

MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF APPLIED SCIENCES AND HUMANITIES
SESSIONAL TEST-1

Course: B. Tech.

Session: 2024-25

Subject: Engineering Chemistry

Max. Marks: 20

Semester: I

Section: A, B, C, D

Subject code: BAS-102

Time: 60 Minutes

Q. No. :	1	2	3	4	5	6
CO. No. :	4	4	4	4	4	4
Bloom's Level	K2	K2	K2	K2	K2	K2

Note: This Question paper contains six questions and all questions are compulsory.

Section A (2 Marks)	
Q1. Write the composition of Bio-Gas.	2 Mark
Section B (6 Marks)	
Q2. The water sample has been found to contain the following impurities expressed in ppm: $\text{Ca}(\text{HCO}_3)_2 = 40.5$, $\text{Mg}(\text{HCO}_3)_2 = 36.5$, $\text{CaSO}_4 = 34.0$, $\text{CaCl}_2 = 27.75$, $\text{MgSO}_4 = 30$, $\text{NaCl} = 10.0$ Calculate the temporary, permanent and total hardness of water sample. }	3 Mark
Q3. Explain the Reverse Osmosis process of desalination of brackish water.	3 Mark
Section C (12 Marks)	
Q4. Explain the zeolite process for the removal of hardness of water.	4 Mark
Q5. A sample of coal was analysed as follows: Exactly 2.000 g was weighed into a silica crucible. After heating for one hour at 110°C, the residue weighed 1.975 g. The crucible next was covered with a vented lid and strongly heated for exactly seven minutes at $950 \pm 20^\circ\text{C}$. The residue weighed 1.328 g. The crucible was then heated without the cover, until a constant weight was obtained. The last residue was found to weigh 0.205 g. Calculate the percentage results of the above analysis.	4 Mark
Q6. With the help of a neat diagram, explain the working of Bomb calorimeter.	4 Mark

Aug 2024 ✓ not max 2

MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF APPLIED SCIENCES AND HUMANITIES
SESSIONAL TEST-2

Course: B. Tech.

Semester: I

Session: 2024-25

Section: A, B, C, D

Subject: Engineering Chemistry

Subject code: BAS-102

Max. Marks: 20

Time: 60 Minutes

Q. No. :	1	2	3	4	5	6
CO. No. :	4	4	5	5	5	5
Bloom's Level	K2	K2	K2	K2	K2	K2

Note: This Question paper contains six questions and all questions are compulsory.

Section A (2 Marks)

- Q1. Why is it conventional of express the hardness of water in terms of CaCO_3 at the international level? 2 Mark

Section B (6 Marks)

- Q2. A 0.90 g sample of a solid fuel was completely combusted in the oxygen using bomb calorimeter. The rise in temperature of water in calorimeter was 3.8°C . Calculate the high calorific value of the fuel. If water taken in calorimeter is 4000 g and water equivalent of calorimeter is 385 g. Also calculate the low calorific value. Given % of H in fuel =1 and latent heat of steam = 587 cal/g 3 Mark

- Q3. Write a short note on Polymer Blends. 3 Mark

Section C (12 Marks)

- Q4. What are conducting polymers? Write the structure of polypyrrole and polythiophene. Discuss about conducting nature of these polymers. 4 Mark

- Q5. Explain the preparation, properties and applications of following polymers: 4 Mark

- (i) Bakelite
- (ii) Nylon 6
- (iii) Dacron

- Q6. Discuss any five applications of Grignard reagents. 4 Mark

Answers ✓ *marks*
Answers *marks*

MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF APPLIED SCIENCES AND HUMANITIES
SESSIONAL TEST-3

Course: B. Tech.
Session: 2024-25
Subject: Engineering Chemistry
Max. Marks: 20

Semester: I
Section: A, B, C, D
Subject code: BAS-102
Time: 60 Minutes

Q. No. :	1	2	3	4	5	6
CO. No. :	2	3	2	1	1	3
Bloom's Level	K2	K2	K2	K2	K2	K2

Note: *This Question paper contains six questions and all questions are compulsory.*

Section A (2 Marks)	
Q1.	Calculate the number of NMR signals to the following compounds: (i) $\text{CH}_3\text{--CH}_2\text{--CH}_2\text{--OH}$ (ii) $\text{CH}_3\text{--CO--CH}_3$ (iii) $\text{C}_6\text{H}_5\text{--C}_2\text{H}_5$ (iv) CH_3CHO
Section B (6 Marks)	
Q2.	Calculate the cell potential of the following cell: $\text{Zn}_{(s)} / \text{Zn}^{2+} (0.1\text{M}) \parallel \text{Cu}^{2+} (1.75\text{M}) / \text{Cu}_{(s)}$ at 25°C Given: $E^{\circ}_{\text{Zn}^{2+}/\text{Zn}} = -0.76$, $E^{\circ}_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}$
Section C (12 Marks)	
Q3.	Write a short note on optical isomerism in compounds without having asymmetric carbon.
Q4.	Draw the molecular orbital diagram of NO and N ₂ molecules. Calculate their bond order and predicts their magnetic behavior.
Q5.	What are liquid crystals? Explain various types of thermotropic liquid crystals.
Q6.	Describe the various steps involve in the manufacturing of Portland cement by rotary kiln method.

[Handwritten signatures and marks]

MORADABAD INSTITUTE OF TECHNOLOGY
DEPARTMENT OF APPLIED SCIENCES AND HUMANITIES
MAKE UP SESSIONAL TEST-1

Course: B. Tech.

Session: 2024-25

Subject: Engineering Chemistry

Max. Marks: 20

Semester: I

Section: A, B, C, D

Subject code: BAS-102

Time: 60 Minutes

Q. No. :	1	2	3	4	5	6
CO. No. :	4	4	4	4	4	4
Bloom's Level	K2	K2	K2	K2	K2	K2

Note: This Question paper contains six questions and all questions are compulsory.

Section A (2 Marks)	
Q1.	Write the composition of Bio-Gas. Mark
Section B (6 Marks)	
Q2.	The water sample has been found to contain the following impurities expressed in ppm: $\text{Ca}(\text{HCO}_3)_2 = 16.2$, $\text{Mg}(\text{HCO}_3)_2 = 14.6$, $\text{CaSO}_4 = 13.6$, $\text{CaCl}_2 = 16$, $\text{MgSO}_4 = 12$, $\text{NaCl} = 20$ Calculate the temporary, permanent and total hardness of water sample.
Section C (12 Marks)	
Q4.	Explain the zeolite process for the removal of hardness of water. 4 Mark
Q5.	A sample of coal contains: $\text{C} = 75\%$, $\text{O} = 30\%$, $\text{H} = 6\%$, $\text{S} = 0.5\%$, $\text{N} = 0.49\%$, Ash = 0.9% Calculate GCV and NCV of the Coal.
Q6.	With the help of a neat diagram, explain the working of Bomb calorimeter. 4 Mark

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**MORADABAD INSTITUTE OF TECHNOLOGY, MORADABAD
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGG.
Class Test- 1 (First Semester) (Section -A, B, C, D)
(2024-25) (SET-1)**

Subject Name: Fundamentals of Electronics Engineering
Subject Code: BEC-101

M.M: 20

Duration: 1 hr

Duration: 1 hr						
Q. No.	1	2	3	4	5	6
CO	1	4	4	4	1	4
Bloom's level	K3	K2	K3	K3	K3	K3

- SECTION (A)

 - Define doping. Differentiate between intrinsic and extrinsic semiconductors. (2*1=2)
 - Subtract using 1's complement method: $(1011)_2 - (110011)_2$ (3*2=6)
 - What are universal gates and why they are named so? Implement the basic gates with the help of only NAND gate.

SECTION (B)

 - Convert the following numbers into the base indicated (4*3=12)
 - $(532)_8 = (\quad)_{10}$
 - $(101)_{10} = (\quad)_2$
 - $(11011.10)_2 = (\quad)_{10}$
 - $(11101.011)_2 = (\quad)_{16}$
 - What is depletion layer? Explain the formation of depletion layer under no bias and reverse bias condition with the help of neat labelled diagrams.
 - Simplify the following function using K Map and realize the output with the help of basic gates.
 $F(A,B,C,D) = \Sigma (0,2,4,5,6,11,15) + \Sigma d (1,9,12)$

$$9 \times 8^8 * 5 \times 8^4 + 2 \times 8^0 \\ 300 + 40 + 0 \\ 362$$

10-9
11-8
12-7
13-6

MORADABAD INSTITUTE OF TECHNOLOGY, MORADABAD
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGG.
CT- 2 (First Semester) (Section -A, B, C, D)
(2024-25)

Subject Name: Fundamentals of Electronics Engineering

M.M: 20

Subject Code: BEC-101

Duration: 1 hr

Q. No.	1	2	3	4	5	6
CO	2	2	2	2	4	4
Bloom's level	K3	K2	K3	K3	K3	K3

SECTION (A)

Following question carries 2 marks.

(2*1=2)

1. Differentiate between Zener breakdown and Avalanche breakdown mechanisms.

SECTION (B)

Each question carries 3 marks.

(3*2=6)

2. Write short note on (any two)

(a) LED

(b) Zener diode

(c) Photodiode

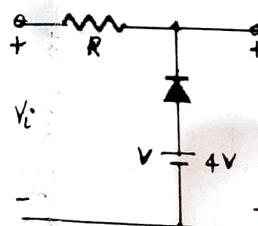
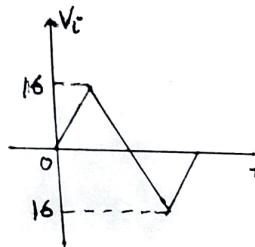
3. Define voltage multiplier circuits. Explain the working of voltage doubler circuit in detail.

SECTION (C)

Each question carries 4 marks.

(4*3=12)

4. Determine V_0 for the following network



5. Draw and explain the circuit of Full Wave Center-tap rectifier with the help of necessary waveforms. Also state its advantages and disadvantages.
6. Explain the construction and working of a PNP transistor in CB configuration. Also draw its input and output characteristics

MORADABAD INSTITUTE OF TECHNOLOGY, MORADABAD
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGG.

Class Test- 3 (1st Semester) (Section -A, B, C, D)
(2024-25) (SET-1)

Subject Name: Fundamentals of Electronics Engineering

M.M: 20

Subject Code: BEC-101

Duration: 1 Hr.

Q. No.	1	2	3	4	5	6
CO	3	3	5	2	3	5
Bloom's level	K2	K3	K2	K3	K3	K3

Note:

1. Attempt all questions.
2. Be precise in your answer.

SECTION (A)

Following question carries 2 marks.

(2*1=2)

1. Define CMRR. List down the characteristics of an ideal Op-Amp.

SECTION (B)

Each question carries 3 marks.

(3*2=6)

2. Draw and explain the circuit diagram of Op-amp Differentiator.

3. Write Short Notes on

(i) Cellular Communication

(ii) Satellite Communication

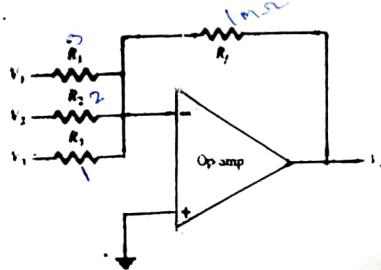
SECTION (C)

Each question carries 4 marks.

(4*3=12)

4. Describe the construction and working of n-channel depletion type MOSFET, with drain and transfer characteristic.

5. Calculate the output voltage of an op-amp summing amplifier for $V_1 = +3\text{ V}$, $V_2 = +2\text{ V}$, $V_3 = +1\text{ V}$, $R_1 = 3\text{ M}\Omega$, $R_2 = 2\text{ M}\Omega$, $R_3 = 1\text{ M}\Omega$ & $R_f = 1\text{ M}\Omega$.



6. An audio frequency signal $10 \sin 2\pi \times 500t$ is used to amplitude modulate a carrier of $50 \sin 2\pi \times 10^5 t$. Calculate

- (i) Modulation index
- (ii) Sideband frequencies
- (iii) Amplitude of each sideband frequencies
- (iv) Bandwidth required
- (v) Total power delivered to the load of 600Ω
- (vi) Transmission efficiency

Expt. fm Engg.

MORADABAD INSTITUTE OF TECHNOLOGY
Mechanical Engineering Department
Class Test- 1
(1st Semester) Session-2024-25

Subject Name: Fundamentals of Mechanical Engineering

M.M:20

Subject Code: BME-101

Duration: 1hr

Q.No.	1	2	3	4	5	6
CO	1		2	2	1	1
Bloom's level	K1	K3	K2	K2	K3	K3

Note: 1) This paper contains three sections. Section (A), (B) & (C)

2) All sections are compulsory.

SECTION (A)

Attempt all questions. Each question carries 2 marks. ($2 \times 1 = 2$)

1. Explain Modulus of Elasticity and Bulk Modulus.

SECTION (B)

Attempt all questions. Each question carries 3 marks. ($3 \times 2 = 6$)

2. Draw stress-strain diagram for a mild steel and explain all salient points on it.

OR

Determine the resultant of force system shown in fig.1

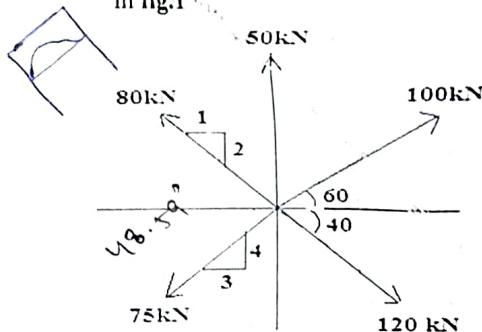


Fig.1

3. Explain the construction of two stroke IC Engine with neat sketch.

SECTION (C)

Attempt all questions. Each question carries 4 marks. ($4 \times 3 = 12$)

4. Explain, with neat sketches, the working of a four-stroke SI engine.

5. Determine the reaction at supports of the loaded beam shown in Fig.2.

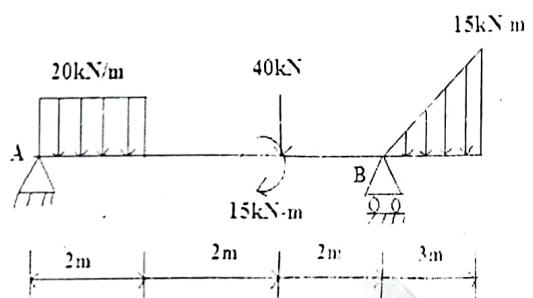


Fig.2

6. Two cylinders of diameters 70 mm and 120 mm weighing 80 N and 120 N respectively are placed in a trough as shown in fig.3. Neglecting friction find the reactions at contact surfaces A, B, C and D

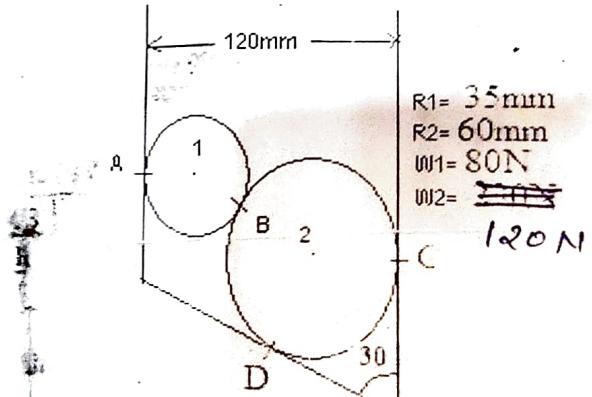


Fig.3.

*R. Guin
04/11/2024*

MORADABAD INSTITUTE OF TECHNOLOGY
Mechanical Engineering Department
Class Test- 2
(1st Semester) 2024-25

Set-1

Subject Name: Fundamentals of Mechanical Engineering
Subject Code: BME-101

M.M:20

Duration: 11/1r

Q.No.	1	2	3	4	5	6
CO	4	3	2	3	3	4
Bloom's level	K ₂	K ₂	K ₂	K ₂	K ₃	K ₃

Note: 1) This paper contains three sections. Section (A), (B) & (C).
 2) All sections are compulsory.

SECTION (A)

Attempt all questions. Each question carries 2 marks.

(2*1=2)

1. Explain the Newtonian and Non-Newtonian fluids.

SECTION (B)

Attempt all questions. Each question carries 3 marks.

(3*2=6)

2. (a) Explain the following term (i) Relative Humidity (ii) Specific humidity.
 (b) Establish the relation between C.O.P of refrigerator and C.O.P of Heat Pump.
3. State the working principle of an electric vehicle. Explain different components of Electric vehicle.

SECTION (C)

Attempt all questions. Each question carries 4 marks.

(4*3=12)

4. Discuss the basic vapour compression refrigeration cycle with T-s and p-h diagram and describe the working of domestic refrigerator.
5. The capacity of a refrigerator is 150TR when working between -5°C and 25°C Determine
 (i) the mass of ice produced per day from water at 25°C. (ii) The power required to drive the unit. Assume that the cycle operates on reversed Carnot cycle and latent heat of ice is 335kJ/kg.
6. (a) Explain the following fluid properties (i) Specific weight (ii) Mass Density (iii) Specific gravity.
 (b) Determine the specific gravity of a fluid having viscosity 0.05 poise and kinematic viscosity 0.035 stokes.

Set-1

MORADABAD INSTITUTE OF TECHNOLOGY
Mechanical Engineering Department
Makeup Class Test- 1
(1st Semester) Session-2024-25

Subject Name: Fundamentals of Mechanical Engineering
Subject Code: BME-101

M.M:20

Duration: 1hr

Q.No.	1	2	3	4	5	6
CO	1	1	2	2	1	1
Bloom's level	K1	K3	K2	K2	K3	K3

- Note: 1) This paper contains three sections. Section (A), (B) & (C)
 2) All sections are compulsory.

SECTION (A)

Attempt all questions. Each question carries 2 marks. $(2 \times 1 = 2)$

1. Explain the moment of a force and state the Varignon's theorem.

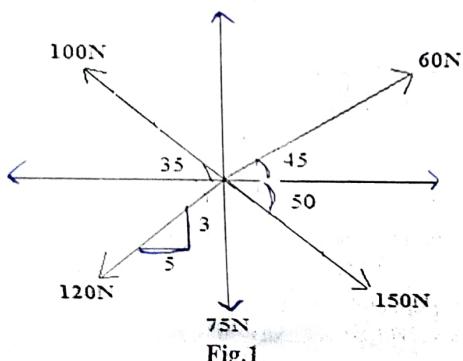
SECTION (B)

Attempt all questions. Each question carries 3 marks. $(3 \times 2 = 6)$

2. Derive the relation between modulus of elasticity, Modulus of Rigidity and Poisson's Ratio.

OR

Determine the resultant of force system shown in fig.1



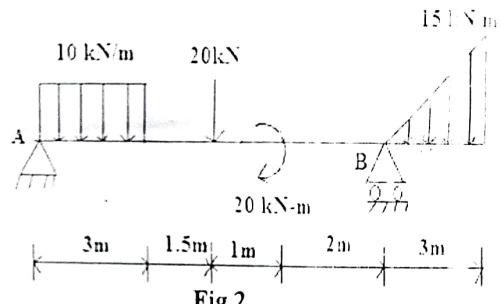
3. Differentiate between SI and CI engine. Explain TDC, BDC, Swept Volume, Clearance Volume of IC engine

SECTION (C)

Attempt all questions. Each question carries 4 marks $(4 \times 3 = 12)$

4. Explain, with neat sketches, the working of a two-stroke CI engine.

5. Determine the reaction at supports of the loaded beam shown in Fig.2.



6. Two smooth spheres each of radius 75 mm and weighing 450 N, rest in a horizontal channel having vertical walls as shown in fig.3. Find the reactions at all contact points.

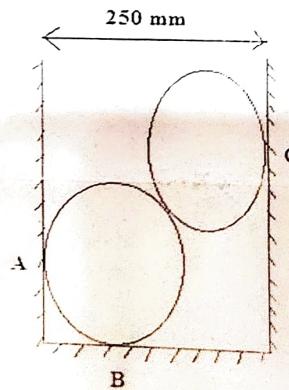


Fig.3.

R. Jee



Fajr (3D)

Moradabad Institute of Technology Department of AS&H

CT- 1

Session – 2024-25

Section – A,B,C,D

Subject – Soft Skills

Subject Code- BAS-105

Max. Marks – 20

Time – 1:00 Hr.

Q. No.	1	2	3	4	5	6
C.O	1	3	1	2	1	2
Bloom's Level	1	2	1	2	1	1

Note- 1. This paper contains three sections (A) (B) and (C)
2. All Sections are compulsory

SECTION A

1. Explain Prefix and Suffix with examples. 2

SECTION B

2. Differentiate between skimming and scanning reading styles. 3
3. What do you understand by Subject -Verb Agreement? 3
Write its four rules with examples.

SECTION C

4. "Listening is an art". Specify this statement with different traits of a good listener.. 4
5. Define simple sentences, compound sentences and complex sentences with transforming each type of sentence to another. 4
6. What is the importance of Note -Taking and write down different methods/types of Note Taking. 4

OR

What is Ted Talk and mention advantages of TED Talks with tips to improve listening by using TED Talks.

Sugandha
20/10/24

✓



Moradabad Institute of Technology
Department of AS&H
CT- 2

Session -- 2024-25

Subject – Soft Skills

Max. Marks – 20

Section – A,B,C,D

Subject Code- BAS-105.

Time – 1:00 Hr.

Q. No.	1	2	3	4	5	6
C.O	3	4	3	4	3	4
Bloom's Level	1	2	1	2	1	1

Note- 1. This paper contains three sections (A) (B) and (C)

2. All Sections are compulsory

SECTION A

1. Define Proxemics and its importance in communication. 2

SECTION B

2. What is the role of confidence, clarity and fluency in public speaking? 3
3. Define the characteristics of business letters in corporate world. 3

SECTION C

4. What do you understand by Oral communication and explain Nuances and Modes of Speech Delivery. 4
5. What is the importance of Effective Writing? Write about different types of Writing tools and methods. 4
6. Mention paralinguistic features and what is the role of paralinguistic features in Presentation Skills? 4

OR

Define Kinesics and Chronemics and its significance in non-verbal communication.

*Sugandha Agarwal
m/s*

Moradabad Institute of Technology
Department of AS&H

CT- 3

Session – 2024-25

Subject – Soft Skills

Max. Marks – 20

Section – A,B,C,D

Subject Code- BAS-105

Time – 1:00 Hr.

Q. No.	1	2	3	4	5	6
C.O	4	5	4	5	4	5
Bloom's Level	1	2	1	2	1	1

Note- 1. This paper contains three sections (A) (B) and (C)
 2. All Sections are compulsory

SECTION A

1. What do you understand by Non-Verbal communication? 2

SECTION B

2. What is the impact of good Leadership for the organization and mention different qualities required for leaders? 3
 3. Elaborate Paralinguistic features of Voice Dynamics. 3

SECTION C

4. Elaborate Application of 4 A's for Mental Health and Stress Management. 4
 5. Define Presentation Strategies with Planning, Preparation, organization and delivery. 4
 6. What is the significance of Mental Health in personal and professional life? 4

After
4 Adart
Accept
Avoid.

OR

Define various techniques for Managing Stress at workplace.

*Sugandha Az
mfp*



MORADABAD INSTITUTE OF TECHNOLOGY
 APPLIED SCIENCES & HUMANITIES DEPARTMENT
 SESSIONAL TEST - I

Course: B.Tech.

Session 2024-25

Subject Name: MATHS-I

Max. Marks: 20

Semester: I

Section: A, B, C, D, E, F, G, H

Subject Code: (BAS-103)

Time: 1 Hour

Q. No. :	1	2	3	4	5	6
CO No. :	2	1	1	1	1	2
Bloom's Level	K3	K3	K3	K3	K3	K3

Note. (1) This paper contains three sections, Section A, Section B & Section C.

(2) All sections are compulsory.

SECTION-A		2*1=2 Marks
Q.1.	If $y = \cos^3 x$ then find y_n .	
SECTION-B		3*2=6 Marks
Q.2.	Find the inverse of the matrix by elementary Row transformation $\begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$	
Q.3.	Find the rank of the matrix by reducing it to Normal form $A = \begin{bmatrix} 1 & 2 & -1 & 3 \\ 4 & 1 & 2 & 1 \\ 3 & -1 & 1 & 2 \\ 1 & 2 & 0 & 1 \end{bmatrix}$	
SECTION-C		4*3=12 Marks
Q.4.	Investigate for consistency of the following equations and find the solution for x,y,z. $3x + 3y + 2z = 1,$ $x + 2y = 4,$ $10y + 3z = -2,$ $2x - 3y - z = 5$	
Q.5.	If $A = \begin{bmatrix} 4 & 3 & 1 \\ 2 & 1 & -2 \\ 1 & 2 & 1 \end{bmatrix}$ then compute A^{-1} using Cayley-Hamilton theorem. OR Find the Eigen values and corresponding Eigen vectors of the matrix $\begin{bmatrix} 3 & 1 & 4 \\ 0 & 2 & 0 \\ 0 & 0 & 5 \end{bmatrix}$	
Q.6.	If $y = e^{m \cos^{-1} x}$ then show that $(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - (n^2 + m^2)y_n = 0$ and calculate $y_n(0)$.	



In pursuit of excellence

MORADABAD INSTITUTE OF TECHNOLOGY
APPLIED SCIENCES & HUMANITIES DEPARTMENT
SESSIONAL TEST - II

Course: B.Tech.

Session 2024-25

Subject Name: MATHS-I

Max. Marks: 20

Semester:

Section: A, B, C, D, E, F, G, H

Subject Code: (BAS-103)

Time: 1 Hour

Q. No. :	1	2	3	4	5	6
CO No. :	2	3	2	2	3	3
Bloom's Level	K3	K3	K3	K3	K3	K3

Note: (1) This paper contains three sections. Section A, Section B & Section C.

(2) All sections are compulsory.

SECTION-A		2*1=2 Marks
Q.1.	If $y = \frac{5x+12}{x^2+5x+6}$ then find y_n .	
SECTION-B		3*2=6 Marks
Q.2.	Verify Chain Rule for Jacobean for $x = r\cos\theta, y = r\sin\theta$	
Q.3.	If $y = \sin(m \sin^{-1} x)$, prove that $(1-x^2)y_{n+2} - (2n+1)x y_{n+1} - (n^2-m^2)y_n = 0$	OR
SECTION-C		
Q.4.	If $u = \sin^{-1}\left[\frac{x^3+y^3+z^3}{ax+by+cz}\right]$ then show that $x\frac{\partial y}{\partial x} + y\frac{\partial y}{\partial y} + z\frac{\partial y}{\partial z} = 2\tan u$	4*3=12 Marks
Q.5.	Expand $e^x \cos y$ in the powers of x & y as far as terms of third degree. OR Examine for maximum and minimum values for: $\sin x + \sin y + \sin(x+y)$.	
Q.6.	If $x+y+z=u, y+z=v, z=w$, then show that $\frac{\partial(x,y,z)}{\partial(u,v,w)} = u^2 v$ OR Show that the rectangular solid of maximum volume that can be inscribed in a given sphere is a cube.	