60 + 10 + 10 = 80% B- Drops to 44/52 = 88.4% B+ avg.
I like 100% much better HW01

PHYSICS 242 EXAM 5,6dS12 PAGE 1 OF 2 NAME Tiffany Whitsett

AT THE RIGHT OF THE PAGE, FILL IN THE "o" OF THE BEST ANSWER, FOR EXAMPLE, d●.
>IF YOU DON'T KNOW IT, RULE OUT THE OBVIOUSLY WRONG ANSWERS AND THEN *GUESS*.<
$\sin 0 = \cos 90^\circ = \sin 180^\circ = 0$ and $\cos 0 = \sin 90^\circ = 1$ and $\cos 180^\circ = -1$

1. If you make a Nobel-prize winning discovery of a magnetic _____, $\oint \vec{B} \cdot d\vec{A}$ will no longer equal zero.

a) monopole b) field c) dipole d) field line ao bo co do 1.

2. A 0.03 m straight segment of wire carrying a current of 9 A is in a uniform external magnetic field of magnitude 0.08 T, which exerts a force of magnitude 0.02 N on the segment. Thus, 9 A is the value of ___.

a) v b) μ c) l d) I ao bo co do● 2.

3. In Question 2 above, 0.02 N is the value of ___.

a) F b) B c) l d) I ao bo co do 3.

4. A proton (charge = $+1.6 \times 10^{-19}$ C) moves toward the bottom (↓) at 7×10^7 m/s through an external 0.2 T magnetic field that is directed to the right (→). The magnitude of the magnetic force on the proton is _____.

a) $-\mu B \cos\phi$ b) $IlB \sin\phi$ c) $qvB \sin\phi$ d) $\mu B \sin\phi$ ao bo co● do 4.

5. In Problem 4 above, 7×10^7 m/s equals ____.

a) l b) μ c) I d) v ao bo co do● 5.

6. A uniform magnetic field makes an angle of 80° with a flat surface. Therefore, that magnetic field makes an angle of $90^\circ - 80^\circ = 10^\circ$ with the normal to the surface. The positive magnetic flux through the surface is _____.

a) $EA \sin\phi$ b) $B \cos\phi A$ c) $\dfrac{F}{|q|v \sin\phi}$ d) $\dfrac{F}{Il \sin\phi}$ ao bo● co do 6.

7. In Question 6 above, ϕ equals _____.

a) the flux b) 10° c) 80° d) 90° ao bo● co do 7. ✓

8. The magnitude of a magnetic dipole's magnetic dipole moment is 2 A·m^2. You place it in a uniform external magnetic field of magnitude 0.3 T with $\phi = 40^\circ$. Therefore, the magnetic potential energy is _____ J.

a) (2)(0.3) b) –(2)(0.3) c) (2)(0.3) sin 40° d) –(2)(0.3) cos 40° ao bo co do● 8. ✓

9. In Problem 8 above, the magnitude of the torque exerted on the magnetic dipole is _____ N·m.

a) (2)(0.3) b) –(2)(0.3) c) (2)(0.3) sin 40° d) –(2)(0.3) cos 40° ao bo co● do 9.

10. A flat coil has a magnetic dipole moment of magnitude 3 A·m^2 when it carries an 15 A current. The magnitude of its area is 0.004 m^2. Thus $\dfrac{3\ \text{A}\cdot\text{m}^2}{(15\ \text{A})(0.004\ \text{m}^2)}$ equals _____. $\frac{\mu}{IA}$

a) N b) I c) μ d) A ao● bo co do 10.

11. A magnetic dipole has a magnetic dipole moment that is to the right (→). You place it in external magnetic field that is into the paper (⊗). The direction of the resulting torque on the magnetic dipole is

a) right (→) b) toward the top (↑) c) undetermined d) into the paper (⊗) ao bo● co do 11.

12. For a negative ion, the direction of $\vec{v} \times \vec{B}$ is toward the bottom (↓). Therefore, the direction of the magnetic force on that negative ion is

a) left (←) b) toward the bottom (↓) c) toward the top (↑) d) into the paper (⊗) ao bo co● do 12.

13. The conducting loop is in the plane of the paper. It carries a clockwise current. The direction of both its magnetic dipole moment and its area vector is

a) out of the paper (⊙) b) toward the bottom (↓) c) into the paper (⊗) d) right (→) ao bo co● do 13.

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14. The equation we use for a certain type of coil is $B = \frac{\mu_0 NI}{2\pi r}$. The coil is a

DRILL SET

a) flat circular coil b) toroid c) solenoid d) hysteresis loop ao (bo) co do 14.

15. The coil in Problem 14 above is wound of wire of radius 0.0013 m. Each (almost) circular turn of the coil has a 0.0200 m average radius. In using the equation above to find B within the turns, $r =$ _____ m.

a) 0.0013 b) 0.0200 c) 0.0213 d) not given ao bo co do● 15.

16. In _____magnetism, adjacent atomic magnetic dipoles line up in strong parallelism in regions called _____.

a) Biot, Savarts
b) dia, hysteresis loops
c) ferro, magnetic domains
d) para, magnetization curves
ao bo co● do 16.

17. A long straight wire has a radius of 0.002 m. We want to find B at a distance of 0.005 m from its center, that is, 0.003 m to its surface. Therefore, we should use $B =$

r

a) $\frac{\mu_0 I}{2r}$ b) $\frac{\mu_0 I}{2\pi r}$ c) $\frac{\mu_0 NI}{2\pi r}(N > 1)$ d) $\frac{\mu_0 NI}{2r}(N > 1)$ ao bo● co do 17.

18. In Problem 17 above, r equals _____ m.

DRILL SET

a) not given b) 0.005 c) 0.003 d) 0.002 ao (bo) co do● 18.

19. At the center of a coil of radius 0.013 meter and length 0.80 meter, $B = \mu_0 nI$. The current in the coil is 2.5 A. The coil has 480 turns and 600 turns per meter. The coil is a

DRILL SET

a) flat circular coil b) toroid c) solenoid d) hysteresis loop ao bo (co) do 19.

20. In Problem 19 above, $\mu_0 =$ _____ T·m/A.

a) 8.988×10^9 b) NIA c) 8.854×10^{-12} d) $4\pi \times 10^{-7}$ ao bo co do● 20.

21. In Problem 19 above, $n =$ _____.

DRILL SET

a) 600 m^{-1} b) 480 c) $\frac{480 \text{ turns}}{0.013 \text{ m}}$ d) 0.013 × 600 (ao) bo co● do 21.

22. On the axis of a coil, 0.60 m from its center, $B = \frac{\mu_0 NIa^2}{2(x^2 + a^2)^{3/2}}$. The coil has 88 turns, a radius of 0.45 m, and carries a current of 2.5 A. The coil is a

a) flat circular coil b) toroid c) solenoid d) hysteresis loop ao● bo co do 22.

23. In Problem 22 above, $a =$ _____.

a) 2.5 A b) ± 0.60 m c) (0.60 – 0.45) m d) 0.45 m ao bo co do● 23.

24. The negative charge shown causes a magnetic field by moving left (←). At point P, directly ahead of the moving charge, the magnitude of that magnetic field _____ because $\phi =$ _____ there.

P· ←⊖

a) equals zero, 0°
b) has its maximum, 180°
c) is undetermined, is undetermined
d) has its maximum, 90°
(ao) bo co do 24.

25. The current in a long straight wire is toward the top (↑). Point P is directly to the right of the center of the wire in the plane of the paper. The direction of the magnetic field at point P is

↑ • P

a) right (→) b) into the paper (⊗) c) out of the paper (⊙) d) toward the top (↑) ao (bo) co do 25.

26. A current flows to the right (→) in an infinitesimal wire segment dl as shown. Point P and the wire segment are both in the plane of the paper. For this segment and point P, the unit vector $\hat{r}$ in the law of Biot and Savart has a direction of

dl →
• P

a) left (←) b) toward the top (↑) c) toward the bottom (↓) d) right (→) ao● bo (co) do 26.

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