2. Answer any four questions in about 30 words each.

Spin, Creave, Mind, Balie:
Trees, Drink, View, Home, Okey, People, Slution, Become.

1. Transcribe any eight words out of the given twelve:

**Note:** Attempt all questions.

Maximum Marks: 80

**Time:** Three Hours

ROLL NO.

CSE/16

TOTAL PAGES: 7
Read the passage given below and answer the questions:

The Generation Gap

What does the word ‘identity’ mean?

Biocentrism

Suggest some steps that can be taken to preserve

Universe.

(a) What is the tone of the chapter, Choosing Our

(b) Answer any five questions in about 100 words each:

(c) Explain the statement: Loyalty to the country comes

(d) Great Book Born Out of Great Mind

(e) These fields make him into a perfect English gentleman. What were

(f) Gandhian decided to take lessons in various fields to

(g) Language and National Identity

(h) What relation does the author establish between man

(i) Wounded Plans

(j) Where does language play in the shaping of culture?

(k) Which makes man yearn for fulfillment?

(l) Living things

(m) How does language make man different from other

(n) In which way does language help man?

(o) Questions

(p) Why does language play a very significant role in the shaping

(q) of culture?

(r) why is language an intrinsic part of the human body?

(s) language is the most efficient weapon of self-discovery of

(t) The Unseen

(u) Read the passage given below and answer the questions:

(v) Waves of the following (Any two)

(6) Write the synonyms of the following (Any two):

(7) Explain all other loyalties.
(a) 12
(happen)
(v) In the year 2006;
(make)
years.

(vi) India has made great progress in the
country.
(have)
(year

(vii) We have just received a letter from my brother: 
(fall

(viii) The boy fell down while he was running.
(walk

(v) Not completed yet.
(vi) For her since noon, but she ______ as
(read)

(vii) The sun ______ when you get up.
(shine

(viii) They ______ from the police last night.
(eat

(v) The baby ______ because it is hungry.
(finish

(vi) I ______ my work by tomorrow evening.
(come

(b) (vii) He ______ to see you but you were not at
(break

(viii) A thief ______ into our house last night.
(drink

(ix) You already ______ three cups of tea.
(learn

(x) We now ______ England.

(try in brackets (any tense)

(xi) Fill in the blanks with the suitable form of verbs given

(c) (2x.2)=g

(try Complex

(ii) Foreign

(i) Knowledge.

(d) Make sentences of the following words (any two):

(iii) Not completely dry.

(ii) One who knows many languages.

(i) An official announcement.

(e) Give one-word for the following (any two):

(iii) Engine.

(ii) Ability.

(i) For of.

(f) Write synonyms of any two of the following:
12

of

the/hers)

They play chess daily. It is a favorite game.

My/Whose(he/ hers)

Room is bigger than

(Your/Your)

This is a nice camera. Is it

(?)

Choose the right word for the blank space:

Science and Modern Warfare:

(a) Indiscipline and Students.
(b) Noise Pollution.

(a) The Crown and Glory of Life is Character.

Write one paragraph (in about 200 words) on any one of

(i) My House Is.................. the end of the street.

(ii) The Red Fort Is.................. Delhi.

(iii) Do you work on Sundays?

(iv) Fill in the blanks with suitable prepositions:

(a) He is the.................. man in our town. (tall)

(b) Honour is.................. to us than life. (dear)

(c) Her doll is.................. than yours. (pretty)

(d) Supply the proper form of the given adjective:

(i) I am not angry with you. I am angry with

(ii) I picked up a very hot plate and burns

(iii) He looks at.................. in the mirror.

(iv) With sale of selves:

(B) Complete each sentence with a pronoun ending

(i) Great.

(ii) Drive.

(iii) Cheer.

(A) From abstract nouns from the given adjectives:

Do as directed (Any verb):
(5x2=10)

(8x2=16)

(9x2=18)

(5x2=10)

(5x2=10)

(5x2=10)
2. Do not enter any personal data. Leave blank.

Maximum Marks: 80

Time: Three Hours

Punjabi (Elective)

CSE&D-16

707

Roll No. 5

Total Pages: 5
10. Eligibility. Desirable:


2. (01=01×1)

3. (01=01×1)

4. (01=01×1)

5. (01=01×1)

6. (01=01×1)

7. (01=01×1)

8. (01=01×1)

9. (01=01×1)

10. (01=01×1)
10. इस प्रश्न का उत्तर क्या है?

(1) 1896 का एक वर्ष
(2) 1897 का एक वर्ष
(3) 1898 का एक वर्ष
(4) 1899 का एक वर्ष
(9×10=90)

1. a + b - c = d + e + f

3. a = b + c

5. a - b + c = d

7. a + b - c = d

9. a = b + c

11. a - b + c = d

13. a = b + c

15. a - b + c = d

17. a = b + c
1. Maxamum Marks: 80

Time: Three Hours

SANSKRT (elementary)

CSE/I-16

ROLL No.

Total Pages: 4

(8x2=16)

(2x4=8)

(4x1=4)

2. 

(16x1=16)
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Note: The question paper consists of nine questions. The candidate is required to attempt five questions in all. The question No. 1 is compulsory. Attempting eight questions is an option.

Maximum Marks: 80

Time: Three Hours

Paper-I

Ancient India (From Earliest Times to Gupta Age)

HISTORY
(8) Who was the greatest ruler of the Satavahana dynasty?

(1) Kushan.
(2) Mahabharata.
(3) Satavahana.
(4) Chandragupta.
(5) Kanishka.
(6) Harshana.
UNIT I (Option-I)

Discuss various sources of Indian Constitution.

UNIT II (Option-II)

Write a note on the Preamble of the Indian Constitution.

UNIT II (Option-II)

3. What are the Emergency powers of President of India?
UNIT IV

1. What are the powers and functions of the Supreme Court of India?

(a) Make judgment
(b) Interpret Constitution
(c) Review of judgments
(d) Grant a writ

2. What is the importance of judicial review in India?

(a) Checks the power of the legislature
(b) Ensures compliance with the Constitution
(c) Protects the rights of the citizens
(d) All of the above

3. Which city is the seat of the Supreme Court of India?

(a) Delhi
(b) Kolkata
(c) Mumbai
(d) Chennai

4. In which year did the Indian Constitution come into force?

(a) 1947
(b) 1950
(c) 1951
(d) 1946

5. When are the powers and role of the Speaker of Lok Sabha?

(a) 26 Jan, 1950
(b) 15 Aug, 1947
(c) 10 Dec, 1947
(d) 9 Dec, 1946

6. Who is the first non-Congress Prime Minister?

(a) Jawaharlal Nehru
(b) Lal Bahadur Shastri
(c) Smt. Indira Gandhi
(d) Morarji Desai

7. When did the Constituent Assembly meet for the first time?

(a) 26 Jan, 1950
(b) 15 Aug, 1947
(c) 10 Dec, 1947
(d) 9 Dec, 1946

8. Kindly highlight the importance of the Prime Minister.

OBJECTIVE TYPE QUESTIONS (MULTIPLE CHOICE):

9. Which of the following is a constitutional amendment?

(a) 15 Aug, 1947
(b) 10 Dec, 1947
(c) 9 Dec, 1946
(d) 26 Jan, 1950
(b) Article 248

(d) Article 370

The proviso following to amending itself in which article

(a) President

(b) Cabinet

(c) Parliament

(d) None of these.

Who can remove President of India?

(a) President

(b) Cabinet

(c) Parliament

(d) None of these.

Who appoints Governor in India?

(a) President

(b) Cabinet

(c) Parliament

(d) None of these.
of special status to state of Jammu & Kashmir.

(vii) Which Article of Indian Constitution makes provision

(a) Article 370
(b) Article 371
(c) Article 21
(d) None of the above.

(e) Article 268
(f) Article 248
(g) Article 370
(h) Article 268
8) Show yourself combinations that he can purchase with \$100.

Questions:

Raman goes to market having \$100 in his pocket. If price of coke is \$2 and samosa is \$1.5 then answer the following:

I. Compulsory Questions (30 marks)

Select one question each from any three of the four units.

Note: Attempt five questions in all. Question No. 1 and 2 are compulsory. Attempt the remaining three questions.

Maximum Marks: 80

Time: Three Hours

Paper I

Micro Economics

CSE/D-16

Roll No. ........................................

Total Pages: 7
2. (a) Choose the correct answer.

(e) Measurement of utility in numbers is called

(1) None.
(2) Both
(3) Cardinal
(4) Ordinal

(d) Sale-purchase of a commodity is known as

(1) Demand
(2) Exchange
(3) Production
(4) TR > TC

(c) The slope of supply curve is normally

(1) Positive
(2) Negative

(b) Ar break even point

(1) None
(2) Horizontal

(a) Consumer wants to maximize

2. 5x1=5
UNIT 1

(1) Cross elasticity of demand
(2) Elasticity of demand
(3) Price mechanism
(4) Production possibility curve
(5) Income tax
(6) Tax on consumption

Which of the following is true?
(1) TR = TC
(2) TR > TC
(3) TR < TC

3. Whether Economics is a social or natural science? Give

(5x1=5)
(6) Principles of Economics
(5) Marshall's First Law
(4) Demand
(3) Wealth of Nations
(2) Law of Diminishing
(1) Necessities

(5x1=5)
(6) Adam Smith
(5) Price Mechanism
(4) Marshall
(3) Law of Diminishing
(2) Necessities
(1) Wealth of Nations
UNIT - IV (खण्ड-IV)

9. Explain Short-run Cost curves as per traditional theory of isoquant.

UNIT - III (खण्ड-III)

8. What is Producer's equilibrium? Discuss it with the help of isoquant.

UNIT - III (खण्ड-III)

7. Explain Law of Returns to scale.

UNIT - II (खण्ड-II)

6. Explain Consumer's surplus. How is it measured?

UNIT - II (खण्ड-II)

5. What are indifference curves? Discuss their properties.

UNIT - II (खण्ड-II)


10. Write AR, MR and IC and discuss their relation.
UNIT II (پروپیل-1)

 Explain in detail about misconceptions regarding physical education.

 UNIT I (پروپیل-1)

 (1) (1) (1)

 compulsory

 Note: Attempt five questions in all, selecting one question from each unit (UNIT-I, II). Question No. 9 of UNIT-I is compulsory.

 Maximum Marks: 60

 Time: Three Hours

 HEALTH AND PHYSICAL EDUCATION

 GSE/D-16

 Roll No. 4

 Total Pages: 4
UNIT-I (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-IV (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-V (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-VI (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-VII (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-VIII (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-IX (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-X (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-XI (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

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UNIT-XIV (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)

UNIT-XV (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z)
UNIT-I (RAZHAKHANAT-1)

Note: Attempt five questions in all, selecting one question from each unit. All questions carry equal marks.

Time: Three Hours

Paper I (Theory)

MUSIC (INSTRUMENTAL)

723

Total Pages: 3
UNIT-III (أجاب -III)

Discuss the structure of shrin and its techniques.

9. 
(a) 
(b) 
(c) 
(d) 
(e) 

6. Write short notes on any one of the following:

(c) 
(d) 
(e) 
(f) 
(g) 
(h) 
(i) 

5. Write in detail about Shrini and Gar.

UNIT-II (أجاب -II)

4. Write in detail about Ragh Yaman and Dhupul.

9. Write down the contribution of Ustad Allah Ditta Khan in the field of music.

10. Write the notation of Chaantal and Exka with Ekgun and Dhun.

8. Write down the contribution of Ustad Allah Ditta Khan in the field of music.

8. Differentiate between Folk and Classical music.
1. What do you mean by office management? State the functions, qualifications and responsibilities of office management.

2. Who is an office manager? Outline his functions, qualifications and responsibilities of office management.

3. What is office organisation? Briefly state the basic principles of office organisation.

4. State briefly the factors to be considered in selecting the site for an office accommodation.

Note: Attempt any four questions. All questions carry equal marks.

Maximum Marks: 80

Time: Three Hours

Office Management

CSE/D-16

Roll No. ........................................

Total Pages: 3
6. Explain the importance of a good working environment for the office staff. Discuss the consideration you will take into account when planning for office layout, ventilation and furniture.

7. What do you understand by communication? What factors influence communication in a modern office?

8. Why do you mean by Office Correspondence? Explain the role of Internet in Office Correspondence?

9. State and explain the principles of office organisation.

10. Explain the factors that affect the degree of decentralisation of authority in an office. Why is it needed?
I. (a) Find the rank of the matrix $A = \begin{bmatrix} 4 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 2 \end{bmatrix}$.

(b) Prove that if $A$ is the eigen value of a non-singular matrix $A$, then $\frac{1}{A}$ is also an eigen value of $A$.

(c) Solve the equation $x^2 - 2x + 1 = 0$.

(d) If $a$, $b$, $c$ are the roots of the equation $x^3 + 2x^2 + 3x + 4 = 0$, then show that $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = \frac{9}{4}$.

II. (a) If $A$ and $B$ are symmetric matrices, show that $AB + BA$ is symmetric and $AB - BA$ is skew-symmetric.

(b) If $A$ is one of the roots,

\[ x^4 + 2x^3 - 3x^2 + 4x + 5 = 0, \]

then show that

\[ \frac{1}{x} = \frac{1}{b} \sum_{i=1}^{n} \lambda_i \]

Note: Attempt five questions in all. Question No. 1 is compulsory. Select one question from each section.

Maximum Marks: 27

Time: Three Hours
(q) Solve completely the following system of equations:

\[
\begin{bmatrix}
1 & 2 & 1 \\
1 & 2 & 3 \\
1 & 1 & 1 \\
\end{bmatrix}
\begin{bmatrix}
x \\
y \\
z \\
\end{bmatrix}
= 
\begin{bmatrix}
2 \\
3 \\
4 \\
\end{bmatrix}
\]

(a) one solution (b) no solution (c) unique solution (d) more than one solution

SECTION I

7. Solve the equation \( x^2 - 3x + 1 = 0 \) by completing the square method.

8. Solve the equation \( x^2 - 9x + 12 = 0 \) by Cardano's method.

SECTION II

3. Verify Cayley-Hamilton Theorem for the matrix

\[
\begin{bmatrix}
2 & 4 & 7 \\
3 & 2 & 4 \\
7 & 4 & 2 \\
\end{bmatrix}
\]

Prove that the adjoint matrix for a skew-symmetric matrix is still skew-symmetric.  

SECTION III

5. Let \( \mathbf{A} \) be a real skew-symmetric matrix such that \( \mathbf{A}^2 = \mathbf{0} \). Show that \( \mathbf{A} \) is orthogonally diagonalizable.

2. Every square matrix \( \mathbf{A} \) can be expressed in one and only one way as \( \mathbf{P} \mathbf{D} \mathbf{P}^{-1} \), where \( \mathbf{P} \) and \( \mathbf{D} \) are orthogonal and triangular matrices.

4. For what value of \( x \) does the system

\[
\begin{bmatrix}
1 & 2 \\
1 & 3 \\
1 & 1 \\
\end{bmatrix}
\begin{bmatrix}
x \\
y \\
z \\
\end{bmatrix}
= 
\begin{bmatrix}
2 \\
3 \\
2 \\
\end{bmatrix}
\]

has (i) no solution (ii) unique solution (iii) more than one solution.
\[ 2 \]

**SECTION 1**

1. \( \frac{1}{\sin x} \) is a continuous function. Prove that 1.\( x \) | 1 2.

**Question**

Compulsory: Select one question from each section.

**Note:** Attempt five questions in all. Question No. 1 is

| Maximum Marks: 26 |

**Time:** Three Hours

**Paper:** BM-112

**Mathematics**

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\[ \frac{2}{v} = \theta \]

One loop of the lemniscate \( r^2 = a^2 \cos 2\theta \) about the line

Find the volume of the solid generated by revolving

Find the volume of the sphere so formed

The circle \( x^2 + y^2 = 1 \) is revolved about the x-axis.

Cardiod \( r = 1 + \cos \theta \)

Find the area inside the circle \( r = \cos \theta \) and outside the

Find the area common to the parabola \( y^2 = 4ax \) and

SECTION-III

\[ \int_0^2 x^2 \left( x + e^{\pi} \right)^2 e^x \left( x + 1 \right)^2 \]

Evaluate the integral

\[ \int_0^1 v = e^{-2n(1-u)n + n} \]

6. If \( n \) and \( u \) show that

\[ \int_0^\infty \sin x \cdot \int_0^1 x = e^{-n(x^2)} \]

SECTION-III

\[ \int_0^2 \frac{1}{(x + \sqrt{x})} dx \]

Find the radius of curvature at the origin for the curve

\[ y = -x^2 + 2x + 3 \]

is a curve whose semi-latus-rectum
defines a local chord of a parabola whose semi-latus-rectum

Find the asymptotes of the curve

\[ \frac{\theta \cos \frac{2}{2} + 1 + 1}{2} = \frac{1}{2} \]

Find all the asymptotes of the curve

\[ \int_0^\infty \frac{1}{1} = \int_0^\infty \frac{1}{1} \]

SECTION-II

\[ \int_0^\infty \frac{1}{1} \]

Evaluate the value of

\[ \log_{10} \left( \frac{10}{11} \right) \int_0^\infty \frac{1}{1} \]

If \( f(x) \) is a polynomial of remainder different n terms.

Series and prove Mechnics theorem with Lagrange's
My use account, lest he requite chide.
To serve them with my maker, and present
Looked with me useless, though my soul more bent
And then one lesson which is death to hide
The half my days, in this dark world and wide
When I consider how my health is spent

Follow the following extract and answer the questions that

Golden and9sumine laws which tempt and say,
Whereas a two-edged sword in all who wield—
An enemy, which he receive and pray
A people smitten and spectacle in the unhinged field.

OR

Die not, poor Death, nor yet consign me all:
For those whom thou think'st thou dost overthrow
Wilt thou not see, for thou art not so,
Dost thou not consider those have called thee

1. Explain with reference to the context:

Note: Attempt all questions.

Maximum Marks: 80
Time: Three Hours

ENGLISH

758

OCESE/D-16

Total Pages: 5

Ref. No.
from business.

I went a pregoence than me until I eat

country.

Her uncle and aunt in the house in the

Ten miles by the way to walk. (be)

Set aopon the very rest.

A very call to rest or money. (cost)

Fill in the blanks with correct form of the verb:

When do you have breakfast?

I understand he is to many houses.

For thinking.

Water in the stream is not suitable

University.

He had always hoped his son would go to

Altar, Brazil and Israel.

Onions are grown in Spain, South

whenever necessary.

Do as directed (Anthony any time).

Consider „Shawdell“ as a satire.

OR

Are Old.

An essay a critical appreciation of the poem. When you

(left)

(left)

(left)

(left)

(left)

(left)

(left)

(left)

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(left)

(left)

(left)
P.T.O.

764/4.700/KD/233

(() Explain two determinants of demand.  
(1) Why is Economic Problem?  
(2) Write brief notes on the following:  

(i) Economic Question  

[Maximum Marks: 80]  

Time: Three Hours  

Paper: I  
Micro Economics — I  
ECONOMICS  
OSCE/16  
764  
Total Pages:  

Roll No.  

8.8  

(() Break-even analysis.  
TR and MR, their relationship.  
Concepts of TR and MR and their relationship.  

(() Explain the concepts of total cost, average cost and marginal cost in short period with the help of tables and diagrams.  

(() Explain the relationship between average cost and marginal cost.  

(() Explain the relationship between average cost and marginal cost.
7. What are isoquants? What are their properties?

6. Explain the Law of Variable Proportions with the help of

UNIT III (II-III-IV)

5. Explain - Price effect, Income effect and Substitution effect

UNIT II (II-III-IV)

4. Explain the Law of Equimarginal Utility of Consumption

3. What is price elasticity of demand? Explain any three

2. What is Capitalism? How are the economic problems in a

UNIT I (II-III-IV)

1. (i) International/Exchange Rate

(iii) When total utility is maximum, marginal utility

FILL in the blanks with appropriate answers:

(ii) When Internal and External economies of scale

(iv) Explain the difference between Explicit cost and Implicit

(v) What is source of demand?

(vi) What is income elasticity of demand?
4. (a) Find inverse of \( A = \begin{bmatrix} 3 & 2 \\ 1 & 0 \end{bmatrix} \) by using elementary transformations.

4. (b) Hermitian matrices are in one and only one way as \( P^* A P \), where \( P \) and \( A \) are Hermitian matrices. Show that every square matrix \( A \) can be expressed

**SECTION 1**

4. (c) State Descartes rule of signs.
4. (d) Find the value of \( a \) in order that the roots of the equation \( 2x^2 + 6x + 5x + 4 = 0 \) are in \( A.P. \)
1/4 4. (e) Prove that eigen values of \( A^2 \) are squares of the eigen values of \( A \).
1/4 4. (f) Define linear dependence and linear independence of vectors.
1/4 4. (g) Show that diagonal elements of a Hermitian matrix are all real.
1/4 4. (h) Show that diagonal elements of a Hermitian matrix are

**Compulsory Question**

Select one question from each section.

**Note**: Attempt five questions in all. Question No. 1 is Compulsory.

**Maximum Marks**: 40

**Time**: Three Hours

**Paper**: BM-111
    ( Algebra )

**Mathematics**

GSE/B.F.-16

**Roll No.** 3

**Total Pages**: 3

**772**
Repeat tools.

(a) Solve the equation $x^2 - 19x + 12 = 0$.

(b) Solve the equation $x^2 + 3x - 2 = 28x + 12 = 0$.

SECTION III

Transformation.

(a) Also find rank, index, signature and equations of

\[ y = \frac{x^2}{2} - \frac{3x}{2} - \frac{x^2}{2} + 3x + 6x \]

(b) Diagonalize the quadratic form.

\[
\begin{bmatrix}
1 & 3 \\
3 & -1
\end{bmatrix}
\]

5. (a) Obtain the linear transformation which reduces the quadratic form $x^2 - 12x + 22$.

(b) Orthogonality matrix $P$ such that $AP = B$.

SECTION IV

(a) If $A$ and $B$ are two non-singular matrices of same order

\[ 0 = m + 2x - 2 + x \]

Prove that any two eigenvalues correspond to

(b) State and prove Cayley-Hamilton Theorem.
not continuous at \( x = 0 \), but its derivative is

\[
\begin{cases}
0 = x & \text{if } x = 0 \\
0 \neq x & \text{if } x = \frac{x}{\sin x}
\end{cases}
\]

\[(x)f = (x)f\]

2. (a) Prove that the function defined by

SECTION I

2

\[
\prod_{i=1}^{n} a_i = a_1 \cdot a_2 \cdot \cdots \cdot a_n
\]

Prove that

(e) What is the point of inflection?

(d) Define Radius of Curvature.

(c) Show that

\[
\sum_{i=1}^{n} a_i = a_1 + a_2 + \cdots + a_n
\]

(b) If \( a \in \mathbb{R} \), prove that \( (1 + x)^n = a \cdot x^n \).

I. (a) Prove that \( x \cdot \sin x \) is continuous.

Compulsory Question

compulsory. Select one question from each section.

Note: Attempt five questions in all. Question No. 1 is

Maximum Marks: 40

Paper: BM-112

CALCULUS

GSE/D-16

773

Total Pages: 3
1. Find the centroid of the area bounded by $y = 2x^3$, the $x$-axis, and the ordinate at $x = r$. Use the formula for the moment of inertia about the $x$-axis. $I = \frac{q}{x}$ about the $x$-axis.

2. Find the volume of the solid generated by revolving the area $y = \sqrt{a^2 - x^2}$ about the $x$-axis.

3. Find the area between the two curves $y = x^2$ and $y = 2x$. $\int (x^2 - 2x) \, dx.$

4. Find the radius of curvature of the curve at the origin for the curve $y = x^2$.

5. Find the length of the arc $x^2 + y^2 = 4$ in the first quadrant. $\int_0^1 \sqrt{1 + f'(x)^2} \, dx.$

6. Trace the curve $y = x^3 + 2x$.

SECTION-II

7. Expand $\ln(1 + x)$ in powers of $x$ up to four terms.

8. Prove that $\int_0^1 \frac{e^{-x} - 1}{x} \, dx = \gamma$.

SECTION-III

9. Find an equation of the curve $y = \sqrt{a^2 - x^2}$.

10. Find the area of one loop of the curve $y = 2\sin x$, the $x$-axis, and the asymptote.

11. Find the area bounded by the curve $y = x^2 - 1$, the $x$-axis, and the asymptote.

12. Prove that $\int_0^1 \frac{e^{-x} - 1}{x} \, dx = \gamma$. Use the Taylor's theorem evaluate.
UNIT-I

1. State and prove law of conservation of energy for a single particle system.

2. State and prove law of conservation of angular momentum for a single particle system.

3. Write down two limits of the rest mass.

4. Find the velocity at which the mass of a particle becomes infinite.

UNIT-IV

1. What is the importance of the movement of particles and why is it important?

2. What is conservation of angular momentum and moment of inertia?

3. What is the fundamental principle of special theory of relativity?

UNIT-III

1. What are Galilean transformations? Show that law of transformation of velocity and momentum are invariant under Galilean transformation.

2. Write down the minimum no. of coordinates required to describe the system.

3. Show that constraints imposed on the system reduce acceleration.
3. Field intensity at a point near an infinite plane sheet of
Lei: Class. Now derive an expression for the electric
a scalar.
Also show that E is a Laplacian, where E is
Explain an expression for his Cartesian co-ordinates.

UNIT-1

2. (a) What do you mean by divergence of a vector field?

Compassory Question

Each unit Question No. 1 is compulsory.

Note: Attempt five questions in all. Select one question from

Maximum Marks: 40

Time: Three Hours

Papers

Electromagnetism and Electromagnetic Waves

Total Pages: 3

ROLL NO. 3
7. Explain the concept of Displacement Current in Interface between the two media.

8. In a circuit a 50 ohm resistor, 0.3 Henry inductor and 60 uF capacitor are connected in series with a 120 volt, 60 Hz source of electromotive force. Calculate the impedance of the circuit.

9. In a circuit a 50 ohm resistor, 0.3 Henry inductor and a 60 uF capacitor are connected in series with a 120 volt, 60 Hz source of electromotive force. Calculate the current in the circuit.

UNIT III

10. Give the comparison between Electromagnetic field and Magnetic field.

11. Prove that the electric field inside a conductor is absent.

UNIT IV

12. Prove that the electric field inside a conductor is absent.

13. Derive Gauss's Law, and also show that it is invariant in nature.

14. Derive the boundary conditions for B and E at the interface between the two media.

15. Explain the concept of Scalar and Vector potential.
(a) What is Madelung constant $\rho$?

(b) Explain.

(c) Which is more bond angle between NH$_3$ and NF?

(d) Mulliken concept of electronegativity.

(e) What is the relationship between Pauling scale and Mulliken concept of electronegativity?

(f) Which is more stable between CO and CO$_2$?

(g) Does paired structure?

(h) Which is coordination number in three-dimensional cubic:
   - of octahedral and tetrahedral holes.
   - In a close-packed array of N spheres, predict the number $R$, C, N and O.

election affinity

Arrange the following in decreasing order of their

(a) Write the electronic configuration of Pd (Z = 46).

(b) Write the following in decreasing order of their

(c) Select two questions from each section.

(d) Answer the following questions in all Question No. 1 is compulsory.

Note: Attempt these questions in all Question No. 1 is compulsory.

Time: Three Hours

Maximum Marks: 32

Paper I

Inorganic Chemistry (Theory)

CHEMISTRY

CSE/D-16

779

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779/16.300/3242
7. Draw a neat diagram and discuss the structure of a molecule. Explore the role of ionic character in HF and other molecules. Calculate the bond length and dipole moment of HF.

8. Discuss various factors on which ionization energy depends. Which element has the highest ionization energy? Why is the first ionization energy of magnesium higher than that of sodium in the same period?

9. What is the trend of ionization energy of the second period? Give the Lewis dot structure of K⁺ and Ca²⁺ ions. Using Pauling's electronegativity scale, KCl is 3.144. Calculate the ionic radius difference in KCl.

10. Why are the electronegativity values for a diatomic molecule? What is the shape of the molecular ion Cl₂⁻? Explain the formation of a covalent bond by two chlorine atoms.

SECTION A

2. What are isoelectronic species? Arrange the following in order of increasing radius:

- 2. K⁺, Ca²⁺, Cl⁻.

3. Why are normal and orthogonal wave functions used? Explain these terms.

SECTION B

2. How do you draw a molecular orbital diagram for the ground state of an atom? Explain the formation of a covalent bond between two hydrogen atoms.

3. Calculate the ratio between the wavelength of an electron and the velocity of the electron.
2

(ii) The height of Arsenic

(i) Ternary

Systems

(c) What are the crystallographic dimensions of their unit cell? If some solids belong to the following crystal

(c) Chalkone gas will be equal to that of SO₂ at NTP.

(c) What is Boyle's temperature of alcohol? What is the effect of temperature on viscosity?

1. (a) Define coefficient of viscosity. Describe briefly the

Compulsory Question

Available.

Select two questions from each section. Log tables are

Note: Attempt four questions in all. Question No. 1 is compulsory.

Maximum Marks: 32

Time: Three Hours

Elective

Paper-II
(Physical Chemistry)

CHEMISTRY

CSE/D.16

Total Pages: 4

Roll No.

780

9. (a) Define Law of symmetry. Explain with a suitable
SECTION-A

1. Why do X-ray diffraction patterns of different crystals have similar structures but differ somewhat?
2. Derive an expression for specific rotation.
3. What are the axes on which optical rotation depends?
4. What are the Miller indices of this face?
5. The intercepts on the unit plane of the face made by the unit plane on the
   (a) The intercepts made by the unit plane on the
   (b) The value of \( q \) for which \( f \) is a maximum.
   (c) The points 15.81 cm and 15.88 cm are the
5. Describe the effect of temperature and pressure on
   (i) Collision Frequency
   (ii) Collision Number
   (iii) Mean Free Path
   (d) Define the following terms:

SECTION-B

2. Why does the gas helium and hydrogen not condense at room temperature by applying high pressure?
3. Describe the crystallographic axes \( X, Y, Z \) and make a crystallographic axis.
4. Describe the molecular structure of oxygen molecules and its properties.
   (a) Define surface tension. Describe one method for
   (b) Calculate the collision frequency of oxygen molecules.
   (c) Derive equations of state and define law of
   (d) Calculate the collision frequency of oxygen molecules.
   (e) Describe the characteristic of the gas.
(d) Whether CH₃-CH₂=CH₂ will show geometrical isomers or not?

I: Br-CH₂-CH₂\( \equiv \)

Priority (lower first)

Arrange the following groups in order of increasing Electronegative effect

Inductive effect

The following effects:

The presence of halogenation is necessary in which of the following:

- Non-conjugated dienes.
- Conjugated dienes.
- Chemical bond.

Chemistry

Compulsory Question A

and Section-B

Compulsory: Attempt two questions each from Section-A and Section-B.

Note: Attempt five questions in all. Question No. 1 is compulsory.

Maximum Marks: 32

Time: Three Hours

Paper-III

(Theory)

Organic Chemistry

Chemistry

GS/E/16

781

781/16/000/KD/244
2. What are free radicals? Explain the order of alkyl free radicals. 
(c) What is the basis of hyperconjugation?

2. What are carbonates? Give structure of singular and multiple. Why do carbonates have different properties?

6. (a) What are homomorphic and heteromorphic? Name two examples. 
(b) What is the size of molecule? How do they depend on the size of molecule? 
(c) What are Vander Waals forces? How do they depend on the size of molecule? 
(d) Explain how reactivity of vinyl halides on the basis of resonance. 
(e) Example of 1,3-butadiene. 
(f) What is dehydrobromination? Explain taking CH₃Br as a case.

**SECTION B**

2. Assignment of Z and Z configuration to the following:

\[ \text{CH}_3\text{CH}^\equiv \text{CH} \text{OH} \]

\[ \text{CH}_3\text{CH}^\equiv \text{CH} \text{OH} \]

(a) Assign Z and Z configuration to the following.
(b) Assign D and L configuration to the compound.
(c) Why Fischer projection was selected as standard for determination of relative stability?
(d) Draw various conformations of n-butane. Give order of stability.

2. (a) Draw various conformations of n-butane. Give order of stability.
(b) Calculate the second carbon atom in the following:

\[ \text{CH}_3-\text{CH}^\equiv \text{CH}^\equiv \text{CH}_3 \]

Mark the secondary carbon atom in the following:

\[ \text{CH}_3-\text{CH}^\equiv \text{CH}^\equiv \text{CH}_3 \]

Which is planar or symmetric?

2. What are homomorphic and heteromorphic? Explain the case of optical activity.
(a) Explain the cause of optical activity.
(b) When does half-reactions not represent a molecule? 
(c) When is more stable, and why?
(d) Of the naphthenic and cyclohexane configuration of chiral.
A lady of my own
She shall be mine, and I will make
The child I love will make.

Then nature said, 'A lover's vow;
Three years she grew in sun and shower:
Or

(a) Who is the writer of these lines?
(b) Who happens to those who meet death?
(c) Who would meet death at the earliest?
(d) When do we get from rest and sleep?
(e) When are the pictures of death according to the poet?

Questions:

Role of their bones, and souls delivered.
And sorrow's worm with these go,
Which pleasure when from these much more must flow.
From rest and sleep, which but thy picture be
Then follow:

1. Read the passage given below and answer the questions.

Note: Attempt all questions.

Maximum Marks: 40

Time: Three Hours

ENGLISH

82

GE/D-16

Total Pages: 4

Roll No. 4
to be associated with the school. Don't make him feel that
the daily companions of the children's life and play should not
be really helpful to you. For all this, books should be
practiced and you have done something for which
habit of reading. Give him the habit of reading and her
more. Books are the chief of their daily race. Explain,
Ammon all the books you can gift to a child. There is none
at the end.

Read the following passage and answer the questions given
For Non-Hindi Speaking/Preparation Candidates only

OR

3. Attempt the following in around 50 words each:

2. Explain with reference to context:

Question:

How will nature make lucky?

How will nature decide above lucky?

What did nature want to point out?

Who gave in shine and shower for these years?

Name the poem and the poet.

5. Translate the following passage into English:

On His Blessing?

How does the poet justify the ways of God to man in the

4. How does Shakespeare define love?
UNIT I

1. Define the following terms:
   - Aerobic Bacteria
   - Anaerobic Bacteria
   - Psychrophiles
   - Thermophiles
   - Lysogenic Life-cycle
   - Phycocyanin
   - Sporangia

2. Briefly explain the following:

   (a) Difference between Bacteria and Cyanobacteria.
   (b) Reproduction in Bacteria.

UNIT II

3. Write notes on the following:
   - Economic Importance of Lichens.
   - Reproduction in Lichens.

4. Write notes on the following:
   - Sexual Reproduction in Fungi.
   - Stages of Fungi on Brackets.
   - Reproduction in Mucor.

5. Write notes on the following:
   - Sexual Reproduction in Yeasts.
   - Structure of Yeast. 
   - Structure of Bacillus.

Note: Attempt all the questions from each unit. All questions carry equal marks. Draw well-labelled diagrams where they are necessary. Select only one question from each unit. All questions carry equal marks.

Maximum Marks: 40

Paper I

Diversity of Microbes

BOTANY

Total Pages: 2)

ROLL NO.

TIME: Three Hours

CSE/D-16

78S
UNIT-I

1) What is the function of Peroxisomes?
2) What kind of enzymes are present in Peroxisomes?
3) Define the term Cytoplasmic and Endoplasmic Reticulum.
4) Difference between Smooth Endoplasmic Reticulum and Rough Endoplasmic Reticulum.
5) What are Mitosis?
6) At which stage synaphsis occurs during prophase 1 of Meiosis.
7) Name the cell organelle involved in Photosynthesis.
8) When are Mitotic Plates visible?

Computer Question

well labeled diagrams where they are necessary.
Type All questions carry equal marks. Diagrams have been included where necessary. Each question is compulsory and short answer questions have been provided in all sections.

Note: Attempt any 8 questions in all sections. Ignore any two questions from 1-4.

Maximum Marks: 10

Time: Three Hours

Paper: II

BOTANY

GSE/BTECH 16

786

ROLL NO.

TOTAL PAGES: 2
Name the phenomenon that prevents self-fertilization
mitochondria
Where do Kreb's Cycle enzymes occur in
Differentiate between Chila and Fagella.
Where does fertilization occur in Plasmodium?
Name any two types of intercellular functions.
Which Endoplasmic Reticulum is concerned with
Name the class and order of Scapha.
(i) Define parasitic.

(Compulsory Question)

Section B.
Attempt two questions from Section A and two from
Question No. I is compulsory.
Note : (i) Attempt five questions in all.

Maximum Marks : 40

Time : Three Hours

Paper-1
and Cell Biology I
Life & Diversity from Prokarya to Eukarya
ZOOLOGY

787

CSE/D-16

Total Pages : 3

Roll No. :
SECTION-A

7. (a) Describe the ultrastructure of the centriole.

9. (a) Discuss the biogenesis of lysosomes in eukaryotes.

14. (b) Synthesize in mitochondria.

24. (c) Enzymes of electron transport chain and ATP synthase are semiautonomous organelles.

8. (a) Write a note on golgi apparatus.

SECTION-B

2. (b) Describe the Na+-K+-ATPase active transport system in sponges.

5. (a) With the help of diagrams explain functional Ca and Na channels.

4. (a) Write a note on chondrocyte of a spongy.

7. (a) Demonstrate using a protractor giving characters and examples of each order of Porifera. Classify this class into foci of plasmid DNA.

2. (b) Write the symptoms, prevention and therapy of malaria.

(1×10⁻¹⁰) (a) Acrosome of the sperm is formed from which organelle?

(x) An ovum occurs in which stage of life cycle of Plasmodium malariae.

(1×10⁻¹⁰) (a) Describe the ultrastructure of a Golgi body.
UNIT-I

2. (a) Explain V-I characteristic of p-n junction diode. (3)

3. (a) Explain how Zener diode acts as voltage regulator. (4)

4. (a) Explain Schottky clipping with the help of circuit diagram. (4)

5. (a) Explain why is not possible to construct a transistor by connecting two diodes back-to-back. (2)

6. (a) Draw & parameter model of C-B and C-E configuration of transistor. (8)

7. (a) Which is the most used C output configuration of FET. C-B, C-E and C-G. (4)

8. (a) Explain Ebers and Moll model of transistor. (5)

9. (a) Explain emitter follower circuit. Discuss its advantages. (5)

Note: Answer five questions in all. Question No. 1 is compulsory.

Maximum Marks : 40

Time : Three Hours

Electronics

ELECTRONICS

Paper-I

Electronic Devices and Circuits-I

1. Compulsory Question

Select one question from each unit.

UNIT-II

2. (a) Explain the working of Zener voltage multiplier circuit. (3)

3. (a) Draw the working of diode and circuit diagram of half wave, bridge and full wave rectifier. (4)

4. (a) Draw circuit diagram and wave shapes of half wave, bridge and full wave rectifiers. (4)

5. (a) Explain the working of full wave rectifier (FWR). (4)

6. (a) Draw the working and expression for ripple factor and rectification efficiency of FWR. (5)

7. (a) Discuss the advantages of FWR as compared to half wave rectifier. (5)

8. (a) Explain the working of diode and circuit diagram of half wave, bridge and full wave rectifiers. (4)

UNIT-III

9. (a) Draw the working of Zener voltage multiplier circuit. (3)

10. (a) Explain the working of diode and circuit diagram of half wave, bridge and full wave rectifiers. (4)

11. (a) Draw the working of diode and circuit diagram of half wave, bridge and full wave rectifiers. (4)

12. (a) Draw the working of diode and circuit diagram of half wave, bridge and full wave rectifiers. (4)

13. (a) Draw the working of diode and circuit diagram of half wave, bridge and full wave rectifiers. (4)
UNIT-I

(a) Discuss Sequential Codes using suitable examples.
(b) Discuss ASCII codes in detail.
(c) Number System.
(d) Convert (33)10 into Binary, Octal and Hexadecimal.

UNIT-II

(2x4)

(a) Why ECL gates are faster?
(b) Discuss TTL, NAND gate with Truth-Table and explain its applications.
(c) Show that Distributive Law holds good in Binary.
(d) Define Priority & Explain its Applications.

Complementary Question

Each Unit 10 Question No. 1 is compulsory.

Note: Attempt five questions in all, selecting one question from each unit.

Time: Three Hours

Maximum Marks: 40

[Theory]

Paper II

(Digital Electronics - I)

ELECTRONICS

GSE/B.Tech

792

792-000/KD/287

2

UNIT-IV

(a) Discuss the operation of CMOS NOR.
(b) Explain characteristics of Digital IC's.
(c) Discuss DTL NOR gates.
(d) Discuss ECL OR gate.
(e) Propagation Delay - P.D.
(f) Propagation Delay - P.D. (1/4x2)

UNIT-III

(a) Define and discuss the XOR gate.
(b) Define and discuss the Boolean Algebra.
(c) Discuss possibilities of Boolean Algebra.

(5)

1 1
\[ \sum_{0}^{1} (A'.B + A'.C + B.C + A'B.C) \]

4. (a) Design logic circuit to perform AND, OR and NOT.

UNIT-II

(a) Design logic circuit to perform CMOS gates only.
(b) Simplify the following using K-map and Implement.
(c) Design logic circuit to perform XOR and NOR gates only.
2. Make a block diagram of computer and explain its essential parts.

UNIT I

Differences between ROM and RAM.

1. (a) When is Flash Memory
(b) Read, Store and Process Instruction
(c) What symbols used in Flow Chart for Decision-making

2. (a) Define Hardware and Software
(b) Devise

I. (a) Name one Sequential and one Direct Access

Computer Question

Select one question from each unit.

Note: Attempt the question in all Question No. 1 is compulsory.

B. Sc. 40

Maximum Marks : 25

Time : Three Hours

PAPER I

(COMPUTER AND PROGRAMMING FUNDAMENTALS)

COMPUTER SCIENCE

CSE/D-16

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ROLL NO.

TOTAL PAGES : 2

2

UNIT II

C. (a) HLL 1ST LTT.
(b) Compilers vs Interpreters.
(c) Machine Language vs Assembly Language.

3. Write notes on the following :

(b) Discuss Binary Search.
(c) Explain Bubble Sort.

5. (a) Define Operating system and prove how it works as Resource Manager.
(b) Write notes on the following :

6. (a) Define Algorithm and write an algorithm to find

(b) Make decision Table to find lowest of 3 numbers.

(c) Discuss errors and types of errors in Programming.

7. (a) Discuss Top-down and Bottom-up approach in Programming.

8. (a) Discuss Errors and types of errors in Programming.

9. (a) Write notes on the following :

10. (a) Write notes on the major parts of Motherboard.
UNIT-I

in Excel.

(d) What do you mean by Office Automation?

(e) Write the steps to change the Date/Time of your system.

(f) What do you mean by Windows clipboard?

Compulsory Question

(1) All questions carry equal marks.

(iii) Select one question from each unit.

Note: (i) Attempt five questions in all.

Paper-II
(PE Software)

COMPUTER SCIENCE

CSE/D-16

794

Total Pages: 3
UNIT-III

6. Explain following functions by using example:

(a) ROUND
(b) IF
(c) SQR
(d) AVERAGE

UNIT-II

5. Explain various steps to add a Header and Footer in your document.

(a) What do you mean by Auto-Fit in MS-Word?
(b) Various steps to use Auto-Fit feature in your document.

UNIT-I

3. What is the purpose of Start menu? Explain various options under Start menu.

(a) Where is wallpaper? Write steps to change the wallpaper.
(b) Write steps to add a chart in your presentation.

UNIT-IA

9. Write steps to insert bulleted sound effect in a slide.

(a) What do you mean by animation? Explain steps to apply custom animation effects.
2. (a) What are the differences between Analog & Digital?

UNIT-1

(1) Define Operating System.
(2) Define Secondary memory.
(3) What is Dilemmer?
(4) Explain the limitations of computer.

Compulsory Question

Select one question from each unit.

Note: Answer all questions in all Question No. 1 is compulsory.

Maximum Marks: 40
Time: Three Hours

Paper-1

Fundamentals of Computer & Window Operating System

COMPUTER APPLICATIONS

795

GSE/D-16

ROLL NO.

Total Pages: 3
3. (a) Convert the following:
   (i) \((127.54)_{10} \rightarrow ( )_{8}\)
   (ii) \((1245.32)_{10} \rightarrow ( )_{8}\)
(b) Write short notes on ASCII and EBCDIC code.

**UNIT-II**

4. What are Data scanning devices? Explain how they help in improving input data accuracy as compared to keyboard devices.

5. What is an Output device? Explain the following output devices:
   (i) Dot Matrix Printer.
   (ii) Laser Printer.
   (iii) Plotter.

**UNIT-III**

6. (a) Explain RAM and various types of RAM.
(b) Write short note on CPU Registers.

7. (a) Distinguish between a sequential access, a direct access and a random access storage device.
(b) Explain Magnetic Tape. Also write advantages and disadvantages of Magnetic Tape.

**UNIT-IV**

8. (a) Explain various functions performed by Operating system.
(b) Write short note on Desktop.

9. (a) What are the various features of Window?
(b) Write short note on Control Panel.
(i) Why do you mean by Transition effect in PowerPoint?
(ii) What do you mean by MIID function in Excel?
(iii) How can you freeze rows and columns in a worksheet?
(iv) What is default name assigned to a new workbook?
(v) What do you mean by Autorex option in Word?
(vi) What is default name assigned to a new presentation?
(vii) Why do we need Highlights?
(viii) What do you mean by Autorex option available in Excel?

Explain the following concepts related to PowerPoint:

UNIT I

Computer Question

1. Question from each Unit

Note: Question No. 1 is compulsory. In addition to compulsory

Maximum Marks: 40

Time: Three Hours

Paper: II

Office Automation Tools

COMPUTER APPLICATIONS

796

Total Pages: 3

Roll No. .................
UNIT I-A

3. (a) Write steps to perform following operations on MS-Word:

   (i) Insert headers and footers.
   (ii) Create a table.
   (iii) Distinguish between the following:
   (a) Tabulations, Margins, Indents.
   (b) Spell Check, AutoCorrect.
   (c) Inserting symbols.

4. (a) Explain the following terms related to MS-Word:

   (i) AutoCorrect, Macros, Autofilier, Autoformat.
   (ii) Applying Autofilier Option.
   (iii) Renaming Excel in a Cell.
   (iv) Renaming a Worksheet in a Workbook.
   (v) Writing steps to perform following Excel activities:
   (a) Print a worksheet.
   (b) Apply conditional formatting to a cell.
   (c) Use pivot tables.

5. (a) Distinguish between the following:

   (i) (x+y) + (x+y) = (2x+2y).
   (ii) (x+y) - (x+y) = 0.
   (iii) (x+y) x (x+y) = (x^2 + 2xy + y^2).

6. (a) Write steps to perform following Excel activities:

   (i) Applying Autofilier Option.
   (ii) Renaming Excel in a Cell.
   (iii) Renaming a Worksheet in a Workbook.

7. Explain the following terms related to Excel:

   (i) (x+y) x (x+y) = (x^2 + 2xy + y^2).
   (ii) (x+y) + (x+y) = (2x+2y).
   (iii) (x+y) - (x+y) = 0.

8. (a) Briefly describe the following Excel functions giving suitable examples:

   (i) NOW.
   (ii) FLOOR.
   (iii) IF.
   (iv) MOD.

9. (a) Briefly describe the following chart elements:

   (i) Wizard.
   (ii) What are basic rules for creating chart with chart
   (iii) Legend.
   (iv) Origin.

(6+2=8)

(6+2=8)

(6+2=8)
UNIT I

1. (a) Define Biotechnology and give its scope.
(a) Genetic Engineering.
(b) Culture Laboratory.

(c) Basic requirements for establishing animal cell laboratory.

UNIT II

Paper I

Introduction to Biotechnology

BIOENGINEERING

Note: Attempt five questions in all, selecting two questions from each Unit and Question No. 1 is compulsory.

Maximum Marks: 40
Time: Three Hours

Roll No.

Total Pages: 2
2. (a) Define Monosaccharides. Discuss different families of monosaccharides giving suitable examples.

(b) Define Monosaccharides. Discuss different families of monosaccharides. Property of amino acids.

(c) Define Amino acids. Briefly describe the chemical structure.

UNIT-1

1. (a) Define tRNA value.

(b) Define Monosaccharides.

(c) Write down the structure of Glucose and Lactose.

(d) Give names of any two monosaccharide amino acids.

(e) What are Zwitterions?

(f) What are Essential Amines?

(g) Give full forms of NAD and TAC.

(h) Write down the name of four heterogeneous bases of DNA.

Computusory Question

Equal marks, select any four questions from each unit. All questions carry equal marks.

Note: Attempt five questions in all. Question No. 1 is compulsory.

Maximum Marks : 40

Time : Three Hours

Paper-II

(Biochemistry-I)

BIOTECHNOLOGY

CSE/D-16

800

ROLL NO. ..........................................................
Possible values of n, l, m are.
An electron is present in 3d orbital. Write down the
functions.
When do you mean by radial and angular wave
functions?
Difference between their shapes?
2. (a) Draw shapes of 1s and 2s orbitals. When is the basic

I. 2
N! = 2
Calculate number of unpaired electrons in
Explain Hund's rule of maximum multiplicity.

| Given \( m = 9.1 \times 10^{-36} \text{ Kg}\). |
| Given \( h = 6.6 \times 10^{-34} \text{ kg m}^2 \text{s}^{-1}\). |
| Uncertainty in position is \( \lambda \). |

(a) Calculate uncertainty in velocity of an electron in

SECTION-A

From each section.

Note: Attempt five questions in all sections at least two questions

Maximum Marks: 27

Time: Three hours

Paper - 1, CH-101
(Inorganic Chemistry)

CHEMISTRY

819

OCT/16

Total Pages: 3

Roll No..........................
Bond distance = 1.4 Å, Dipole moment = 0.78 D.

From the following data:

(c) Calculate the geometrical structure of NO molecule.
(d) Calculate the bond order of NO molecule.
(e) Draw molecular orbitals for N2 molecule.
(f) Draw molecular orbitals for NO molecule.

Section B:

5. (a) What are the conditions for atomic orbitals to form molecular orbitals?
(b) When are the limitations of VB theory?
(c) Discuss the Lewis formula of SF6 on the basis of hybridization.

Section C:

1. (a) How does a Mulliken scale of electronegativity give its electronegativity?
(b) How do you understand by successive ionization energies?
(c) Discuss Mulliken scale of electronegativity.

2. (a) Why L2ICO3 is soluble while Na2CO3 is quite soluble?
(b) Why Li2CO3 is unsuitable while Na2CO3 is quite soluble?
(c) Why does electronic configuration of d-block elements change on moving down the group in the periodic table?

3. (a) Why certain elements of noble gases are very high whereas their electron affinity are zero.
(b) Why ionization energy of noble gases are very high.
(c) Why inner transition elements have lower ionization energies?

4. (a) Write down electronic configuration of d-block elements.
(b) Write down electronic configuration of p-type semiconductors.
(c) Why Li2ICO3 is unsuitable while Na2CO3 is quite soluble?
SECTION A

From each section, answer any five questions in all, selecting at least two questions from each section.

Note: Attempt five questions in all, selecting at least two questions.

Maximum Marks : 26

Time : Three Hours

Paper - II
(Physical Chemistry)
CHEMISTRY
OCT/DE-16

SECTION B

2

(b) Explain the Law of Rational Indices.

8

(a) Define and explain with example.

7

(a) Define and explain the following:

2

(b) Prove that $V = 3p$.

2

(a) Using Van der Waals equation, derive an expression for Boyle's law in terms of Van der Waals
velocity and most probable velocity of CO at 37°C.

(b) Calculate the root mean square velocity of hydrogen.

(b) Explain the terms:

Collision diameter, collision number and mean free path.

SECTION A

From each section, answer any five questions in all, selecting at least two questions from each section.

Note: Attempt five questions in all, selecting at least two questions from each section.

Maximum Marks : 26

Time : Three Hours

Paper - II
(Physical Chemistry)
CHEMISTRY
OCT/DE-16

SECTION B

2

(b) Explain the Law of Rational Indices.

8

(a) Define and explain with example.

7

(a) Define and explain the following:

2

(b) Prove that $V = 3p$.

2

(a) Using Van der Waals equation, derive an expression for Boyle's law in terms of Van der Waals
velocity and most probable velocity of CO at 37°C.

(b) Calculate the root mean square velocity of hydrogen.

(b) Explain the terms:

Collision diameter, collision number and mean free path.
1. Give the properties of functional groups.

<table>
<thead>
<tr>
<th>CH3</th>
<th>CH3-C-CH3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-I-C-OH</td>
</tr>
</tbody>
</table>

(a) Assign R and S configuration to the following:

(b) Which are functional isomers? Give two examples.

3. (a) What is meant by plane of symmetry?

2. (b) What are the differences between Inductive and Electronic effects?

2. (c) Explain the cause of low reactivity of vinyl halides.

2. (d) Define van der Waals interactions. Give their types.

2. (e) Define suitable example. What is delocalized chemical bond? Explain with example.

SECTION A

Note: Attempt five questions in all, selecting at least two questions from each section.

Maximum Marks: 27

Time: Three Hours

Paper III

[Organic Chemistry (Theory)]

CHEMISTRY

OCSE/D-16

821

Roll No. 3

Total Pages: 3
1. What are the differences between simple and triplet excitations?
2. Explain the structure of methyl carboxylate (CH₃COO⁻).
3. Write the structures of (a) acetic acid, (b) acetyl chloride, (c) ethanol, and (d) acetone.
4. Write the IUPAC names of the following compounds:
   (a) CH₃COONa + H₂O → CH₃COOH + NaOH
   (b) 2CH₃CHO + 2NaOH → Na₂CO₃ + 2CH₃CH₂OH

6. (a) Write the IUPAC names of the following compounds:
   (b) HO⁻ + CH₃CH₂CH₂OH → CH₃CH₂CH₂OH⁻
   (c) HO⁻ + CH₃CH₂COOH → CH₃CH₂COO⁻ + H₂O
   (d) HO⁻ + CH₃COOH → CH₃COO⁻ + H₂O
   (e) HO⁻ + CH₃COOH → CH₃COO⁻ + H₂O

7. (a) Define primary and secondary carbon atoms in alkanes.
   (b) Write the reactions:
      \[ \text{CH}_3\text{COONa} \rightarrow \text{NaOH} + \text{CH}_3\text{COOH} \]
I. Define and explain any eight of the following

(Compile Question)

Select one question from each unit. All questions carry equal marks.

Note: Attempt five questions in all Question No. 1 is compulsory.

Maximum Marks: 40

Time: Three Hours

(Course No. 102)

836

State the relationship between Health & Hygiene and promote Health.

UNIT-IV

8. Why is it essential to have periodic health check-up of children in schools? Explain in detail.

UNIT-I (Epidemiology)

What are the various causes, mode of spread, symptoms, prevention and treatment of Measles occurring in children?

Describe the cause, mode of spread, prevention and treatment of Typhoid fever in children.

Describe in detail the mode of spread, symptoms, prevention and treatment of Diphtheria in children.

UNIT-II (Pathology)

What is immunity? Classify immunity and give vaccination schedule for human life.

UNIT-III (Microbiology)

Describe in detail the mode of spread of the disease by insect bite, e.g., Malaria.

UNIT-IV (Pathology)

What is Tuberculosis? Describe in detail the mode of spread, symptoms, prevention and treatment of Tuberculosis.

UNIT-V (Pathology)

What is the difference between Polio and Polio Drops? Describe in detail the mode of spread, symptoms, prevention and treatment of Polio.

UNIT-VI (Pathology)

What is the difference between Diarrhoea and Dysentery? Describe in detail the mode of spread, symptoms, prevention and treatment of Diarrhoea and Dysentery.
1. Write short notes on the following:

(a) Computation

(b) Bonding

(c) Knitting

(d) Yarn Count

(e) Natural Fibres

Note: Attempt five questions in all, selecting two questions from each unit as well as compulsory questions.

Time: Three Hours

Maximum Marks: 40

Paper: Course No. 103

INTRODUCTION TO TEXTILES

837

GSE/D-16

Roll No. 3

Total Pages: 3
UNIT II

6. Explain various methods of spinning in detail.

5. How the synthetic fibres are important to the consumer?

4. Differentiate between the properties of:
   (a) Silk and Nylon
   (b) Cotton and Wool

3. Explain the manufacturing process of Cotton in detail.

2. What is fibre? Explain in classification.

UNIT I

8. Write short notes on the following:
   (a) Climp
   (b) Yarn Twirl

8. What is weaving? Explain its type.

8. Differentiate between the following:
   (a) Plain weave and Twill weave
   (b) Riding and Bricking

8. Explain the various methods of spinning in detail.

8. Write in detail.

8. How the synthetic fibres are important to the consumer?
Effect of Soaking Treatment on Food Grains.

Nutritional Supplementation.

Satisfaction.

Balanced Diet.

1. Answer the following in 3-5 lines.

Compulsory Question

Note: All questions carry equal marks.

Time: Three Hours

Mark: 40

Paper: Course No. 104

FOOD SCIENCE

838

GSE/D-16

(a)

(b)

(c)

(d)

Write in brief about the following:

Microwave Cooking.

Food Supplementation.
UNIT-I (10 marks)

2. Classify food into various groups based on its nutritional value. (8)

3. Discuss the nutritive contribution of pulses to the diet. (8)

4. Describe the following: (8)

(a) Nutritive value of fish.

(b) Nutritive value of rice.

4. How nutritive value of foods can be improved by using the carbohydrates and proteins. (8)

5. Explain the effect of cooking on nutritive value of milk. (8)

6. Different types of processed milk. (8)

7. Describe the advantages and disadvantages of any three products. (8)

E.g.

8. Nutritive value of fish.
(a) Write the main components of sodium powder.
(b) Write the chemical formula of burned-od.
(c) Sodium
(d) Electrons = 11, Protons = 11 and neutrons = 12 in
(e) Calculate atomic mass of Na (Given: No. of
c) 4. (a) Calculate the No. of moles present in 4.8 gm of NaOH.

Compulsory Question

Note: Question No. 1 is Compulsory. Attempt the questions in

Maximum Marks : 40

Time : Three Hours

Paper : Course NO - 105
Introduction Chemistry
HOME SCIENCE

CSE/D-16

Roll No. .........................

Total Pages : 6
2. (a) Write Lewis acids. 
(b) Table. 
(c) What is the position of noble gases in periodic table? 
(d) Define buffer solution with suitable example. 
(e) When is the pH of 10% mol HCl solution? 
(f) What are acids? 
(g) According to Born's model of an atom, write electronic configuration of Oxygen with atomic weight 16.

3. (a) According to modern periodic table, which group has lowest atomic weight? 
(b) Define mass percentage with suitable example. 
(c) How many groups are present in modern periodic table? 
(d) Differentiate bond, covalent bond and co-ordinate bond. 
(e) No. 8 and C with atomic No. 17. 
(f) Write electronic configuration of Oxygent with atomic weight 16.

4. (a) What are Lewis bases? 
(b) Table. 
(c) Why different? 
(d) Either modernity or normality of substituent acid is same. 
(e) If PH of a solution is 4.2, tell whether it is acidic or basic. 

ENI-1 (Question)
UNIT-II

3.5

3. How does the chemical formula of a compound determine its properties?

(c) Name the functional group in following:

\[
\text{H}_2\text{C=CH}_2
\]

\[
\text{H}_3\text{C-CH}_2\text{COOH}
\]

\[
\text{H}_2\text{C=CH}_2
\]

\[
\text{H}_3\text{C-CH}_2\text{COOH}
\]

3. What are the common prefixes used in naming organic compounds?

(c) Write a short note on polyesters.

3. Why are aromatic compounds important?

(a) Write the IUPAC name of the following:

\[
\text{H}_2\text{C}=\text{CH}_2
\]

\[
\text{H}_2\text{C}=\text{CH}_2
\]

\[
\text{H}_2\text{C}=\text{CH}_2
\]

6. What do you mean by isomerism?

(a) Give an example of any type of isomerism.

3. What are the isomers of the following compounds?

\[
\text{H}_2\text{C}=\text{CH}_2
\]

\[
\text{H}_3\text{C-CH}_2\text{COOH}
\]

\[
\text{H}_2\text{C}=\text{CH}_2
\]

\[
\text{H}_3\text{C-CH}_2\text{COOH}
\]

7. Why do you mean by conjugation property?

(c) Give an example of conjugation property.

3. Which of the following carbon atoms can form two bonds and tell which is stronger:

\[
\text{H}_2\text{C}=\text{CH}_2
\]

\[
\text{H}_2\text{C}=\text{CH}_2
\]

\[
\text{H}_2\text{C}=\text{CH}_2
\]

(c) In alkenes (C=C) there are two bonds in Carbon-Carbon and Carbon-Hydrogen.

3. What do you mean by conjugation of following?

\[
\text{H}_2\text{C}=\text{CH}_2
\]

\[
\text{H}_3\text{C-CH}_2\text{COOH}
\]

\[
\text{H}_2\text{C}=\text{CH}_2
\]

\[
\text{H}_3\text{C-CH}_2\text{COOH}
\]
1. Define Human Development and what is the scope of Human Development?

2. What is Development and explain principles of Human Development?

3. How Heredity and Environment are Important in Human Development?

Note: Attempt five questions in all. Select two questions from each unit. Question No. 9 is compulsory. All questions carry equal marks.

[Maximum Marks: 40]

Time: Three Hours

Paper: Course No. 106
Introduction to Human Development

HOME SCIENCE

GSE/B.D-16

Total Pages: 4

Roll No. 2

(16)
8. Give characteristics of Early Childhood Stage.

9. Define the following terms:

- Adolescent (a)
- Adolescence (b)
- Adult (c)
- Adulthood (d)

2. (a) At the time of birth, infant's length is

- 90-100 cm (a)
- 10-12 cm (b)
- 7-7.5 cm (c)
- 4.5-10.5 cm (d)

2. (b) Baby's hand at the age of:

- 0-2 months (a)
- 4-5 months (b)
- 6-8 months (c)

9. Comparative Questions:

7. What are the factors which are responsible for prenatal development?

8. Explain old age in human development.

5. Describe any two methods of child study.

UNIT II (Phases II):

4. Discuss physical and emotional development of an

8. Explain the following phrases:

- Inborn
- Learned

8. Explain the following statements:

- Inborn
- Learned
UNIT I

1. Write the working of Magnetic Disk.
   (b) Memory.
   (a) What is Primary Memory? Discuss types of Primary Memory.
   (c) Explain the block diagram of Computer and its essential parts.

UNIT II

1. Define Computer, Interpreter and their difference.
   (b) Language.
   (c) Differentiation between Machine Language and Assembly Language.
   (a) Processing Start in Flow-chart.

UNIT III

1. Differentiate between Primary and Secondary Memory.
   (b) What are the symbols used for Input, Decision, etc.
   (a) Differentiate between Primary and Secondary Memory.

Select one question from each unit.

Note: Answer five questions in all. Question No. 1 is compulsory.

Maximum Marks : 80

Time : Three Hours

PAPER : BCA-III

COMPUTER AND PROGRAMMING Fundamentals

BCA/D-16

Roll No. 2

TOTAL PAGES : 2
Attempt all the following questions:

Compulsory Question

Each unit in addition to Question No. 1 which is compulsory.

Note: Attempt the questions in all, selecting one question from each unit.

Maximum Marks: 80

Time: Three Hours

Paper: BCA-112

Windows and PC Software

BCA/D-16

854
UNIT-III

8
9
12
4
7.
(a) Explain cell formatting in detail.
(b) Explain various methods of inserting, deleting and
hiding rows & columns from a worksheet by giving
suitable examples.
(c) Explain various steps of inserting, deleting and
renaming a worksheet.
(d) Explain various steps of inserting, deleting and
renaming steps on insert, delete and
rename a worksheet.
(e) Explain various steps of inserting, deleting and
renaming steps on insert, delete and
rename a worksheet.

UNIT-II

8
9
12
4
7.
(a) Explain the steps of creating charts in Excel.
(b) What is Macro? Explain various steps of record and
the steps of creating charts in Excel.
(c) Explain various steps of record and
the steps of creating charts in Excel.
(d) Explain the steps of creating charts in Excel.
(e) Explain the steps of creating charts in Excel.

UNIT-I

8
9
12
4
7.
(a) Explain the steps of creating charts in Excel.
(b) What is function? Explain any four mathematical/
scientific functions.
(c) What is function? Explain any four mathematical/
scientific functions.
(d) What is function? Explain any four mathematical/
scientific functions.
(e) What is function? Explain any four mathematical/
scientific functions.
3. Find the value of $u$ if $u = \frac{e^x + 1}{(e^x - 1)^2}$

4. Evaluate $\lim_{x \to 0} \frac{\sin x}{x}$

5. Prove that $\frac{\sin \theta}{\sin \theta - \sin \theta}$

Define Supremum and Infimum of a set.

3. Let $A = \{0 = 2 - 2x = 15\}$
   - Set $B = \{x : x \text{ is a positive integral root of}\}$
   - Set $A = \{0 = 2 - x : x\}$
   - Prove that the following sets are equal.

Compulsory Question

Compulsory

Each section in addition to Question No. 1 which is

Note: Attempt five questions in all. Select one question from

Maximum Marks: 80

Time: Three Hours

Paper: BCA I

MATHMATICAL FOUNDATION - I

BCA/D-16

855

Total Pages: 3

Roll No. 3
8. \((4 + x_2)(3 + x_2) = \frac{\partial P}{\partial x} (1 + x) + \frac{\partial P}{\partial x} (1 + x) \) (q)

8. \(x \log z = \frac{\partial P}{\partial x} x + \frac{\partial P}{\partial x} x \) (a) Solve the differential equation

8. \(x + x = \log \frac{\partial P}{\partial x} x + \frac{\partial P}{\partial x} x \) (a) Solve the differential equation

SECTION IV

8. is exact and hence solve it:

8. Verify the given differential equation

7. Solve the linear equation

6. Find the differential equation of the family of curves

SECTION III

SECTION II

9. Find the value of \( f \) if it is

3. Define a Boolean Algebra as an algebraic structure.

2. A survey shows that 63% of Indians like cheese whereas

8. If \( x \) apples are divided by 10, how many ways can be invented

8. If \( x \) apples are divided by 10, how many ways can be invented

8. How many different numbers of six digits can be formed with the digits 1, 2, 3, 4, 5, 6.

8. Define a Boolean Algebra as an algebraic structure.
UNIT I

2. (i) Why is number system explained two positional?

101

S(T) = 8(T) = 01(T) = 1(T) = 19(T) (iv)

8

(iii) Why computer system uses binary number system?

(iv) What is multiplier?

(v) What is combinational circuit?

(vi) What is NAND gate?

(iv) Prove distributive law using Venn Diagram.

(v) De Morgan law of Boolean Algebra.

Explain Minterm.

Compassory Question

Note: Attempt any five questions. Question No. 1 is compulsory.

Maximum Marks : 80

Time : Three Hours

Paper : BCA-I.14
LOGICAL ORGANISATION OF COMPUTER

BCA/D-16

856

Roll No.

Total Pages : 3
8. Prove that NAND gate is an universal gate.
8. NOR gate.

7. (i) Explain implementation of AND, OR, NOT gates by

(ii) Explain the working of 3 input NAND gate:
\[ y = \overline{ABC} + \overline{A} + \overline{BCD} + \overline{ABCD} \]

8. Implement it using OR and AND gates.

6. (i) Simplify the following boolean expression and

(ii) Design a 6 × 32 decoder with the help of 8 × 8 decoder.
8. Explain and draw the logic diagram of decimal to BCD

by using 8-bit adder.

8. When is Full Adder? Explain it. Draw its logic diagram.
8. Describe the design procedures of Combinational

UNIT-IV

8. Design an 8-bit adder.
8. Explain two canonical forms of boolean expression:

(i) Simplify the boolean function.

8. State De Morgan's Theorem and prove it.

UNIT-II

8. Explain ASCII and EBCDIC code.
8. Discuss how negative numbers can be represented in

computer system.
Questions selection one question from each unit
in addition to compulsory question answer four more
Note: Attempt five questions in all. Question No. 1 is compulsory.

Maximum Marks: 80

Time: Three Hours

Paper: BCA-116

PROGRAMMING IN C

BCA/D-16

Roll No. 3
UNIT 1

What does a string class template? Describe the features of different string classes available in C++.

UNIT 2

Write a program to check whether a given string is palindrome or not.

UNIT III

The importance of bitwise operators with suitable examples. Explain bitwise and unary operators available in C++. Illustrate numbers.

UNIT IV

What is the purpose of if-else statement? Write a program to print the largest among three numbers. Difference between two different forms of if-else statement? Write a program to negate a condition of boolean variable using logical operators

UNIT V

What are escape sequences? Write a program to output a message in double quotes.
3. Explain various types of Primary Memory Devices. OR

Determine the functional units of a Computer.

UNIT-1

I. (a) What is ROM?
(b) What is Machine Language?
(c) What is Debugging?
(d) Define the term "Virus".
(e) Define the term "Software".

II. (a) What is a Computer?
(b) What is a Network?
(c) How are network topologies different?

UNIT-1A

I. (a) Which is a Computer Network?
(b) Explain various types of Network topologies.

II. (a) Which is a Computer Network?
(b) Explain various types of Programing Languages.
(c) Draw and explain the various symbols used in Flowcharts.

UNIT-1B

I. (a) Explain different categories of Software with examples.
(b) Explain different types of Programs.

III. (c) Explain various types of Software.
(d) Explain various types of Operating Systems.

UNIT-2

I. (a) Explain various types of Operating Systems.
(b) Explain various types of Hardware.

III. (a) Explain various types of Hardware.
(b) Explain various types of Software.

Paper: BCA-I

Time: Three Hours

Maximum Marks: 80

Total Pages: 2

Roll No.
2. Define a lower triangular matrix and its importance.
3. Example of each.
4. Define round off error and function error with

\[
\begin{bmatrix}
3 & 4 & 0 \\
0 & 4 & 2 \\
0 & 2 & 3
\end{bmatrix}
\]

3. Find the inverse of matrix.

Initial value \( x_0 \) to start Newton-Raphson method.
5. \( \frac{df}{dx} = 1 \) and the best approximation.
6. \( \int f(x)dx \) including error term.
7. Interpolating polynomial for Risezoidal rule for function \( f(x) \) in

\[ \Delta x \]

I. \( \Delta \) is backward difference operator then compute

**Computer Question**

Questions carry equal marks.

Computer: Select one question from each unit. All

**Note:** Attempt five questions in all. Question No. 1 is

Maximum Marks: 80

Time: Three Hours

Paper: BCA-113

COMPUTER ORIENTED NUMERICAL METHODS

861

Total Pages: 4

**UNIT IV**
8

\[ 0 = \eta \text{ taking } (0,0) \text{ and } (1,0) \text{ to } 0 = (0,0) \]

\[ \frac{\Delta y}{\Delta x} = \frac{\Delta x}{\Delta y} \]

\[ y = \frac{\Delta y}{\Delta x} \]

\[ y = \frac{\Delta y}{\Delta x} \]

UNIT III

8

\[ 0 = \eta \text{ taking } (0,0) \text{ and } (1,0) \text{ to } 0 = (0,0) \]

\[ \frac{\Delta y}{\Delta x} = \frac{\Delta x}{\Delta y} \]

\[ y = \frac{\Delta y}{\Delta x} \]

\[ y = \frac{\Delta y}{\Delta x} \]

UNIT-III

8

\[ 0 = \eta \text{ taking } (0,0) \text{ and } (1,0) \text{ to } 0 = (0,0) \]

\[ \frac{\Delta y}{\Delta x} = \frac{\Delta x}{\Delta y} \]

\[ y = \frac{\Delta y}{\Delta x} \]

\[ y = \frac{\Delta y}{\Delta x} \]

UNIT-II

8

\[ y(x) = x^2 + 2x + 1 \]

\[ y(x) = x^2 + 2x + 1 \]

\[ y(x) = x^2 + 2x + 1 \]

\[ y(x) = x^2 + 2x + 1 \]

UNIT-I

8

\[ y(x) = x^2 + 2x + 1 \]

\[ y(x) = x^2 + 2x + 1 \]

\[ y(x) = x^2 + 2x + 1 \]

\[ y(x) = x^2 + 2x + 1 \]
UNIT-I

4

(i) If $\frac{x}{49} = \frac{xp}{x^2}$, find $x$.

4

Solve $\frac{x}{\sqrt{9}} = \frac{xp}{\sqrt{p}}$.

2

equally among your heads.

(d) In how many ways can 52 playing cards be distributed.

2
differentiate with respect to $x$.

(e) Define complete and bounded lattice.

2

\[ A = \{ x : x \in \mathbb{N} \}; \quad B = \{ -4 \} \]

(i) State whether $A = B$ or not.

Note: Attempt five questions in all, selecting one question from each unit in addition to Question No. 1 which is compulsory.

Maximum Marks: 80

Time: Three Hours

Paper: BCA-115 (Mathematical Foundation-I)

MATHEMATICS

863

Total Pages: 3
(x - 1) \log \cos \varphi = \xi + \frac{\varphi}{\xi} (x + 1) + \frac{\varphi}{\xi} \xi(x + 1) \quad \text{(q)}

Show that \( x = \xi - \frac{\varphi}{\xi} \).

\[ x + \frac{\varphi}{\xi} \xi(x + 1) \frac{\partial}{\partial \xi} \xi(x + 1) \quad \text{(q)} \]

\[ \frac{\partial}{\partial \xi} \xi(x + 1) \quad \text{(q)} \]

\[ \frac{\partial}{\partial \xi} \xi(x + 1) \quad \text{(q)} \]

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\[ \frac{\partial}{\partial \xi} \xi(x + 1) \quad \text{(q)} \]
Write a short note on any two of the following announcements over a public address system. What points should be kept in mind while making communication?

1. Give merits and demerits of oral and written care for:
   - Make a sentence from the following phrases: verb:
     - Communal or Best Effort
     - Better, finest
     - What is a circle?
     - Discuss invention.
     - What is informal communication?

2. Answer the following questions:

   Note: Attempt all questions.

   Maximum Marks: 30

   Time: Three Hours

BSCIT-101
COMMUNICATION SKILLS-1

BSCIT-D-16
12599
Roll No. 35
Total Pages: 03
1. The principle declared a holiday.
2. The teacher praised the child.
3. Time has been done by me.
4. He flood the broiler impenetrably.
5. He is studying in University.
6. Honor to be here.
7. I am Chinese.
8. I am short.
9. I have phone.
10. I am well.

Make a piece of the following passages and suggest a suitable title:

The principal declared a holiday.
The teacher praised the child.
Time has been done by me.

Change the voice of the following sentences:

Write a detailed note on FAX.

Leave all this and go to college, said his

Change the narration of the following sentences:

The rain lasted for ten minutes. (imperative)

The rain continued for Delhi (leave)

We must have a ticket in the required

Fil in the blanks with appropriate articles:

I ordered two bottles

I, 1.25; 09
Find the characteristic roots and spectrum of matrix.

Reducing it to normal form:

\[
\begin{bmatrix}
2 & 1 & 2 \\
7 & -2 & 4 \\
3 & -2 & 1
\end{bmatrix} = \lambda
\]

To find the rank of the matrix.

Using

carry equal roots.

from each unit. No. 9 is compulsory; All questions.

Note: Attempt five questions in all, selecting one question.

Maximum Marks: 40

Time: Three Hours

| BSTT-102 Technology-1 Mathematical Foundation for Information MATHEMATICS |

| 12600 BST/D-16 |

| Roll No. Total Pages: 04 |

\( \frac{\lambda p}{x} - 7 - \frac{\lambda p}{x} = 0 \)

: Solve

\[
\begin{bmatrix}
1 & 0 & 1 \\
0 & 2 & 0 \\
1 & 0 & 0
\end{bmatrix}
\]

: Find the rank of the matrix.

\[
\begin{bmatrix}
1 & 0 & 0 \\
2 & 1 & 0 \\
1 & -2 & 1
\end{bmatrix}
\]

: Find eigen values of the matrix.

\( \{q, p\} \); Find the power set \( P(A) \).

9. (a) If \( A = \{3, 4, 5\} \) and \( B = \{4, 12, 15\} \), find R.

Let \( R = \{3, 4\} \). Also find \( R^{-1} \).
A survey shows that 63% of Indians like oranges and apples, whereas 76% like apples. If \% of Indians like both oranges and apples, find the value of \%.

Let \( f : \mathbb{R} \to \mathbb{R} \) be a function defined as

Prove the relation \( (A \cup B) \cap \mathbb{N} = (A \cap \mathbb{N}) \cup (B \cap \mathbb{N}) \).

Prove that \( \forall \in \mathbb{N} \), \( \forall - \exists u - \exists v \) is a multiple of \( a \) for all \( a \).

Solve the differential equation

Solve the differential equation

Solve the differential equation

The characteristic equation

Diagonalize

Prove that

To find the necessary and sufficient conditions that

Solve (a) \( x^2 + \frac{\partial}{\partial z}\psi - \frac{\partial}{\partial x} = K^2 \psi \)

Solve the differential equation

Solve the differential equation

Prove that

Prove that
Unit II

4. (a) Describe Skin Effect.

5. (a) What is Lorentz Force conditions?

8. (a) Drive an expression for plane wave equation in conducting medium.

Unit III

8. (a) What is Ground Wave Propagation?

8. (b) What is resonant antennas?

Unit IV

8. Define Antenna Gain.

8. (a) Explain radiation mechanism of antenna.

8. What is Caused Difference between Drive Mechanism?

Unit V

3. Give basic ideas of EM waves and write Maxwell's equations

3. What is expression of the same.

2. What is Caused Difference Between Drive Mechanism?
1111 \times 0 \times \frac{1}{2} \times 1111 = 01111111

2.

(a) Convert a grey code \(10111110\) into binary

4. Write the uses of multiplexer and \(NOR\) gates.

5. Design \(AND\) gate and \(OR\) gate using \(NAND\) gates.

6. Convert the following:

\(8^2 + 4^1 + 1^0 = 9\)

1. What is grey code? Give the advantages of grey code.

5. Explain the concept of \(K\)-map.

1. What is \(K\)-map? Explain.

2. Design a 4-bit subtractor using \(NAND\) gates alone.

3. Design a 4-bit adder using \(NAND\) gates alone.

4. Design a 4-bit subtractor using \(NOR\) gates alone.

5. Design a 4-bit adder using \(NOR\) gates alone.

Note: Attempt any five questions. Q. No. 1 is compulsory.

Time: Three Hours

Maximum Marks: 40
UNI 1

4. (b) Explain the synchronous behavior of J-K flip-flops. How is J-K flip-flop can be converted into T flip-flops?

5. (a) Discuss and design D-type flip-flop.

6. (b) Write the applications of flip-flops. Also discuss its asynchronous features. Also discuss the use of NAND gates. Also discuss its asynchronous behavior. Also discuss the use of flip-flop units.

UNIT II

7. (a) Design a BCD code converter using NAND gates.

8. (a) Write the applications of BCD codes.

9. (a) What is a decoder? Write the applications of decoders.

UNIT III

10. (a) Design a digital comparator to compare two 2-bit numbers.

11. (a) Design XOR gate using NAND gate.

UNIT IV

12. (a) And make the circuit diagram using NAND gates. Obtain the minimum SOP expression using K-map.

13. (a) Simplify the logic equation using Boolean algebra.

14. (a) Write the symbol and truth table of XOR gate.

15. (a) Write the symbol and truth table of OR gate.

16. (a) Write the symbol and truth table of AND gate.

17. (a) Write the symbol and truth table of NOT gate.

18. (a) Write the symbol and truth table of XOR gate.

19. (a) Write the symbol and truth table of OR gate.

20. (a) Write the symbol and truth table of AND gate.

21. (a) Write the symbol and truth table of NOT gate.

22. (a) Write the symbol and truth table of XOR gate.

23. (a) Write the symbol and truth table of OR gate.

24. (a) Write the symbol and truth table of AND gate.

25. (a) Write the symbol and truth table of NOT gate.

26. (a) Write the symbol and truth table of XOR gate.

27. (a) Write the symbol and truth table of OR gate.

28. (a) Write the symbol and truth table of AND gate.

29. (a) Write the symbol and truth table of NOT gate.

30. (a) Write the symbol and truth table of XOR gate.

31. (a) Write the symbol and truth table of OR gate.

32. (a) Write the symbol and truth table of AND gate.

33. (a) Write the symbol and truth table of NOT gate.

34. (a) Write the symbol and truth table of XOR gate.

35. (a) Write the symbol and truth table of OR gate.

36. (a) Write the symbol and truth table of AND gate.

37. (a) Write the symbol and truth table of NOT gate.
How FM is advantageous over AM?

(a) 40%
(b) 20%

5 modules by a sinusoidal audio voltage to a depth:
Compute its rms value when it has been amplitude
modulated by a sinusoidal audio voltage of 100 volts.

2. (a) The rms value of a carrier voltage is 150 volts.

Unit

I - How does noise affect channel capacity? 2 each

(d) in a PCM system far more than large signals?

(c) Why quantizing noise effects small amplitude signals

(b) Why high frequency noises are used for

(a) What is compounding and why is it required?

1. (a) carry equal marks

Note: Attempt five questions in all, selecting one question

Maximum Marks: 40

Time: Three Hours

BIT-105

ELECTRONIC COMMUNICATION

BIT/D-16

No. of Pages: 03
Unit IV

9. What is Crossbar? State the steps to reduce the interference.

10. What are the steps for the prevention of transmission? List the steps for the prevention of data communication system. Explain.

11. What factors are necessary while designing a communication system? Explain.

Unit V

5. What is Pulse Modulation? Discuss PWM in detail.

6. Should be the minimum modulation frequency? Explain.

Unit II

8. For a low pass signal with $f_m = 20$ KHz, what is the modulation frequency is reduced to 200 Hz.

6. The audio modulation frequency is 500 Hz and the audio modulation voltage is 2V. Compute modulation index. Also compute the frequency deviation and the modulation index. What will be the VAF voltage if AF volume is increased to 8V whilst the index of AF volume is increased to 8V?
Unit I

What information is available on the tasker? (d)
What is community-supported software? (e)
What storage media used for data archiving? (f)
What is data archiving? Name some secondary storage media. (g)
Give the name of first supercomputer. (h)

1. Attempt all questions.
2. Carry equal marks.
3. From each Unit, Q No. is compulsory. All questions are compulsory.
4. Attempt five questions in all, selecting one question from each unit.
5. Maximum Marks: 40

BSTT-106
COMPUTER FUNDAMENTALS
BSTT/D-16
12604
Roll No. : 03
Total Pages : 03
Unit II

4. Write short notes on the following:
   (a) Magnetic Bubble Memory
   (b) Charged Couple Devices.

5. (a) In the context of magnetic disk storage, define the following term and write relationship among them (if any):
   (i) Track
   (ii) Cylinder
   (iii) Sector
   (iv) Disk Address.
   (b) What will be storage capacity of a double-sided disk with 400 tracks, 16 sectors per track, and 512 bytes per sector?

Unit III

6. What are the different ways of acquiring software? List their advantages and limitations.

7. (a) Are all public-domain software "freeware"?
   Explain.
   (b) Why is firmware gaining popularity?
   (c) Distinguish between application software and system software.

Unit IV

8. What is Multimedia? Explain its components and give its Applications.

9. (a) What do you mean by indent in MS-Word?
   Distinguish between Positive and Negative Indent.
   (b) How can you correct your document from Misspell?
   (c) How you can create a macro and use it?