

Addis ketema Subcity

physics model exam for grade 12 in 2012E.C

- Which one of the following experimental errors can be reduced by taking repeated measurements?
A. Parallel errors B. systematic errors C. Random errors D. Zeros errors
- The vector $2\mathbf{i} + \mathbf{j} + \mathbf{k}$ is perpendicular to $\mathbf{i} - 4\mathbf{j} + \mathbf{k}$. If A is equal to.
A. 0 B. -1 C. 2 D. 3
- If $\mathbf{A} = 8\mathbf{i} + \mathbf{j} - 2\mathbf{k}$ and $\mathbf{B} = 5\mathbf{i} - 3\mathbf{j} + \mathbf{k}$, then. What is the value of $\vec{B} \times \vec{A}$?
A. $3\mathbf{i} + 4\mathbf{j} - 3\mathbf{k}$ B. $-3\mathbf{i} - 4\mathbf{j} + 3\mathbf{k}$ C. $-5\mathbf{i} - 18\mathbf{j} - 29\mathbf{k}$ D. $5\mathbf{i} + 18\mathbf{j} + 29\mathbf{k}$
- Suppose $\mathbf{A} = 3\mathbf{i} - 2\mathbf{j}$ $\mathbf{B} = -\mathbf{i} - 4\mathbf{j}$ and vector $\vec{C}$ is in the xy plane with the property $\mathbf{A} + \mathbf{B} - \mathbf{C} = 0$ which of the following is a unit vector along $\vec{C}$?
A. $2\mathbf{i} - 6\mathbf{j}$ B. $-2\mathbf{i} + 6\mathbf{j}$ C. $\frac{1}{\sqrt{10}}\mathbf{i} + \frac{6}{\sqrt{10}}\mathbf{j}$ D. $\frac{1}{\sqrt{10}}\mathbf{i} - \frac{3}{\sqrt{10}}\mathbf{j}$
- A ball is thrown vertically up ward with the speed of 25m/s. what is total time taken?
[take $g = 10\text{m/s}^2$]
A. 10sec. B. 2sec. C. 15sec. D. 5sec.
- A particle is moving with uniform acceleration along a straight line, the average velocity of the particle from **P** to **Q** is **8m/s** and that from **Q** to **S** is **12m/s**, if **QS=PQ**, the average velocity from **P** to **S** is
A. 9.6 m/s
B. 12.87 m/s
C. 64 m/s
D. 327 m/s


- A body is rotated with a uniform speed in a circle of radius 1m, what is the centripetal acceleration in m/s^2 if it completes 4 revolutions in 2seconds.
A. 36m/s^2 B. 16m/s^2 C. 4m/s^2 D. 4m/s
- A mass of 4kg falls on the floor with the velocity of $[4, -9]\text{m/s}$. it bounces off the floor with a velocity of $[4, 9]\text{m/s}$. what is impulse?
A. 62kgm/s B. 82kgm/s C. 64kgm/s D. 72kgm/s

9. what is the initial speed would foo ball need in order to travel by 40m horizontally if it kicked at an angle of 45^0 above the horizontal ground? [take $g=10\text{m/s}^2$]
- A. 4m/s B. 20m/s C.24.5m/s D. 400m/s^2 E. None
10. _____ is an object that has been launched into the air by the action of a force?
- A. Trajectory B. Projectile C. Dynamics D. Kinematics
11. A bus of mass 1200kg goes round a corner radius 50m at a speed of 10m/s. what is the force?
- A. 2400N B. 3000N C. 1200N D.600N
12. _____ is a collision in two dimension where the objects rebound in the same plane but not necessary in the same direction as the original path.
- A. Head on collision B. Glancing collision C. Elastic collision D. None
13. A body of a mass 10kg is moving with a velocity of 4m/s. if the force of 20N is applied on the body. What will be its velocity after 4 second?
- A. 12m/s B. 8m/s C. 16m/s D. 4m/s
14. If the position of body is given by $s(t) = 3t + 4t^2 + t^3$, what is the instantaneous velocity at $t=2\text{sec}$.
- A. 37m/s B. 41m/s C. 31m/s D. 48m/s
15. Which one of the following is correct about the force
- A. Something that can change the speed.
- B. That can change the direction of movement body.
- C. Can act in any direction
- D. Can changing the shape & size of a body. E. All are the answer
16. A projectile is fired at 60^0 with the horizontal, at the highest point of its path the vertical component of its velocity is momentarily zero, what is the magnitude of its acceleration at this point,
- A. 20m/s^2 B. 10m/s^2 C. 5m/s^2 D. 0 m/s^2
17. The coordinate of a particle in meters is given by $x(t) = 25t - 3t^3$, where the time t is in second, at what value of t will the particle become momentarily at rest,
- A. 2.78s B. 1.67 se C. 0.6se D. 0.36se
18. A very large open tank is full of oil whose density is 800kg/m^3 , if the absolute pressure at the bottom of the tank is $1.81 \times 10^5 \text{pa}$, than what is the depth of the oil?

Given $P_{\text{atm}} = 1.01 \times 10^5 \text{ pa}$, $g = 10 \text{ m/s}^2$

- A. 100m B. 75m C. 10m D. 95 m

19. A 2kg object experiences two concurrent force of 100 N at 30° above the positive x-axis and 80N at 60° above the negative x- axis, what is the magnitude of acceleration of the object?

- A. 68 m/s^2 B. 64 m/s^2 C. 48 m/s^2 D. 46 m/s^2

20. What does the slope of a velocity – time graph represents?

- A. Distance C. displacement
B. A acceleration D. speed

21. A body is rotated with a uniform speed in a circle of radius 1m, what is the centripetal acceleration in m/s^2 if it completes 12 rotations in 3seconds.

- A. 36 m/s^2 B. 16 m/s^2 C. 4 m/s^2 D. 4 m/s

22. Uniform circular motion is a:

- A. Motion with constant velocity
B. Motion in one dimension
C. Motion with acceleration of constant magnitude
D. Motion in which net force is constant

23. The necessary and sufficient condition for a rigid body to be in equilibrium is the sum of:-

- A. All torques acting on it is zero
B. All forces acting on it should be zero
C. All forces should be equal in magnitude but opposite in direction to the sum of all torques acting on it,
D. All force and the sum of all for fuse should be

24. An object in equilibrium must not have.

- A. Acceleration C. any torques acting on it
B. Any force acting on it D. all of the above
E. none of the above

25. when a force acts on an object reducing a stress on the object the resulting strain is the

- A. relative change in its dimensions
B. the applied force per unit area
C. the bulk modulus

D. the ultimate strength of the material

26. Young's Modulus is the

- A. ratio of stress to strain C. ratio of strain to stress
B. force per unit area D. force per unit elongation

27. A charge of $4\mu\text{C}$ placed in an electric field experience a force of 0.16N . what is the magnitude of the electric field strength

- A. $3.8 \times 10^4 \text{ N/C}$ B. $2 \times 10^8 \text{ N/C}$ C. $4 \times 10^4 \text{ N/C}$ D. $4.2 \times 10^4 \text{ N/C}$

28. Which one of the following statement is true about both electrostatics force and gravitational force?

- A. Electro static force is stronger than gravitation force
B. Electro static force is attractive while gravitational force is repulsive
C. Both force are attractive force D. all except C

29. What is the capacitance of parallel plate capacitor whose plate area of each plate 1 cm^2 and 1mm apart in air (take $\epsilon_0 = 8.85 \times 10^{-12} \text{ F/M}$)

- A. $26 \times 10^{-13} \text{ F}$ B. $14.25 \times 10^{-13} \text{ F}$ C. $8.85 \times 10^{-13} \text{ F}$ D. $6.43 \times 10^{-13} \text{ F}$

30. Which of the following statement is false about charges?

- A. Charges are always conserved
B. Like charges attract each other
C. Charges are quantized
D. A charge can be positive or negative

31. The electric field strength inside a hollow sphere is

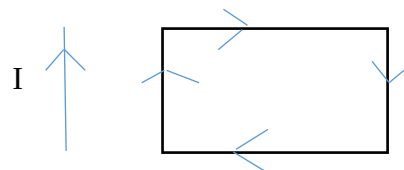
- A. Maximum B. minimum C. zero D. unpredictable

32. What will happen to the charge stored in a parallel plate capacitor when a dielectric slab is placed between the plates

- A. Increase B. decrease C. unchanged D. zero

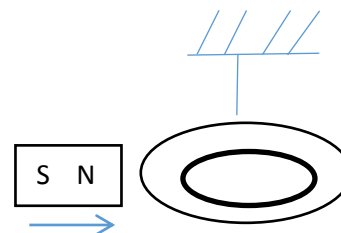
33. An ion accelerated through a potential difference of 115V experience an increase in kinetic energy of $7.37 \times 10^{-17} \text{ J}$. what is the charge on the ion?

- A. $6.41 \times 10^{-19} \text{ C}$ B. $2.32 \times 10^{-15} \text{ C}$ C. $4.51 \times 10^{-15} \text{ C}$ D. $2 \times 10^{-21} \text{ C}$
34. Moving $2.5 \times 10^{-6} \text{ C}$ of charge from point A to point B in an electric field requires $6.3 \times 10^{-4} \text{ J}$ work the potential difference b/n point A and B is approximately
 A. $4 \times 10^{-3} \text{ V}$ B. $2.5 \times 10^{-2} \text{ V}$ C. $1.6 \times 10^{-19} \text{ V}$ D. $1 \times 10^{-14} \text{ V}$
35. The resistance of an ohm's conductor is independent of
 A. The size of the material C. the temperature
 B. The nature of the material D. none
36. Two copper wires have equal length but the diameter of one is three times that of the other. What is the ratio of the resistance of the thicker wire to the thinner wire?
 A. 1:3 B. 3:1 C. 1:9 D. 9:1
37. An electron is projected at right angle in to a uniform magnetic field of 1.2 T with a velocity of $5 \times 10^7 \text{ m/s}$. what is the magnitude of magnetic force on the electron. ($e = 1.6 \times 10^{-19} \text{ C}$)
 A. $3.6 \times 10^{12} \text{ N}$ B. $7.2 \times 10^{-12} \text{ N}$ C. $4.8 \times 10^{-12} \text{ N}$ D. $9.6 \times 10^{-12} \text{ N}$
38. A rectangular loop carrying a current is situated near a long straight wire such that the wire is parallel to one of the side of the loop and it is in a plane of the loop. If a steady current is established in the wire as shown the loop will.
 A. Remain stationary
 B. Move toward the wire
 C. Move away from the wire
 D. Rotate about an axis parallel to the wire



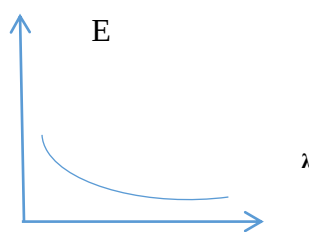
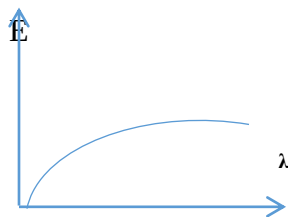
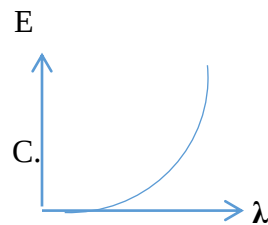
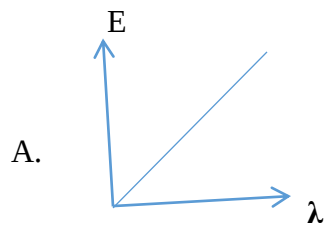
39. What is the change in magnetic flux in a coil of area 5 m^2 as its orientation relative to the perpendicular of a uniform 3.0 T magnetic field changes from 45° to 90° ?
 A. 0 wb B. -11 wb C. 7.5 wb D. 11wb
40. A small radio receiver uses a battery that delivers a constant current of 25 A for 3 second. Calculate the total charge delivered by the battery
 A. 75C B. 57C C. 25C D. 45C
41. A particle of mass m is fired in to a magnetic field of strength B at a speed V . the particle travels in a circular path inside the field with radius r . which of the following expression gives the magnitude of the charge on the particle?
 A. $\frac{mr}{vB}$ B. $\frac{mv^2}{Br}$ C. $\frac{VB}{mr}$ D. $\frac{mv}{Br}$
42. What is the magnetic field strength of a toroid of radius 10 cm with 2500 loops per unit length when a current of 4 A . flows a through each loop
 A. 0.1 T B. 0.02 T C. 0.03 T D. 0.04 T

43. A copper ring is suspended by a thread in vertical plane, the north pole of a magnet is brought near the ring in horizontal direction, what will be the effect on the ring?
 A. Ring will be attracted to wards the magnet
 B. Ring will be repelled away



- C. Ring will be make simple harmonic motion
- D. No change in the position of ring

44. The voltage output of a generator is given by $v = (300\text{V}) \sin(\omega t)$, what is the rms current in the circuit when this generator is connected to a $100\text{-}\Omega$ resistor?
- A. 1.50 A
 - B. 2.12 A
 - C. 1.12 A
 - D. 1.41 A
45. Which devices function with the principle of mutual induction?
- A. Electromagnet
 - B. Transformer
 - C. electro motor
 - D. transistor
46. A capacitance $C = 2\text{ }\mu\text{F}$ and inductance $L = 10\text{H}$ and coil resistance 5Ω are in series in a circuit, when an alternating current of 2A rms flows. The power in watts in the circuit is
- A. 100
 - B. 50
 - C. 20
 - D. 2
47. The photoelectric effect is based on the conservation of
- A. Mass
 - B. Energy
 - C. momentum
 - D. angular momentum
48. Light of frequency f is incident on a substance of threshold frequency $f_0 (f_0 < f)$. the energy of the emitted photo –electron will be.
- A. $h(f-f_0)$
 - B. h/f
 - C. $h(f_0-f)$
 - D. h/f_0
49. Which graph shows how the energy E of a photon of light is related to its wave length λ ?



50. the work function for aluminum is 4.125 eV, the cut-off wavelength for photo electric effect for aluminum is

A. 300nm

C. 200nm

B. 420nm

D. 150 nm