P P SAVANI UNIVERSITY

First Semester of Diploma Examination
November 2022
IDSH1020 Engineering Physics

29.11.2022, Tuesday   Time: 01:00 p.m. To 03:30 p.m.   Maximum Marks: 60

Instructions:
1. The question paper comprises of two sections.
2. Section I and II must be attempted in same answer sheet.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

			CO	BTL
Q - 1	Choose the correct Answer.	[16]		
(i)	The symbol to represent "Amount of Substance" is		1	1/2
	(a) K (b) A (c) Cd (d) mol			
(ii)	Which is the system of unit?		1	1
	(a) SMS system (b) MKP system (c) FPS System (d) CJS System			
(iii)	Which one of the following is the unit of velocity?		1	1
	(a) kilogram (b) metre (c) m/s (d) second			
(iv)	Motion in a plane is called		1	2
	(a)Motion in one dimension (b)Motion in two dimensions			
	(c)Motion in three dimensions (d)Motion in four dimensions			
(v)	A body of mass 5 kg is travelling with a uniform velocity of 2 m/s. Its momentum is......		2	5
	(a) 10 kg m/s (b) 7 kg m/s (c) 2 .5 kg m/s (d) 3 kg m/s			
(vi)	β-decay of a nucleus is an example of		2	1/2
	(a)Electromagnetic Force (b) Gravitational force			
	(c) Strong Nuclear Force (d) Weak Nuclear Force			
(vii)	The energy possessed by the body by virtue of its motion is known as?		2	2
	(a)Chemical energy (b)Thermal energy			
	(c)Potential energy (d)Kinetic energy			
(viii)	A ball moves in a frictionless inclined table without slipping. The work done by the table surface on the ball is................		2	4
	(a)Negative (b)Zero (c)Positive (d)None of the options			
(ix)	Hooke's law essentially defines		3	2
	(a) Stress (b) Strain (c) Yield point (d) Elastic limit			
(x)	At critical temperature, the surface tension of a liquid		3	1/2
	(a) Is zero (b) Is infinity (c) Is the same as that at any other temperature			
	(d) Can not be determined			
(xi)	The commonly used unit of temperature is		4	1
	(a) Kelvin (b) Degree Fahrenheit (c) Degree Celsius (d) All			
(xii)	The device used for heat measurement is called as		4	1
	(a) Thermometer (b) Barometer (c) Calorimeter (d) None			
(xiii)	Spring is pulled down by 2 cm. What is amplitude of motion?		5	5
	(a) 0 cm (b) 6 cm (c) 2 cm (d) cm			
(xiv)	The acceleration of particle executing S.H.M. when it is at mean position is		5	1/2

	(a) Infinite (b) Varies (c) Maximum (d) Zero			
(xv)	Whenever a wave enters from one medium to the another, its..........		5	2
	(a) velocity changes. (b) frequency changes.			
	(c) frequency does not change. (d) wavelength remains constant.			
(xvi)	Decibel is the unit of		5	1
	(a) sound intensity (b) heat intensity			
	(c) light intensity (d) all of the above			
Q - 2 (a)	Sketch a neat diagram of Vernier calipers.	[04]	1	1/3
Q - 2 (b)	How many-dimensional motion does the following have?	[04]	1	2/4
	(a) Train moving fast on its track.			
	(b) A lizard moving on a wall in a room.			
	(c) Kite flying in the sky.			
	(d) Bee flying in a closed room.			

OR

Q - 2 (a)	In a given micrometer screw gauge, the value of pitch is 0.5 mm and there are 50 divisions exists on circular scale. (1) Calculate the least count of micrometer screw gauge in meter. (2) Calculate diameter of the ball when main scale reading is 2 divisions and circular scale reading is 27 divisions.	[04]	1	5
Q - 2 (b)	What is called Projectile motion? Derive the equation for maximum height and range of a projectile with a proper diagram.	[04]	1	2/3
Q - 3 (a)	Define momentum and discuss the conservation law of momentum with an appropriate example.	[04]	2	2/4
Q - 3 (b)	When force (6, 5, 2) N acts on a body displacement of the body in the direction of X-axis is 5m. Calculate work done.	[04]	3	5

OR

Q - 3 (a)	write a short note on gravitational force.	[04]	2	1/2
Q - 3 (b)	Discuss collision between two objects moving in one dimension with an appropriate diagram.	[04]	3	2
Q - 4	(a)Write the difference between vector and scalar quantities with an example.	[03]	2	1/2
	(b) Write the S.I. units of force, momentum, and impulse	[03]	3	1

OR

Q - 4	(a)Explain Triangle method for vector addition with an appropriate diagram.	[03]	2	3
	(b) An astronaut accidentally gets separated out of his small spaceship accelerating in inter stellar space at a constant rate of 100 m s^{-2}. What is the acceleration of the astronaut the instant after he is outside the spaceship ? (Assume that there are no nearby stars to exert gravitational force on him.)	[03]	3	5
Q - 5 (a)	What is the statement of Hook's law and also give its limitations.	[04]	4	1/2
Q - 5(b)	Explain: (I) Heat Capacity (II) Specific heat	[04]	4	1

OR

Q - 5(a)	What is Bernoulli's theorem and give its applications?	[04]	3	2/3
Q - 5 (b)	Write a short note on Conduction.	[04]	4	1

Q - 6 (a)	Define: (I)Time Period (II) Frequency (III) Amplitude (IV) Phase	[04]	5	1
Q - 6 (b)	Write a short note on Doppler effect.	[04]	5	2/4

<div align="center">OR</div>

Q - 6(a)	What is the difference between Periodic motion and oscillatory motion?	[04]	5	2
Q – 6 (b)	Give the difference between longitudinal wave and transverse wave.	[04]	5	1
Q – 7	Write the statement of Pascal's law for fluids and also Discuss any one application of it.	[06]	5	2/3/4

<div align="center">OR</div>

Q – 7	Define: (I) Deforming Force (II) Restoring Force (III) Factor of safety (IV) Surface Energy (V) Surface tension (VI) terminal velocity	[06]	4	1

<div align="center">*******</div>

CO   : Course Outcome Number   BTL   : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create