

Section A

Answer at least ten questions.

Each question carries 3 marks.

All questions can be attended.

Overall Ceiling 30.

1. 'Management is a process'. Explain.
2. What is derivative plan ?
3. What is Kaizen ?
4. List out the functions of management.
5. What is delegation of authority ?
6. Why do you mean by organisation structure ?
7. What is line and staff organization ?
8. What do you mean by 'policy' and 'rules' ?
9. What is contingency approach ?
10. Explain MBE.
11. What is unity of command ?
12. What is informal organisation ?
13. What is resistance to control ?
14. What do you mean by functional organisation ?
15. Define Organising.

(10 × 3 = 30 marks)

Turn over

Section B

*Answer at least five questions.
Each question carries 6 marks.
All questions can be attended.
Overall Ceiling 30.*

16. Discuss the bases of departmentation.
17. What are the various tools used for the implementation of Kaizen ?
18. What is Bureaucratic management ? Explain its features.
19. What are the principles of effective delegation ?
20. What are the limitations of planning ?
21. Who are the different types of stakeholders ?
22. Briefly discuss the essentials of an effective control system.
23. Differentiate between single use plan and standing plan.

(5 × 6 = 30 marks)

Section C

*Answer any two questions.
Each question carries 10 marks.*

24. Explain CSR towards different stakeholders.
25. Define span of control. Discuss the importance and factors influencing it.
26. Critically evaluate Neo-classical approach to management.
27. Define Staffing. Discuss the importance and functions of staffing.

(2 × 10 = 20 marks)