

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(Third Semester)

Branch - **MATHEMATICS**
MECHANICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Question No.	Question	K Level	CO
1	Calculate the magnitude of resultant of two like parallel forces of 20 N separated by a distance of 20 cm. a) 40 N b) 60 N c) 20 N d) 0 N	K1	CO2
2	In case of forces, a couple means _____ a) Two unequal forces acting at two points b) Two equal and like parallel forces acting at two points c) Two equal and perpendicular forces acting at two points d) Two equal and opposite forces acting at two points	K2	CO2
3	CG of a plane lamina is not at its geometrical centre, if it is a: a) Circle b) Square c) Rectangle d) Right angled triangle	K1	CO3
4	_____ is done when a force moves an object through some distance. a) work b) mass c) energy d) force	K2	CO3
5	For the point moving on a straight line which of following is true. a) Has no radial component of acceleration b) Has no tangential component of acceleration c) Has both tangential and radial component of acceleration d) Has no radial and tangential component of acceleration	K1	CO4
6	The rate of change of velocity is known as _____. a) Acceleration b) Speed c) Momentum d) Force	K2	CO4
7	There is an opposite and equal reaction to every action. This situation is described by: a) the first law of motion b) second law of motion c) law of inertia d) third law of motion	K1	CO3
8	What is the force applied on a body with 5 kg of mass and an acceleration of 7 m/s ² ? a) 35 N b) 5 N c) 7 N d) 0 N	K2	CO3
9	A man projects a coin upwards from the gate of a uniformly moving train. The path of coin for the man will be _____. a) Vertical straight line b) Inclined straight line c) Parabolic d) Horizontal straight line	K1	CO5
10	On calculating which of the following quantities, the mass of the body has an effect in simple projectile motion? a) Velocity b) Force c) Time of flight d) Range	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Question No.	Question	K Level	CO
11.a.	Explain the resultant of two like parallel forces acting on a rigid body.	K2	CO2
	(OR)		
11.b.	Prove that theorem on the resultant of a couple and forces.		
12.a.	Develop the Centre of gravity of a symmetry and uniform triangular lamina.	K3	CO4
	(OR)		
12.b.	Identify the Forces which may be omitted in forming the equation of virtual work.		
13.a.	Explain Polygon of force statement and Relate magnitude with direction.	K2	CO3
	(OR)		
13.b.	Interpret the relative angular velocity between two moving points.		
14.a.	Explain Newton's second law of motion.	K3	CO4
	(OR)		
14.b.	Develop the work done in stretching an elastic string.		
15.a.	Deduct the Range on an inclined plane.	K5	CO2
	(OR)		
15.b.	Justify the Theorem of perpendicular axes.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Question No.	Question	K Level	CO
16	State and Prove the Varignon's theorem of moments.	K4	CO4
17	Deduct the Centre of gravity of three rods forming a triangle.	K5	CO3
18	Explain the Angular velocity of any point on a wheel rolling uniformly.	K2	CO2
19	Apply the principle of energy in the case of a freely falling body.	K3	CO3
20	Explain the Fundamental principles and plane path of the projectile with characteristics of the motion of projectile.	K3	CO3

Z-Z-Z

END