

Code No. 2007

FACULTY OF ENGINEERING and INFORMATICS**B.E. I — Year (Common to All) (Main) Examination, June 2013****Subject : Engineering Mechanics****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

1. State the Triangular law for concurrent co-planner force system. (2)
2. Write the static equilibrium equations for non-concurrent co-planner force system. (2)
3. Define the angle of friction. (2)
4. State the parallel axis theorem. (3)
5. Derive the impulse momentum equation. (3)
6. State the PAPPU's theorems. (3)
7. The motion of a particle is given by the equations (3)
 $s = vt - 12t^2 - 40$, where s is displacement in meter and t is sec. Determine the acceleration of particle after 2 sec.
8. State D' Alembert's principle. (2)
9. Derive the mass moment of inertia for a rectangular place with thickness t and density S . (3)
10. Derive the work-energy principle. (2)

PART – B (50 Marks)

- 11.a) The moment of a certain force 'F' is in clockwise about 'O' and 90N-m counter clockwise about B. If its moment about 'A' is zero. Determine the force, (5)

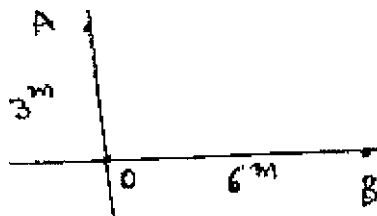


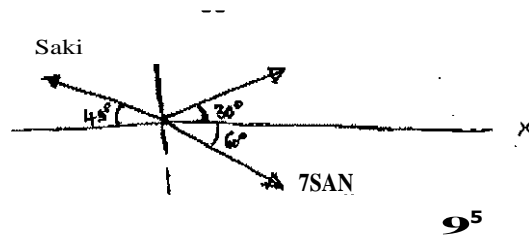
Fig-1

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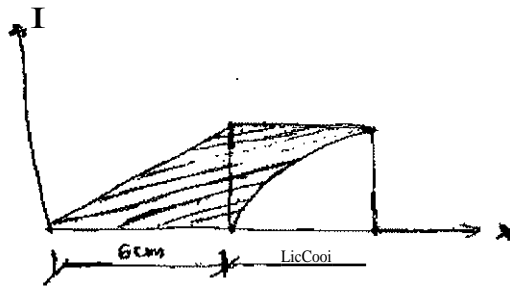
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11.b) Find the resultant for concurrent co-planar force system as shown in fig.2. (5)

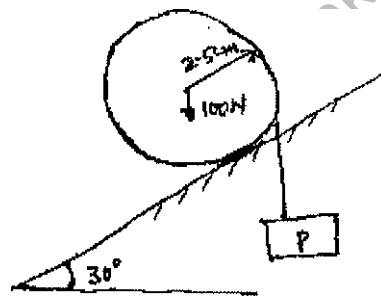
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12, Locate the Centroid of the hatch plate about the axis as shown in fig.3. (10)



13. A 100N cylinder shown in fig.4 is held at rest by a weight P suspended from a chord wrapped around the cylinder if the slipping impends between the cylinder and the inclined, determine the value of P & also the coefficient of friction. (10)



14. Calculate the product of inertia for a shaded area as shown in fig.5 with respect to given x — y axis. (10)

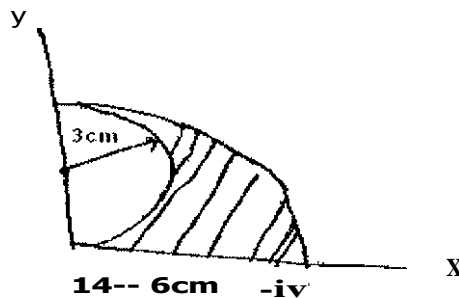


Fig-5

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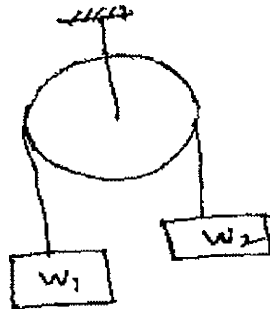
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15. Derive the expression for the acceleration of a block as shown in fig if (10)

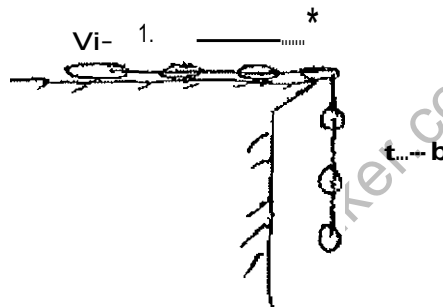
Case 1: is a frictionless pulley

Case 2 : friction pulley

$W_2 > W_1$



16. A chain of length 'L' and weighing w/m -run is released from rest on a smooth table when it is (10)



In the position as shown in fig. Determine the velocity of the chain while last link leaves the table.

17. Write a short note on
- a) Compound pendulum (4)
 - b) Rectilinear & curvilinear motion (3)
 - c) Radius of gyration and instantaneous centre of rotation (3)