

Govt. Polytechnic Talwar

Branch: Civil Engg.		Subject: Applied Chemistry		
Semester: First				
Unit No.	Name of Topic	Proposed Date	Actual Date	Remarks
1	Fundamental particles of atoms : Electron, proton, neutron(Definitions only)	03.08.2026		
	Bohr's Model of an atom (Postulates, Success and Limitation)	05.08.2026		
	Atomic number, atomic mass number, isotopes, isobars and isotones	06.08.2026		
	Concept of orbitals, difference between orbit and orbitals,	10.08.2026		
	Shapes of s and p orbitals, quantum Numbers (Significance only)	12.08.2026		
	Aufbau's principle, Pauli's exclusion principles, Hund's rule of maximum multiplicity,	13.08.2026		
	Electronic configuration of elements with atomic number (Z) 1 to 30 only,	17.08.2026		
	Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic bonding (NaCl)	19.08.2026		
2	Covalent bond (O_2 , N_2 , H_2), difference between sigma and pi (π) bond.	20.08.2026		
	Definition of Solution, Solute and Solvent with examples	24.08.2026		
	Methods to express the concentration of solutions - Molarity, Molality and Normality (Numerical excluded)	26.08.2026		
	pH of solution, industrial application of pH solution	27.08.2026		
	Definition of buffer solution and industrial application of buffer solution	31.08.2026		
	Definition of Hard and soft water, Types of hardness, Units of hardness (mg/ltr and ppm),	02.09.2026		
	Simple numerical based on hardness	03.09.2026		
	Disadvantages caused by use of hard water in domestic and industrial use	07.09.2026		
	Class Test-1	09.09.2026		
	Disadvantages caused by use of hard water in domestic and industrial use	10.09.2026		
	Removal of hardness - permutit process, Characteristics of drinking water	14.09.2026		

Asst.

3	Electronic concept of oxidation, reduction and Redox reaction,	16.09.2026		
	Definition of Electrolyte and non-electrolyte with suitable examples,	17.09.2026		
	Faradays law of Electrolysis and industrial application of electrolysis	21.09.2026		
	Electrometallurgy, Electroplating, Electro - refining,	23.09.2026		
	Introduction to corrosion of metals	24.09.2026		
	Internal corrosion preventive measure (purification, alloying and heat treatment).	28.09.2026		
	External corrosion preventive measure: Metal coating (anodic and cathodic).	30.09.2026		
4	Natural occurrence of metals- minerals, ores; ores of iron, aluminium and copper,	01.10.2026		
	Definition of Gangue, Flux, Metallurgy, Pyrometallurgy, Electrometallurgy & Hydrometallurgy,	05.10.2026		
	Class Test-2	07.10.2026		
	A brief account of general principles of metallurgy- Crushing, Grinding;	08.10.2026		
	Concentration of ore (Froth floatation process) : Extraction of metal (Roasting, Calcination & Smelting),	12.10.2026		
	Refining (Electrorefining); Extraction of iron from their Haematite ore by using blast furnace in brief along with diagram,	14.10.2026		
	Alloys - definition, Ferrous and non-ferrous alloy, purpose of making alloy.	15.10.2026		
	Definition of Polymer, Monomer, Degree of Polymerization,	19.10.2026		
5	Name of monomer and simple reaction involved in preparation of Polythene, PVC, PTFE, PS and Nylon-6,6 only	21.10.2026		
	Definition of fuel, Classification of fuels,	22.10.2026		
	Characteristics of a good fuel,	28.10.2026		
	House Test	1st Week of November		
	Calculation of HCV and LCV by using Dulong's formulae,	09.11.2026		
	Fuel rating (octane and cetane numbers), Chemical composition,	12.11.2026		
	Calorific value application and diagram of water gas, producer gas and biogas,	16.11.2026		
	Definition of Lubricants, Function of good lubricant, classification of fuels	18.11.2026		
	Physical properties (Viscosity, viscosity index, flash and fire point)	19.11.2026		

Chemical properties (TAN, Saponification value) of lubricants	23.11.2026		
Refining (Electrorefining): Extraction of iron from their Haematite ore by using blast furnace in brief along with diagram.	25.11.2026		
Name of monomer and simple reaction involved in preparation of Polythene, PVC, PTFE, PS and Nylon-6,6 only	26.11.2026		

P. K. S.
Signature of Teacher

H. S.
HOD

(AS&ID)

Govt. Polytechnic Talwar

Branch: Civil Engg.		Subject: Applied Chemistry Lab				Remarks
Semester: First				Actual Date		
Sr. No.	Name of Practical	Proposed Date		Actual Date		
		G1	G2	G1	G2	
1	Preparation of standard solution of oxalic acid	03-08-2026 & 10-08-2026	05-08-2026 & 12-08-2026			
2	To determine strength of given sodium hydroxide solution by titrating against standard oxalic acid solution using phenolphthalein indicator.	17-08-2026 & 24-08-2026	19-08-2026 & 26-08-2026			
3	Experimental verification of Faraday's first law of Electrolysis using Copper sulphate solution and Copper electrodes.	07-09-2026 & 14-09-2026	09-09-2026 & 16-09-2026			
4	Determination of pH of given solution by using pH meter.	21-09-2026 & 28-09-2026	23-09-2026 & 30-09-2026			
5	To estimate moisture in given coal sample gravimetrically.	05-10-2026 & 12-10-2026	07-10-2026 & 14-10-2026			
6	To estimate ash in given coal sample gravimetrically.	19-10-2026 & 26-10-2026	21-10-2026 & 28-10-2026			
7	To determine viscosity of given lubricating oil by Redwood viscometer.	16/11/2026	11/11/2026 & 18/11/2026			
8	To estimate total alkalinity of given water sample by titrating it against standard Sulphuric acid solution	23/11/2026	25/11/2026			

[Signature]
HOD (ASST)

Govt. Polytechnic Talwar
Lesson Plan

Name of Faculty : Rajni Sharma	Designation: Lecturer Mathematics
Department : Applied Sciences	Semester : 1st
Subject : Applied Mathematics-1	Class : Civil Engg.
Lesson Plan for the Duration : Aug. - Nov. 2026	

Month	Week	Date	Topic	Contents to be taught	Remarks
Aug.	1st	1,3,4,5	Trigonometry	Orientation	
	2nd	10,11,12,		Concept of angles, measurement of angles in degrees, grades and radians and their conversions.	
	3rd	17,18,19,		Radian measure formula (Arc Length Formula in radians) and simple related problems,	
	4th	22,24,25, 26		Ratios of Allied angles (without proof Sum, difference formulae and their applications (without proof).	
	5th	29,31		Product formulae (Transformation of product to sum, difference and vice versa)	
Sept.	1st	1,2,5	Function and Limits	Graphs of $\sin x$, $\cos x$.	
	2nd	8,9, 14		Definition of function, Value of a function, Even and Odd Function, Function of a function.	Class Test 1
	3rd	15,16,19, 21		Limit of a function, Standard limits (with proof) lim and related questions	
	4th	22,23, 26,28		Problems related to find the limit of an Algebraic function by using factorization method, substitution method and rationalization method.	
	5th	29,30		Differentiation by first principle (x^n , $\sin x$ & $\cos x$).	
Oct.	1st	3,5,6	Differentiation	Rules of differentiation (sum, and product, quotient)	
	2nd	7,12,13, 14		Chain rule (Differentiation of function of a function). Differentiation of trigonometric and inverse trigonometric functions, Logarithmic differentiation	Class Test 2
	3rd	17,19,21		Complex Numbers: Definition, real and imaginary parts, conjugate of a complex number, algebra of complex numbers (Addition, Subtraction, Multiplication and Division)	

Oct.	4th	24,27	Complex Number and Partial Fraction	Multiplicative inverse, solution of quadratic equation having Discriminant < 0 Geometrical representation of a complex number- Argand Diagram, modulus and amplitude of a complex number, Polar form of a complex number.	
	5th	28,31		Partial fractions: Definition of polynomial fraction (proper, improper fractions) and definition of partial fractions. Problems related to resolve a fraction (proper & improper fractions) into partial fraction with denominator containing non-repeated linear factors	
Nov.	1st	2,3,4,7,	Permutations, Combinations and Binomial Theorem	Permutations and Combinations: Definition of $n!$, Special case: $0! = 1$, Simplification of factorial expressions,	House Test
	2nd	9,10,16		Permutation: Meaning, formula nPr and simple numerical problems. Combination: Meaning, formula nCr and simple numerical Problems	
	3rd	17,18,21		Binomial theorem: Binomial theorem (without proof) for positive integral index (expansion and general form); binomial theorem for any index (expansion without proof)	
	4th	23,25,28		first and second binomial approximation with applications to engineering problems.	



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Applied Sciences

Subject — App. Physics I — Theory →

LESSON PLAN PHYSICS THEORY

GOVT. POLYTECHNIC TALWAR

Branch:	Civil Engineering	Semester:	First
Subject:	App. Physics I	Session:	08-Aug 2026 to 28-Nov-2026
Teacher:	Vinay Guleira	Laboratory:	Physics Lab
Sr. No	No. of Lectures	Chapter/unit Description	
1	9 (10 Aug to 29 August)	Unit 1: Units and Dimensions	20 Marks Physical quantities - fundamental and derived quantities, System of units: CGS, FPS, MKS, SI, Dimensional formulae and SI units of physical quantities - displacement, area, volume, density, velocity, acceleration, linear momentum, force, work, power, energy, pressure, stress & strain, Principle of homogeneity of dimensions, Application of dimensional analysis: checking the correctness of physical equation (three equations of motion), Errors, Types of errors - Instrumental, Systematic, Random and Gross error.
2	10 (31 Aug to 15 Sept)	Unit 2: Force and Motion	25 Marks Scalar and vector quantities - definition and examples, representation of vector, types of vectors (equal vectors, negative vectors, unit vectors, co-initial vectors, co-planar vectors), linear momentum, law of conservation of linear momentum with derivation, angular displacement, angular velocity, angular acceleration, relation between linear and angular velocity, torque, angular momentum, law of conservation of angular momentum and its applications, moment of inertia and its physical significance.
3	9 (16 Sept to 07 Oct)	Unit 3: Work, Power, and Energy	20 Marks Work and types of work (zero work, positive work and negative work) with examples, Energy - definition and its SI unit, examples of transformation of energy, Kinetic energy - definition, examples, formula and its derivation, Potential energy - definition, examples, formula and its derivation, Law of conservation of mechanical energy for freely falling bodies (with derivation), Power and simple numerical problems based on Power.
4	8 (12 Oct to 28 Oct)	Unit 4: Properties of Matter	15 Marks Elasticity and plasticity - definition, Definition of stress and strain, Types of stress and strain, Hooke's law, Modulus of elasticity and its types, Pressure - definition, atmospheric pressure, gauge pressure, absolute pressure.
5	9 (2 Nov to 25 Nov)	Unit 5: Heat and Temperature	20 Marks Definition of heat and temperature (on the basis of kinetic theory), Difference between heat and temperature, Modes of transfer of heat- conduction, convection and radiation with examples, Different scales of temperature and their relationship, Numerical problems based on conversion of temperature into various scales.
Recommended Books		Text book of Physics, N.C.E.R.T., App. Physics I By RA Banwat, Concepts of Physics By HC Verma Vol I and Vol II	
Signature of Teacher		HOD/OIC Applied Sciences and Humanities	

LESSON PLAN PHYSICS PRACTICAL

GOVT. POLYTECHNIC TALWAR

Branch:	Civil Engineering	Semester:	First
Subject:	App. Physics I	Session:	Aug 2026 to Nov-2026
Teacher:	Vinay Kr. Guleira	Laboratory:	Physics Lab
Sr. No	Expected Schdule	NAME OF EXPERIMENT	
1	Second week of August	Laboratory Safety and Familiarization: To acquaint students with laboratory safety rules and the construction, least count, handling, and reading of common measuring	
2	Third week of August	To find the diameter of a solid cylinder using a Vernier Calliper.	
3	Fourth week of August	To find the internal diameter and depth of a beaker using a Vernier Calliper and hence find its volume.	
4	First week of September	To find the diameter of wire & thickness of cardboard by using a screw gauge.	
5	Second week of September	To determine the thickness of the glass strip using a spherometer.	
6	First week October	To determine the radius of curvature of a given spherical surface by a spherometer.	
7	Second week October	To determine the force constant of spring using Hooke's law.	
8	third week of October	To measure room temperature using a thermometer and convert it into different temperature scales.	
9	Second week of November	To verify the law of conservation of mechanical energy (PE to KE).	
10	Third week of November	To find the moment of inertia of a flywheel.	


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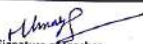
Applied Sciences and Humanities

Subject :- App - Mechanics :->

LESSON PLAN THEORY

GOVT. POLYTECHNIC TALWAR

Branch:	Civil Engineering	Semester:	First
Subject:	Applied Mechanics	Session:	08-Aug-2026 to 28-Nov-2026
Teacher:	Vinay Guleira		
Sr. No.	No. of Lectures	Chapter/unit Description	
1	11 (10 Aug to 5 Sept)	Unit 1: Basics of Mechanics and Force System	Unit 1: Basics of Mechanics and Force System 25 Marks Introduction - Mechanics, Applied Mechanics, Statics, Dynamics (Kinetics, Kinematics), utility of mechanics in engineering field, rigid body, flexible body, scalar and vector quantities. Law of forces - Definition of force, measurement of force in SI units, its representation, effects of force, characteristics of a force, free body, free body diagram, force systems and its classification, principle of transmissibility, law of superposition, resultant force, parallelogram law of forces (with derivation), triangle law of forces, polygon law of forces - analytically, resolution of forces, resolution of a force into two components only (orthogonal/ nonorthogonal). (Basic Numerical Problems)
2	8 (7 Sept. to 30 Sept.)	Unit 2: Moment	Unit 2: Moment 20 Marks Concept of moment, Moment of a force and units of moment, Varignon's theorem (definition only), equilibrium, equilibrant, general conditions of equilibrium, Lami's theorem, determine resultant and its position in parallel force system (like and unlike parallel forces) under coplanar forces. (Basic Numerical Problems)
3	8 (1st oct to 16 oct.)	Unit 3: Friction	Unit 3: Friction 20 Marks Friction and its relevance in engineering, types and laws of friction, limiting equilibrium, limiting friction, co-efficient of friction, angle of friction, angle of repose and their relations. Equilibrium of bodies on level surface subjected to force parallel and inclined to plane. Equilibrium of bodies on inclined plane subjected to force parallel to the plane only. (Basic Numerical Problems)
4	8 (16 oct to 05 Nov)	Unit 4: Centroid and Centre of Gravity	Unit 4: Centroid and Centre of Gravity 15 Marks Definition of centroid, centre of gravity, axis of symmetry, reference axis. Centroid of plane figures - square, rectangle, triangle, circle, semi-circle (without derivation), determination of centroid of lamina T, L & I shape, centroid of composite plane figures with/without removed portion (combination of only two plane figures), using the moment method only. Determination of centre of gravity of symmetrical solid bodies - cube, cuboid, cone, cylinder, sphere and hemisphere (without derivation).
5	10 (5 Nov to 28 Nov)	Unit 5: Simple Lifting Machine	Unit 5: Simple Lifting Machine 20 Marks Definition of machine, simple machine, load, effort, velocity ratio, mechanical advantage and efficiency of a machine and their relationship. Law of machines. Definition of ideal machine, reversible and self-locking machine. Mechanical advantages, velocity ratio and efficiency of simple wheel & axle, simple screw jack, worm & worm wheel, single winch crab (Basic Numerical Problems)


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Applied Sciences and Humanities

**Govt. Polytechnic Talwar
Distt. Kangra H.P. 176096**

Lesson Plan

Session: Aug - Dec 2026

Name of Teacher:- Nemjel Choudhary		Designation:-Senior Lecturer (AS&H)	Group:- GI
Name of Lab/Workshop:-Applied Mechanics Lab		Class/Branch:- 1st Sem/Civil Engg.	
Sr. No.	Name of Practical	Date	Remarks
1	Verification of polygon law of forces graphically using universal force table/ Gravesend's apparatus.	13 Aug.	
2	Verification of Lami's theorem	20 Aug.	
3	Revision & Viva	27 Aug.	
4	Study forces in various members of Jib crane.	3 Sept.	
5	Determine coefficient of friction and angle of friction on horizontal plane for two or three different contact surfaces	10 Sept.	
6	Revision & Viva	17 Sept.	
7	To verify relation between angle of friction and angle of repose on inclined plane.	24 Sept.	
8	To find out center of gravity of a regular & irregular lamina.	1 Oct.	
9	Revision & Viva	8 Oct.	
10	To find the M.A., V.R. and efficiency of a Worm and worm wheel.	15 Oct.	
11	To find the M.A., V.R. and efficiency of a Simple Screw Jack	22 Oct.	
12	Revision & Viva	29 Oct.	
13	To find the M.A., V.R. and efficiency of a Single winch crab.	5 Nov.	
14	Revision & Viva	19,26 Nov.	

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**Govt. Polytechnic Talwar
Distt. Kangra H.P. 176096**

Lesson Plan

Session: Aug - Dec 2026

Name of Teacher:- Nemjel Choudhary		Designation:-Senior Lecturer (AS&H)		Group:- GII
Name of Lab/Workshop:-Applied Mechanics Lab		Class/Branch:- 1st Sem/Civil Engg.		
Sr. No.	Name of Practical	Date	Remarks	
1	Verification of polygon law of forces graphically using universal force table/ Gravesend's apparatus.	10 Aug.		
2	Verification of Lami's theorem	17 Aug.		
3	Revision & Viva	24 Aug.		
4	Study forces in various members of Jib crane.	07 Sept.		
5	Determine coefficient of friction and angle of friction on horizontal plane for two or three different contact surfaces	14 Sept.		
6	Revision & Viva	21 Sept.		
7	To verify relation between angle of friction and angle of repose on inclined plane.	28 Sept.		
8	To find out center of gravity of a regular & irregular lamina.	5 Oct.		
9	Revision & Viva	12 Oct.		
10	To find the M.A., V.R. and efficiency of a Worm and worm wheel.	19 Oct.		
11	To find the M.A., V.R. and efficiency of a Simple Screw Jack	2 Nov.		
12	Revision & Viva	16 Nov.		
13	To find the M.A., V.R. and efficiency of a Single winch crab.	16 Nov.		
14	Revision & Viva	23 Nov.		

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GOVT. POLYTECHNIC TALWAR

Distt. Kangra H.P. 176096

LESSON PLAN : ENGINEERING GRAPHICS

Teacher: Gaurav Puwari

Designation: Lecturer

Group: G 1 & G2

Branch: 1st Sem / Civil

Lab/Workshop: Engg. Graphics

Session: Aug - Dec 2026

SR. NO.	DESCRIPTION OF PRACTICAL JOB	DAY	MONTH	REMARKS
1	Sheet-01, Introduction to lines and free hand sketching	7, 11	AUGUST	
2	Sheet-02, Technical Lettering	14, 18, 21		
3	Sheet-03, Dimensioning Techniques	22, 25, 28, 29		
4	Sheet-04, Plain Scale	1, 5		
5	Sheet-05, Diagonal Scales	8, 11, 15	SEPTEMBER	★ 1ST CLASS TEST
6	Sheet-06, Projection of Points	18, 19, 22, 25		
7	Sheet-07, Orthographic Projections (1st Angle)	6, 9, 13		★ 2ND CLASS TEST
8	Sheet-08, Orthographic Projections (3rd Angle)	16, 17, 23	OCTOBER	
9	Sheet-09, Sectioning of different objects	24, 27		
10	Sheet-10, Projections by sectioning of Objects	30, 31		
11	Sheet-11, Isometric Views	10, 13, 17, 20	NOVEMBER (HOUSE TEST 1ST WEEK)	
12	Sheet-12, Symbols of Civil, Mechanical and Electrical Engineering	21, 27, 28		★ PTM

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Govt. Polytechnic Talwar

Distt. Kangra H.P. 176096

Lesson Plan

(Labs/Workshop)

Session - August - December 2026

Name of Teacher:-Rakesh Kumar		Designation:-Workshop Instructor Welding		Group -2
Name of Lab/Workshop:-Workshop Practice (Welding Shop) -II		Class/Branch:- 1st sem/Civil Engg.		
Sr. No.	Description of Practical job	Date	Remarks	
1	Job I : Practice of striking arc and depositing uniform and straight beads on flat at different current levels. (Minimum 4 beads on M.S. flat at four setting of current level using shielded metal arc welding and differentiating their characteristics).	Flat. 13, 18, 24 27		
2	Job II : Cut a job with abrasive cut off / chop saw machine and make a lap joint using shielded metal arc welding (SMAW) process.	Aug. to Sep. 1, 4, 10		
3	Job III : Edge Preparation and welding butt joint using shielded metal arc / gas welding process.	Sep. to Oct. 15, 22, 29, 10		
4	Job IV : Edge Preparation and welding T Joint using shielded metal arc welding (50mm x 50mm x 6 mm x 100 mm M.S. Flat).	Oct. 10, 13, 16		
5	Job V : Cut a round pipe with abrasive cut off / chop saw machine & prepare T-pipe joint using gas/arc welding.	Oct. to Nov. 23, 30, 5, 11		
6	Job VI : Prepare a job on Spot Welding.	Nov. 13, 19, 26		

Signature of Teacher

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**Govt. Polytechnic Talwar
Distt. Kangra H.P. 176096**

**Lesson Plan
(Labs/Workshop)**

Session - August - December 2026

Name of Teacher:-Rakesh Kumar		Designation:-Workshop Instructor Welding	Group -1
Name of Lab/Workshop:-Workshop Practice (Welding Shop) - <u>II</u>		Class/Branch:- 1st sem/Civil Engg.	
Sr. No.	Description of Practical job	Date	Remarks
1	Job I : Practice of striking arc and depositing uniform and straight beads on flat at different current levels. (Minimum 4 beads on M.S. flat at four setting of current level using shielded metal arc welding and differentiating their characteristics).	Aug. $\frac{11}{8}, \frac{14}{8}, \frac{21}{8}, \frac{28}{8}$	
2	Job II : Cut a job with abrasive cut off / chop saw machine and make a lap joint using shielded metal arc welding (SMAW) process.	Aug to Sep. $\frac{28}{8}, \frac{29}{8}, \frac{1}{9}, \frac{11}{9}$	
3	Job III : Edge Preparation and welding butt joint using shielded metal arc / gas welding process.	Sep to Oct. $\frac{18}{9}, \frac{24}{9}, \frac{28}{9}, \frac{6}{9}$	
4	Job IV : Edge Preparation and welding T Joint using shielded metal arc welding (50mm x 50mm x 6 mm x 100 mm M.S. Flat).	Oct. $\frac{7}{9}, \frac{15}{9}, \frac{22}{9}, \frac{27}{9}$	
5	Job V : Cut a round pipe with abrasive cut off / chop saw machine & prepare T-pipe joint using gas/arc welding.	Oct. to Nov. $\frac{30}{9}, \frac{7}{10}, \frac{6}{10}, \frac{12}{10}$	
6	Job VI : Prepare a job on Spot Welding.	Nov. $\frac{17}{10}, \frac{28}{10}, \frac{27}{10}$	


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GOVT POLYTECHNIC TALWAR

(Deptt. of Applied Sciences)

Lesson Plan

(Labs/Workshop)

Session:

Name of the teacher: Virender thakur		Designation: Lecturer	
Name of Lab: Sports and Yoga		Class: 1st Semester Civil Engg.	
Sr.No.	Description of Practicals	Date	Remarks
		Group-1	
1	Physical Fitness This module emphasizes the development of physical fitness through activities such as warmup, stretching, flexibility, endurance, strength exercises, cool-	12/8/26 , 13/8/26	
2	: Yoga The module on yoga may include loosening exercises, Surya Namaskar, Asanas (standing, sitting, prone and supine), Pranayama, Meditation, relaxation techniques.	13/8/26 , 14/8/26	
3	Sports Activities	16/8/26 , 20/8/26, 22/08/26	

Name of Teacher

Virender

H.O.D.
Applied Sciences

(VIRENDER KUMAR)