

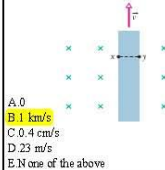
EXAM 4

Summary table for your attention. Exam 2 will be corrected to 100

class15				
Rnumber	Exam1	Exam2	Exam3	Exam4
R00151631	100	68	100	92
R00542746	34			
R00645753	100	100	100	84
R00755805	84	84	100	100
R00762970	68	68	100	70
R00766893	68	84	100	84
R00867387	84	68	100	68
R00867424	84	68	100	34
R00920841	100	84	100	100
R00945392	68	100	84	84
R01025253	100		100	50
R01045676	100	84	100	100
R01074223	36	36	34	68
R01074436	52	68	84	68
R01075399	84	100	100	100
R01077981	68	84	100	68
R01080567	84	84	100	100
R01084235	84	84	84	92
R01085510	84	68	100	84
R01085771	100	52	100	68
R01109294	68	84	100	70
R01113113	84	100	100	
R01128456	52	86	100	100
R01148464	84	100	100	84
R01148668	84	100	100	100
R01165984	68	84	100	86
R01174627	52	17	84	50
R01175146	84	100	100	100
R01175785		34	17	34
R01176443	84	100	100	100
R01178396	68	100	100	100
R01182017	84	68	68	
R01189420	68	100	100	100

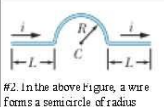
Summer 2015. Exam 4. QQ 1-3

#1. A copper strip 1 cm long, 1 mm wide, and 1 mm thick moves with velocity  $v$  in the magnetic field  $B = 1 \text{ mT}$ . A voltage 1 mV is measured between  $x$  and  $y$ . Calculate  $v$ .



A. 0  
**B. 1 km/s**  
 C. 0.4 cm/s  
 D. 23 m/s  
 E. None of the above

#2. In the above figure, a wire forms a semicircle of radius  $R = 1 \text{ cm}$  and two (radial) straight segments each of length  $L = 1 \text{ cm}$ . The wire carries current 1 A. What is the of the net magnetic field at the center of curvature  $C$ ?



A.  $31.4 \text{ mT}$   
 B.  $-1 \text{ T}$   
 C.  $0.01 \text{ T}$   
 D.  $-1.57 \text{ mT}$   
**E. None of the above**

#3. A solenoid 1 m long and 1 cm in diameter carries a current of 500 A. The magnetic field inside the solenoid is 0.1 T. Find the length of the wire forming the solenoid.

A. 12.56 m  
**B. 10 m**  
 C. 471 m  
 D. 29 cm  
 E. None of the above

Summer 2015. Exam 4. QQ 4-6

#4. The inductance of a closely packed coil of 400 turns is 8.0 mH. Calculate the magnetic flux through the coil when the current is 5.0 mA.

A. 40 Wb  
 B.  $0.1 \text{ Tm}^2$   
**C.  $0.1 \mu\text{Wb}$**   
 D. None of the above

#5. A charged capacitor and an inductor are connected at time  $t=0$ . After four and a quarter periods of the resulting oscillations, which of the following quantities reaches its maximum?

A. The emf of the inductor  
**B. Magnetic energy**  
**C. Magnetic flux through the inductor**  
 D. None of the above

#6. A 1 H superconducting inductor in an oscillating LC circuit with angular frequency  $1000 \text{ s}^{-1}$  carries maximum current 1 A. The maximum voltage on the capacitor is:

A. 120 V  
 B. 0.04 F  
**C. 1000 V**  
 D. Zero  
 E. None of the above

R01290875	84	100	84	70
R01309869	84		100	
R01314078	84	100	100	100
R01314409	84	100	84	100
R01344090	84	100	100	100
R01345745	84	100	84	100
R01348865	52	100	100	84
R01382754	52	84	84	80