EE117: APPLIED PHYSICS - Part I

DATE: 19 December, 2018

Serial No:_____

Final Exam

Total Time:30 Min.

Total Marks: 20

Course Instructors

Ms. Ayesha Zafar
Mrs. Sabeen Sher Afgan
Dr. Muhammad Usman

_____
Signature of Invigilator

Solution to the Final Exam

_____	_____	_____	_____
Student Name	Roll No	Section	Signature

DO NOT OPEN THE QUESTION BOOK OR START UNTIL INSTRUCTED.

Instructions:

1. Verify at the start of the exam that you have a total of ten (10) MCQs printed on seven (4) pages (single side) including this title page.
2. Attempt all questions on the question-book and in the given order.
3. The exam is closed books, closed notes. Please see that the area in your threshold is free of any material classified as 'useful in the paper' or else there may a charge of cheating.
4. Read the questions carefully for clarity of context and understanding of meaning and make assumptions wherever required, for neither the invigilator will address your queries, nor the teacher/examiner will come to the examination hall for any assistance.
5. Fit in all your answers in the provided space. You may use extra space on the back page if required. If you do so, clearly mark question/part number on that page to avoid confusion.
6. Use only your own stationery and calculator. If you do not have your own calculator, use manual calculations.
7. Use only permanent ink-pens. Only the questions attempted with permanent ink-pens will be considered. Any part of paper done in lead pencil cannot be claimed for checking/rechecking.

	Q-1	Q-2	Q-3	Q-4	Q-5	Q-6	Q-7	Q-8	Q-9	Q-10	Total
Total Marks	2	2	2	2	2	2	2	2	2	2	20
Marks Obtained											

Vetted By: _____Vetter Signature: _____

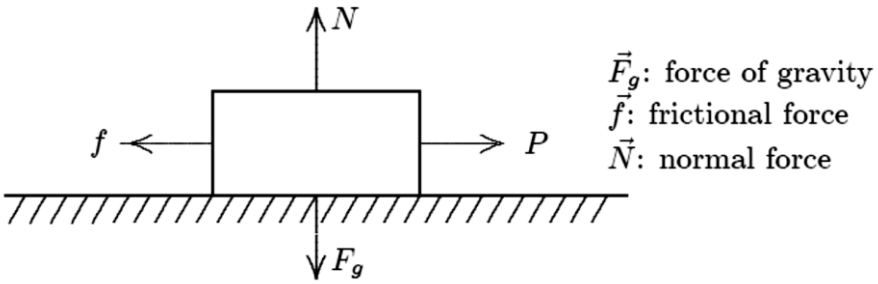
Q1. Two objects, one having three times the mass of the other, are dropped from the same height in a vacuum. At the end of their fall, their velocities are equal because:

A. Anything falling in vacuum has constant velocity
B. All objects reach the same terminal velocity
C. The acceleration of the larger object is three times greater than that of the smaller object
D. The force of gravity is the same for both objects
E. None of the above
Ans: E

Q2. An object is moving on a circular path of radius π meters at a constant speed of 4.0m/s. The time required for one revolution is:

A. $2/\pi^2 s$
B. $\pi^2/2s$
C. $\pi/2s$
D. $\pi^2/4$
E. $2/\pi s$
Ans: B

Q3. A boy pulls a wooden box along a rough horizontal floor at constant speed by means of a force $\vec{P}$ as shown. In the diagram $\vec{f}$ is the magnitude of the force of friction, $\vec{N}$ is the magnitude of the normal force, and $\vec{F}_g$ is the magnitude of the force of gravity. Which of the following must be true?

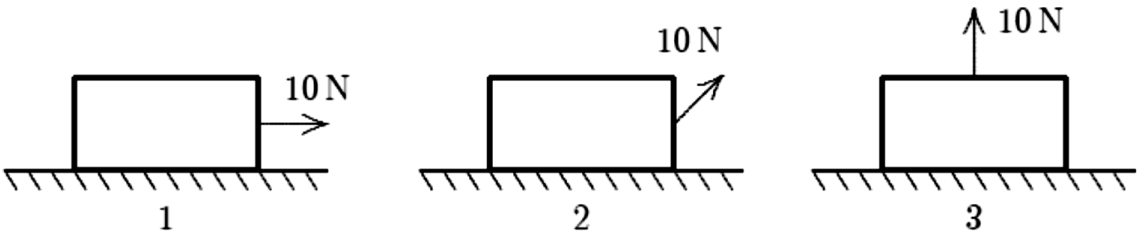


A. $P = f$ and $N = F_g$
B. $P = f$ and $N > F_g$
C. $P > f$ and $N < F_g$
D. $P > f$ and $N = F_g$
E. none of these
Ans: A

Q4. An object is undergoing simple harmonic motion. Throughout a complete cycle it:

A. has constant speed
B. has varying amplitude
C. has varying period
D. has varying acceleration
E. has varying mass
Ans: D

Q5. A crate rests on a horizontal surface and a woman pulls on it with a 10-N force. Rank the situations shown below according to the magnitude of the normal force exerted by the surface on the crate, least to greatest.



A. 1, 2, 3
B. 2, 1, 3
C. 2, 3, 1
D. 1, 3, 2
E. 3, 2, 1
Ans: E

Q6. A transverse traveling sinusoidal wave on a string has a frequency of 100 Hz, a wavelength of 0.040 m, and an amplitude of 2.0 mm. The maximum velocity in m/s of any point on the string is:

A. 0.2
B. 1.3
C. 4
D. 15
E. 25
Ans: B

Q7. Experimenter A uses a test charge q_o and experimenter B uses a test charge $-2q_o$ to measure an electric field produced by stationary charges. A finds a field that is:

A. the same in both magnitude and direction as the field found by B
B. greater in magnitude than the field found by B
C. less in magnitude than the field found by B
D. opposite in direction to the field found by B
E. either greater or less than the field found by B, depending on the accelerations of the test charges
Ans: A

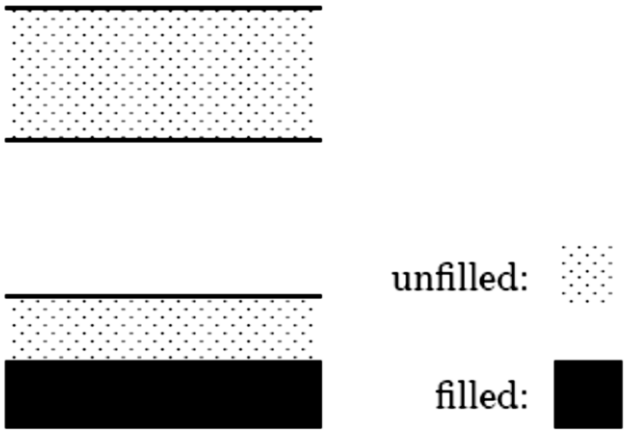
Q8. A battery is used to charge a series combination of two identical capacitors. If the potential difference across the battery terminals is V and total charge Q flows through the battery during the charging process then the charge on the positive plate of each capacitor and the potential difference across each capacitor are:

A. Q/2 and V/2, respectively
B. Q and V, respectively
C. Q/2 and V, respectively
D. Q and V/2, respectively
E. Q and 2V, respectively
Ans: D

Q9. A wire with a length of 150 m and a radius of 0.15 mm carries a current with a uniform current density of 2.8×10^7 A/m^2. The current is:

A. 0.63A^2
B. 2.0A
C. 5.9A^2
D. 296A
E. 400A^2
Ans: B

Q10. The energy level diagram shown applies to:



A. an insulator
B. a semiconductor
C. a conductor
D. an isolated molecule
E. an isolated atom
Ans: C

Answers Key

Q#	Set 1
1	E
2	B
3	A
4	D
5	E
6	B
7	A
8	D
9	B
10	C