Sanjay Ghodawat University, Kolhapur

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

2020-21
EXM/P/09/00

F Y B Sc | **School of Science** | **Department of Physics**
PHS 101 | **Physics I** | **Semester: I**
Examination: Re-ESE | **Max Marks: 50**

Instructions for Students: 1) Use of non-programmable calculator is allowed
2) All questions are compulsory
3) Figures to the right indicate full marks.

Q.1	**Answer the following questions (Any Two)**	**Marks**	**BL**	**CO**
a)	Prove that $\vec{A}.\vec{B} = A_xB_x+A_yB_y+A_zB_z$ and $\vec{A}\times\vec{B} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ A_x & A_y & A_z \\ B_x & B_y & B_z \end{vmatrix}$	08	L3	CO1
b)	Describe the law of addition of vector algebra.	08	L3	CO1
c)	Explain the law of conservation of linear momentum for a system of particles.	08	L2	CO2
Q.2	**Answer the following questions (Any Two)**	**Marks**	**BL**	**CO**
a)	i) Discuss the motion of rockets. ii) Obtain the moment of inertia of a solid cylinder about its own axis of symmetry.	08	L2	CO2
b)	Derive an expression for the gravitational field at a point just outside the spherical shell.	08	L4	CO3
c)	Explain the kinetic energy and potential energy of the simple harmonic motion and calculate its total energy.	08	L1	CO3
Q.3	**Answer the following questions (Any Two)**	**Marks**	**BL**	**CO**
a)	i) Obtain the equation of continuity for a steady fluid flow. ii) Describe the Jaegers method to determine the surface tension of a liquid.	09	L2	CO4
b)	What is Cantilever? Derive an expression for the depression	09	L2	CO4

of free end of cantilever due to load.

c) i) Solve first order homogeneous differential equation 09 L3 CO1

$\left(x^2 + y^2\right)dx - 2xydy = 0$

ii) Solve $(1 + e^x)ydy = (y + 1)e^x dx$