

YEKA SUB CITY PHYSICS MODEL EXAMINATION FOR GRADE 10
GINBOT 2011E.C/MAY 2019

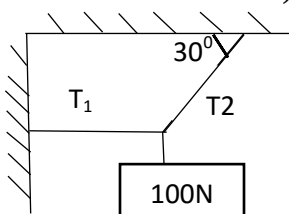
Number of items: 45

Time Allowed: 1.30hours

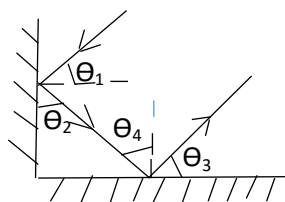
Directions: each of the following questions is followed by four possible alternatives. Read each question carefully and blacken the letter of your choice on the separate answer sheet provided.

7. From the diagram given below, find the value of T_2 if the block is at equilibrium.

($\sin 30^\circ = 0.5$ and $\cos 30^\circ = 0.866$)



- A. 50N
B. 200N
C. 20N
D. 100N
8. Which of the following law tells about the direction of flow of induced current in a coil?
- A. Faraday's law
B. Lenz's law
C. Ohm's law
D. Kepler's law
9. Which of the following is correct?



- A. $\theta_1 = \theta_2$
B. $\theta_1 = \theta_4$
C. $\theta_2 = \theta_3$
D. $\theta_2 = \theta_4$
10. Which one of the following is not correct about simple machine?
- A. It multiplies speed.
B. It multiplies energy.
C. It multiplies force.
D. It multiplies distance.
11. Which one of the following is not correct about charge distribution on a spherical conductor?
- A. There is no charge inside a spherical conductor.
B. There is no electric field inside a spherical conductor.
C. There is no net charge at the outer surface of the spherical conductor.
D. Electric field lines are perpendicular to the outer surface of the spherical conductor.
12. An iron rod A is heated from 15°C to 50°C and iron rod B is heated up from 20°C to 60°C . If the original length of rods A and B is equal, which one of the following is the reason for the change in the lengths of A and B?
- A. The difference in the final temperatures of the rod.
B. The difference in the change in temperatures of the rod.
C. The difference in the coefficient of linear expansion of the rod.
D. The difference in the initial temperatures of the rod.

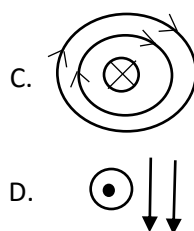
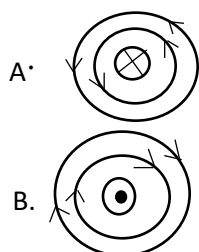
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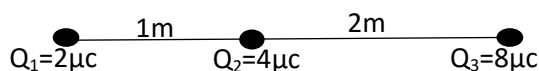
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13. A bat flying in a cave emits sound wave and receives its echo 4 seconds later. How far is the cave wall? (the speed of sound = 340m/s)
A. 1360 m
B. 85 m
C. 680 m
D. 340 m
14. Which one of the following is the total resistance of two identical resistors connected in parallel, if they are connected in series their total resistance is 4 Ω ?
A. 4 Ω
B. 1 Ω
C. 6 Ω
D. 3 Ω
15. The x and y- component of two vectors in the same plane are $A_x = 5$ units, $A_y = 2$ units, $B_x = 3$ units and $B_y = 4$ units respectively. Which one is the resultant of vectors **A** and **B**?
A. 14
B. 8
C. 10
D. 6
16. Which one of the following is correct? ($\otimes$ current in to the page
 $\odot$ Current out of the page)



17. A person standing in a moving car tends to fall forward when the car suddenly stops. This law is due to
A. Law of inertia
B. Newton's third law
C. Newton's second law
D. Law of acceleration
18. Which of the following is correct when we reduce friction of a machine by adding oil?
A. The mechanical advantage of a machine do not change.
B. The velocity ratio of a machine changes.
C. The mechanical advantage of a machine decreases.
D. The mechanical advantage of a machine increases.
19. Three charges $2\mu\text{C}$, $4\mu\text{C}$ and $8\mu\text{C}$ are placed in a straight line with 1m and 2m apart as shown in the figure below.



What is the force exerted on Q_2 by Q_1 and Q_3 ? (use $k = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$)

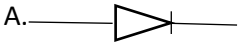
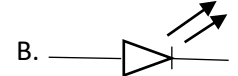
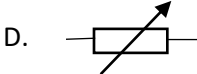
- A. $7.2 \times 10^{-2} \text{ N}$ to the right
B. 0
C. $7.2 \times 10^{-2} \text{ N}$ to the left
D. $8 \times 10^{-3} \text{ N}$ to the right

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20. If system A is in thermal equilibrium with system B and system B is in thermal equilibrium with system C, which one of the following is not correct?
- A. System A is at higher temperature than C.
 - B. System B is at the same temperature with C.
 - C. System A is at the same temperature with C.
 - D. System B is at the same temperature with A.
21. Which one of the following is the nature of an image formed by a concave mirror if the object is placed between focal point and vertex?
- A. Real
 - B. Inverted
 - C. Virtual
 - D. Diminished
22. An object is placed 30cm from a concave mirror whose radius of curvature is 40cm. At what distance the image is formed and what type of image is it?
- A. 60cm, real
 - B. -120cm, inverted
 - C. 60cm, virtual
 - D. 12cm, real
23. Which one of the following is not the effect of force?
- A. Change of momentum
 - B. Deformation
 - C. Change of mass
 - D. Change of velocity
24. Which one of the following circuit symbol represents diode?
- A. 
 - B. 
 - C. 
 - D. 
25. Which one of the following is true about waves?
- A. Electromagnetic waves can travel in both vacuum and material.
 - B. Mechanical waves can travel only in vacuum.
 - C. Mechanical waves can travel in both vacuum and material.
 - D. Electromagnetic waves can travel only in vacuum.
26. Which one of the following is the measure of the distribution of mass of an object that relates to its axis of rotation?
- A. Angular momentum
 - B. Angular velocity
 - C. Torque
 - D. Moment of inertia

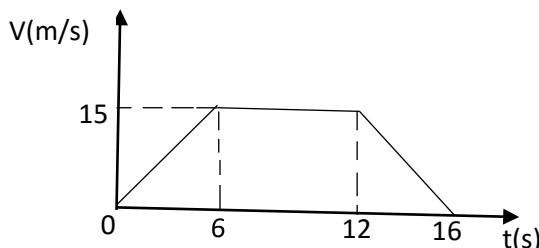
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27. The diagram shown below is a velocity- time graph for a car moving in a straight line.



What is the displacement of the car up to 12 seconds?

- | | |
|----------|----------|
| A. 135 m | C. 120 m |
| B. 185 m | D. 180 m |
28. Which one of the following negatively affects resistance of a conductor?
- | | |
|----------------|----------------|
| A. Length | C. Area |
| B. Temperature | D. Resistivity |
29. In which type of motion the average velocity is the same as instantaneous velocity?
- | | |
|---------------------------------|--------------------|
| A. Uniformly accelerated motion | C. circular motion |
| B. Two dimensional motion | D. Uniform motion |
30. The number of turns in the primary and secondary coils of the transformer are 100 and 4000 respectively. If the input voltage across the first coil is 20v, what is the output voltage?
- | | |
|----------|----------|
| A. 1000v | C. 2000v |
| B. 40v | D. 800v |
31. Which one of the following is not correct about Centre of mass?
- A. All objects have Centre of mass.
- B. The Centre of mass of non-uniform objects is at the intersection of their lines of symmetry.
- C. The Centre of mass of uniform objects is at the intersection of their lines of symmetry.
- D. The Centre of mass of irregular shaped objects will be outside the object.
32. Which one of the following semiconductor devices used as a switch and amplifier?
- | | |
|---------------|---------------|
| A. LDR | C. Thermistor |
| B. Transistor | D. Motor |
33. Which one of the following statement is true about Newton's third law of motion?
- A. Action and reaction forces can takes place on a single body.
- B. The third law of Newton gives two pairs of forces of unequal magnitude.
- C. The gravitational force between two masses does not form action-reaction forces.
- D. Action and reaction forces can never takes place on a single body.

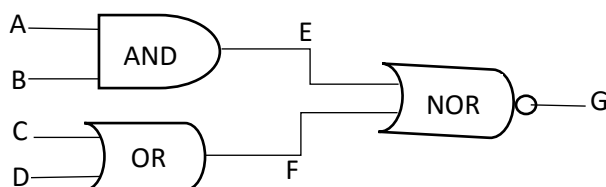
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34. An object 5 cm high is placed 60 cm in front of a converging lens having focal length 20 cm. Which one is the value of magnification?
A. 2
B. 0.5
C. 3
D. 6
35. Which one of the following cannot pass through vacuum?
A. X-rays
B. Sound waves
C. Infrared rays
D. Ultraviolet rays
36. Which one of the following is the effective capacitance of two capacitors C_1 and C_2 if they are connected in series?
A. $C_1 + C_2$
B. $\frac{C_1 + C_2}{C_1 C_2}$
C. $\frac{C_1 C_2}{C_1 + C_2}$
D. $C_1 - C_2$
37. The electric potential at a point A is 10 v and at a point B is 30 v. How much work is done by an external force in a moving charge from point A to B? ($q = 1.6 \times 10^{-19} \text{ C}$)
A. $1.6 \times 10^{-18} \text{ J}$
B. $4.8 \times 10^{-18} \text{ J}$
C. $6.4 \times 10^{-18} \text{ J}$
D. $3.2 \times 10^{-18} \text{ J}$
38. Which one of the following is true when the index of refraction of a medium decreases?
A. The frequency of light increases.
B. The speed of light decreases.
C. The wavelength of light increases.
D. The frequency of light decreases.
39. When a current carrying wire is grasped by the right hand the thumb points in the direction of
A. Current
B. Force
C. Magnetic field
D. Electric field
40. The following diagram shows logic gates.



If the inputs A, B and C are all 1 and at point D the input is 0. What will be the output of F and G respectively?

- A. 1, 0
B. 0, 1
C. 1, 1
D. 0, 0

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41. A boy of mass 50 kg is standing on a lift moving down with an acceleration of 10 m/s^2 .

Which of the following is the apparent weight of a boy? ($g=10 \text{ m/s}^2$)

A. 500 N

C. 1000 N

B. 0

D. 250 N

42. Which of the following is constant when an object oscillates left to right?

A. Kinetic energy

C. Mechanical energy

B. Potential energy

D. Elastic potential energy

43. Which one of the following is correct about Archimedes principle?

A. The weight of displaced fluid is equal to the buoyant force acting on the immersed object.

B. The weight of displaced fluid is equal to the weight of the immersed object.

C. The weight of displaced fluid is equal to the apparent weight of the object.

D. The weight of displaced fluid is always greater than the buoyant force acting on the object.

44. A water tank puts at the top of our house. Because

A. To decrease the pressure of water.

B. To make the pressure constant.

C. To increase the pressure of water.

D. To increase density of water.

45. What mass can be lifted by a hydraulic press if the area of a small piston is 50 cm^2 , the area of a large piston is 150 cm^2 and the force acting on the small piston is 500 N?

($g= 10 \text{ m/s}^2$)

A. 1500 kg

C. 15000kg

B. 150 kg

D. 150 N