APPENDICES
APPENDIX - I

DIAGNOSTIC TEST FOR THE STUDENTS
STANDARD XI PHYSICS
ERODE DISTRICT

From

K. M. Rajendiran,
Ph.D Scholar,
Sri Ramakrishna mission Vidyalaya,
College of Education,
Coimbatore - 640 020.

Dear Students,

I am doing Ph.D in Sri Ramakrishna mission Vidyalaya, College of Education Coimbatore-640 020, under the guidance of Dr. V. Ramakrishnan, Reader in Physical Science, SRKV, College of Education, Coimbatore - 640 020. The title of the thesis is “Study of the Learning impediments of the students of standard XI in learning Physics and Remedial measures through Educational Technology in Erode District”. I request you to go through the Diagnostic test question paper and give your answers. I assure you that the answer given will be kept in confidential manner and used only for the purpose of research.

Thanking you,

Yours

(K.M.Rajendiran)

i
BIO - DATA

Name of the student : 

Community : FC / BC / MBC / SC

Sex : Male/Female

Name of the school : 

Locality of the school : Rural / Urban

Type of the school : Aided / Govt.

Signature of the student
PILOT STUDY

DIAGNOSTIC TEST TO THE LEARNERS

PHYSICS
Standard XI

Time: 3.00 hours
Max. Marks: 150

PART I

i) Answer all the questions
ii) Choose the correct answer
iii) Each question carries one mark

1. Unit of solid angle is
   a) radian              b) steradian           c) degree              d) kelvin

2. Dimensional formula of work is
   a) ML^{-1}T^{-1}      b) ML^{-1}T^{-1}        c) ML^2T^{-2}         d) ML^2T^{-2}

3. Significant figure for 40.00 is
   a) 1                   b) 2                   c) 3                   d) 4

4. The distance traveled by a body, falling freely from rest in first, second and third seconds are in the ratio
   a) 1:2:3               b) 1:3:5               c) 1:4:9               d) 9:4:1

5. Path of a projectile is
   a) straight line       b) curved line         c) parabola line       d) none

6. A particle moves along a circular path under the action of a force. The work done by the force is
   a) positive and non zero b) zero                c) negative and non zero
       d) none of the above
7. Rotational analogue of mass in linear motion is
   a) weight  b) moment of inertia  c) torque  d) angular momentum

8. If a force of 16 n acts on a body of mass 0.08 kg, the acceleration is
   a) 200 ms\(^{-2}\)  b) 20 ms\(^{-2}\)  c) 1.28 ms\(^{-2}\)  d) 12.8 ms\(^{-2}\)

9. If a fly wheel of an engine starting from rest attain an angular velocity of 100 rads\(^{-1}\) in 10 sec, the angular acceleration is
   a) 100 rad s\(^{-2}\)  b) 10 rad s\(^{-2}\)  c) 1000 rad s\(^{-2}\)  d) 0 rad s\(^{-1}\)

10. If a force of 20 n is applied tangentially to the surface of the disc of radius 5 cm. Torque produced is
    a) 100 Nm  b) 4 Nm  c) 200 Nm  d) 2 Nm

11. The time taken by the sunlight to reach the earth is
    a) 8 hrs 20 minutes  b) 8 minutes 20 seconds  c) 8 days  d) 8 seconds

12. After the sun the nearest star to the earth is
    a) sirius  b) polaris  c) alpha centauri  d) andromeda

13. The escape velocity of the earth is
    a) 11.2 km s\(^{-1}\)  b) 22.4 km s\(^{-1}\)  c) 5.6 km s\(^{-1}\)  d) 44.8 km s\(^{-1}\)

14. The astronomical unit is
    a) 6.95x10\(^8\) m  b) 1.496 x10\(^11\) m  c) 1.989x10\(^30\) m  d) 9.467x10\(^{12}\) m

15. If the temperature of a liquid is raised then its surface tension is
    a) decreased  b) increased  c) does not change  d) equal to viscosity

16. Two wires of the same radii and material have their lengths in the ratio 1 : 2.
    If these are stretched by the same force the strains produced in the two wires will be in the ratio
17. Molecular range for solids and liquids is
   a) $10^{-9}$ m  b) $10^{-7}$ m  c) $10^9$ m  d) $10^7$ m

18. The relation between the three modules of elasticity
   a) $1/K = 9/q - 3/n$  b) $3/n=1/k-9/q$  c) $1/q=1/n+1/K$  d) $9/q=3/n-1/k$

19. If the magnitude of displacement is equal to acceleration, then the time period is
   a) 1s  b) $\pi$ s  c) $2\pi$s  d) $4\pi$s

20. The velocity of a vibrating particle at mean position is
   a) 0  b) $a\omega$  c) $a\omega^2$  d) $-a\omega^2$

21. The length of seconds pendulum at a place where $g = 9.8$ ms$^{-2}$ is
   a) 0.25m  b) 1m  c) 0.99 m  d) 0.5 m

22. Which of the following does not affect the velocity of sound?
   a) temperature of the gas  b) specific heat capacities of the gas
   c) mass of the gas  d) pressure of the gas

23. Number of beats produced by two waves of $y_1 = a \sin 200 t$, $y_2 = a \sin 208 t$
   a) 0  b) 1  c) 4  d) 8

24. The velocity of sound increases for every degree rise of temperature by
   a) 280ms$^{-1}$  b) 331.3ms$^{-1}$  c) 0.61ms$^{-1}$  d) 1ms$^{-1}$

25. For an ant moving on the horizontal surface, the number degrees of freedom of the ant will be
   a) 6  b) 3  c) 1  d) 2

26. The efficiency of a Carnot engine when operated between 100 k and 500 k is
   a) 100%  b) 80%  c) 40%  d) 50%
27. In Michelson’s experiment, when the number of faces of rotating mirror increases, the velocity of light
   a) decreases   b) increases   c) does not change   d) becomes zero

28. Rainbow is formed due to the phenomenon of
   a) refraction and absorption   b) dispersion and focusing
   c) refraction and scattering   d) dispersion and total internal reflection

29. The angle between magnetic meridian and the geographic meridian place is
   a) declination   b) dip   c) does not change   d) becomes zero

30. The magnetic moment of a magnet is 5 Am\(^2\). If the pole strength is 25Am.
   What is the length of the magnet
   a) 10cm   b) 20cm   c) 25 cm   d) 1.25cm

**PART II**

i) Answer any 15 questions

ii) Answers should not Exceed 30 Words

31. Why SI system is considered superior to other systems?

32. What are scalar and vector quantities? Give each an example

33. Define momentum. Give its unit and dimension

34. A man weighing 60 kg. runs up a flight of stairs 3 m high in 4 seconds.
   Calculate the power developed by him

35. Write the equations of rotational motion

36. State the universal law of gravitation. Give the dimensional formula of
   gravitational constant
37. State the first two Kepler’s laws of planetary motion.

38. What will be the acceleration due to gravity on the surface of the moon, if its radius is \(1/4\)th the radius of the Earth and its mass is \(1/80\)th the mass of the Earth? Take \(g\) as 9.8 m/s\(^2\).

39. Define surface Tension. Give its unit and dimensional formula.

40. Define phase and phase difference of a SHM.

41. What is a spring factor? Give its unit.

42. What are the acceleration due to gravity on the surface of the moon, if its radius is \(1/4\)th the radius of the Earth and its mass is \(1/4\)th the mass of the Earth? Take \(g\) as 9.8 m/s\(^2\).

43. Define Doppler Effect.

44. Determine the velocity and wavelength of sound of frequency 256Hz traveling in water of Bulk modulus \(0.022 \times 10^9\) Pa.

45. State Stefan’s law.

46. State three postulates of kinetic theory of gases.

47. What are the conditions for total internal reflection to take place?

48. State three significances of the velocity of light.

49. Define Hysteresis.

50. A magnet of volume 25Cm\(^3\) has a magnetic moment of \(12.5 \times 10^{-4}\) Am\(^2\). Calculate the intensity of magnetization.

**PART III**

\[7\times5=35\]

**Note:**

i) Answer the question 59 compulsorily

ii) Of the remaining 11 questions answer any 6 questions

iii) Draw diagram wherever necessary

51. Give any five rules and conventions followed while writing SI units.

52. State Lami’s theorem. Describe an experiment to prove the Lami’s theorem.

53. State and prove parallel axes theorem of moment of inertia.
54. Two forces of magnitude 12 N and 8 N are acting at a point. If the angle between the two forces is 60° determine the magnitude of the resultant force.

55. Obtain an expression for escape velocity.

56. Write a note on milky way.

57. What is meant by Coefficient of viscosity? Derive the expression for the same.

58. Derive an expression for the time period of a body when it executes angular SHM.

59. The velocity of sound at 27°C is 347 m/s. Calculate the velocity of sound in air at 627°C (OR)

   What is the focal length of a thin lens if the lens is in contact with 20 dioptre lens to form a combinations lens which has a focal length of -80 cm?

60. Explain Fery's concept of a perfect black body.

61. Write a note on formation of rainbows.

62. What is meant by Dip and Declination? Explain.

**PART IV**

4×10=40

**Note:**

i) Answer 4 questions in detail

ii) Draw diagrams wherever necessary

63. State and Explain parallelogram law of vectors.

64. Obtain an expression for the critical velocity of a body revolving in a vertical circle.

65. Obtain an expression for the angular momentum of a rotating rigid body.

66. The acceleration due to gravity varies with i) altitude and depth. Prove

67. State and prove Bernoulli’s theorem.

68. Explain how overtones are produced in

   i) Closed organ pipe ii) open organ pipe
69. What is meant by Fraunhofer line? On how these lines explained on the basis of Kirchoff’s law?

70. Device an equation for dispersive power of a prism

71. State and prove Bernoulli’s principle.

List the titles you feel difficult

i) Simple Harmonic Motion.

ii) Tan-A & Tan-B position.

iii) Foucault’s Method.
FINAL STUDY

DIAGNOSTIC TEST TO THE LEARNERS

PHYSICS

Standard XI

Time: 3.00 hours
Max Marks: 150

PART I 30x1=30

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   a) radian b) steradian c) degree d) kelvin

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   a) 100 rad s\(^{-2}\)  b) 10 rad s\(^{-2}\)  c) 1000 rad s\(^{-2}\)  d) 0 rad s\(^{-1}\)

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11. The time taken by the sunlight to reach the earth is
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12. After the sun the nearest star to the earth is
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    If these are stretched by the same force the strains produced in the two wires will be in the ratio
    a) 1:4  b) 2:1  c) 1:2  d) 4:1

17. Molecular range for solids and liquids is
    a) 10\(^{-9}\) m  b) 10\(^{-7}\) m  c) 10\(^9\)m  d) 10\(^7\)m
18. The relation between the three moduli of elasticity
   a) \( \frac{1}{K} = 9/q - 3/n \)  
   b) \( 3/n = 1/k - 9/q \)  
   c) \( 1/q = 1/n + 1/K \)  
   d) \( 9/q = 3/n - 1/k \)

19. If the magnitude of displacement is equal to acceleration, then the time period is
   a) 1 s  
   b) \( \pi \) s  
   c) 2\( \pi \) s  
   d) 4\( \pi \) s

20. The velocity of a vibrating particle at mean position is
   a) 0  
   b) \( a\omega \)  
   c) \( a\omega^2 \)  
   d) \( -a\omega^2 \)

21. The length of seconds pendulum at a place where \( g = 9.8 \text{ ms}^{-2} \) is
   a) 0.25 m  
   b) 1 m  
   c) 0.99 m  
   d) 0.5 m

22. Which of the following does not affect the velocity of sound?
   a) temperature of the gas  
   b) specific heat capacities of the gas  
   c) mass of the gas  
   d) pressure of the gas

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   a) 6  
   b) 3  
   c) 1  
   d) 2

26. The efficiency of a carnot engine when operated between 100 k and 500 k is
   a) 100%  
   b) 80%  
   c) 40%  
   d) 50%

27. In Michelson’s experiment, when the number of faces of rotating mirror increases, the velocity of light
   a) decreases  
   b) increases  
   c) does not change  
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29. The angle between magnetic meridian and the geographic meridian place is
   a) declination  b) dip  c) does not change  d) becomes zero

30. The magnetic moment of a magnet is 5 Am². If the pole strength is 25 Am.
   What is the length of the magnet?
   a) 10cm  b) 20cm  c) 25 cm  d) 1.25cm

**PART II 15x3=45**

i) Answer any 15 questions
ii) Answers should not Exceed 30 Words

31. Why SI system is considered superior to other systems?
32. What are scalar and vector quantities? Give each an example
33. Define momentum. Give its unit and dimension
34. A man weighing 60 kg runs up a flight of stairs 3 m high in 4 seconds.
   Calculate the power developed by him.
35. Write the equations of rotational motion
36. State the universal law of gravitation. Give the dimensional formula of
   gravitational constant
37. State the first two Kepler’s laws of planetary motion
38. What will be the acceleration due to gravity on the surface of the moon,
   if its radius is 1/4th the radius of the Earth and its mass is 1/80th the mass
   of the Earth? Take g as 9.8 ms⁻²
39. Define surface Tension Give its unit and dimensional formula
40. Define phase and phase difference of a SHM
41. What is a spring factor? Give its unit
42. What are the acceleration due to gravity on the surface of the moon, if its radius is $\frac{1}{4}$th the radius of the Earth and its mass is $\frac{1}{4}$th the mass of the Earth? Take $g$ as $9.8 \text{ ms}^{-2}$.

43. Define Doppler Effect.

44. Determine the velocity and wavelength of sound of frequency 256 Hz traveling in water of Bulk modulus $0.022 \times 10^{11} \text{ p.a}$.

45. State Stefan’s law

46. State three postulates of kinetic theory of gases

47. What are the conditions for total internal reflection to take place?

48. State three significances of the velocity of light

49. Define Hysteresis

50. A magnet of volume $25 \text{ Cm}^3$ has a magnetic moment of $12.5 \times 10^{-4} \text{ Am}^2$. Calculate the intensity of magnetization

**PART III**

$7 \times 5 = 35$

**Note:**

i) Answer the question 59 compulsorily

ii) Of the remaining 11 questions answer any 6 questions

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53. State and prove parallel axes theorem of moment of inertia

54. Two forces of magnitude 12 N and 8N are acting at a point. If the angle between the two forces is 60° determine the magnitude of the resultant force

55. Obtain an expression for escape velocity

56. Write a note on milky way

57. What is meant by Coefficient of viscosity? Derive the expression for the same.
58. Derive an expression for the time period of a body when it executes angular SHM.

59. The velocity of sound at 27°C is 347 ms⁻¹. Calculate the velocity of sound in air at 627°C.

   (OR)

What is the focal length of a thin lens if the lens is in contact with 20 dioptre lens to form a combinations lens which has a focal length of 80 cm?

60. Explain Ferys concept of a perfect black body.

61. Write a note on formation of rainbows.

62. What is meant by Dip and Declination? Explain.

**PART IV**

\[4 \times 10 = 40\]

**Note:**
1) Answer 4 questions in detail
2) Draw diagrams wherever necessary

63. State and Explain parallelogram law of vectors.

64. Obtain an expression for the critical velocity of a body revolving in a vertical circle.

65. Obtain an expression for the angular momentum of a rotating rigid body.

66. The acceleration due to gravity varies with i) altitude and depth. Prove.

67. State and prove Bernoulli’s theorem.

68. Derive Newton and Laplace’s equation for sound in gas.

69. Define solar constant. Describe the working of pyrheliometer.

70. Distinguish between the virtual image produced
   i) Plane Mirror  ii) Concave Mirror  iii) Convex Mirror

**List the titles you feel difficult**

1) Simple Harmonic Motion
2) Tan-A & Tan-B position
3) Foucault’s Method
SCORING KEY

FINAL STUDY

DIAGNOSTIC TEST TO THE LEARNERS

PART – I

I. Choose the correct answer

1. b) Steradian
2. c) $ML^2 T^{-2}$
3. d) 4
4. c) 1 : 4 : 9
5. c) Parabola
6. b) Zero
7. b) Moment of Inertia
8. a) 200 ms$^{-2}$
9. b) $10\text{rad}\ S^{-2}$
10. d) Nm
11. b) 8 minutes 20 seconds
12. c) Alpha Centauri
13. a) 11.2 km S$^{-1}$
14. b) $1.496 \times 10^{11}\ m$
15. a) decreased
16. b) 2 : 1
17. a) $10^{-9}\ m$
18. a) $9/q - 3/n$
19. c) $2\pi S$
20. b) ao
21. c) 0.99 m
22. d) pressure of the gas
23. c) 4
24. c) 0.61 ms$^{-1}$
25. d) 2
26. b) 80%
27. c) does not change
28. d) dispersion and total interval reflection
29. a) declination
30. b) 20 cm

PART – II

31. i) permanence, reproducibility (1)
   ii) Based on the properties of the atoms (1)
   iii) Coherent system of units (1)
32. Scalars:
Scalar quantities have magnitude only.
Eg. Length, mass, time, speed, work, energy
Vectors quantities have both magnitude and direction
Eg. Displacement, velocity, acceleration force weight momentum

33. Momentum: mass x velocity
unit: Kgms⁻¹
dimension: MLT⁻¹

34. Formula P = FS/t = mgs/t
60 x 9.8 x 3
Substitution = \[ \frac{60 \times 9.8 \times 3}{4} \]
Answer including calculation: 441 w

35. (i) \( \omega = \omega_0 + \alpha t \)
(ii) \( \theta = \omega_0 t + \frac{1}{2} \alpha t^2 \)
(iii) \( \omega^2 = \omega_0^2 + 2 \alpha \theta \)

36. Law of gravitation force
Dimensional for gravitational constant

37. First law
Second law

38. Acceleration due to gravity \( g = \frac{GM}{R^2} = 9.8 \) (½)
Data written (½)
Acceleration due to gravity on the moon \( g_1 = \frac{GM}{R_1^2} \) (½)
Substitution - \( G \left( \frac{1}{80} \right) M / \left( \frac{1}{4} R \right)^2 = G(\frac{1}{80})M / (R^2 / 16) \) (1)
\[ = 16 GM / 80R^2 = 9.8 / 5 = 1.96 \text{ ms}^{-1} \]
On the moon \( g_1 = 1.96 \text{ ms}^{-1} \) (½)
39. Surface tension definition (2)
   Unit (Nm\(^{-1}\)) \(\frac{1}{2}\)
   Dimensional formula MT\(^{-2}\) \(\frac{1}{2}\)

40. Phase definition (1\(\frac{1}{2}\))
    Phase difference (1\(\frac{1}{2}\))

41. Spring factor definition (2)
    Unit (N/m) or Nm\(^{-1}\) (1)

42. Advantages of resonance (1\(\frac{1}{2}\))
    Disadvantages of resonance (1\(\frac{1}{2}\))

43. Wave motion definition (2)
    properties of the medium (elasticity, inertia) (1)

44. Formula \(V = \sqrt{\frac{K}{P}}\) (\(\frac{1}{2}\))
    Date, substitution (\(\frac{1}{2}\))
    Answer \(V = \sqrt{0.022 \times 10^{11}} / 1000\)
    \(= 1483 \text{ ms}^{-1}\) (2)

45. Stephen’s law statement (2\(\frac{1}{2}\))
    Equation form \(E \propto T^4 E = \sigma T^4\) (\(\frac{1}{2}\))

46. Any three postulates (3)

47. (i) light must travel from a denser medium to rarer medium (1\(\frac{1}{2}\))
    (ii) The angle of incidence inside the denser medium must be greater than the critical angles \((i - c)\) (1\(\frac{1}{2}\))

48. Any three significance of velocity of light (3)

49. Inverse square law statement (2\(\frac{1}{2}\))
    Equation formula (\(\frac{1}{2}\))
50. Formula $I = \frac{M}{V}$
    Substitution & Answer $I = 50 \text{ Am}^{-1}$

PART – III

51. Any five rules and conventions (5)

52. Statement
    Upto $\frac{P}{\sin \alpha} = \frac{Q}{\sin \beta} = \frac{R}{\sin \gamma}$
    Diagram (1)

53. Statement of parallel axis theorem (1)
    Diagram (1)
    Proof
    Upto $I_0 = Mx^2 + My^2 + 2x \Sigma m h$ (2)
    Derivation $I_0 = Mx^2 + IG$ (1)

54. Formula $R = \sqrt{P^2 + Q^2 + 2PQ \cos \theta}$ (1)
    Substituting for $P, Q, \theta$ (2)
    Bringing $R = 304$ (1)
    $R = 17.44 \text{ N}^{-1}$

55. Escape Velocity definition (1)
    Up to $E_f = \frac{1}{2} mv^2 - GMm / (R+h)$ (2)
    From $E_i, E_f$
    Up to $V_e = \sqrt{2gR}$ (2)

56. Milky way galaxy
    Diagram with data (1)
    (i) Shape and size
    Diameter, thickness, the distance from the sun (1)
(ii) Interstellar matter
Dusts and gases, 90% hydrogen

(iii) Clusters
Definition, 100 – 1000 stars galactic cluster
1000 – stars globular cluster

(iv) Rotation
Revolve around the centre once in 300 millions
sun revolves with the velocity of 250 km/s

(v) Mass
The mass of the Milky way $3 \times 10^{41}$ kg

57. Co-efficient of viscosity
$$ F \quad \text{upto } q = \frac{\text{constant}}{\text{dv/dx}} $$
Explanation

58. Angular SHM diagram
Explanation

59. $V_{27}/V_{62} = \sqrt{(2373+27)/(273+627)}$
   $= \sqrt{(300/900)}$
   Upto $\sqrt{1/3}$
   $V_{627} = V_{27} \times \sqrt{3}$

   $= 347 \times \sqrt{3}$
   $= 347 \times 1.732$
   $= 601 \text{ m/s}$

(OR)

Power of the lens $P_1 = \frac{1}{f_1} = 2$ diopter
$\frac{1}{f_1} \quad \frac{1}{f_1} \quad \frac{1}{f_1}$
$\frac{1}{f_1} \quad \frac{1}{f_1} \quad \frac{1}{f_1}$

$= f_1 \quad f_1 \quad f_2$
Substitution – $10/8 = -5/4$

From $= 2 + \frac{1}{f_2}$

$$1 = \frac{5}{4} \quad (2)$$

$$f_2 = -\frac{13}{4} \quad (2)$$

$$f_2 = -\frac{30.8 \times 10^{-2}}{13} \text{ m including lag values} \quad (2)$$

60. Ferry’s black body
   diagram
   Double walled hollow sphere-
   Explanation
   (1)
   (1)
   (3)

61. Rainbows
   Diagram
   Reason for formation of rainbow
   Explanation
   Primary Rainbows – formation
   Secondary Rainbows – formation
   (1½)
   (1½)

62. Dip
   Declination
   Explanation
   (2)
   (2)
   (1)

PART – IV

63. Parallelogram law of vectors
   Statement
   Diagram
   (2)
   (1)
\[
R = \sqrt{P^2 + Q^2 + 2PQ \cos \theta} \quad (2)
\]

\[
\alpha = \tan^{-1} \left( \frac{Q \sin \theta}{P + Q \cos \theta} \right) \quad (2)
\]

**Special cases**

64. Critical velocity for velocity circle

**Diagram**

**Explanation**

\[
T_A = mg + \frac{mv_A^2}{r} \quad (1)
\]

\[
T_B = m \left( \frac{V_B^2}{r} - g \right) \quad (1)
\]

Up to \( V_c = \sqrt{rg} \) (3)

The motion in a vertical circle is possible only if \( V_B > \sqrt{rg} \) (1)

65. Angular momentum of a rotating body

**Diagram**

**Explanation**

The moment of linear momentum of first particle (1)

Angular momentum (1)

angular momentum for 2\(^{nd}\), 3\(^{rd}\) particle (1)

angular momentum of a rigid body definition (1)

\[
L = m_1r_1^2 \omega + m_2r_2^2 \omega + m_3r_3^2 \omega + \ldots m_n r_n^2 \omega
\]

\[
L = \omega \left[ m_1r_1^2 + m_2r_2^2 + m_3r_3^2 + \ldots m_n r_n^2 \right]
\]

\[
L = \omega \left( \sum_{i=1}^{\infty} m_i r_i^2 \right) \quad (1)
\]
66. Acceleration due to gravity

i) attitude : effect

Diagram

\[ \phi \]

Explanation upto \( gn = g \left( 1 + \frac{2h}{R} \right) \) (4)

ii) Depth

Diagram

\[ \frac{d}{R} \]

Explanation upto \( gn = g \left( 1 + \frac{d}{R} \right) \) (4)

67. Bernolli’s theorem

Theorem

Diagram

Explanation (1)

Equation of continuity \((-\frac{1}{2})\)

Net work done/sec. On the liquid \((-\frac{1}{2})\)

Increase in potential energy/sec \((-\frac{1}{2})\)

Increase in kinetic energy/sec \((-\frac{1}{2})\)

Equating both the equations (1)

upto \( P/p + gh + 1/2r^2 = \) (3)

dividing by ‘g’ explanation for pressure head,
velocity head, gravitational head (1)

68. Newton statement

Duration (2)

xxii
Laplace’s stalenit
Deri value

Explanation

\[ \frac{5V}{4l} \]

upto \( n_5 \) = \( 5 n_1 \)

Harmones in the ratio 1:3:5

Open organ pipe;

Diagram

Upto fundamental frequency \( n_1 = \frac{V}{2l} \)

\[ n_2 = \frac{V}{l} = 2n_1 \]

\[ n_3 = \frac{\lambda_3}{4l} = 3n_1 \]

The frequencies of Harmones in the ratio 1:2:3 ....

Solar constant

Definition

Pyroheliometer diagram with parts

Explanation

Working

\[ Q = \frac{VI}{Aa} \]

Dispersive power of a prism

Plane mirror

Cancave mirror

Concern mirror

Diagram