



LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc.DEGREE EXAMINATION – MATHEMATICS

THIRD SEMESTER – APRIL 2018

PH 3104- PHYSICS FOR MATHEMATICS - I

Date: 05-05-2018
Time: 09:00-12:00

Dept. No.

Max. : 100 Marks

Part A

Answer **ALL** the questions

(10×2 = 20)

1. Define acceleration. Give its unit.
2. What are generalized coordinates?
3. State Newton's law of gravitation.
4. What is gravitational red shift?
5. Define Poisson ratio and give its limiting values.
6. Why mercury doesn't wet the surface of glass?
7. What is a flip flop?
8. List any two characteristics of an ideal op-amp.
9. State the postulates of special theory of relativity.
10. Determine the length of a rod moving with velocity of $0.8c$. Given the proper length of the rod is 100 cm.

Part B

Answer any **FOUR** questions

(4 x 7.5 = 30)

11. What are constraints? Explain different types with an example each.
12. a) What is parking orbit?
b) Write a short note on weightlessness. (2+5.5)
13. Deduce an expression for terminal velocity of a spherical ball falling under gravity through a viscous liquid.
14. Simplify using K-map: $Y = F(A,B,C,D) = \Sigma (0,1,2,4,5,10,11,14,15)$.
15. Obtain Einstein's mass energy relation.
16. Give a brief outline about the molecular theory of surface tension.

Part C

Answer any **FOUR** questions

(4 x 12.5 = 50)

17. Set up Lagrangian and obtain equation of motion for a) Atwood's machine
b) Simple pendulum. (6.5+6)
18. Discuss Boy's method of determining gravitational constant G.
19. Obtain the relation connecting the three moduli of elasticity.
20. Discuss the working of operational amplifier as a) Inverting amplifier b) Summing amplifier
(6+6.5)
21. Describe the Michelson-Morley experiment and discuss about its negative results.
22. Explain Quincke's method of determining surface tension and angle of contact of mercury.

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