Pokhara University

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| Level: Bachelor | Semester – Fall | Year : 2012 |
| Programme: BE | | Full Marks: 100 |
| Course: Physics I | | Pass Marks: 45 |
| Time : 3hrs. |

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| *Candidates are required to give their answers in their own words as far as practicable.* |
| *The figures in the margin indicate full marks.* |
| Attempt all the questions. |

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|  | 1. What is wave motion ? Write the equation of sine wave traveling on the string. Apply the theory of superposition to find the maxima and minima of interference pattern on the string.   **OR**  Derive the differential equation of simple angular harmonic motion. Calculate the time period of bar pendulum hence calculate the equivalent length of simple pendulum.   1. A body oscillates with SHM according to the equation y = (6.12m) sin [(8.38 rad/s) t + 1.92 rad]. Find the i) frequency ii) amplitude and iii) phase constant | 9  6 |
|  | 1. Obtain an expression for apparent frequency heard by observer when source and observer are approaching each other. 2. The frequency of the horn of the car is observed to drop from 272 Hz to 256 Hz the car passes a stationary observer, what is the speed of the car. | 9  6 |
|  | 1. Find the potential and field due to short dipole. 2. Find the electric field due to a charge hollow sphere at i) out side sphere ii) on the sphere iii) inside the sphere. | 9  6 |
|  | 1. What is Gauss law. Show that the total electric flux coming out from a closed surface in q/εo where q is the charge enclosed by the surface. 2. A 300 V battery is connected across capacitors of  and  in parallel. Calculate the charge and energy stored in each capacitor.   **OR**   1. Define three electric vectors. Find the capacitance of a parallel plate capacitor. 2. A 100 μf capacitor is charged by p.d. of 50 volts, the charging battery then being disconnected the capacitor is then connected to a second capacitor in parallel. If the measured p.d. is 35 volts what is the capacitance of this second capacitor? | 9  6  9  6 |
|  | 1. Derive an expression for deviation produced by thin lens. 2. Two thin lens of focal length 6 cm and 2 cm are coaxial and separated by a 3 cm. Find equivalent focal length. | 9  6 |
|  | 1. Distinguish between dia, para and ferromagnetic material and define three magnetic vector. 2. Find the magnetic field intensity at 50 cm on the equatorial line due to a bar magnet of length 5 cm and pole strength 6 Am. | 9  6 |
|  | Write short notes on **(any two):**   1. Types of semiconductor 2. Neutral point 3. Linear momentum and its conservation | 2×5 |