Th. 2a-ENGINEERING PHYSICS

Full Marks: 80   Time: 3 Hours

Answer any **Five** Questions including Q No.1&2

Figures in the right hand margin indicates marks

1.	Answer **ALL** questions.	2×10
	(a) Express 1 Joule into erg.	
	(b) A force of 100N is resolved into two equal components at 60˚ to each other. Find the magnitude of each component.	
	(c) Establish a relation between linear velocity & angular velocity.	
	(d) State two methods to reduce friction.	
	(e) Write down the S.I. unit and dimension of specific heat.	
	(f) What are the conditions for minimum deviation when a ray of light passes through a prism?	
	(g) Two capacitors of capacitances C_1 and C_2 are connected in parallel. If a charge Q is given to the assembly the charge gets shared. What is the ratio of the charge on the capacitor C_1 to the charge on the capacitor C_2?	
	(h) The gravitational force between two objects is F. If masses of both the objects are halved without altering the distance between them, then what will be the change in gravitational force?	
	(i) State Fleming's Left Hand Rule.	
	(j) Define Population Inversion.	
2.	Answer any **SIX** questions.	5×6
	(a) Check the correctness of the following equation by dimensional analysis where the symbols have their usual meaning. $$T = 2\pi\sqrt{\frac{l}{g}}$$	
	(b) State the properties of magnetic lines of force.	
	(c) Distinguish between mass and weight.	
	(d) How much heat is needed to convert 0.005 kg of ice at 0°C to water at 10°C?	
	(e) Define optical fibre. Mention two of its properties and applications.	
	(f) Derive a relation between 1) farad and stat farad 2) farad and ab farad	
	(g) State laws of limiting friction.	
3.	Derive an expression for equation of trajectory, time of ascent and maximum height of a projectile fired at an angle θ with the horizontal.	10

4.	Derive an expression for displacement, velocity and acceleration of a particle executing S.H.M.	10
5.	State and explain Kirchhoff's laws with an example. Derive the condition for a balanced Wheatstone bridge.	10
6.	State Faraday's law of electro magnetic induction. A field of 0.0125 T is at right angles to a coil of area 5×10^{-3} m^2 with 1000 turns. It is removed from the field in 1/20 s. Find the e.m.f. produced.	10
7.	Establish the relation between α, β & γ. A piece of copper wire has a length of 2m at 0°C. Find its length at 100°C. Given $\alpha=17\times10^{-6}$ °C^{-1}.	10

BST 101- Engg. Physics

Full Marks: 80   Time: 3 Hours

Answer any Five Questions including Q No. 1& 2

Figures in the right hand margin indicates marks

1.	Answer ALL Questions:	2x10

	a. Write down Dimensional formulae for the following quantities.
	   (i) Pressure
	   (ii) Universal Gravitational Constant(G)	

	b. Find $\vec{A} \cdot \vec{B}$ if $\vec{A} = 2i+3j-k$ and $\vec{B} = 3i-2k$	
	c. Write the relation between (i) Linear & Angular Velocity (ii) Linear & Angular Acceleration.	
	d. What do you mean by Limiting Friction?	
	e. Define Weight. Write down its unit.	
	f. What is the relation between wavelength and frequency of a wave?	
	g. State any two differences between heat and temperature.	
	h. Define Critical Angle.	
	i. Find the equivalent Capacitance if a 2μF Capacitor is connected parallel with a 0.5 μF capacitor.	
	j. Define Population Inversion of LASER.	
2.	Answer any SIX questions:	5x6
	a. With a neat diagram explain resolution a vector.	
	b. Define Circular motion. Find the expression for Angular Displacement and Angular Velocity of a particle executing circular motion.	
	c. Define Co-efficient of Friction. Write methods for reducing friction.	
	d. State Kepler's laws of planetary motion.	
	e. A 500g cube of lead is heated from 25⁰C to 75⁰C. How much energy was required to heat the lead? Sp. Heat of lead is 0.129 J/g⁰C.	
	f. State & Explain with diagram the Kirchhoff's laws of Electric current.	
	g. State the Faradays laws of Electromagnetic induction.	
	h. Write down the Characteristics & Application of LASER.	
3.	Define Projectile. Derive Expression for equation of Trajectory, Maximum Height and Total time of flight for a Projectile fired at an angle θ with the horizontal.	10
4.	State laws of Limiting Friction. An object of 1Kg rests on a horizontal floor. The Co-efficient of Static Friction is 0.4 and g is 9.8 m/s². Calculate the force of static friction.	10
5.	Differentiate between Mass & Weight. What is the value of acceleration due to gravity at a height 40Km above earth's surface? Diameter of Earth = 12800 Km.	10
6.	Define Wave motion. Differentiate between Transverse & Longitudinal Wave. If the frequency of Tuning fork is 400 Hz and the velocity of sound in air is 320 m/s. Find the wavelength of the wave.	10
7.	Derive an expression for force acting on a current carrying Conductor placed in a uniform magnetic field. Write any two properties of ULTRASONICS.	10

ENGINEERING PHYSICS

(Code : BST-101)

Full Marks : 80   *Time* : 3 hours

Answer any **five** questions including **Q. Nos. 1 & 2**

Figures in the right-hand margin indicate marks

1. Answer *all* questions : 2×10

   (*a*) State the principle of homogeneity.

   (*b*) Define Universal Gravitational Constant (G).

   (*c*) What is the greatest and least resultant between two vectors, $\vec{A}$ and $\vec{B}$?

   (*d*) State two properties of Ultrasonic.

   (*e*) What is the condition for maximum horizontal range of projectile ?

   (*f*) Write the formula for refractive index of a prism.

   (*g*) Define Joule's Mechanical Equivalent of heat.

   (*h*) What is the force of repulsion between two unit charges at unit distance apart in air ?

   (*i*) Mention two applications of LASER in Medical Science.

   (*j*) State Lenz's law.

2. Answer any *six* questions : 5×6

   (*a*) Check the correctness of the relation dimensionally : $T = 4\pi\sqrt{l/g}$

   (*b*) State Kepler's laws of Planetary Motion.

   (*c*) Establish the relation : $v = n\lambda$.

   (*d*) Define Total Internal Reflection with diagram.

   (*e*) State the laws of Limiting Friction.

   (*f*) State the Properties of Magnetic Lines of Force.

   (*g*) State Coulomb's laws in Magnetism.

   (*h*) Find the equivalent resistance when three resistors of resistances, 2Ω, 5Ω and 10Ω are connected in parallel.

3. Derive expressions for displacement, velocity and acceleration of a particle executing Simple Harmonic Motion.   10

4. State Kirchhoff's laws and obtain Balanced Condition of Wheatstone's bridge. $4 + 6$

(Turn Over)

5. Define the Coefficients of Linear, Superficial and cubical expansion of solids and establish the relation $\alpha : \beta : \gamma :: 1 : 2 : 3$.   4 + 6

6. State Faraday's laws of electromagnetic induction. Distinguish between Fleming's Hand rule and Right hand rule.   6 + 4

7. State the laws of photoelectric Emission and mention applications of photocell.   6 + 4

ENGINEERING PHYSICS

(Code : BST-101)

Full Marks : 70

Time : 3 hours

Answer any **five** questions

Figures in the right-hand margin indicate marks

1. (a) Write down the basic units in SI system ? 2

   (b) Derive expressions for velocity of a particle executing Simple Harmonic Motion. 5

   (c) Define coefficient of Friction and state different methods to reduce friction. 2 + 5

2. (a) What will be the angle between two vectors $\vec{A}$ and $\vec{B}$, when $\vec{A}.\vec{B} = \vec{A} \times \vec{B}$. 2

   (b) How g varies with height ? 5

   (c) State Newton's laws of Gravitation and define G and state its unit and dimension. 5 + 2

3. (a) State 1st law of Thermodynamics. 2

   (b) Distinguish between Progressive wave and Stationery wave 5

   (c) Establish the relation between the two specific heats of a gas. 7

4. (a) Define Coefficient of Cubical Expansion of solids. 2

   (b) State Kepler's laws of Planetary Motion. 5

   (c) State and explain Kirchhoff's laws and find the equivalent resistance between 5 resistors of 5 Ω each connected in series. 5 + 2

5. (a) State Ohm's Law. 2

   (b) Derive an expression for capacity of a parallel plate capacitor. 5

   (c) State Einstein's photoelectric equation and explain the symbols used. 7

6. (a) State Fleming's Left Hand Rule. 2

   (b) Write the properties of Lines of force. 5

   (c) State and explain Faraday's laws of Electromagnetic Induction. 7

7. (a) Mention two main characteristics of LASER Radiation. 2

   (b) Obtain Balance Condition of Wheatstone's Bridge. 5

   (c) State and explain Biot Savart's Law. 7

I—Sem/COMMON/2019(S)(New)

ENGINEERING PHYSICS

(Theory : 2 (A))

Full Marks : 80

Time : 3 hours

Answer any **five** questions including **Q.Nos.1 & 2**

Figures in the right-hand margin indicate marks

1. Answer *all* questions : 2 × 10

   (a) State the Principle of Homogeneity.

   (b) Define Universal Gravitational Constant (G).

   (c) State Triangle law of vector addition.

   (d) State two properties of Ultrasonic.

   (e) State the Laws of Refraction.

   (f) Define Unit Charge.

   (g) Define Joule's Mechanical Equivalent of Heat.

   (h) State Ohm's Law.

   (i) Mention the properties of LASER.

   (j) State Lenz's Law.

2. Answer any *six* questions : 5 × 6

   (a) Check the correctness of the relation dimensionally : $F = 2mv^2/r$.

   (b) Establish the relation between (i) Linear and Angular Velocity (ii) Linear and Angular Acceleration.

   (c) Distinguish between Transverse wave and Longitudinal wave.

   (d) State Kepler's Laws of Planetary Motion.

   (e) State the Laws of Limiting Friction.

   (f) Define Specific Heat. Find its unit and dimension.

   (g) State Coulomb's Laws in Magnetism.

   (h) Find the total capacity when three capacitors of capacity, 2μF, 3μF and 5 μF are connected in series.

3. Derive expression for displacement, velocity and acceleration of a particle executing. Simple Harmonic Motion. 10

4. State Kirchhoff's Laws and obtain Balanced condition of Wheatstone's Bridge. 4 + 6

5. Define the coefficients of Linear, Superficial and cubical Expansion of solids and Establish the relation $\alpha : \beta : \gamma :: 1 : 2 : 3$. $4 + 6$

6. State Faraday's Laws of Electromagnetic Induction. Calculate the equivalent resistance of 5 resistors of 5Ω each connected in parallel. $6 + 4$

7. Write short notes on any *two* : 5×2

   (*i*) Total Internal Reflection

   (*ii*) Properties of Magnetic Lines of Force

   (*iii*) Relation between wave parameters

   (*iv*) Fleming's Left Hand Rule.

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(handwritten: 0.2mF = $\frac{0.2}{1000}$ µF = 0.0002)

ENGINEERING PHYSICS
(Code : BST-101)

Full Marks : 80   *Time* : 3 hours

Answer any **five** questions including **Q. Nos. 1 and 2**

Figures in the right-hand margin indicate marks

1. Answer *all* questions :   2 × 10

   (a) Write down the units of the following physical quantities :

       (i) Potential Energy
       (ii) Frequency
       (iii) Pressure
       (iv) Momentum

   (b) Given, $\vec{A} = 2\hat{i} + 3\hat{j} - 5\hat{k}$, $\vec{B} = \hat{i} - 2\hat{j} + \hat{k}$, Find $\vec{A} \cdot \vec{B}$

   (c) What is the condition for maximum range of projectile ?

   (d) What is the relation between linear velocity and angular velocity ?

   (e) Write down the application of Optical Fibre.

   (f) Define Unit Charge.

   (g) State the First Law of Thermodynamics.

   (h) State Ohm's law.

   (i) Write down properties of LASER.

   (j) Calculate the magnetic flux density at the centre of a circular coil of radius 5 m, when a current of 2 A flows through it.

2. Answer any *six* questions :   5 × 6

   (a) A car starting from rest attains a velocity of 60 m/sec in 2 minutes. Calculate the acceleration.

   (b) Derive expression for velocity and acceleration of a particle executing SHM.

   (c) Distinguish between progressive wave and stationery wave.

   (d) Calculate the equivalent capacitance between 3 capacitors of capacity 5 µF, 10 µF and 0·2 mF connected in parallel. *(handwritten: C = 5 + 10 + 0.0002 µF = 15.0002 µF)*

   (e) State and explain Fleming's Left Hand Rule.

   (f) Establish the relation, $\beta = 2\alpha$.

   (g) State Coulomb's laws in Magnetism.

   (h) State the laws of Photoelectric Emission.

3. State Newton's laws of Gravitation. Define Gravitational Constant G and establish a relation between g and G.   6 + 4

4. State the laws of Limiting Friction and mention some methods to reduce friction.   6 + 4

5. Define Critical Angle and Total Internal Reflection with diagram, Establish the relation between refractive index and critical angle.   6 + 4

6. State Kirchhoff's laws and obtain balanced condition of Wheatstone's Bridge.   6 + 4

7. State and explain Faraday's laws of Electromagnetic Induction.   10

ENGINEERING PHYSICS

(Code : BST-101)

Time : 3 hours   Full Marks : 70

Answer any **five** questions

Figures in the right-hand margin indicate marks

1. (a) Mention the dimensional formula of :   2
   (i) Angular Acceleration
   (ii) Electric Intensity.

   (b) Check the dimensional correctness of the equation

   $$S = 4ut + \frac{1}{2}gt^2$$ 5

2. (a) Define "Horizontal Range" of a projectile.   2

   (c) Define Refractive Index of a medium and state it's SI unit. Find out a relation between critical Angle (C) and Refractive Index (μ) of a medium.   2+5

(Turn Over)

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(4)

8. (a) Write down the "Characteristics" of Laser Beam.   2

   (b) Explain Einstein's photoelectric equation.   5

   (c) State and explain Fleming's Right Hand Rule. Draw the Vector Diagram.   2+3+2

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(b) Establish that the maximum horizontal range is 4 times the maximum height attained by the projectile; when fired at an inclination so as to achieve maximum horizontal range. 5

(c) What is "limiting friction"? State and explain the laws of limiting friction. 2 + 5

3. (a) Define "Angular Displacement" of a particle. 2

(b) Explain the variation of ' g ' (acceleration due to gravity) with altitude. 2

(c) Derive the formulae for velocity (V) and Acceleration (A) of a body in Simple Harmonic Motion (SHM). 4 + 3

4. (a) State the relation between frequency (f) and time-period (T) of a wave. 2

(b) How are stationary waves different from progressive waves ? 5

(c) What is Doppler's Effect ? Explain about the apparent change in frequency of sound when source and listener are in relative motion with respect to each other. [Source at rest, listener in motion and vice-versa]. 2 + 5

5. (a) Define coefficient of Linear Expansion (α) of a solid material. 2

(b) Deduce a formula for Thermal Conductivity (K) of a solid. 5

(c) Establish Mayer's Relation for specific heats of a gas. 7

6. (a) Define Magnetic Flux Density ($\vec{B}$). 2

(b) The equivalent capacitance of 02 capacitors is 18 μf when joined in parallel and 4 μf when joined in series. Find the individual capacitances. 5

(c) Establish the formula for capacitance of a parallel plate capacitor with air as dielectric. 7

7. (a) What is Electromagnetism ? 2

(b) State and explain Biot~Savart Law. 5

(c) Find out the "Condition of Balance" in a Wheatstone Bridge. 7

ENGINEERING PHYSICS

(Code : BST-101)

Time : 3 hours

Full Marks : 70

Answer any **five** questions

Figures in the right-hand margin indicate marks

1. (a) Write down the SI units of 2

    (i) Gravitational constant

    (ii) Coefficient of thermal conductivity.

  (b) Check the correctness of the formula dimensionally : 5

$$T = 2\pi \sqrt{\frac{1}{g}}$$

  (c) Define coefficient of friction and state laws of limiting friction. 7

2. (a) If velocity of a particle is doubled and mass is doubled, what will happen to the kinetic energy. 2

(b) What is the expression for horizontal range of a projectile fined at an angle θ with the horizontal. 5

(c) Find out the expression for displacement, velocity and acceleration for a particle executing simple Harmonic motion. 7

3. (a) What will be the wavelength in metre for a wave radiated at a frequency of 710 KHz ?

Given, velocity of wave = 3×10^8 m/sec. 2

(b) Distinguish between "Longitudinal Waves" and "Transverse Waves". 5

(c) Define ultrasonic. Mention any three properties and user of ultrasonics. 7

4. (a) Define mechanical equivalent of heat. 2

(b) Establish the relation between C_P and C_V. 5

(c) State the relation between different coefficients of thermal expansion. The volume of a lead ball is 10^{-5} m³ at 0° C and 1.0064×10^{-5} m³ at 50° C. Calculate the coefficient of linear expansion. 2 + 5

5. (a) What are the condition for total internal reflection ? 2

(b) Explain the concept of mirage and looming. 5

(c) Draw a diagram for refraction of light through a prism and deduce the formula for refractive index. 2 + 5

6. (a) Define unit pole. 2

(b) State Biot Savart's law. 5

(c) Obtain balanced condition of Wheatstone's Bridge applying Kirchhoff's laws. Find the total capacity when two capacitors of 100 μF and 0.5 mF are connected in series. 7

7. (a) State the principles of LASER. 2

(b) What is a photocell ? Mention four applications of photocell. 5

(c) State and explain Faraday's laws of electro-magnetic induction. 7

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ENGINEERING PHYSICS

(Code : BST-101)

Full Marks : 70

Time : 3 hours

Answer any five questions

Figures in the right-hand margin indicate marks

1. (a) Which of the following quantities are dimensionally similar : 2

   (i) Work

   (ii) Momentum

   (iii) Kinetic energy.

   (b) Time period T of a simple pendulum depends upon its length and acceleration due to gravity at that place. Obtain an expression for T using method of dimensional analysis. 5

   (c) What are the advantages and disadvantages of friction ? Write four methods to reduce friction. 3 + 4

(4)

(c) State the laws of photoelectric emission. Write 2 uses of photo cell. 5 + 2

7. (a) Define unit charge. 2

   (b) State and explain Fleming's left hand rule. 5

   (c) Establish the relation between C_p and C_v. 7

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2. (a) What will be the angle between two vectors, so that their cross product is numerically equal to the dot products ? 2

(b) How does acceleration due to gravity vary with depth ? 5

(c) If a projectile is fired with a velocity u making an angle θ with the horizontal, what will be the maximum height to which it will rise ? Calculate the horizontal range covered by a stone thrown, with velocity 40 m/sec making an angle of 45° with the horizontal. 3 + 4

3. (a) State the principle of optical fibre with diagram. 2

(b) Distinguish between transverse wave and longitudinal wave. 5

(c) Define critical angle with diagram. What will be the critical angle for a ray going from glass to water ? 3 + 4
Refractive index of glass = 1·62
Refractive index of water = 1·35

4. (a) A piece of copper wire has a length of 10 m at 50 °C. Find its length at 80 °C. Given $α = 17 × 10^{-6}\ °C^{-1}$. 2

(b) Define coefficient of thermal conductivity and find its unit and dimension. 5

(c) State and explain Kirchhoff's laws with diagram. 7

5. (a) State the properties of LASER. 2

(b) Derive an expression for capacity of a parallel plate capacitor. 5

(c) State and explain Faraday's laws of electro-magnetic induction. 7

6. (a) Write down the formula for magnetic field at the centre of a circular coil of n turns having radius r and carrying current I amperes. 2

(b) Find an expression force experienced by a current carrying conductor placed in a magnetic field. 5

ENGINEERING PHYSICS

(Code : BST-101)

Full Marks : 70

Time : 3 hours

Figures in the right-hand margin indicate marks

Answer any five questions

1. (a) Given, $\vec{A} = 3\hat{i} + 5\hat{j}$, $\vec{B} = 2\hat{i} + 7\hat{j}$. Find $\vec{A} \cdot \vec{B}$.   2

   (b) How g varies with depth?   5

   (c) Distinguish between static and dynamic friction. What are various methods to reduce friction.   7

2. (a) Under what condition range of a projectile is maximum?   2

   (b) Define gravitational constant and state its unit and dimension.   5

(Turn Over)

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(4)

Write down the magnitude of B when the charge moves,

(i) in a direction parallel to the field

(ii) in a direction perpendicular to the field.   7

(c) Explain SHM as a projection of uniform circular motion. 7

3. (a) Define longitudinal wave. 2

(b) Establish the relation between different wave parameters and define the parameters. 5

(c) State and explain Kepler's laws of planetary motion with diagrams. 7

4. (a) Write the formula for refractive index through a prism and name the symbols. 2

(b) Define critical angle with the diagram. Find refractive index of a liquid for which the critical angle is 45°. 5

(c) Define total internal reflection. Explain mirage and looming with diagram. 7

5. (a) Define mechanical equivalent of heat. 2

(b) Derive expression for coefficient of thermal conductivity and state its unit and dimension. 5

(c) Define specific heats of a gas and establish the relation between them. 7

6. (a) Write the expression for capacity of a parallel plate capacitor with a dielectric inserted in it. 2

(b) State and explain Coulomb's laws in magnetism and define unit pole. 5

(c) State and explain Kirchhoff's laws. What will be the equivalent resistance when 5 resistors of resistance 3 Ω each are connected in parallel. 7

7. (a) Draw the vector diagram of Fleming's Right Hand Rule. 2

(b) Write Einstein's photoelectric equation and explain the symbols used. 5

(c) What is the force experienced by a charge 'q' moving with velocity 'v' through a magnetic field of strength 'B'. 5

ENGINEERING PHYSICS

(Code : BST-101)

Full Marks : 70

Time : 3 hours

Answer any five questions

Figures in the right-hand margin indicate marks

1. (a) Given $\vec{A} = 3\hat{i} - 2\hat{j}$, $\vec{B} = 5\hat{i} + 7\hat{j}$. Find $(\vec{A} \times \vec{B})$. 2

   (b) State Kepler's laws of planetary motion. 5

   (c) Define gravitational constant. Show the relation between g and G. Show the variation of g with height. 2+2+3

2. (a) Equation of a particle vibrating in SHM is, $y = 5 \sin 9t$. Find its time period. 2

   (*Turn Over*)

(4)

(b) Describe the properties and uses of LASER. 5

(c) What is photoelectric effect ? State the laws of photoelectric emission. 2 + 5

(2)

(b) State the laws of limiting friction. 5

(c) Find the expression for equation of trajectory, time of flight, maximum height attained by a particle projected at an angle θ with the horizontal. 7

3. (a) State two applications of ultrasonics. 2

(b) Distinguish between progressive wave and stationery wave. 5

(c) Explain simple Harmonic motion as projection of uniform circular motion. 7

4. (a) State Doppler's effect. 2

(b) Define critical angle. State the relation between refractive index and critical angle. 5

(c) Define different coefficients of expansion of solids and establish relation between them. 7

(3)

5. (a) State two applications of optical fibre. 2

(b) Define coefficient of thermal conductivity and obtain its dimensional formula and unit. 5

(c) State and explain Kirchhoff's laws. Find the capacity in microfarad of a parallel plate capacitor of two plates, of size $(0·2 \times 0·2)$ m^2 each, separated by a 10^{-5} m thick mica plate of dielectric constant 5. 7

6. (a) State Lenz's law. 2

(b) State Biot Savart's law and express it in vector form. 5

7. (a) Write down the expression for magnetic flux density at the centre of a circular coil carrying current. 2

(b) Distinguish between Fleming's Left Hand Rule and Fleming's Right Hand Rule. 5

ENGINEERING PHYSICS

(Code : BST-101)

Full Marks : 70

Time : 3 hours

Answer any five questions

Figures in the right-hand margin indicate marks

1. (a) Given, $\bar{A} = 2\hat{i} + 3\hat{j} - 5\hat{k}$, $\bar{B} = 3\hat{i} + 5\hat{j} - 2\hat{k}$
Find $(\bar{A} \times \bar{B})$.   2

(b) Check the correctness of the formula dimensionally,

$$T = 4\pi \sqrt{\dfrac{l}{g}}$$ 5

(c) A projectile is fired horizontally with a velocity u from a height h. Find the velocity and the horizontal distance covered when it touches the ground.   7

2. (a) Define Gravitational constant.   2

(b) State Kepler's laws of planetary motion. 5

(c) How does acceleration due to gravity vary with height and depth ? 7

3. (a) Define Work. 2

(b) State laws of limiting friction. 5

(c) Explain S.H.M. as a projection of uniform circular motion and determine velocity and acceleration. 7

4. (a) State Doppler's effect. 2

(b) Distinguish between transverse wave and longitudinal wave. 5

(c) Define total internal reflection. Explain the concept of mirage and looming. 7

5. (a) On which factors does capacity of a parallel plate capacitor depend ? 2

(b) State and explain 1st law of Thermodynamics. 5

(c) Establish the relation,

$$\alpha : \beta : \gamma :: 1 : 2 : 3$$ 7

6. (a) Define unit pole. 2

(b) State Biot Savart's law. 5

(c) Apply Kirchhoff's laws to determine balanced condition of Wheatstone's Bridge. 7

7. (a) State the properties of LASER. 2

(b) State laws of photoelectric emission. 5

(c) State and explain Faraday's laws of electro-magnetic induction. 7

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