JAIN COLLEGE

463/465, 18th Main Road, SS Royal, 80 Feet Road, Rajarajeshwari Nagar,
Bangalore - 560 098

Date: 2019-2020 ***SUBJECT: PHYSICS***

I PUC

Mock Examination

Timings Allowed: 3Hrs. ***Total Marks: 70***

General Instructions:

- All parts are compulsory.
- Answer without relevant diagram/figure wherever necessary will not carry any marks.
- Direct answers to numerical problems without detailed solutions will not carry any marks.

PART-A

I Answer **ALL** the following questions: 10x1=10

1. Write the number of significant figure in 51.701.
2. If a scalar is multiplied by a vector, is it a scalar or a vector?
3. What is kinetic energy?
4. Define radius of gyration.
5. State Pascal's law.
6. On what principle does a venturimeter work?
7. How does the speed of earth change when it is nearer to Sun?
8. How much volume does one mole of a gas occupy at NTP?
9. State Boyle's law.
10. What is a closed pipe?

PART-B

II Answer any **FIVE** of the following questions: 5x2=10

11. Name the concepts unified by Einstein.
12. Calculate the distance travelled and displacement of a particle moving once around a circle of radius 10m.
13. Mention two disadvantages of friction.
14. When is torque maximum and minimum?
15. Give the equation for escape velocity and explain the terms used.
16. Write any two applications of capillarity.
17. State the Clausius Clayperon and Kelvin Planck statements for II law of thermodynamics.
18. Distinguish between progressive and stationary waves.

PART-C

III Answer any **FIVE** of the following questions: 5x3=15

19. Verify the correctness of the equation $T = 2\pi\sqrt{\frac{l}{g}}$ using dimensional analysis.
20. Derive F= ma in vector form.
21. What is meant by collision? Distinguish between elastic and inelastic collision.
22. State Kepler's laws of planetary motion.
23. Draw stress-strain curve and give its important features.
24. Obtain the relation between C_p and C_v.
25. Draw schematic diagram of a refrigerator. Define its coefficient of performance and mention the expression.
26. Define wavelength and velocity. Write the relation connecting them.

PART-D

IV Answer any **TWO** of the following questions: 2x5=10

27. What is centripetal acceleration? Derive the expression for centripetal acceleration.
28. State the law of conservation of mechanical energy and illustrate the same for a freely falling body.
29. Sate and explain parallel axes and perpendicular axes theorem.

V Answer any **TWO** of the following questions: 2x5=10

30. Mention the laws of thermal conductivity and hence define co-efficient of thermal conductivity.
31. Arrive at the expression for pressure of an ideal gas.
32. What is Doppler Effect of sound? Derive expression for apparent frequency of sound when source is moving towards a stationary observer.

PART-E

VI Answer any **THREE** of the following questions: 3x5=15

33. A train accelerates from 36kmph to 72kmph on covering a distance of 100m. Calculate the acceleration of the train and time taken to cover the distance.
34. The MI of a grind stone about its axis of rotation is 25kgm^2 starting from rest. It acquires a speed of 120rpm in 10s. Find the torque acting on it.
35. Calculate the acceleration due to gravity at
    i) a height 20km above the surface of the earth.
    ii) a depth 16.6km below the surface of the earth.
36. A Carnot engine has an efficiency of 0.3 when the temperature of the sink is 350K. Find the change in temperature and the source when the efficiency becomes 0.5.
37. A progressive wave is given by y= 0.5Sin $2\pi[\frac{t}{0.02} - \frac{x}{0.5}]$where x and y are in m and t in s. Find the amplitude, wavelength and velocity of the wave.

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