Pokhara University

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| Level: Bachelor | Semester – Fall | Year : 2012 |
| Programme: BE | | Full Marks: 100 |
| Course: Physics | | 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. Derive the equation of motion of simple harmonic motion (not in differential form) and discuss the energy conservation in simple harmonic motion. 2. Calculate the frequency of vibration of air particle in a plane progressive wave of amplitude 2.18 × 10-10 m and intensity 10-10 W/m2, the velocity of sound in air is 330 m/s and density of air is 0.001293 g/cm3. | 9  6 |
|  | 1. What is thin film? Discuss the interference due to reflection on thin film. 2. What distance should the plates each of area 0.2m×0.1m of an air capacitor be placed in order to have same capacitance as a spherical conductor of radius 0.5m? | 9  6 |
|  | 1. What is reverberation? Derive Sabine’s reverberation formula and explain its significance. 2. Prove that the equation of continuity | 9  6 |
|  | 1. What do you mean by capacitance? Derive an expression for current in RC-circuit for both charging and discharging of capacitor. 2. Calculate the energy in electron volt of an electron wave of λ=3x10-2m. Given h= 6.62x10-34JS. | 9  6 |
|  | 1. Derive the Maxwell's third and fourth equations and write its significance. 2. In the Bohr model of H-atom, the electron circulates around the nucleus in a path of radius 5.1x10-11 m at a frequency of 6.8x1015 rev/sec. What is the value of magnetic field at the center of orbit? | 9  6 |
|  | 1. State Biot's and savart's law and use it to find the magnetic field at a point on the axis of circular coil. 2. Describe about the spontaneous and stimulated emission. | 9  6 |
|  | Write short notes on **any two:**   1. Extrinsic semiconductor 2. Displacement current 3. Hall effect | 5×2 |