FAST National University of Computer and Emerging Sciences, Lahore

Course: EE–117: Applied Physics
Session: Fall 2019
Date of Examination: 4 Sep 2019
Section: F
Name: _____

Instrument: Quiz–1
Instructor: Muhammad Shiraz Ahmad
Time duration: 30 min
Total Points: 20
Roll No.: _____

Note: All problems must be attempted. At the slightest suspicion of cheating, your paper will be marked zero. There will be no extension in time.

Q. 1 (5 points) Proof that the range remains the same for angles θ_1 and θ_2, if $\theta_1 + \theta_2 = \pi/2$

Q. 2 (5 points) Two vectors are given by $\vec{A} = 2\hat{i} + 2\hat{j} - \hat{k}$ and $\vec{B} = 6\hat{i} - 3\hat{j} + 2\hat{k}$ in Cartesian coordinate system. Find angle between: (a) $\vec{A}$ and $\vec{B}$, (b) $\vec{A}_z$ and $\vec{B}_z$.

Q. 3 (5 points) An ambulance is currently traveling at $15\,\mathrm{m\,s^{-1}}$, and is accelerating with a constant acceleration of $5\,\mathrm{m\,s^{-2}}$. The ambulance is attempting to pass a car which is moving at a constant velocity of $30\,\mathrm{m\,s^{-1}}$. How far must the ambulance travel until it matches the car's velocity?

Q. 4 (5 points) A small ball rolls horizontally off the edge of a tabletop that is $1.20\,\mathrm{m}$ high. It strikes the floor at a point $1.52\,\mathrm{m}$ horizontally from the table edge. (a) How long is the ball in the air? (b) What is its speed at the instant it leaves the table?