

Hall Ticket Number:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Code No. : 21613

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. II Year I-Semester (Main & Backlog) Examinations, Nov./Dec.-2016

Bridge Course: Engineering Mechanics

Time: 3 hours

Max. Marks: 50

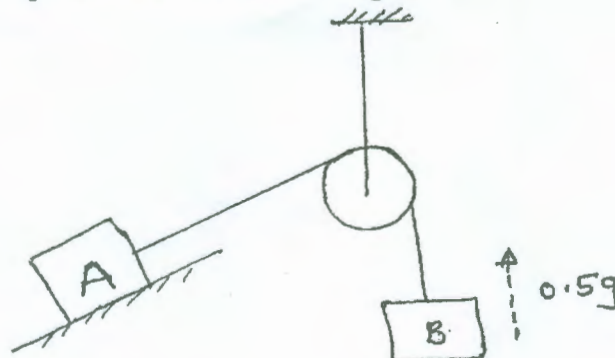
Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (15 Marks)

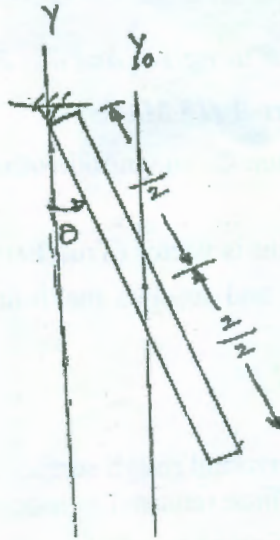
1. The force system is in equilibrium, then the magnitude of resultant is _____ [1]
2. What is free body diagram? [1]
3. Moment of a spatial force about a point is vector (True/False). [1]
4. A particle was thrown vertically up and reaches maximum height in 1 sec, what is the position of particle from ground? [1]
5. What are the oblique components of force? [1]
6. Write the frictional Laws. [2]
7. A block of weight 50 N placed on horizontal rough surface has co-efficient of friction 0.12, what should be minimum horizontal force required to move the block? [2]
8. Write the governing equation for rotation of a particle. [2]
9. The spatial force $F = 600 \text{ N}$ is acting from point A (3, 6, 9) to point B (-3, 8, 12) then the force moment is _____. [2]
10. State 'D' Alembert's principle. [2]

Part-B ($5 \times 7 = 35$ Marks)

11. a) Find the moment of a spatial force ($6i + 7j + 8k$) about a point (0, 0, 6). [3]
b) Write the equations of equilibrium for spatial force system also find the shortest distance of spatial force $20i + 40j + 60k$ about origin. [4]
12. a) Define cone of friction, justify the magnitude of cone of friction for static problem. [3]
b) A block of weight 1000 N placed on rough inclined surface of co-efficient of friction 0.18, angle of inclination 30° . Find the minimum and maximum horizontal force required to move the block. [4]
13. a) Write the equation for rectilinear motion of a particle. [3]
b) A stone was dropped in to well and hears a sound wave after 3 sec, find the depth of water level from ground (take velocity of sound is 330 mps). [4]
14. a) Distinguish between kinematics and kinetics. [3]
b) In the connected system of rigid bodies with inextensionable string, find the ratio of weights if 'B' has upward accelerations of $0.5g$. [4]



15. a) Find the mass moment of inertia for a circular plate of radius 'r'. [3]
 b) Determine the mass moment of inertia for a rectangular rod for continual axis and also for vertical axis as shown in fig. [4]



16. a) If two forces acting at a point $\vec{F} = 3i + 6j + 3k$, $\vec{s} = 6i + 3j + 6k$, then find the equilibrant of force. [3]
 b) Find the moment of spatial force $20(3i + 6j + 8k)$ above a point A (3, 6, 4), if starting force is (2, 4, 3). [4]
17. Write short notes on any *two* of the following: [7]
- Co-planer Force system.
 - Static & Dynamics of a Rigid body.
 - Plane motion and rotator motion of a body.
