DIPLOMAWING

RAJIVGANDHIPROUDYOGIKIVISHWAVIDYALAYA,BHOPAL

SCHEMEOFSTUDIES&EXAMINATIONS(IMPLEMENTEDFROMSESSION:JULY-2023)

FIRSTSEMESTER-GROUP'B'

:NAMEOFTHEPROGRAMME:

CementTechnology,CivilEngg.,CTM,ElectricalEngineering,ICManufacturing,MineSurveying, PRPC, Plastic Technology,Printing Technology, Production Engineering ,Textile Technology

S.N.	PAPER CODE	SUBJECTCODE	SUBJECTNAME	THEORYCOMPONENT								PRACTICALCOMPONENT					TOTALCREDITS	TOTALMARKS
				HRSPERWEEK	CREDITS	TERMWORK			THEORYPAPER			HRSPERWEEK	CREDITS	LABWORK	PRACTICAL EXAM/VIVA			
						QUIZ/ASSIGNMENT	MID TERM TEST*		TOTAL	MARKS	DURATION				MARKS	DURATION		
							I	II										
1	7350	101	MATHEMATICS-I	4	4	10	10	10	30	70	03Hrs.	0	0	0	0	0	4	100
2	7351	102	APPLIEDPHYSICS-I	3	3	10	10	10	30	70	03Hrs.	4	2	20	30	3Hrs.	5	150
3	7354	103	INTRODUCTION TO IT SYSTEMS	3	3	10	10	10	30	70	03Hrs.	4	2	20	30	3Hrs.	5	150
4	7355	104	FUNDAMENTALS OF ELECTRICAL &ELECTRONICS ENGINEERING	3	3	10	10	10	30	70	03Hrs.	4	2	20	30	3Hrs.	5	150
5	7356	105	ENGINEERING MECHANICS	3	3	10	10	10	30	70	03Hrs.	4	2	20	30	3Hrs.	5	150
6			ENVIRONMENTAL SCIENCE	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7			SPORTS AND YOGA	0	0	0	0	0	0	0	0	2	1	20	30	3Hrs.	1	50
TOTAL				18	16				150	350		18	9	100	150		25	750

NOTE- (1) *TwoBest,outofThreeMidTermTests(ProgressiveTests)Marksshouldbeenteredhere.

(2) Mandatory InductionProgram,rightat thestart of thefirstyear.

GRANDTOTALOFCREDITS
25

GRANDTOTALOFMARKS
750

Course Title	:	Mathematics-I
Paper Code	:	7350
Subject Code	:	101
Theory Credits	:	4
Practical Credits	:	0

Course Content:

Unit	Topics and Sub-topics	Hours	Marks
Unit-1 Trigonometry	• Concept of angles, measurement of angles in degrees, grades and radians and their conversion. • T-ratios of allied angles (without proof) • Sum, difference formulae (without proof) and related problems. • Product formulae (transformation of product to sum, difference and vice versa) • T-rations of multiple angles (2A,3A)	12	22
Unit – II : Differential Calculus	• Definition of function, concept of limits, Two standard limits $\lim_{x\to a}\frac{x^n-a^n}{x-a}$, $\lim_{x\to 0}\frac{sinx}{x}$ • Differentiation by definition (first principal) of x^n, $sinx, cosx, tanx, e^x$ and $\log_e x$. • Differentiation of sum, product and quotient of functions. • Differentiation of function of a function. Differentiation of trigonometric functions. • Logarithmic differentiation,	12	22
Unit – III : Algebra	• Complex Numbers: Definition, real and imaginary parts of a Complex number, polar and Cartesian, representation of a complex number and its conversion from one form to other. conjugate of a complex number, modulus and amplitude of a complex number Addition, Subtraction, Multiplication and Division of a complex number. Introduction of De-movier's theorem. • Partial fractions: Definition of polynomial fraction proper & improper fractions and definition of partial fractions. To resolve proper fraction into	16	26

	partial fraction with denominator containing non-repeated linear factors. • Permutations and Combinations: Value of nPr and nCr . • Binomial theorem: Binomial theorem (without proof) for positive integral index (expansion and general form). Middle term.		

Course Objectives:

This course is designed to give a comprehensive coverage at an introductory level to the subject of Trigonometry, Differential Calculus and Basic elements of algebra.

References:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, New Delhi, 40th Edition, 2007.

2. G. B. Thomas, R. L. Finney, Calculus and Analytic Geometry, Addison Wesley, 9th Edition, 1995.

3. S.S. Sabharwal, Sunita Jain, Eagle Parkashan, Applied Mathematics, Vol. I & II, Jalandhar.

4. Comprehensive Mathematics, Vol. I & II by Laxmi Publications, Delhi.

5. Reena Garg & Chandrika Prasad, Advanced Engineering Mathematics, Khanna Publishing House, New Delhi

S.N.	PAPER CODE	SUBJECT CODE	SUBJECT NAME	THEORY COMPONENT								PRACTICAL COMPONENT					TOTAL CREDITS	TOTAL MARKS
				HRS PER WEEK	CREDITS	TERM WORK				THEORY PAPER		HRS PER WEEK	CREDITS	LAB WORK	PRACTICAL EXAM/VIVA			
						QUIZ/ASSIGNMENT	MID TERM TEST*		TOTAL	MARKS	DURATION				MARKS	DURATION		
							I	II										
1	7357	201	MATHEMATICS - II	4	4	10	10	10	30	70	03 Hrs.	0	0	0	0	0	4	100

Blue Print of Question Paper

Time: Three Hours Maximum Marks: 70

Unit	Part-A		Part-B	Part-C	Part-D
	10 Marks	10 Marks	15 Marks	20 Marks	15 Marks
Unit – I : Trigonometry Unit – II : Differential Calculus Unit – III : Algebra	**Pattern:** 5 Objective type Questions. (min 1 Question from each unit.)	**Pattern:** 1 Question of Match the column. 5 parts (min one part from each unit.)	**Pattern:** Short Numerical problems. (7 Questions set) 2 Questions from unit 1, 2 Questions from unit 3 And 3 Questions from unit 3, (5 Questions are to be attempted).	**Pattern:** Numerical problems. (7 Questions set) 2 Questions from unit 1, 2 Questions from unit 3 And 3 Questions from unit 3, (5 Questions are to be attempted).	**Pattern:** Numerical problems. (6 questions set, 2 from each unit. (3 questions are to be attempted.)
Total Marks =70	**10**	**10**	**15**	**20**	**15**

Question Bank for Mathematics-1

Unit-1 Trigonometry

Part-A

Q.1) Choose the correct answers.

(i) If $\cos\theta = \frac{4}{5}$, then $\cos 2\theta =$

(a) $\frac{7}{25}$ (b) $\frac{9}{25}$ (c) $\frac{16}{25}$ (d) $\frac{24}{25}$

(ii) If $\sin\theta = \frac{3}{5}$, then $\sin 2\theta =$

(a) $\frac{7}{25}$ (b) $\frac{9}{25}$ (c) $\frac{16}{25}$ (d) $\frac{24}{25}$

(iii) $\frac{\cos\theta}{\sin(90^0-\theta)}+\frac{\sin\theta}{\cos(90^0-\theta)}=$

(a) 0 (b) 1 (c) -1 (d) 2

(iv) $\sin^2 20^0+\cos^2 20^0=$

(a) 0 (b) 1 (c) -1 (d) 2

(v) $(1-\cos\theta)(1+\cos\theta)(1+\cot^2\theta)=$

(a) 0 (b) 1 (c) -1 (d) 2

(vi) $\sqrt{\sec^2\theta-1}=$

(a) $\tan\theta$ (b) $\operatorname{cosec}\theta$

(c) $\cos\theta$ (d) $\cot\theta$

Q.2 Match the column

(A) $sin60^0$	(a) $\frac{2}{\sqrt{3}}$
(B) $\sec 30^0$	(b) 0
(C) $\operatorname{cosec} 45^0$	(c) $\frac{\sqrt{3}}{2}$
(D) $\cos 90^0$	(d) $\sqrt{2}$
(E) $\tan 30^0$	(e) $\sqrt{3}$
(F) $\frac{\pi}{4}$	(f) 120^0
(G) $\frac{2\pi}{3}$	(g) 18^0
(H) $\frac{\pi}{10}$	(h) 30^0
(I) $\frac{\pi}{6}$	(i) 360^0
(J) 2π	(j) 45^0

Part-B

Q.1) If $\tan\theta = \frac{4}{5}$, find the value of $\frac{2sin\theta+3\cos\theta}{4cos\theta+3\sin\theta}$

Q.2) Find the value of following:

(i) $sin15^0$ (ii) $cos75^0$ (iii) $tan105^0$

Q.3) Prove that: $\tan(45^0 - A) = \frac{1-tanA}{1+ta}$

Q.4) Prove that $\frac{1+sin2\theta-cos2}{1+sin2\theta+cos2} = tan\theta$

Q.5) Prove that $\sqrt{\frac{1-si}{1+sin}} = SecA - tanA$

Q.6) Prove that $cotA + tanA = 2cosec2A$

Part-C

Q.1) Prove that: $\sin 50^0 - \sin 70^0 + \sin 10^0 = 0$

Q.2) If $\sin A = \frac{1}{\sqrt{5}}$ and $\sin B = \frac{1}{\sqrt{10}}$, then show that $A + B = 45^0$

Q.3) If $\tan A = \frac{5}{6}$ and $\tan B = \frac{1}{11}$, then show that $A + B = 45^0$

Q.4) Prove that $\frac{sin\theta+sin2\theta}{1+cos\theta+cos2\theta} = tan\theta$

Q.5) Prove that $\frac{cos1\ ^0+sin1\ ^0}{cos11^0-sin11^0} = tan56^0$

Part-D

Q.1) Prove that: $\frac{\cos 2\theta}{1+\sin\ \theta} = \tan\left(\frac{\pi}{4} - \theta\right)$

Q.2) Prove that: $\cos 20^0 \cos 40^0 \cos 60^0 \cos 80^0 = \frac{1}{16}$

Q.3) Prove that: $\sin 20^0 \sin 40^0 \sin 60^0 \sin 80^0 = \frac{3}{16}$

Q.4) Prove that: $\sin(A + B)\sin(A - B) = \sin^2 A - \sin^2 B$

Q.5) If $A + B = \frac{\pi}{4}$, then prove that $(1 + tanA)(1 + tanB) = 2$

Unit-2 (Differential Calculus)

Part-A

Q.1) Choose the correct answers.

(i) Value of $\lim_{x\to 0} \frac{sin3x}{x}$ is:

(a) 0 (b) 1

(c) 3 (d) $\frac{1}{3}$

(ii) Value of $\lim_{x\to a} \frac{(x^n - a^n)}{(x-a)}$ is:

(a) n (b) 1

(c) a (d) $n\,a^{n-1}$

(iii) Value of $\lim_{\theta\to \frac{\pi}{2}} \cos^2\theta$ is :

(a) 1 (b) 0

(c) 4 (d) 3

(iv) Value of $\lim_{x\to 0} \frac{\sin 3x}{\tan 2x}$ is:

(a) 2 (b) 3

(c) 1 (d) $\frac{3}{2}$

(v) If $f(x) = \sqrt{x}$ then value of $f(4)$ is

(a) 1 (b) 2

(c) 4 (d) 0

(vi) If $f(x) = tanx$, then value of $f\left(\frac{\pi}{4}\right)$ is

(b) 1 (b) 4

(c) ∞ (d) 0

Q.2 Match the columns

(A) $\frac{d}{dx}e^x$ (a) $\sec^2 x$

(B) $\frac{d}{dx}tanx$ (b) $-\text{cosec}^2 x$

(C) $\frac{d}{dx}cotx$ (c) $\frac{1}{x}$

(D) $\frac{d}{dx}secx$ (d) e^x

(E) $\frac{d}{dx}\log_e x$ (e) $\sec x \tan x$

(F) $\frac{d}{dx}\log \sin x$ (f) $cotx$

(G) $\frac{d}{dx}\log \cos x$ (g) $-tanx$

Part-B

Q.1) if $f(x) = x^2 + 1$, then find the value of $f(a) - f(b)$.

Q.2) If $f(x) = x^2 - \frac{1}{x^2}$, then prove that $f(x) + f\left(\frac{1}{x}\right) = 0$

Q.3) Find the value of $\lim_{x\to 0} \frac{sin5x}{x}$

Q.4) Find the value of $\lim_{x\to 3} \frac{(x^2 - 9)}{(x-3)}$

Q.5) Find the value of $\lim_{x\to 0} \frac{Sinax}{Sinbx}$

Q.6) Find the value of $\lim_{x\to 0} \frac{(x - x^3)}{x}$

Q.7) if $f(x) = sin^2 x - 1$, then find the value of $f(\frac{\pi}{2})$.

Part-C

Q.1) If $y = xe^x$, then prove that $\frac{1}{y}\frac{dy}{dx} = 1 + \frac{1}{x}$

Q.2) If $y = \log_e(\log_e \sin x)$, then find $\frac{dy}{dx}$

Q.3) If $y = \log_e(\sec x + \tan x)$, then find $\frac{dy}{dx}$

Q.4) If $y = \frac{1+\cos x}{1-\cos x}$, then find $\frac{dy}{dx}$

Q.5) If $x^n + y^n = a^n$, then find $\frac{dy}{dx}$

Q.6) If $y = \frac{\sin x}{1+\cos}$, then find $\frac{dy}{dx}$

Q.7) If $y = \frac{\log_e x}{x} + x^5 \sec x + 10^x$, then find $\frac{dy}{dx}$

Part-D

Q.1) Differentiate $\boldsymbol{\sin x}$ by first principle.

Q.2) Differentiate $\boldsymbol{\cos x}$ by first principle.

Q.3) If $x^3 + y^3 = 3xy$, then find $\frac{dy}{dx}$.

Q.4) If $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x +}}}}$ ... ... ∞, then find $\frac{dy}{dx}$.

Q.5) If $y = x^{x^{x^{x^{\cdots\cdots\cdots\infty}}}}$, then find $\frac{dy}{dx}$.

Q.6) If $y = e^{x+e^{x+e^{x+e^{x+\cdots\cdots\cdots\infty}}}}$ then find $\frac{dy}{dx}$.

Q.7) If $x^y = e^{x-y}$, then prove that $\frac{dy}{dx} = \frac{\log_e x}{(1+\log_e x)^2}$.

Unit-3 (Algebra)

Part-A

Q.1) Choose the correct answers.

(i) The value of $(1 + i)^2$ is

(a) $3i$ (b) i (c) 2i (d) 1+ i

(ii) Value of $1 + i + i^2 + i^3$ is

(a) i (b) -1 (c) 1 (d) 0

(iii) Total number of terms in the expansion of $(x + y)^6$ is

(a) 7 (b) 5 (c) 12 (d) 0

(iv) Which term is/are middle terms in expansion of $(x+y)^7$

(a) 4^{th} and 5^{th} (b) 3^{nd} and 4^{rd} (c) 3^{rd} (d) 4^{th} term

(v) If C_5^8 is equal to –

(a) C_2^8 (b) C_1^8 (c) C_3^8 (d) P_3^8

(vi) If C_0^{10} is equal to –

(a) 0 (b) 10 (c) 5 (d) 1

(vii) Total number of permutations of 3 different objects are-

(a)3 (b) 6 (c) 12 (d) 9

(viii) P_4^6 is equal to –

(a) 20 (b) 120 (c) 360 (d) 30

Q.2) Match the columns

(A)	i^{20}	(a)	-1
(B)	i^{10}	(b)	$+1$
(C)	C_r^n	(c)	$\frac{n!}{(n-r)!}$
(D)	P_r^n	(d)	$\frac{n!}{r!\times(n-r)!}$
(E) General term in expansion of $(x+a)^n$		(e)	$T_{r+1} = C_r^n\, x^{n-r} a^r$
(F) $(\cos\theta + i\sin\theta)^n$		(f)	$cos\theta + isin\theta$

Part-B

Q.1) Find modulus and argument of complex number $1 + i$

Q.2) Find the multiplicative inverse of $3 + 2\,\mathrm{i}$

Q.3) Find the values of x and y for $2x + (3x + y)\mathrm{i} = 4 + 10\mathrm{i}$

Q.4) Express $\frac{3-2i}{4+3i}$ in to $a + ib$ form.

Q.5) If $C_{12}^{n} = C_{8}^{n}$, then find the value of C_{n}^{22}.

Q.6) If $C_{r}^{21} = C_{r+3}^{21}$, then find the value of C_{6}^{r}

Q.7) If $P_{5}^{n} : P_{6}^{n} = 1 : 2$, then find the value of n.

Q.8) If $P_{2}^{n} = 12$, then find the value of n.

Part-C

Q.1) Find the 4th term in the expansion of $(x - 2)^4$

Q.2) Evaluate $(101)^4$ using binomial theorem.

Q.3) Expand $(x + 2)^5$ using binomial theorem.

Q.4) Find the middle term in the expansion of $\left(\frac{a}{x} + \frac{x}{a}\right)^{10}$

Q.5) Find the middle term in the expansion of $\left(x^2 - \frac{1}{x}\right)^6$

Q.6) Prove that $(1 + \mathrm{i})^4 \left(1 + \frac{1}{\mathrm{i}}\right)^4 = 16$

Q.7) Prove that $\left(\frac{1}{1-\mathrm{i}}\right)^2 - \left(\frac{1}{1+\mathrm{i}}\right)^2 = i$

Part-D

Q.1) Resolve into partial fraction $\frac{2x+5}{(x-1)(x-2)}$

Q.2) Resolve into partial fraction $\frac{2x+3}{(x+1)(x-2)}$

Q.3) Resolve into partial fraction $\frac{x+1}{(x+2)(x+3)}$

Q.4) Resolve into partial fraction $\frac{x^2}{(x+2)(x+3)(x+4)}$

Q.5) Resolve into partial fraction $\frac{x^2+1}{x(x^2-1)}$

Module Question Paper-1

Mathematics-1

Time: Three Hours | Maximum Marks: 70

All parts are mandatory

Parts-A

Q.1) Choose the correct answers. $2\ each \times 5 = 10\ Marks$

(i) If $\sin A = \frac{3}{5}$, then sin2A is equal to

(a) $\frac{6}{5}$ (b) $\frac{12}{13}$

(c) $\frac{24}{25}$ (d) $\frac{9}{25}$

(ii) The value of 60^0 in radian

(a) $\left(\frac{\pi}{4}\right)^c$ (b) $\left(\frac{\pi}{5}\right)^c$

(c) $\left(\frac{\pi}{6}\right)^c$ (d) $\left(\frac{\pi}{3}\right)^c$

(iii) $\lim_{x\to a} \frac{x^2-a^2}{x-a}$ is equal to

(a) $2a$ (b) $-2a$

(c) 0 (d) 1

(iv) Complex conjugate of $2-3i$ is

(a) $2+3i$ (b) $2-3i$

(c) $3-2i$ (d) $3+2i$

(v) If $P_2^n = 12$ then the value of n is

(a) 2 (b) 4

(c) 5 (d) 6

Q.2) Match the Column $2\ each \times 5 = 10\ Marks$

(A)	$\sin(180^0 - \theta)$	(a)	11
(B)	$\frac{d}{dx} secx$	(b)	0
(C)	$f(x) = cos2x$, Then $f\left(\frac{\pi}{4}\right)$	(c)	$\sin\theta$
(D)	Total terms in $(2x + 3y)^{10}$	(d)	1
(E)	C_n^n	(e)	$secxtanx$

Parts-B

(Attempt any five out of seven questions) $3\ each \times 5 = 15\ Marks$

Q.1) Find the values of x and y for following equation

$$2x + (3x + y)\mathrm{i} = 4 + 10\mathrm{i}$$

Q.2) Prove that: $\sqrt{\frac{1-\sin}{1+\sin}} = \mathrm{SecA} - \mathrm{tanA}$

Q.3) Prove that: $\tan(45^0 - A) = \frac{1-tanA}{1+tanA}$

Q.4) If $f(x) = x^2 - \frac{1}{x^2}$, then prove that $f(x) + f\left(\frac{1}{x}\right) = 0$

Q.5) Find the value of $\lim_{x\to 0} \frac{Sinax}{Sinbx}$

Q.6) If $P_2^n = 12$, then find the value of n.

Q.7) If $C_{12}^n = C_8^n$, then find the value of C_n^{22}.

Parts-C

(Attempt any five out of seven questions) $4\ each \times 5 = 20\ Marks$

Q.1) Prove that $sin50^0 - sin70^0 + sin10^0 = 0$

Q.2) If $tanA = \frac{5}{6}$ and $tanB = \frac{1}{11}$, then prove that $A + B = 45^0$

Q.3) If $y = \frac{sinx}{1+cos}$, then find $\frac{dy}{dx}$

Q.4) Find the value of $\lim_{x\to 0}\left(\frac{1-cos}{x^2}\right)$

Q.5) Resolve into partial fraction: $\frac{2x+5}{(x-1)(x-2)}$

Q.6) Evaluate $(101)^4$ using binomial theorem

Q.7) Prove that: $(1+\mathrm{i})^4\left(1+\frac{1}{\mathrm{i}}\right)^4 = 16$

Parts-D

(Attempt any three out of six questions) $5\ each \times 3 = 15\ Marks$

Q.1) Prove that: $sin20^0 sin40^0 sin60^0 sin80^0 = \frac{3}{16}$

Q.2) Prove that: $\sin 50^0 - \sin 70^0 + \sin 10^0 = 0$

Q.3) Find the differential coefficients of $cosx$ by the first principles.

Q.4) If $y = \sqrt{sinx + \sqrt{sinx + \sqrt{sinx + \sqrt{sinx + \cdots \infty}}}}$, then find $\frac{dy}{dx}$

Q.5) Resolve into partial fractions: $\frac{x^2}{(x+2)(x+3)(x+4)}$

Q.6) Find the middle term in the expansion of $\left(\frac{a}{x} + \frac{x}{a}\right)^{10}$

……..…….. xxxxxxxxx ……

Module Question Paper-2

Mathematics-1

Time: Three Hours Maximum Marks: 70

All parts are mandatory

Parts-A

Q.1) Choose the correct answers. $2\ each \times 5 = 10\ Marks$

(i) If $cos\,\emptyset = \frac{4}{5}$, then $cos2\emptyset$ is equal to

(a) $\frac{8}{5}$ (b) $\frac{16}{25}$

(c) $\frac{24}{25}$ (d) $\frac{7}{25}$

(ii) $\frac{\cos\theta}{\sin(90^0-\theta)} + \frac{\sin\theta}{\cos(90^0-\theta)} =$

(a) 0 (b) 1

(c) -1 (d) 2

(iii) $\lim_{x\to 0} \frac{sin3x}{x}$ is equal to

(a) 3 (b) 2

(c) 0 (d) 1

(iv) Value of $1 + i + i^2 + i^3$ is

(a) 4 (b) 0

(c) 10 (d) $4i$

(v) If $P_2^n = 12$ then the value of n is

(a) 2 (b) 4

(c) 5 (d) 6

Q.2) Match the Column $2\ each \times 5 = 10\ Marks$

(A)	$\sec 30^0$	(a)	$T_{r+1} = C_r^n\, x^{n-r} a^r$ 11
(B)	$\frac{d}{dx} \log \sin x$	(b)	$\frac{2}{\sqrt{3}}$
(C)	$f(x) = cotx$, Then $f\left(\frac{\pi}{2}\right)$	(c)	$cosnx + isin\, nx$
(D)	General term in expansion of $(x + a)^n$	(d)	0
(E)	$(cos\, x + i\ sin\, x)^n$	(e)	$cotx$

Parts-B

(Attempt any five out of seven questions) $3\ each \times 5 = 15\ Marks$

Q.1) Find modulus and argument of complex number $1 + i$

Q.2) Prove that: $\frac{1+sin2\theta-cos2}{1+sin2\theta+cos} = tan\theta$

Q.3) Prove that: $\frac{cos11^0+sin11^0}{cos11^0-sin11^0} = tan56^0$

Q.4) if $f(x) = x^2 + 1$, then find the value of $f(a) - f(b)$

Q.5) Find the value of $\lim_{x\to 3} \frac{(x^2-9)}{(x-3)}$

Q.6) If $P_5^n : P_6^n = 1 : 2$, then find the value of n.

Q.7) If $C_r^{21} = C_{r+3}^{21}$, then find the value of C_6^r

Parts-C

(Attempt any five out of seven questions) $4\ each \times 5 = 20\ Marks$

Q.1) If $\sin A = \frac{1}{\sqrt{5}}$ and $\sin B = \frac{1}{\sqrt{10}}$, then show that $A + B = 45^0$

Q.2) Prove that $cotA + tanA = 2cosec2A$

Q.3) If $y = \log_e(\sec x + \tan x)$, then find $\frac{dy}{dx}$

Q.4) If $x^n + y^n = a^n$, then find $\frac{dy}{dx}$

Q.5) Resolve into partial fraction: $\frac{x+1}{(x+2)(x+3)}$

Q.6) Expand $(x + 2)^5$ using binomial theorem

Q.7) Prove that $\left(\frac{1}{1-i}\right)^2 - \left(\frac{1}{1+i}\right)^2 = i$

Parts-D

(Attempt any three out of six questions) $5\ each \times 3 = 15\ Marks$

Q.1) Prove that: $cos20^0 cos40^0 cos60^0 cos80^0 = \frac{1}{16}$

Q.2) Prove that: $\frac{\cos 2\theta}{1+\sin 2\theta} = \tan\left(\frac{\pi}{4} - \theta\right)$

Q.3) Find the differential coefficients of $sinx$ by the first principles.

Q.4) If $y = x^{x^{x^{x^{\cdots\cdots\cdots\cdots\infty}}}}$, then find $\frac{dy}{dx}$

Q.5) Resolve into partial fractions: $\frac{x^2+1}{x(x^2-1)}$

Q.6) Find the middle term in the expansion of $\left(\frac{x}{2} + 2y\right)^6$

DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL (M.P.)

SEMESTER– I

COURSE TITLE: APPLIED PHYSICS–I

SUBJECT CODE : 102

PAPER CODE: 7351 THEORY

CREDIT: 03

Course Objectives:

Applied Physics includes the study of a large number of diverse topics all related to materials/things that exist in the world around us. It aims to give an understanding of this world both by observation and by prediction of the way in which such objects behave. Concrete use of physical principles and analysis in various fields of engineering and technology are given prominence in the course content. The course will help the diploma engineers to apply the basic concepts and principles to solve broad based engineering problems and to understand different technology based applications.

Teaching Approach:

- Teachers should give examples from daily routine as well as, engineering/technology applications on various concepts and principles in each topic so that students are able to understand and grasp these concepts and principles. In all contents, SI units should be followed.
- Use of demonstration can make the subject interesting and develop scientific temper in the students. Student activities should be planned on all the topics.
- Activity- Theory - Demonstrate/practice approach may be followed throughout the course so that learning may be outcome and employability based.

Course Content:

Unit 1: Units and Measurements

Physical quantities: fundamental and derived, Units and systems of units (FPS, CGS, MKS and SI units), Dimensions and dimensional formulae of physical quantities, Errors in measurements (systematic and random), absolute error, relative error, error propagation, error estimation and significant figures.

Scalar and Vector quantities – examples, representation of vector, types of vectors. Addition and Subtraction of Vectors, Triangle and Parallelogram law (Statement only), Scalar and Vector Product, Resolution of a Vector.

Unit 2: Force and Motion

Force, Momentum, Conservation of linear momentum its statement and applications, Impulse and its applications.

Friction: concept, types, laws of limiting friction, coefficient of friction, reducing friction and its engineering applications.

Circular motion, definition of angular displacement, angular velocity, angular acceleration, frequency, time-period, Relation between linear and angular velocity, linear acceleration and angular acceleration, Centripetal and Centrifugal forces with live examples, Expression and applications such as banking of roads and bending of cyclist.

Unit 3: Work, Energy, Power and Rotational Motion

Work: Concept and units, examples of zero, positive and negative work.

Energy and its units, kinetic energy, gravitational potential energy with examples and derivations, mechanical energy, conservation of mechanical energy for freely falling bodies, transformation of energy (examples). Power and its units, Calculation of power.

Translational and rotational motions with examples, Definition of torque and angular momentum and their examples, Conservation of angular momentum (quantitative) and its applications. Moment of inertia and its physical significance.

Unit 4: Properties of Matter

Elasticity: definition of stress and strain, moduli of elasticity, Hooke's law, significance of stress-strain curve

Surface tension: concept and unit. Cohesive and adhesive forces, Angle of contact, Ascent Formula (No derivation), Applications of surface tension, Effect of temperature and impurity on surface tension.

Viscosity and coefficient of viscosity, Terminal velocity, Stoke's law, effect of temperature on viscosity, stream line and turbulent flow, Reynold's number Equation of continuity, Bernoulli's Theorem (only statement) and its applications.

Unit 5: Heat and Thermometry

Concept of heat and temperature, Mercury thermometer, scales of temperature and their relationship, specific heat, modes of heat transfer (conduction, convection and radiation with examples), Co-efficient of thermal conductivity and its engineering applications. Expansion of solids, coefficient of linear, surface and cubical expansions and relation amongst them.

Learning Outcome:

After undergoing this subject, the student will be able to:

- Identify physical quantities, select their units for use in engineering solutions, and make measurements with accuracy by minimizing different types of errors.
- Represent physical quantities as scalar and vectors and solve real life relevant problems.
- Analyse type of motions and apply the formulation to understand banking of roads/railway tracks and conservation of momentum.
- Define scientific work, energy and power and their units. Drive relationships for work, energy and power and solve related problems.
- Describe forms of friction and methods to minimize friction between different surfaces.
- Identify various forms of energy, and energy transformations.
- Compare and relate physical properties associated with linear motion and rotational motion and apply conservation of angular momentum principle to known problems.

- Describe the phenomenon of surface tension, effects of temperature on surface tension and solve statics problems that involve surface tension related forces.
- Describe the viscosity of liquids, coefficient of viscosity and the various factors affecting its value. Determine viscosity of an unknown fluid using Stokes' Law and the terminal velocity.
- Define stress and strain. State Hooke's law and elastic limits, stress–strain diagram, deter- mine; (a) the modulus of elasticity, (b) the yield strength (c) the tensile strength, and (d) estimate the percent elongation.
- Illustrate the terms; heat and temperature, measure temperature in various processes on different scales (Celsius, Fahrenheit, and Kelvin etc.)
- Distinguish between conduction, convection and radiation; identify different methods for reducing heat losses and mode of heat transfer between bodies at different temperatures.
- State specific heats and measure the specific heat capacity of solids and liquids.

References:

1. Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi

2. Applied Physics, Vol. I and Vol. II, TTTI Publications, Tata McGraw Hill, Delhi.

3. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi

4. अनुप्रयुक्त भौतिकी - I, अमित जैन एवम इन्दर कुमार सिंह, संजय पब्लिकेशन्स, जयपुर

5. Practical Physics by C. L. Arora, S. Chand Publication.

6. e-books/e-tools/ learning physics software/websites etc.

APPLIED PHYSICS – I LAB

Course Objectives

Study of Applied Physics aims to give an understanding of physical world by observations and predictions. Concrete use of physical principles and analysis in various fields of engineering and technology is very prominence. The course aims to supplement the factual knowledge gained in the lecture by first hand manipulation of apparatus. This will develop scientific temper and help to apply the basic concepts and principles in solving engineering and technology based problems. In addition, students get necessary confidence in handling equipment and thus learn various skills in measurement.

List of Practical's/Activities (To perform minimum 8 practical's).

1. To find volume of given object by using a Vernier caliper.

2. To determine radius of a given wire by using a screw gauge.

3. To determine radius of curvature of a convex or concave mirror/surface using a spherometer.

4. To verify triangle law of forces.

5. To verify parallelogram law of forces.

6. To find the co-efficient of friction between wood and glass using a horizontal board.

7. To determine force constant of a spring using Hook's Law.

8. To find the viscosity of a given liquid (Glycerin) by Stoke's law.

9. To find the coefficient of linear expansion of the material of a rod.

10. To measure room temperature and temperature of a hot bath using mercury thermometer and convert it into different scales.

SUGGESTED STUDENT ACTIVITES & STRATEGIES

Apart from classroom and laboratory learning following are the suggested student related

activities which can be undertaken to accelerate the attainment of various outcomes of the course

a. Make survey of different physical products and compare the following points

- Measurements of dimensions
- Properties
- Applications

b. Library survey regarding engineering materials/products used in different industries

c. Seminar on any relevant topic.

Teachers should use the following strategies to achieve the various outcomes of the course.

- Different methods of teaching and media to be used to attain classroom attention.
- Massive open online courses (MOOCs) may be used to teach various topics/sub topics.
- 15-20% of the topics which are relatively simpler of descriptive in nature should be given to the students for self-learning and assess the development of competency through classroom presentations.
- Micro-projects may be given to group of students for hand-on experiences.

Learning Outcome:

After undergoing this lab work, the student will be able to:

- Select right kind of measuring tools (Meter scale, Vernier caliper, Screw gauge, Spherometer etc.) for determining dimensions of physical quantities and make measurements with accuracy and precision.
- Differentiate various shapes and determine dimensions of plane, curved and regular surfaces/bodies.
- Apply and Verify laws of forces and determine resultant force acting on a body.
- Appreciate role of friction and measure co-efficient of friction between different surfaces.
- Describe and verify Hook's law and determine force constant of spring body.
- Understand Stoke's law for viscous liquids and determine viscosity of a given liquid.
- Understand how materials expand on heating and determine linear expansion coefficient for a given material rod.
- Understand use of thermometers to measure temperature under different conditions and different scales of temperature measurements.

References:

1. Text Book of Physics for Class XI& XII (Part-I, Part-II); N.C.E.R.T., Delhi

2. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P)Ltd.,

3. Practical Physics by C. L. Arora, S. Chand Publication.

4. e-books/e-tools/ learning physics software/YouTube videos/websites

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL (M.P.)

SEMESTER – I

COURSE TITLE: APPLIED PHYSICS – I

SUBJECT CODE: 102

PAPER CODE: 7351

THEORY CREDIT: 03

BLUE PRINT OF QUESTION PAPER

UNIT NO.	UNIT NAME	MARKS WISE NO OF QUESTIONS				TOTAL MARKS
		2 MARKS (Multiple choice type question)	2 MARKS (Fill in the blanks or match the column or very short answer type question)	4 MARKS (Short answer type question)	6 MARKS (Long answer type question)	
1	UNITS & MEASUREMENTS	1	1	1	1	**14**
2	FORCE AND MOTION	1	1	1	1	**14**
3	WORK, ENERGY, POWER & ROTATIONAL MOTION	1	1	1	1	**14**
4	PROPERTIES OF MATTER	1	1	1	1	**14**
5	HEAT AND THRMOMETRY	1	1	1	1	**14**
TOTAL MARKS		**10**	**10**	**20**	**30**	**70**

Guidelines for Question Paper Design:

1. The question paper should be prepared on the basis of the blueprint.
2. The question paper should carry 70 marks and be of 3 hours duration.
3. Each unit is given equal weightage (14 marks for each unit).
4. There should be a total of six questions. All are compulsory for students to attempt.
5. Question no. 1 should be of multiple-choice type and carry 10 marks. It has 5 sub-questions (one from each unit). Each sub-question is of 02 marks.
6. Other questions (from question no. 02 to question no.06), one from each unit, has three sub-questions like (a), (b) and (c).
7. Sub-question (a) has 2 marks. It can be of fill-in-the-blanks / match-the column / very short answer (VSA) type question. This question should be of cognitive type only.
8. Sub-questions (b) and (c) have 4 and 6 marks respectively. Sub-questions (b) should be of short answer (SA) type and Sub-questions (c) should be of long answer (LA) type. **Internal choices should be given to these sub-questions.**
9. Numerical questions can be asked only of 2 and 4 marks. Numerical questions can not be asked more than 10 marks.
10. Questions which are based on the same concept, law, fact etc. should not be repeated under different forms like MCQ. VSA, SA, LA.

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL (M.P.)

SEMESTER – I

MODEL QUESTION PAPER : APPLIED PHYSICS –I

SUBJECT CODE: 102 **PAPER CODE: 7351**

TIME: 3 hours **MAXIMUM MARKS: 70**

NOTE: (1) All questions are compulsory. Question no. 1 is of multiple choice type.
सभी प्रश्न अनिवार्य हैं। प्रश्न क्रमांक 1 बहुविकल्पीय प्रकार का है।

(2) Internal choices are given in 4 marks and 6 marks questions.
4 अंक तथा 6 अंक वाले प्रश्नों में आन्तरिक विकल्प दिए गए हैं।

(3) In case of any doubt or dispute, the English version question should be treated as final.
किसी भी संदेह अथवा विवाद की स्थिति में अंग्रेजी भाषा के प्रश्न को अन्तिम माना जायेगा।

Q.1 Choose the correct answer:
सही उत्तर का चयन कीजिए : **2x5 marks**

(i) 'light year' is the unit of -
(a) Time (b) Distance (c) Light (d) None of these

'प्रकाश वर्ष' मात्रक है -
(a) समय (b) दूरी (c) प्रकाश (d) इनमें से कोई नहीं

(ii) Friction between two surfaces depends on -
(a) Size of surface (b) Area of surface
(c) Shape of surface (d) Roughness of surface

दो सतहों के मध्य लगने वाला घर्षण निर्भर करता है -
(a) सतह के आकार पर (b) सतह के क्षेत्रफल पर
(c) सतह की आकृति पर (d) सतह के खुरदुरेपन पर

(iii) Which of the following is not a unit of energy?
(a) calorie (b) joule (c) electron-volt (d) watt

निम्न में से कौन सा मात्रक ऊर्जा का मात्रक नहीं है?
(a) कैलोरी (b) जूल (c) इलेक्ट्रॉन-वोल्ट (d) वाट

(iv) Rain drops are spherical in shape. It is due to -
(a) Viscosity (b) Surface tension (c) Gravity (d) Pressure

वर्षा की बूँदें गोल होती हैं। इसका कारण है -

(a) श्यानता (b) पृष्ठ तनाव (c) गुरुत्वाकर्षण (d) दाब

(v) Heat transfer in solids takes place by -

(a) Conduction (b) Convection

(c) Radiation (d) All of the above

ठोस पदार्थों में ऊष्मा स्थानान्तरण होता है -

(a) चालन द्वारा (b) संवहन द्वारा

(c) विकिरण द्वारा (d) उपरोक्त सभी के द्वारा

Q.2 a) Fill in the blank: 1x**2 marks**

(i) Total number of significant figures in 0.0050 m are ……

(ii) 1 nanometre = ……. metre.

रिक्त स्थान भरें:

(i) 0.0050 मीटर में सार्थक अंकों की कुल संख्या …… है

(ii) 1 नैनोमीटर = ……. मीटर

b) Define negative vector and unit vector. **4 marks**

ऋण सदिश तथा इकाई सदिश को परिभाषित कीजिए।

OR (अथवा)

If error in the measurement of side of a cube is 5% then calculate the percentage error in its volume.

यदि किसी घन की भुजा के मापन में 5% की त्रुटि होती है तो उसके आयतन में त्रुटि की गणना कीजिए।

c) Describe SI system of units. Write its merits. **6 marks**

मात्रकों की SI पद्धति का वर्णन करते हुए इसकी विशेषतायें लिखिए।

OR (अथवा)

What do you mean by error in measurement. Explain the types of error in brief.

मापन में त्रुटि से क्या तात्पर्य है? विभिन्न प्रकार की त्रुटियों का संक्षिप्त वर्णन कीजिए।

Q.3 a) A particle is moving along a circular path of radius 50 m. Calculate its angular speed if it makes 7 revolutions per second. **2 marks**

एक कण 50 m त्रिज्या के वृत्तीय मार्ग पर प्रति सेकण्ड 7 चक्कर लगा रहा है। कण की कोणीय चाल ज्ञात कीजिए।

b) What is limiting friction? Write its laws. **4 marks**

सीमान्त घर्षण क्या है? इसके नियम लिखिए।

OR (अथवा)

Define force and momentum.

बल तथा संवेग को परिभाषित कीजिए।

c) Define centripetal acceleration and obtain an expression of it. **6 marks**

अभिकेन्द्र त्वरण को परिभाषित करते हुए इसका व्यंजक प्राप्त कीजिये।

OR (अथवा)

Deduce an expression for the maximum safe speed of a car on a banked circular road.
वृत्ताकार बंकित सड़क पर किसी कार की अधिकतम सुरक्षित चाल के लिए सूत्र प्राप्त कीजिए।

Q.4 a) Arrange in proper pairs - **2 marks**

(i) Work	(a) watt-second
(ii) Energy	(b) kilogram-metre^2
(iii) Angular momentum	(c) newton-metre
(iv) Moment of inertia	(d) joule-second

सही जोडियाँ बनाइये -

(i) कार्य	(a) वाट-सेकण्ड
(ii) ऊर्जा	(b) किलोग्राम-मीटर^2
(iii) कोणीय संवेग	(c) न्यूटन-मीटर
(iv) जड़त्व आघूर्ण	(d) जूल-सेकण्ड

b) Explain positive, negative and zero work with one example of each. **4 marks**
धनात्मक, ऋणात्मक तथा शून्य कार्य को एक-एक उदाहरण सहित समझाइये।

OR (अथवा)

The power of a pump is 1 kW. How much water can this pump lift to a height of 50 m in I hour?
एक पम्प की शक्ति 1 kW है। यह पम्प 1 घंटे में कितना पानी 50 m की ऊँचाई तक उठा पायेगा?

c) Define kinetic energy and drive a formula of it. **6 marks**
गतिज ऊर्जा को परिभाषित करते हुए इसका सूत्र प्राप्त कीजिए।

OR (अथवा)

Define moment of inertia and explain its significance with an example.
जड़त्व आघूर्ण को परिभाषित करते हुए इसका महत्त्व एक उदाहरण सहित समझाइये।

Q.5 a) What is the effect of temperature on the viscosity of liquid? **2 marks**
द्रव की श्यानता पर ताप का क्या प्रभाव होता है?

b) Explain why Steel is more elastic than rubber. **4 marks**
रबर की तुलना में स्टील अधिक प्रत्यास्थ क्यों होती है ? समझाइये।

OR (अथवा)

Define angle of contact. Write the factors on which it depends.
स्पर्श कोण को परिभाषित कीजिए। इसका मान किन-किन कारकों पर निर्भर करता है?

c) What do you understand by terminal velocity. Obtain an expression for it. **6 marks**
सीमान्त वेग से क्या तात्पर्य है? इसके लिए सूत्र प्राप्त कीजिए।

OR (अथवा)

State Bernoulli's Theorem and explain magnus effect.
बरनौली प्रमेय का कथन लिखिए तथा मैगनस प्रभाव को समझाइये।

Q.6 a) Temperature of an object on Celsius scale is 70^{0}. What would be its temperature on Fahrenheit scale? **2 marks**

किसी वस्तु का सेल्सियस स्केल पर ताप 70^{0} है। फाह्रेनहाइट स्केल पर इसका ताप क्या होगा?

b) Define specific heat. Write a daily life use of specific heat of water. **4 marks**

विशिष्ट ऊष्मा को परिभाषित कीजिए। जल की विशिष्ट ऊष्मा का दैनिक जीवन में कोई एक उपयोग बताइए।

OR (अथवा)

Differentiate between heat and temperature.

ऊष्मा तथा ताप में अन्तर स्पष्ट कीजिए।

c) What is heat conduction? Explain the coefficient of thermal conductivity. **6 marks**

ऊष्मा चालन क्या है? ऊष्मा चालकता गुणांक को समझाइये।

OR (अथवा)

Define coefficients of linear and surface expansion of solid. Establish relation between them.

ठोस के रेखीय तथा क्षेत्रीय प्रसार गुणांकों को परिभाषित करते हुए उनमें सम्बन्ध प्राप्त कीजिए।

DIPLOMAWING
RAJIVGANDHIPROUDYOGIKIVISHWAVIDYALAYA,BHOPAL

SEMESTER I–GROUP'B'

COURSE TITLE	:	INTRODUCTION TO IT SYSTEMS
PAPER CODE	:	7354
SUBJECT CODE	:	103
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	02

Course Objectives::

This course is intended to make new students comfortable with computing environment - Learning basic computer skills, Learning basic application software tools, Understanding Computer Hardware, Cyber security awareness

Course Content:

UNIT1:

Basic Internet skills: Understanding browser, efficient use of search engines, awareness about Digital India portals(state and national portals) and college portals.

General understanding of various computer hardware components –CPU, Memory, Display, Keyboard, Mouse, HDD and other Peripheral Devices.

UNIT2:

OS Installation(Linux and MS Windows),Unix Shell and Commands, vieditor.

UNIT3:

HTML4, CSS ,making basic personal webpage.

UNIT 4:

OfficeTools: Open OfficeWriter,OpenOffice Spreadsheet(Calc),OpenOfficeImpress.

UNIT5: Information security best practices.

Class lectures will only introduce the topic or demonstrate the tool, actual learning will take place in the Lab by practicing regularly.

SuggestedLabWork:

This is a skill course.Topics/concepts taught in the class should be practiced in the Lab same week and practiced regularly during the semester till student becomes confident about it. This course is all about some theory and a lot of practice.

References:

- R.S.Salaria, Computer Fundamentals, Khanna Publishing House
- RameshBangia,PCSoftwareMadeEasy–ThePCCourseKit,KhannaPublishingHouse
- Online Resources, Linuxmanpages,Wikipedia
- Mastering Linux Shell Scripting: A practical guide to Linux command-line, Bash scripting, and Shell programming, by Mokhtar Ebrahim, Andrew Mallett

Course outcomes:

At the end of the course student will be able to comfortably work on computer, install and configure OS, assemble a PC and connect it to external devices, write documents, create worksheets, prepare presentations ,protect information and computers from basic abuses/ attacks.

INTRODUCTION TO IT SYSTEMS LAB

Course Objectives:

This Lab course is intended to practice what eve is taught in theory class of' Introduction of IT Systems' and become proficient in using computing environment-basic computer skills, basic application software tools, Computer Hardware, cyber security features, etc.

Course Content:

S.No.	Topics for Practice
1	Browser features, browsing, using various search engines, writing search queries
2	Visit various e-governance/Digital Indiaportals, understand their features, services of-fered
3	Read Wikipedia pages on computer hardware components, look at those components in lab ,identify them, recognise various ports/interfaces and related cables, etc.
4	Install Linux and Windows operating system on identified lab machines, explore various options, do it multiple times
5	Connect various peripherals (printer, scanner, etc.) to computer, explore various features of peripheral and their device driver software.
6	Practice HTML commands, try them with various values, make your own Webpage
7	Explore features of Open Office tools, create document susing these features, do it multiple times
8	Explore security features of Operating Systems and Tools, try using the command see what happens.

This is a skill course. More you practice ,better it will be.

References:

1. On line resources, Linux man pages,Wikipedia.
2. R.S.Salaria,Compute rFundamentals ,Khanna Publishing House.
3. RameshBangia,PC Software MadeEasy–The PC Course Kit, Khanna Publishing House.
4. Mastering Linux Shell Scripting: A practical guide to Linux command-line, Bash scripting, and Shell programming, by Mokhtar Ebrahim, Andrew Mallett.
5. IT Essentials PC Hardware and Software Companion Guide, Davis Anfinson and Ken Quamme, CISC Press, Pearson Education.
6. PC Hardware and A+Handbook, KateJ.ChasePHI(Microsoft).

Course outcomes:

At the end of the course student will be able to comfortably work on computer, install and configure OS ,assemble a PC and connect it to external devices ,write documents, create worksheets, prepare presentations, protect information and computers from basic abuses/attacks

DIPLOMA WING

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

SEMESTER I B

COURSE TITLE	FUNDAMENTALS OF ELECTRICAL AND ELECTRONICS ENGINEERING
PAPER CODE	7355
SUBJECT CODE	204
THEORY CREDITS	03
PRACTICAL CREDITS	02

Course Objectives: To provide basic knowledge of the different elements and concepts of electrical engineering field and to learn basic concepts of various active and passive electronic components, Signals, Op-Amp and their applications, Digital Electronics and their applications

Course Content:

S. No.	Unit	Topic	Sub – Topic	Hours	Marks
1.	Unit 1	Overview of Electronic Components & Signals	1.Definition, symbol and Applications of Passive, Active Components: Resistances, Capacitors, Inductors, Diodes, Transistors, FET, MOS and CMOS. 2. Definition& waveform ofSignals:DC/AC, voltage/current, periodic/non-periodic signals,average, rms, peak values 3. Definition and Symbols of Ideal/non-ideal voltage&current sources, independent/dependent voltage& current sources.	08	12
2.	Unit 2	Overview of Analog Circuits	1. Introduction to Operational Amplifiers. 2. Block diagram of Op- Amp, 3. Ideal Op-Amp characteristics, Concept of Virtual ground 4. Practical Op-Amp: Inverting and Non-Inverting amplifier configurations 5. Application of Op-Amp as adder&Subtractor (Circuitdiagram only)	08	12

3.	Unit 3	Overview of Digital Electronics	1. Introduction to Boolean Algebra. 2. Laws of Boolean algebra(Commutative law, Associative law, Distributive law, AND law, OR law, Inversion law) 3. Boolean Algebra Theorems (De Morgan's first and second law) 4. Symbol and Truth- table of Basic logic gates (AND, OR, NOT), Universal logic gates (NAND, NOR), Other logic gates (EX-OR, EX-NOR)	05	10
4.	Unit 4	Electric and Magnetic Circuits	1. Introduction to Electric and Magnetic circuits. 2. Definitions and units of Current, EMF, Potential Difference, Power and Energy; 3. Definitions and units of Magnetic Flux,Flux Density(B), M.M.F, Field Intensity(H) magnetic permeability 4. Introduction to hysteresis loop and BH curve; 5. Introduction to Electromagnetic induction: Faraday's laws of electromagnetic induction&Lenz's law 6. Comparison between electric and magnetic circuits.	08	12
5.	Unit 5	A.C. Circuits	1.Introduction to A.C. Circuit 2. Definitions of Important terms of alternating current: Cycle, Frequency, Periodic time, Amplitude, Angular velocity, RMS value, Average value, Form Factor Peak Factor, impedance, phase angle, and power factor; 3. Definitions and unit of Power in A. C. Circuits: Apparent, Reactive& Real, Introduction to power Triangle only.	08	12
6.	Unit 6	Transformer and Machines	1.Introduction to Transformer. 2. Transformer type based on voltage levels (Step up and Step-down Transformer). 3. Working principle of transformers; Emf equation and transformation ratio of transformers; 4. Introduction to Auto transformers; 5.Construction and Working principle ofDC Series motors	08	12

FUNDAMENTAL OF ELECTRICAL & ELECTRONICS ENGINEERING LAB

Course Content: SUGGESTED PRACTICALS/ EXERCISES

The practical in this section are PrOs (i.e., sub-components of the COs) to be developed and assessed in the student for the attainment of the competency

S, No.	Practical Outcomes (PrOs)	Unit No.
1.	Study of Colour Coding of Resistor	1
2	Study the VI characteristic of pn junction diode	1
3	Study the VI characteristic of Zener diode	1
4	Identify p type terminal and n type terminal of pn junction diode using multimeter	1
5	Study of Inverting and Non-Inverting amplifier configurations using IC 741	2
6.	Verify truth Table of Logic Gate: AND, OR, NOT	3
7.	Verify truth Table of Universal Logic Gate	3
8	Verify Boolean Algebra Laws	3
9	Measurement of Current and Voltage using multimeter	4
10.	Study of Sinusoidal Waveform Parameters using CRO: Amplitude, Peak to Peak, Time period, Frequency	5
11	Study of square, sawtooth and triangular waveform on CRO	5

Reference Books:

1. Ritu Sahdev, Basic Electrical Engineering, Khanna Publishing House, 2018
2. Mittle and Mittal, Basic Electrical Engineering, McGraw Education, New Delhi, 2015, ISBN : 978-0-

07-0088572-5
3. Saxena, S. B. Lal, Fundamentals of Electrical Engineering, Cambridge University Press, latest edition ISBN : 9781107464353
4. Theraja, B. L., Electrical Technology Vol – I, S. Chand publications, New Delhi, 2015, ISBN: 9788121924405
5. Theraja, B. L., Electrical Technology Vol – II, S. Chand publications, New Delhi, 2015, ISBN:
9788121924375
6. Jegathesan, V., Basic Electrical and Electronics Engineering, Wiley India, New Delhi, 2015, ISBN :
97881236529513
7. Sedha, R.S., A text book of Applied Electronics, S.Chand ,New Delhi, 2008, ISBN-13: 978-8121927833
8. Malvino, Albert Paul, David, Electronics Principles, McGraw Hill Eduction, New Delhi,2015, ISBN13: 0070634244-978
9. Mehta, V.K., Mehta, Rohit, Principles of Electronics, S. Chand and Company, New Delhi, 2014, ISBN13-9788121924504
10. Bell Devid, Fundamental of Electronic Devices and Circuits, Oxford University Press, New Delhi 2015 ISBN : 9780195425239

DIPLOMAWING
JIVGANDHIPROUDYOGIKIVISHWAVIDYALAYA,BHOPAL

SEMESTER I–GROUP'B'

COURSE TITLE	:	ENGINEERING MECHANICS
PAPER CODE	:	7356
SUBJECT CODE	:	105
TREORY CREDITS	:	03
PRACTICAL CREDITS	:	02

Course Objectives:

Following are the objectives of this course:

1) To obtain resultant of various forces
2) To calculate support reactions through conditions of equilibrium for various structures
3) To understand role of friction in equilibrium problems
4) To know fundamental laws of machines and their applications to various engineering problems.

Course Contents:

Unit–I Basics of mechanics and force system

Significance and relevance of Mechanics, Applied mechanics, Statics, Dynamics. Space, time, mass, particle, flexible body and rigid body.
Scalar and vector quantity, Units of measurement (SIunits) – Fundamental units and derived units.
Force–unit, representation as a vector and by Bow's notation, characteristics and effects of a force, Principle of transmissibility of force, Force system and its classification.
Resolution of a force-Orthogonal components of a force,
Moment of a force, Varignon's Theorem.
Composition of forces – Resultant, analytical method for determination of resultant for concurrent, non-concurrent and parallel co-planar force systems–Law of triangle, parallelogram and polygon of forces.(Numerical problems preferably with figure)

Unit–II Equilibrium

Equilibrium and Equilibrant, Free body and Free body diagram, Analytical and graphical methods of analysing equilibrium
Lami's Theorem–statement and explanation, Application for various engineering problems.
(Numerical problems preferably with figure)

Unit–III Friction

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, relation between co-efficient of friction and angle of friction.

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.(Numerical problems preferably with figure)

Unit–IV Centroid and centre of gravity

Centroid of geometrical plane figures (square, rectangle, triangle, circle, semi-circle, quarter circle)
Centroid of composite figures composed of not more than two geometrical figures
Centre of Gravity of simple solids-Cube, cuboid, cone, cylinder, sphere, hemi sphere (No Derivation required)
(Simple numerical problems with figure)

Unit–V Simple lifting machine

Simple lifting machine, load, effort, mechanical advantage, applications and advantages.Velocity ratio, efficiency of machines, law of machine.
Ideal machine, friction in machine, maximum Mechanical advantage and efficiency, reversible and non-reversible machines, conditions for reversibility.

Suggested Learning Resources:

1. D.S.Bedi, *Engineering Mechanics*, Khanna Publications, NewDelhi(2008)
   Khurmi, R.S., *Applied Mechanics*, S. Chand & Co. New Delhi.
2. Bansal RK, A text book of Engineering Mechanics,Laxmi Publications.
3. Ramamrutham, Engineering Mechanics, S.Chand& Co. NewDelhi.
4. Dhade,Jamadar&Walawelkar,FundamentalofAppliedMechanics,PuneVidhyarthiGruh.
5. Ram,H.D.;Chauhan,A.K.,FoundationsandApplicationsofAppliedMechanics,Cam-bridge University Press.
6. Meriam,J.L.,Kraige,L.G.,EngineeringMechanics-Statics,Vol.I,WileyPublication,New Delhi.

Course outcomes: After completing this course, student will be able to:

1. Identify the force systems forgiven conditions by applying the basics of mechanics.
2. Determine unknown force(s) of different engineering systems.
3. Apply the principles of friction in various conditions for useful purposes.
4. Find the centroid and centre of gravity of various components in engineering systems.
5. Calculate the mechanical advantage, velocity ratio and efficiency of a simple lifting machine.

ENGINEERINGMECHANICSLAB

Course Objectives::

Following are the objectives of this course:

1. To obtain resultant of various forces
2. To understand role of friction in equilibrium problems
3. To know fundamental laws of machines and their applications to various engineering problem.
4. To obtain the centroid of geometrical plane figures.

List of Practical to be performed:

1. To study various equipments related to Engineering Mechanics.
2. Determine resultant of concurrent force system applying Law of Polygon of forces using force table.
3. Determine resultant of concurrent force system graphically.
4. Determine resultant of parallel force system graphically.
5. Verify Lami's theorem.
6. Study forces invarious members of jib crane.
7. Determine coefficient of friction formotion on horizontal and inclined plane.
8. Determine centroid of geometrical plane figures.

Suggested Learning Resources:

1. Bedi D.S.,Engineering Mechanics, Khanna Publishing House
2. Khurmi, R.S., Applied Mechanics,S.Chand&Co.NewDelhi.
3. Bansal RK,A tex t book of Engineering Mechanics,Laxmi Publications.
4. Ramamrutham, Engineering Mechanics,S.S Chand& Co.New Delhi
5. Dhade,Jamadar&Walawelkar,FundamentalofAppliedMechanics,PuneVidhyarthi Gruh.
6. Ram,H.D.;Chauhan,A.K.FoundationsandApplicationsofAppliedMechanics,Cambridge University Press.
7. Meriam,J.L.,Kraige,L.G.,EngineeringMechanics-Statics,Vol.I,WileyPublication,New Delhi.

Course outcomes:

After completing this course, student will be able to

1. Identify the force systems for given conditions by applying the basics of mechanics.
2. Determine unknown force(s) of different engineering systems.
3. Apply the principles of friction in various conditions for useful purposes.
4. Find the centroid and centre of gravity of various components in engineering systems.

DIPLOMAWING
RAJIVGANDHIPROUDYOGIKIVISHWAVIDYALAYA,BHOPAL

SEMESTER I–GROUP'B'

COURSETITLE	:	ENVIRONMENTAL SCIENCE
PAPERCODE	:	--
SUBJECTCODE	:	--
TREORYCREDITS	:	00
PRACTICALCREDITS	:	00

Course Objectives:

Technicians working in industries or elsewhere essentially require the knowledge of environmental science so as to enable them to work and produce most efficient, economical and eco friendly finished products.

- Solve various engineering problems applying ecosystem to produce eco–friendly products.
- Use relevant air and noise control method to solve domestic and industrial problems.
- Use relevant water and soil control method to solve domestic and industrial problems.
- To recognize relevant energy sources required for domestic and industrial applications.
- Solve local solid and e-waste problems.

Course Content:

Prerequisite:-High School Chemistry

Unit-1 Ecosystem

Structure of ecosystem, Biotic & Abiotic components

Food chain and food web

Aquatic (Lentic and Lotic) and terrestrial ecosystem

Carbon, Nitrogen, Sulphur, Phosphorus cycle.

Global warming-Causes, effects process, Green House Effect, Ozone depletion

Unit–2Airand,Noise Pollution

Definition of pollution and pollutant, Natural and manmade sources of air pollution (Refrigerants, I.C., Boiler)

Air Pollutants: Types, Particulate Pollutants: Effects and control (Bag filter, Cyclone separator, Electrostatic Precipitator)

Gaseous Pollution Control: Absorber, Catalytic Converter, Effects of air pollution due to Refrigerants, I.C., Boiler

Noise pollution: sources of pollution, measurement of pollution level, Effects of Noise pollution, Noise pollution (Regulation and Control) Rules, 2000

Unit-3Water and Soil Pollution

Sources of water pollution, Types of water pollutants, Characteristics of water pollutants

Turbidity, pH ,total suspended solids, total solids BOD and COD: Definition, calculation

Waste Water Treatment: Primary methods: sedimentation, froth floatation, Secondary methods: Activated sludge treatment, Trickling filter, Bioreactor, Tertiary Method: Membrane separation technology, RO (reverse osmosis).

Causes, Effects and Preventive measures of Soil Pollution: Causes-Excessive use of Fertilizers, Pesticides and Insecticides, Irrigation, E-Waste.

Unit–4 Renewable sources of Energy

Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air). Theory of flat plate collector. Importance of coating .Advanced collector. Solar pond. Solar water heater ,solar dryer. Solar stills.

Biomass: Overview of biomass as energy source. Thermal characteristics of biomass as fuel. Anaerobic digestion. Biogas production mechanism. Utilization and storage of biogas.

Wind energy: Current status and future prospects of wind energy. Wind energy in India.

Environmental benefits and problem of wind energy.

New Energy Sources: Need of new sources. Different types new energy sources. Applications of (Hydrogen energy, Ocean energy resources, Tidal energy conversion.) Concept, origin and power plants of geothermal energy

Unit-5 Solid Waste Management, ISO14000& Environmental Management 06hours

Solid waste generation-Sources and characteristics of: Municipal solid waste, E-waste, bio-medical waste.

Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries.

Collection and disposal: MSW (3R, principles ,energy recovery, sanitary landfill),Hazardous waste

Air quality act 2004, air pollution control act 1981 and water pollution and control act1996.

Structure and role of Central and state pollution control board.

Concept of Carbon Credit, Carbon Foot print.

Environmental management in fabrication industry.

ISO14000: Implementation in industries, Benefits.

References:

(a) Suggested Learning Resources:

Books:

1. S.C.Sharma&M.P.Poonia,EnvironmentalStudies,KhannaPublishingHouse,NewDelhi
2. C.N.R.Rao, Understanding Chemistry, UniversitiesPress(India)Pvt.Ltd.,2011.
3. Arceivala,SoliAsolekar,Shyam,WasteWaterTreatmentforPollutionControland
4. Reuse,Mc-GrawHillEducationIndiaPvt.Ltd.,NewYork,2007,ISBN:978-07-062099-
5. Nazaroff, William, Cohen, Lisa, Environmental Engineering Science, Willy, New York, 2000, ISBN 10: 0471144940.
6. O.P.Gupta,ElementsofEnvironmentalPollutionControl,KhannaPublishingHouse,NewDelhi
7. Rao,C.S., Environmental Pollution Control and Engineering, New Age International Publication, 2007, ISBN: 81-224-1835-X.
8. Rao, M. N.Rao, H.V.N, Air Pollution, Tata Mc-Graw Hill Publication, New delhi, 1988, ISBN: 0-07-451871-8.
9. Frank Kreith, Jan F Kreider, Principles of Solar Engineering, McGraw-Hill, New York ; 1978, ISBN:9780070354760.

10. Aldo Vieira, DaRosa, Fundamentals of renewableenergy processes, Academic Press Oxford, UK; 2013. ISBN: 9780123978257.
11. Patvardhan, A.D,Industrial SolidWaste,TeriPress,NewDelhi,2013,ISBN:978-81-7993-502-6
12. Metcalf&Eddy, Waste Water Engineering,Mc-GrawHill,NewYork,2013,ISBN:077441206.
13. KeshavKant,AirPollution&Control,KhannaPublishingHouse,NewDelhi(Edition2018)

(b) Open source software and website address:

1) www.eco-prayer.org
2) www.teriin.org
3) www.cpcp.nic.in
4) www.cpcp.gov.in
5) www.indiaenvironmentportal.org.in
6) www.whatis.techtarget.com
7) www.sustainabledevelopment.un.org
8) www.conserve-energy-future.com)

Teachers should use the following strategies to achieve the various outcomes of the course.

- Different methods of teaching and media to be used to attain classroom attention.
- Massive open online courses (MOOCs) may be used to teach various topics/subtopics.
- 15-20% of the topics which are relatively simpler of descriptive in nature should be given to the students for self-learning and assess the development of competency through classroom presentations.
- Micro-projects may be given to group of students for hand-on experiences
- Encouraging students to visit to sites such as Railway station and research establishment around the institution.

Course outcomes

At the end of the course student will be able to

1. Understand the ecosystem and terminology and solve various engineering problems applying ecosystem knowledge to produce eco – friendly products.
2. Understand the suitable air, extent of noise pollution, and control measures and acts.
3. Understand the water and soil pollution, and control measures and acts.
4. Understand different renewable energy resources and efficient process of harvesting.
5. Understand solid Waste Management , ISO14000& Environmental Management.

DIPLOMAWING
RAJIVGANDHIPROUDYOGIKIVISHWAVIDYALAYA,BHOPAL

SEMESTER I–GROUP'B'

COURSE TITLE	:	SPORTS AND YOGA
PAPER CODE	:	--
SUBJECT CODE	:	--
TREORY CREDITS	:	00
PRACTICAL CREDITS	:	01

CourseObjectives:

- Tomakethestudentsunderstandtheimportanceofsoundhealthandfitnessprinciples as they relate to better health.
- Toexposethestudentstoavarietyofphysicalandyogicactivitiesaimedatstimulating their continued inquiry about Yoga, physical education, health and fitness.
- To create a safe, progressive, methodical and efficient activity based plan to enhance improvement and minimize risk of injury.
- Todevelopamongstudentsanappreciationofphysicalactivityasalifetimepursuitand a means to better health.

CourseContent:

- **Introduction to Physical Education**
  - Meaning & definition of Physical Education
  - Aims & Objectives of Physical Education
  - Changing trends in Physical Education
- **Olympic Movement**
  - Ancient &Modern Olympics (Summer& Winter)
  - Olympic Symbols, Ideals, Objectives& Values
  - AwardsandHonoursinthefieldofSportsinIndia(DronacharyaAward,ArjunaAward, Dhayanchand Award, Rajiv Gandhi KhelRatna Award etc.)
- **Physical Fitness, Wellness & Lifestyle**
  - Meaning & Importance of Physical Fitness & Wellness
  - Components of Physical fitness
  - Components of Health related fitness
  - Components of wellness
  - Preventing Health Threats through Lifestyle Change
  - Concept of Positive Lifestyle

- **Fundamentals of Anatomy & Physiology in Physical Education,Sports and Yoga**
    - Define Anatomy, Physiology & Its Importance
    - Effect of exercise on the functioning of Various Body Systems. (Circulatory System, Respiratory System, Neuro-Muscular System etc.)

- **Kinesiology, Biomechanics & Sports**
    - Meaning&ImportanceofKinesiology&BiomechanicsinPhysicalEdu.&Sports
    - Newton's Law of Motion & its application in sports.
    - Friction and its effects in Sports.
- **Postures**
    - Meaning and Concept of Postures.
    - Causes of Bad Posture.
    - Advantages & disadvantages of weight training.
    - Concept & advantages of Correct Posture.
    - CommonPosturalDeformities–KnockKnee;FlatFoot;RoundShoulders;Lordosis,Kyphosis, Bow Legs and Scoliosis.
    - Corrective Measures for Postural Deformities

- **Yoga**
    - Meaning & Importance of Yoga
    - Elements of Yoga
    - Introduction-Asanas, Pranayama, Meditation& Yogic Kriyas
    - Yogaforconcentration&relatedAsanas(Sukhasana;Tadasana;Padmasana&Shashankasana)
    - Relaxation Techniques for improving concentration- Yognidra
- **Yoga &Lifestyle**
    - Asanasas preventive measures.
    - Hypertension: Tadasana, Vajrasana, Pavan Muktasana, Ardha Chakrasana, Bhujangasana, Sharasana.
    - Obesity: Procedure, Benefits & contraindications for Vajrasana, Hastasana, Trikonasana, ArdhMatsyendrasana.
    - BackPain:Tadasana, ArdhMatsyendrasana,Vakrasana,Shalabhasana,Bhujangasana.
    - Diabetes: Procedure, Benefits&contraindicationsforBhujangasana,Paschimottasana, Pavan Muktasana, Ardh Matsyendrasana.
    - Asthema: Procedure, Benefits&contraindicationsforSukhasana,Chakrasana, Gomukhasana, Parvatasana,Bhujangasana,Paschimottasana,Matsyasana.

- **Training and Planning in Sports**
  - Meaning of Training
  - Warming up and limbering down
  - Skill, Technique & Style
  - Meaning and Objectives of Planning.
  - Tournament–Knock-Out, League/Round Robin & Combination.
- **Psychology & Sports**
  - Definition & Importance of Psychology in Physical Edu .& Sports
  - Define & Differentiate Between Growth & Development
  - Adolescent Problems & Their Management
  - Emotion: Concept, Type & Controlling of emotions
  - Meaning, Concept & Types of Aggressions in Sports.
  - Psychological benefits of exercise.
  - Anxiety & Fear and its effects on Sports Performance.
  - Motivation, its type & techniques.
  - Understanding Stress & Coping Strategies.
  - Doping
    - Meaning and Concept of Doping
    - Prohibited Substances & Methods
    - Side Effects of Prohibited Substances
  - **Sports Medicine**
    - First Aid–Definition, Aims & Objectives.
    - Sports injuries: Classification, Causes& Prevention.
    - Management of Injuries: Soft Tissue Injuries and Bone & Joint Injuries
  - **Sports/Games**

    Following sub topics related to any one Game/Sport of choice of student out of: Athletics, Badminton, Basketball, Chess, Cricket, Kabaddi, LawnTennis, Swimming, TableTennis, Volleyball, Yoga etc.
    - History of the Game/Sport.
    - Latest General Rules of the Game/Sport.
    - Specifications of Play Fields and Related Sports Equipment.
    - Important Tournaments and Venues.
    - Sports Personalities.
    - Proper Sports Gear and its Importance.

References:

1. Modern Trends and Physical Education by Prof. AjmerSingh.
2. Light On Yoga By B.K.S. Iyengar.
3. Health and Physical Education–NCERT(11thand12thClasses)

Course Outcomes:

On successful completion of the course the students will be able to:

(i) Practice Physical activities and Hatha Yoga focusing on yoga for strength, flexibility, and relaxation.

(ii) Learn techniques for increasing concentration and decreasing anxiety which leads to stronger academic performance.

(iii) Learn breathing exercises and healthy fitness activities

(iv) Understand basic skills associated with yoga and physical activities including strength and flexibility, balance and coordination.

(v) Perform yoga movements in various combination and forms.

(vi) Assess current personal fitness levels.

(vii) Identify opportunities for participation in yoga and sports activities.

(viii) Develop understanding of health-related fitness components: cardio respiratory endurance, flexibility and body composition etc.

(ix) Improvepersonalfitnessthroughparticipationinsportsandyogicactivities.

(x) Developunderstandingofpsychologicalproblemsassociatedwiththeageandlifestyle.

(xi) Demonstrate an understanding of sound nutritional practices as related tohealth and physicalperformance.

(xii) Assessyogaactivitiesintermsoffitnessvalue.

(xiii) Identifyandapplyinjurypreventionprinciplesrelatedtoyogaandphysicalfitnessactivities.

(xiv) Understandandcorrectlyapplybiomechanicalandphysiologicalprincipleselatedtoexercise and training

INDUCTION PROGRAM

Please refer Appendix IV for guide lines.

The Essence and Details of Induction program can also be understood from the‘ Detailed Guide on Student Induction program’, as available on AICTE Portal ,although that is for UGstudents of Engineering & Technology
(Link:https://www.aicteindia.org/sites/default/files/Detailed%20Guide%20on%20Student%20Induction%20program.pdf).

Induction program(mandatory)	**Two-week duration**
Induction program for students to be offered right at the start of the first year.	• Physical activity • Creative Arts • Universal Human Values • Literary • Proficiency Modules • Lectures by Eminent People • Visits to local Areas • Familiarization to Dept./Branch& Innovations



Appendix - IV

Student Induction Program

STUDENTINDUCTIONPROGRAM

The students will have to undergo a mandatory induction program as part of their Diploma Programme Curriculum right at the start of the first year. The duration of the induction program will beoftwoweekswhereinstudentswillundergoawidevarietyofactivitieswithoutactuallystarting withtheirusualclasses. Normalclasseswillstart only afterthe inductionprogram isover.

Thiswillhelpbuildconfidenceamongthenewstudents,instila senseofconnectandappreciation towards their institution, provide them with the comfortable environment to adjust and pick up friendship with other students, facilitate them to get to know important functionaries and faculty membersof the institution, equip them with human and social values.

TheInductionProgramwillhelpthenewstudentsinbuildingsocialcharacter,leadershipqualities, self-confidence,creativityandappreciationformankindandnatureatlarge.Innutshell,theinduction program isenvisagedto give thenew studentsthebroaderfoundationalexperienceforthe lifelongsuccess.

Thenewstudents,intheprocess,willgettolearnaboutvariousprocessesandproceduresinplace intheinstitution,facilitiesandbestpractices,studentactivities,andtheculture&valuesprevailing in the institution. The Program is also expected to be used for rectifying some critical lacunas, for example, Communication Skills in English for those students who have deficiency in it. Such students canbeidentifiedbyconductingdiagnostictestsandspecialProficiencyModulescanbeconducted forthem.

Thementor-menteegroupsofthestudentsareformedwitheachgroupcomprisingsmallnumber of students and being associated with a faculty mentor. Then the different activities start with a healthy dailyroutine.

Thesuggestivelistofactivitiesisasmentionedbelow:

- PhysicalActivity
- CreativeArtsandCulture
- Mentoring&UniversalHumanValues
- Familiarizationwiththeinstitution,Dept./Branch
- LiteraryActivity
- ProficiencyModules
- Lectures&WorkshopsbyEminentPeople
- VisitsinLocalArea
- Extra-CurricularActivitiesintheinstitution
- FeedbackandReportontheProgram

InductionProgramSchedule(Suggestiveonly)

Note: Itispresumedthatthefirstyearstudentsaresodividedintotwomajorgroupsthatthenumberofstudentsineachgroupisalmostequalwithsomebranchesformingpartof Group-Iwhilethe rest of the branches being part of Group-II.

Time	**Activity**	**Students' Group**	**Venue**
Wholeday	Studentsarrive-Hostelallotment	I&II	
DAY1			
9.30am–10.45am	Mentor-mentee groups - Introduction with-in group.	I	Suitable Venue asper number of mentor-men-teegroups
	Screening of Institute Documentary Movie; videoclipsofvariousfunctionsandevents	II	Conference/SeminarHall
11.00am–12.15pm	Mentor-mentee groups - Introduction with-in group.	II	Suitable Venue asper number of mentor-men-teegroups
	Screening of Institute Documentary Movie; videoclipsofvariousfunctionsandevents	I	Conference/SeminarHall
12.30pm–2.30pm	Lunch	I&II	RespectiveHostels
3.30pm–5.30pm	InstituteExcursion	I&II	AroundtheCampus
5.30pm–9.30pm	RestandDinner	I&II	RespectiveHostels
DAY2			
6:00am	Wakeupcall	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am–12.30pm	PresentationcumInteractiveSessionwith: Important Institution Functionaries like Principal, HoDs etc.	I	Conference/SeminarHall
	VisittoRespectiveDepartments	II	RespectiveDepartments
12.30pm–2.30pm	Lunch	I&II	RespectiveHostels
2.30pm–5.30pm	PresentationcumInteractiveSessionwith: Important Institution Functionaries like Principal, HoDs etc.	II	Conference/SeminarHall
	VisittoRespectiveDepartments	I	RespectiveDepartments
DAY3			
6:00am	Wakeupcall	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am–10.30am	Diagnostictest(forEnglish)	I&II	Suitablevenueasper strength of students

10.30am–11.00am	Break	I&II	
11.00am–12.30pm	UniversalHumanValues	I(Section wise-)	Suitablevenueasper number of sections
	Creative Arts / Technical Workshops / ProficiencyModules	II(Section wise)	Suitablevenueasper number of sections
12.30pm–2.30pm	Lunch	I&II	RespectiveHostels
2.30pm –4.00pm	UniversalHumanValues	II(Section wise-)	Suitablevenueasper number of sections
	Creative Arts / Technical Workshops / ProficiencyModules	I(Section wise)	Suitablevenueasper number of sections
4.00pm –4.30pm	Break	I&II	
4.30pm –6.30pm	Lecture Sessions or Films on Universal Human Values / Cultural / Talent hunt Activities / Performances by Classical or folk artists	II	Conference/SeminarHall
	Sports&Games	I	SportsGround
2.30pm –6.30pm	Localvisits	02/03 sections (byrotation)	Historical places in and around the area
6.30pm –9.30pm	RestandDinner	I&II	RespectiveHostels
DAY4			
6:00am	Wakeup call	I&II	RespectiveHostels
6:30am-7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am-9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am–10.30am	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
10.30am–11.00am	Break	I&II	
11.00am–12.00pm	Creative Arts / Technical Workshops / ProficiencyModules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
12.30pm–2.30pm	LunchBreak	I&II	RespectiveHostels
2.30pm –3.30pm	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall

3.30pm–4.30pm	Creative Arts / Technical Workshops / ProficiencyModules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
4.30pm–5.00pm	Break	I&II	
5.00pm–7.00pm	Lecture Sessions or Films on Universal Human Values / Cultural / Talent hunt Activities / Performances by Classical or folk artists	II	Conference/SeminarHall
	Sports&Games	I	SportsGround
2.30pm–7.00pm	Localvisits	02/03 sections (byrotation)	Historicalplacesinand around the area
7.00pm–9.30pm	RestandDinner	I&II	RespectiveHostels
DAY5			
6:00am	Wakeupcall	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am–10.30am	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
10.30am–11.00am	Break	I&II	
11.00am–12.00pm	Creative Arts / Technical Workshops / ProficiencyModules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
12.30pm–2.30pm	LunchBreak	I&II	RespectiveHostels
2.30pm–3.30pm	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
3.30pm–4.30pm	Creative Arts / Technical Workshops / ProficiencyModules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
4.30pm–5.00pm	Break	I&II	

5.00pm – 7.00pm	Lecture Sessions or Films on Universal HumanValues/Cultural/TalenthuntActivities/PerformancesbyClassicalorfolk artists (coordinated by Students' Clubs and TechnicalSocieties)	I	Conference/SeminarHall
	Sports&Games	II	SportsGround
2.30pm – 7.00pm	Localvisits	02/03 sections (byrotation)	Historical places in and around the area
7.00pm – 9.30pm	RestandDinner	I&II	RespectiveHostels
DAY6			
6:00am	Wakeup call	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am– 10.30am	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
10.30am– 11.00am	Break	I&II	
11.00am– 12.00pm	Creative Arts / Technical Workshops / ProficiencyModules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
12.30pm– 2.30pm	LunchBreak	I&II	RespectiveHostels
2.30pm – 3.30pm	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
3.30pm – 4.30pm	Creative Arts / Technical Workshops / ProficiencyModules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
4.30pm – 5.00pm	Break	I&II	
5.00pm – 7.00pm	Lecture Sessions or Films on Universal HumanValues/Cultural/TalenthuntActivities/PerformancesbyClassicalorfolk artists (coordinated by Students' Clubs and TechnicalSocieties)	II	Conference/SeminarHall
	Sports&Games	I	SportsGround

2.30pm–7.00pm	Localvisits	02/03 sections (byrota-tion)	Historicalplacesinand around the area
7.00pm–9.30pm	RestandDinner	I&II	RespectiveHostels
DAY7			
6:00am	Wakeupcall	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am–10.30am	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
10.30am–11.00am	Break	I&II	
11.00am–12.00pm	Creative Arts / Technical Workshops / Profi-ciencyModules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
12.30pm–2.30pm	LunchBreak	I&II	RespectiveHostels
2.30pm–3.30pm	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
3.30pm–4.30pm	Creative Arts / Technical Workshops / Profi-ciencyModules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
4.30pm–5.00pm	Break	I&II	
5.00pm–7.00pm	Lecture Sessions or Films on Universal HumanValues/Cultural/TalenthuntAc-tivities/PerformancesbyClassicalorfolk artists (coordinated by Students' Clubs and TechnicalSocieties)	I	Conference/SeminarHall
	Sports&Games	II	SportsGround
2.30pm–7.00pm	Localvisits	02/03 sections (byrota-tion)	Historicalplacesinand around the area
7.00pm–9.30pm	RestandDinner	I&II	RespectiveHostels
DAY8			
6:00am	Wakeupcall	I&II	RespectiveHostels

6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am– 10.30am	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
10.30am– 11.00am	Break	I&II	
11.00am– 12.00pm	Creative Arts / Technical Workshops / Proficiency Modules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
12.30pm– 2.30pm	LunchBreak	I&II	RespectiveHostels
2.30pm – 3.30pm	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
3.30pm – 4.30pm	Creative Arts / Technical Workshops / Proficiency Modules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
4.30pm – 5.00pm	Break	I&II	
5.00pm – 7.00pm	Lecture Sessions or Films on Universal HumanValues/Cultural/TalenthuntActivities/PerformancesbyClassicalorfolk artists (coordinated by Students' Clubs and TechnicalSocieties)	II	Conference/SeminarHall
	Sports&Games	I	SportsGround
2.30pm – 7.00pm	Localvisits	02/03 sections (byrotation)	Historical places in and around the area
7.00pm – 9.30pm	RestandDinner	I&II	RespectiveHostels
DAY9			
6:00am	Wakeup call	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels

9.30am–10.30am	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
10.30am–11.00am	Break	I&II	
11.00am–12.00pm	Creative Arts / Technical Workshops / ProficiencyModules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
12.30pm–2.30pm	LunchBreak	I&II	RespectiveHostels
2.30pm–3.30pm	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
3.30pm–4.30pm	Creative Arts / Technical Workshops / ProficiencyModules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
4.30pm–5.00pm	Break	I&II	
5.00pm–7.00pm	Lecture Sessions or Films on Universal HumanValues/Cultural/TalenthuntActivities/PerformancesbyClassicalorfolk artists (coordinated by Students' Clubs and TechnicalSocieties)	I	Conference/SeminarHall
	Sports&Games	II	SportsGround
2.30pm–7.00pm	Localvisits	02/03 sections (byrotation)	Historicalplacesinand around the area
7.00pm–9.30pm	RestandDinner	I&II	RespectiveHostels
DAY10			
6:00am	Wakeupcall	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am–10.30am	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
10.30am–11.00am	Break	I&II	

11.00am–12.00pm	Creative Arts / Technical Workshops / ProficiencyModules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
12.30pm–2.30pm	LunchBreak	I&II	RespectiveHostels
2.30pm – 3.30pm	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
3.30pm – 4.30pm	Creative Arts / Technical Workshops / ProficiencyModules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
4.30pm – 5.00pm	Break	I&II	
5.00pm – 7.00pm	Lecture Sessions or Films on Universal HumanValues/Cultural/TalenthuntActivities/PerformancesbyClassicalorfolk artists (coordinated by Students' Clubs and TechnicalSocieties)	II	Conference/SeminarHall
	Sports&Games	I	SportsGround
2.30pm – 7.00pm	Localvisits	02/03 sections (byrotation)	Historical places in and around the area
7.00pm – 9.30pm	RestandDinner	I&II	RespectiveHostels
DAY11			
6:00am	Wakeup call	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am–10.30am	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
10.30am–11.00am	Break	I&II	
11.00am–12.00pm	Creative Arts / Technical Workshops / ProficiencyModules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
12.30pm–2.30pm	LunchBreak	I&II	RespectiveHostels

2.30pm–3.30pm	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
3.30pm–4.30pm	Creative Arts / Technical Workshops / ProficiencyModules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
4.30pm–5.00pm	Break	I&II	
5.00pm–7.00pm	Lecture Sessions or Films on Universal HumanValues/Cultural/TalenthuntActivities/PerformancesbyClassicalorfolk artists (coordinated by Students' Clubs and TechnicalSocieties)	I	Conference/SeminarHall
	Sports&Games	II	SportsGround
2.30pm–7.00pm	Localvisits	02/03 sections (byrotation)	Historicalplacesinand around the area
7.00pm–9.30pm	RestandDinner	I&II	RespectiveHostels
DAY12			
6:00am	Wakeupcall	I&II	RespectiveHostels
6:30am -7:20am	Physicalactivity(mildexercise/yoga)	I&II	SportsGround
7.30am -9.20am	Bath,Breakfastetc.	I&II	RespectiveHostels
9.30am–10.30am	UniversalHumanValues	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
10.30am–11.00am	Break	I&II	
11.00am–12.00pm	Creative Arts / Technical Workshops / ProficiencyModules	I(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	II	Conference/SeminarHall
12.30pm–2.30pm	LunchBreak	I&II	RespectiveHostels
2.30pm–3.30pm	UniversalHumanValues	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall
3.30pm–4.30pm	Creative Arts / Technical Workshops / ProficiencyModules	II(Section wise)	Suitablevenueasper number of sections
	Presentation cum Interactive Session with Eminent Alumni/Eminent Speaker	I	Conference/SeminarHall

4.30pm – 5.00pm	Break	I&II	
6.00pm – 8.00pm	TalentShowandValedictoryFunction Principal'sAddress	I&II	Suitablevenue(indoor/ outdoor)
8.00pm – 9.30pm	RestandDinner	I&II	RespectiveHostels

Note:

1. Total duration of the Induction Program is two weeks i.e. 12 working days with Saturdays being working and Sundays off.
2. Sundays can be utilized for screening some Patriotic / Socially Significant Movies inthe Jubilee Hall.
3. Facultymentorswouldberequiredtoobtainthefeedbackcumsuggestionsofthe students of their respective groups about the Induction programme on the last day.
4. Coordinatorscanbeassignedforvariousactivitiesduringtheinductionprogramme. Thesuggestivetemplateisasunder:
5.

S.No.	**Nameoftheactivity**	**Coordinators**
1.	Visitstodifferentdepartmentsandaroundthecampus	HoDs
2.	Physical/Sports activities in the Sports Ground (Morning as well as Evening)	InchargeofPhysicalEducation/ Sports
3.	• CreativeArts/TechnicalWorkshops. • Lecture Sessions or Films on Universal Human Values / Cultural / Talent hunt Activities / Performances by Classical or folk artists. • TalentShowandValedictoryFunction.	InchargeofTechnical/Cultural activities
4.	Presentation cum Interactive Session with Eminent Alumni/EminentSpeaker	Training&PlacementIncharge
5.	UniversalHumanValues	SuitableFacultymembers
6.	ProficiencyModule(English)	FacultyofEnglishlanguage
7.	LocalVisits	Hostel Wardens / Discipline in charge
8.	• Wakeupcall/Hostelrelatedactivities • ArrangementsatValedictoryFunction	ChiefWardens(Boys/Girls)

Scheduleoflocalvisits

Dates	Sections
…	…
…	…
…	…

Note:

1. Thefacultymentors oftherespectivementor-menteegroups/sectionswill accompanythe students on local visits.

2. The Institute buses,ifthere, maybemadeavailableforthepurposeeach dayorsome other arrangements may be made.

3. Attendanceofthestudentsbetakenatthetimeofdepartureandreturn.

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