OSDAV Public School, Kaithal
May Test 2025-26
Class : XI
Subject : Physics

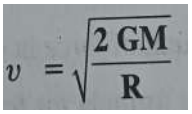
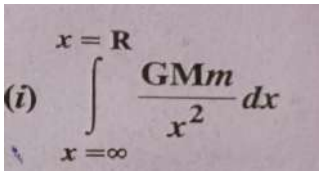
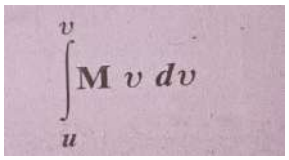
SET -A

Time: 1 hr 30 min. **M.M. : 35**

General Instructions:-

I. **There are 17 questions in all. All questions are compulsory.**
II. **This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.**
III. **Section A contains seven MCQ of one mark each, Section B contains five questions of two marks each, Section C contains 3 questions of three marks each, section D contains one question of 4 marks and section E contains one long questions of five marks .**

Q.No.	Questions	Marks
	SECTION - A	
1	The value of sin 240° is a) -3/2 b) -1/2 c) $1/\sqrt{2}$ d) $-\sqrt{3}/2$	**1**
2	What will be the dimensional formula for Power a) $[ML^2T^{-2}]$ b) $[MLT^{-2}]$ c) $[ML^2T^{-3}]$ d) none of these	**1**
3	The number of significant figures in 0.006320 is a) 7 b) 6 c) 4 d) 3	**1**
4	E, m, I and G denote energy, mass, angular momentum and gravitational constant respectively, $EI^2/(m^5G^4)$ has the dimensions of: (a) angle (b) length (c) mass (d) time	**1**
5	What will be the value of $\log_a 1$? a) a b) 1 c) zero d) none of these	**1**
6	Assertion: Relative density of substance is a dimensionless quantity. Reason: Relative density of substance is the ratio of density of substance to the density of water. (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true but R is not the correct explanation of A (c) A is true but R is false (d) A is false and R is also false	**1**
7	Assertion: Dimensional formula for linear momentum is same as that of angular momentum. Reason: Impulse = Change in momentum. (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true but R is not the correct explanation of A (c) A is true but R is false (d) A is false and R is also false	**1**
	SECTION - B	
8	Solve the equation for x: $4x^2 - 4ax + (a^2 - b^2) = 0$	**2**
9	Expand the following using logarithms : a) $PV^{\gamma} = K$ b) $T = 2\pi\sqrt{\frac{I}{g}}$	**2**
10	i) Expand these Trigonometric formulaes a) Sin(A-B)	**2**

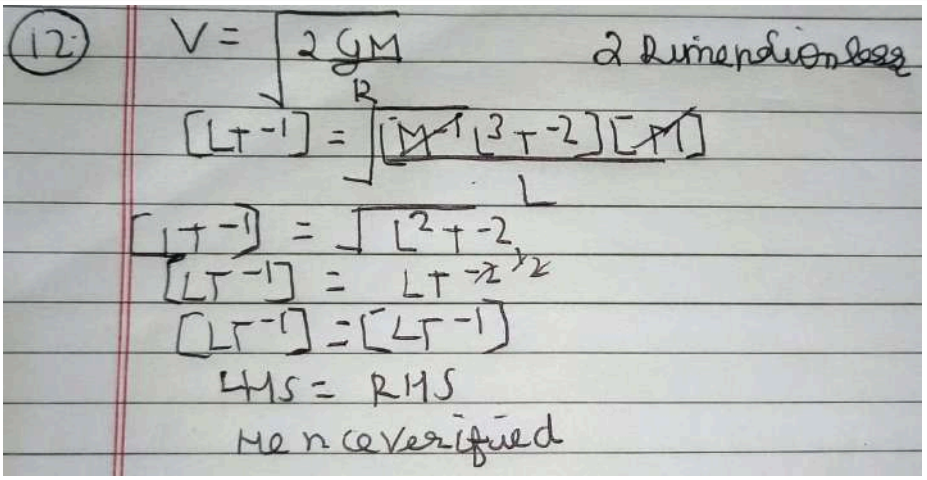
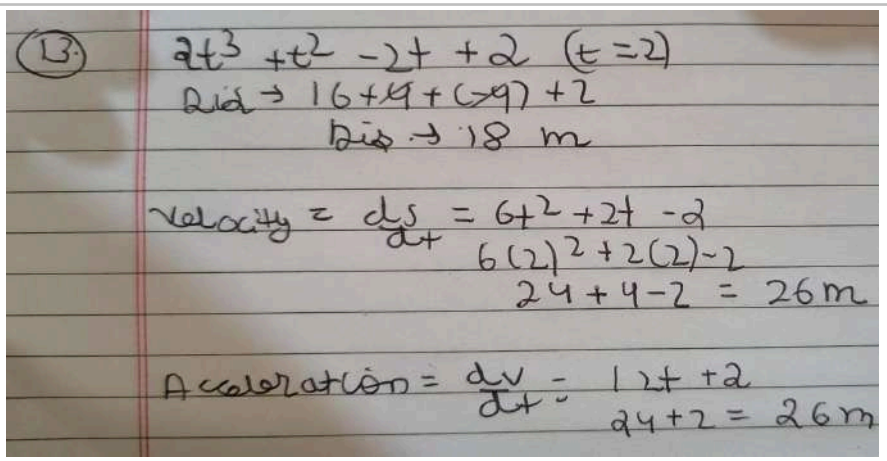
	b) Sin 2x	
11	Find $\frac{dy}{dx}$ when $y = x^2 \log_e x$	**2**
12	Check the correctness of the relation  where, v is the velocity, G is gravitational constant, M is mass and R is radius of earth.	**2**
	SECTION - C	
13	If the motion of the particle is represented by $S = 2t^3 + t^2 - 2t + 2$. Find the position, velocity and acceleration of the particle after 2 seconds.	**3**
14	Find the value of 10 joule in a system when mass is 1 kg, length is 10 cm and time 5 min.	**3**
15	Find the units of length, mass and time, if the units of force, velocity and energy respectively are 100 dyne, 10cm/s and 500 erg.	**3**
	Section – D	
16	a) Integrate the following functions with respect to x (i)  ii)  b) Define one Ampere.	**2** **1** **1**
	Section - E	
17	a) Given that the time period T of oscillation of a gas bubble from an explosion under water depends on P, d and E where P is the pressure, d is the density of water and E is the total energy of the explosion. Find dimensionally a relation for T. b) The value of acceleration due to gravity (g) at a height h above the surface of earth is given by $g^{l} = gR^2 / (R+h)^2$. If h<<R , then prove that $g^{l} = g\left(1 - \frac{2h}{R}\right)$.	**3** **2**

Marking Scheme

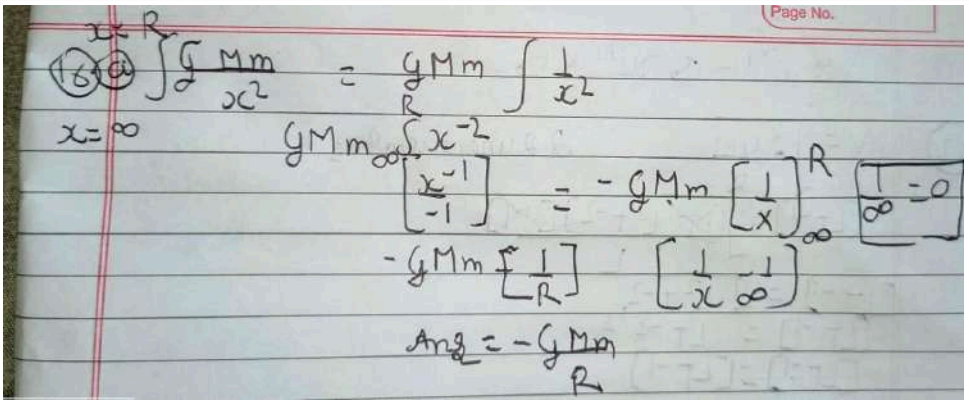
Physics-XI

Set-A

1.	D	1
2.	C	1
3.	C	1
4.	None of these	1
5.	C	1
6.	A	1
7.	D	1
8.	$D=B^2-4AC$ $=16A^2-16A^2+16B^2$ $=16B^2$ $X=(A+B)/2$ & $(A-B)/2$	 1 1
9.	A.)Loge P + Loge $V^{\gamma p}$= Loge K Loge p + γLoge v= Loge k B.)LogeT =Loge 2+ Loge π +1/2(Loge L –Loge a)	0.5 0.5 1
10.	A.)SinA CosB-CosA SinB B.)2SinxCosx	1 1
11.	dy/dx=x+Logex(2x)	2

12.		1 1
13.		1 1 1
14.	N2=N1[(m1/m2)(t1/t2)(l1/l2)] N2=10[(1kg/1kg)(1m/10cm)(1sec/300sec)] N2=10*10*10*300*300 $N2=9*10^7$	1 1 1
15.	Length=500/100=5cm Time=5/10=0.5sec Mass=500/100=5g	1 1 1

16.



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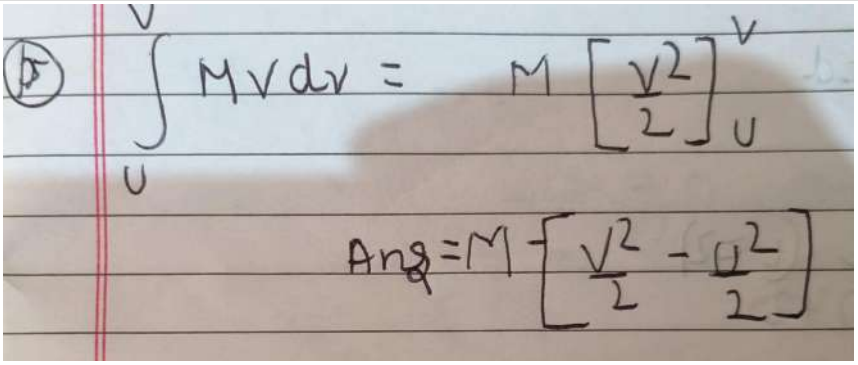
b.)



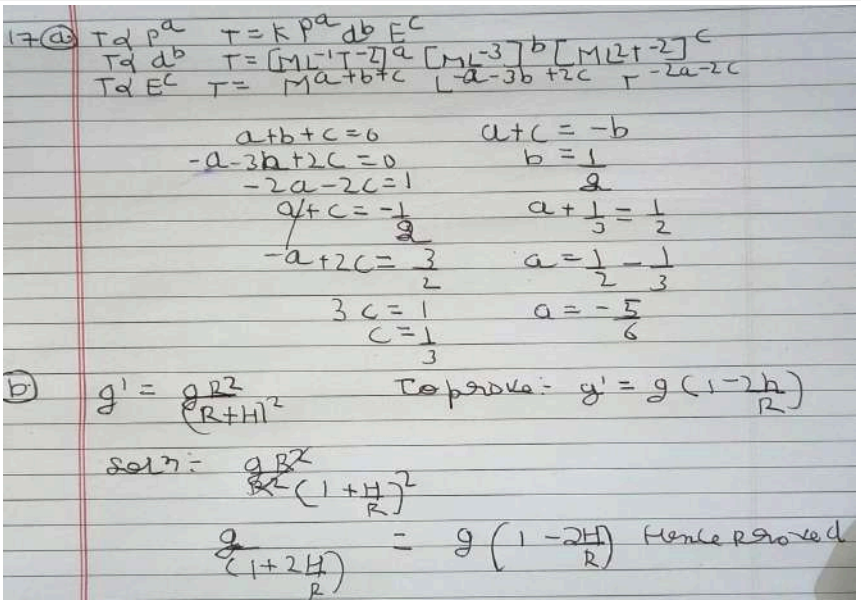
1

1

One Ampere is said to when current flowing through two parallel straight wires of infinite length placed one meter apart in vaccum produces force $2*10^{-7}$N then it is said to 1ampere.

1

17.


17(a) Td ρ^a $T = k\rho^a d^b E^c$
Td d^b $T = [ML^{-1}T^{-2}]^a [ML^{-3}]^b [ML^2T^{-2}]^c$
Td E^c $T = M^{a+b+c} L^{-a-3b+2c} T^{-2a-2c}$
$a+b+c=0$ $a+c=-b$
$-a-3b+2c=0$ $b=\frac{1}{2}$
$-2a-2c=1$ $a+\frac{1}{3}=\frac{1}{2}$
$a+c=-\frac{1}{2}$ $a=\frac{1}{2}-\frac{1}{3}$
$-a+2c=\frac{3}{2}$ $a=-\frac{5}{6}$
$3c=1$
$c=\frac{1}{3}$
(b) $g' = \frac{gR^2}{(R+H)^2}$ To prove: $g' = g(1-\frac{2h}{R})$
Soln: $\frac{gR^2}{R^2(1+\frac{H}{R})^2}$
$\frac{g}{(1+\frac{2H}{R})} = g(1-\frac{2H}{R})$ Hence proved

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OSDAV Public School, Kaithal
May Test 2025-26
Class : XI
Subject : Physics **SET - B**

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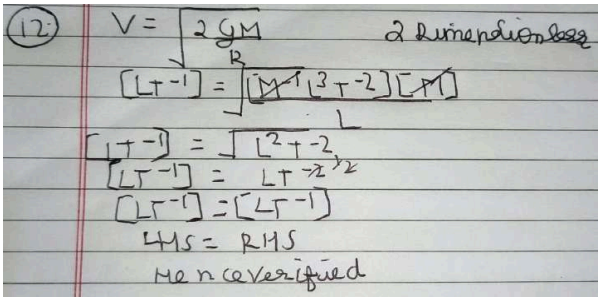
II. **This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.**
III. **Section A contains seven MCQ of one mark each, Section B contains five questions of two marks each, Section C contains 3 questions of three marks each, section D contains one question of 4 marks and section E contains one long questions of five marks .**

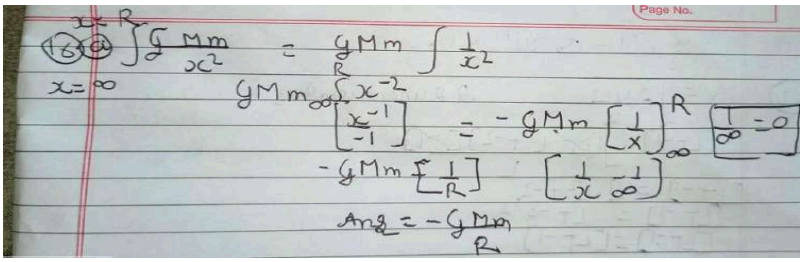
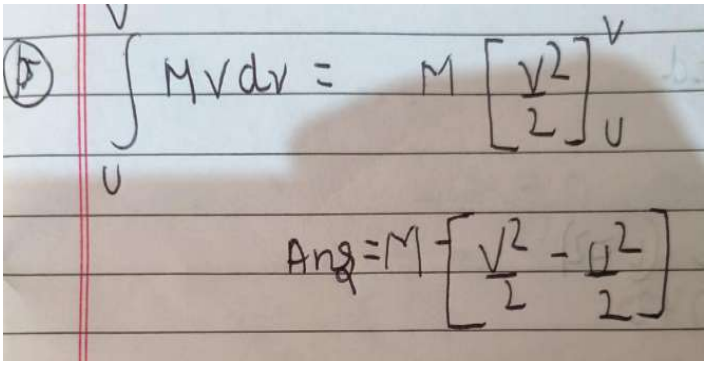
Q.No.	Questions	Marks
	SECTION - A	
1	The value of sin 300° is a) -3/2 b) -1/2 c) $1/\sqrt{2}$ d) $-\sqrt{3}/2$	**1**
2	What will be the dimensional formula for surface tension a) $[ML^0T^{-1}]$ b) $[ML^0T^{-2}]$ c) $[ML^0T^{-3}]$ d) none of these	**1**
3	The number of significant figures in 0.063200 is a) 7 b) 5 c) 4 d) 3	**1**
4	E, m, I and G denote energy, mass, angular momentum and gravitational constant respectively, $EI^2/(m^5G^4)$ has the dimensions of: (a) angle (b) length (c) mass (d) time	**1**
5	What will be the value of $\log_a a$? a) a b) 1 c) zero d) none of these	**1**
6	Assertion: Dimensional formula for linear momentum is same as that of angular momentum. Reason: Impulse = Change in momentum. (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true but R is not the correct explanation of A (c) A is true but R is false (d) A is false and R is also false	**1**
7	Assertion: The dimensional analysis fails to derive the relation involving more than three independent factors. Reason: Dimensional analysis is not able to determine dimensionless constants. (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true but R is not the correct explanation of A (c) A is true but R is false (d) A is false and R is also false	**1**
	SECTION - B	
8	Show using Differentiation that power is the product of force and velocity.	**2**
9	Expand the following using logarithms : a) $TV^{\gamma-1} = K$ b) $T= 2\pi\sqrt{\frac{I}{g}}$	**2**
10	i) Expand these Trigonometric formulaes a) Cos (A - B) b) Sin (A + B)	**2**

11	Find $\frac{dy}{dx}$ when $y = x^2 \cos x$	**2**
12	Check the correctness of the relation $v = \sqrt{\frac{2GM}{R}}$ where, v is the velocity, G is gravitational constant, M is mass and R is radius of earth.	**2**
	SECTION - C	
13	If the motion of the particle is represented by $S = 3t^3 - t^2 + 3t - 2$. Find the position, velocity and acceleration of the particle after 3 seconds.	**3**
14	Find the value of 20 joule in a system when mass is 1 kg, length is 100 cm and time 5 min.	**3**
15	Find the units of length, mass and time, if the units of force, velocity and energy respectively are 100 dyne, 10cm/s and 500 erg.	**3**
	Section – D	
16	a) Integrate the following functions with respect to x (i) $\int_{x=\infty}^{x=R} \frac{GMm}{x^2} dx$	**2**
	ii) $\int_{u}^{v} M v \, dv$	**1**
	b) Define one metre .	**1**
	Section - E	
17	a) Suppose that the oscillations of a simple pendulum depends on (i) mass of the bob (m), (ii) the length of the string (L), (iii) acceleration due to gravity (g) and (iv) angular displacement (theta). Dimensionally, show which of the above factors have an influence upon the period and in what way?	**3**
	b) The value of acceleration due to gravity (g) at a height h above the surface of earth is given by $g' = gR^2 / (R+h)^2$. If $h \ll R$, then prove that $g' = g\left(1 - \frac{2h}{R}\right)$.	**2**

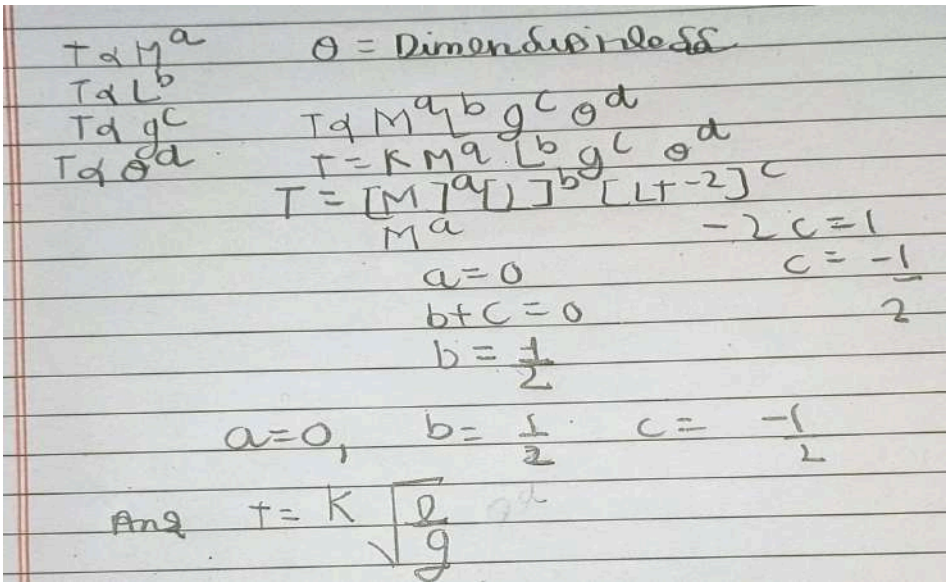
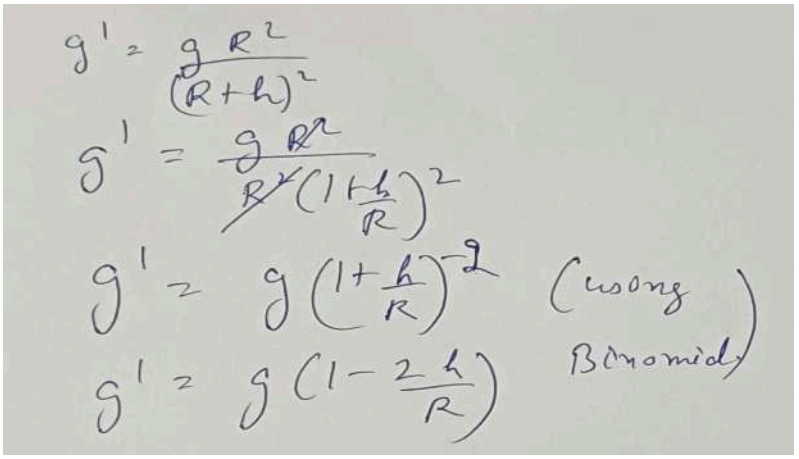
Osdav Public School Kaithal
Marking Scheme
Physics-XI
Set-B

1.	D	1
2.	B	1
3.	B	1
4.	None of These	1
5.	B	1
6.	D	1
7.	B	1
8.	W=F.x dw/dt=d(F.x)/dt dw/dt=f dx/dt p=dw/dt and v=dx/dt so, p=F.v	1 1
9.	A.)Loge T + (γ- 1) Loge V= Loge K B.)LogeT =Loge 2+ Loge π +1/2(Loge L –Loge a)	1 1
10.	A.)CosACosB+SinASinB B.)SinACosB+CosASinB	1 1
11.	X^2(-SinX)+CosX(2x)	1
12.		1 1
13.	$S=3t^3-t^2+3t-2$ (t=3) $S=3(3)^3-(3)^2+3(3)-2$ S=79m Velocity=ds/dt=$27t^2$-2t+3=240m Acceleration=dv/dt=54t-2=160m	1 1 1
14.	N2=n1[(m1/m2)a(l1/l2)b(t1/t2)c] N2=20[(1kg/1kg)1(100cm/100cm)2(1sec/300sec)-2] N2=20*300*300=18*105=ans	1 1 1
15.	Length=500/100=5m Mass=500/100=5m Time=100/10=10sec	1 1 1

Osdav Public School Kaithal
Marking Scheme
Physics-XI
Set-B

16.		1 1
		0.5 0.5
	One metre is said to be when light travelled 1/299792458 distance in one second in vaccum then it is called one metre.	1

Osdav Public School Kaithal
Marking Scheme
Physics-XI
Set-B

17.	 	1 1 1 1 1