

AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XII EXAMINATION

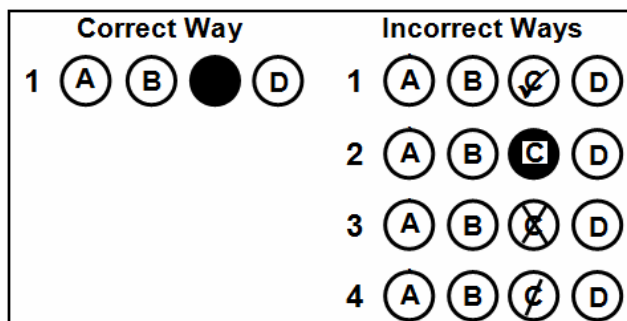
MAY 2012

Physics Paper I

Time allowed: 40 minutes Marks 30

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 30 only.
4. In each question there are four choices A, B, C, D. Choose ONE. On the answer grid black out the circle for your choice with a pencil as shown below.



Candidate's Signature

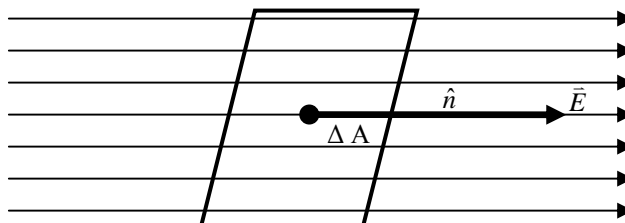
5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a scientific calculator if you wish.

1. Which of the following statements is NOT correct for Coulomb's force?

- A. It depends upon mass.
- B. It is medium dependent.
- C. It is proportional to charges.
- D. It may be attractive or repulsive.

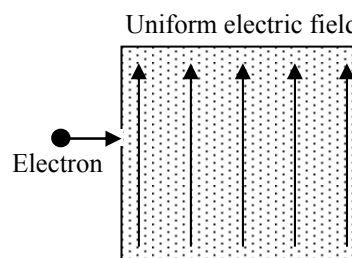
2. In the given figure, the maximum flux is passing through the given area. At what angle will the flux be half of maximum?

- A. 30°
- B. 45°
- C. 60°
- D. 90°



3. An electron travelling horizontally enters a region where a uniform electric field is directed upward as shown in the given figure. What will be the direction of the force exerted on the electron when it enters into the field?

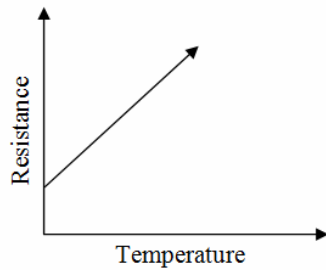
- A. Upward
- B. To the left
- C. Downward
- D. To the right



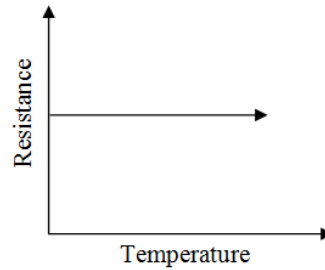
4. If a dielectric is inserted between the plates of a charged capacitor, then its capacitance

- A. increases.
- B. decreases.
- C. remains the same.
- D. first increases and then decreases.

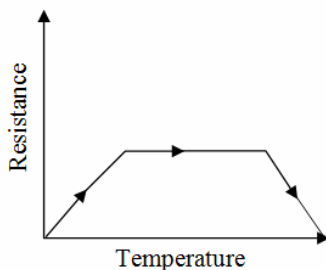
5. Which of the following graphs shows the relation between the temperature and the resistance of a metallic conductor?



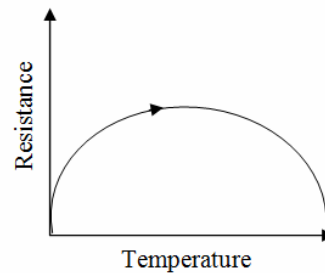
(A)



(B)



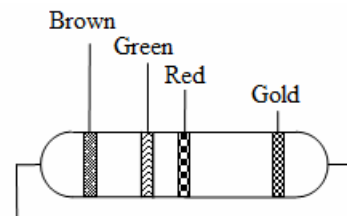
(C)



(D)

6. In the given figure of a resistor, the value of carbon resistance is

- A. $360 \pm 5 \Omega$
- B. $970 \pm 5 \Omega$
- C. $1500 \pm 5 \Omega$
- D. $2800 \pm 5 \Omega$



7. Heat generated by a 40 watts bulb in one hour is

- A. 480 J.
- B. 4800 J.
- C. 14400 J.
- D. 144000 J.

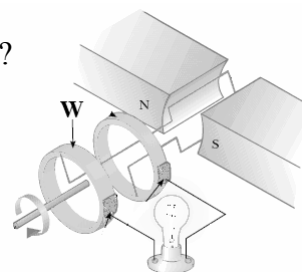
8. In a wire wound core, if the current increases through the coil, then

- A. flux lines reverse.
- B. flux density increases.
- C. flux density decreases.
- D. flux lines follow the current.

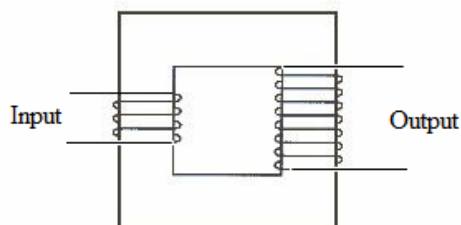
9. All of the following factors depend upon the force that acts on a current carrying conductor placed in a magnetic field EXCEPT
- A. length
 - B. current
 - C. electric field
 - D. magnetic field

10. When a shunt is connected parallel with a galvanometer, it is converted into
- A. a voltmeter.
 - B. an ammeter.
 - C. an ohmmeter.
 - D. a photometer.

11. Which of the following in the given figure is labelled as 'W'?
- A. Loop
 - B. Slip ring
 - C. Split ring
 - D. Commutator



12. Consider the following diagram of a working transformer.

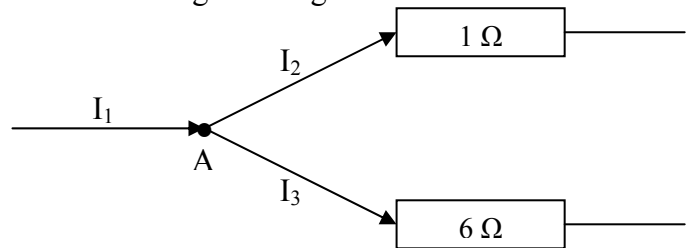


Which statement is correct about the transformer?

- A. Input voltage is equal to output voltage.
 - B. Input voltage is less than output voltage.
 - C. Input power is greater than output power.
 - D. Input voltage is greater than output voltage.
13. Which of the following transformers converts 220 V into 9 V?
- A. An ideal transformer
 - B. A step up transformer
 - C. A step down transformer
 - D. An automatic transformer

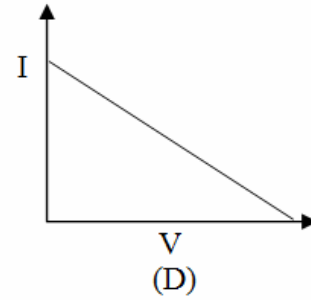
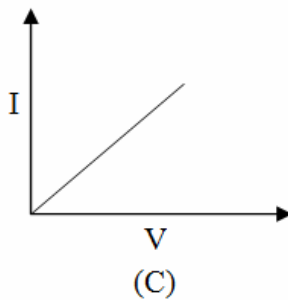
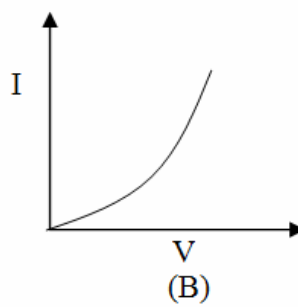
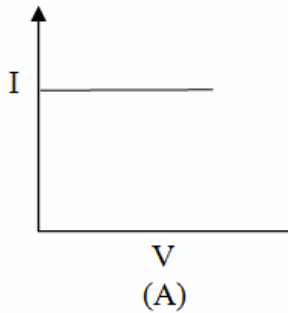
14. The impedance in a series LC circuit at resonance is
- A. zero.
 - B. infinite.
 - C. maximum.
 - D. minimum.

15. Which of the following statements is correct for the given diagram?



- A. I_2 is smaller than I_3 and I_1 .
 - B. I_3 is smaller than I_2 and I_1 .
 - C. I_2 is smaller than I_1 but bigger than I_3 .
 - D. I_2 is smaller than I_3 but bigger than I_1 .
16. All of the following are uses of metal detectors EXCEPT
- A. locating buried objects.
 - B. calculating the depth of oceans.
 - C. detecting objects for security purposes.
 - D. finding concealed weapons and bombs.
17. Which of the following has the lowest value of Young's modulus?
- A. Steel
 - B. Glass
 - C. Copper
 - D. Rubber
18. The ratio of tensile stress to tensile strain is called
- A. Bulk modulus.
 - B. Shear modulus.
 - C. Young modulus.
 - D. Modulus of electricity.

19. Which of the given graphs shows the relation of voltage and current in a diode?



20. Photodiodes are used in all of the following EXCEPT

- A. transistors.
- B. optical fibre.
- C. logic circuits.
- D. automatic switching.

21. Which of the following logic gates is used to amplify and invert the resulting combined signal?

- A. Diode
- B. Buffer
- C. Resistor-Diode
- D. Resistor-Transistor

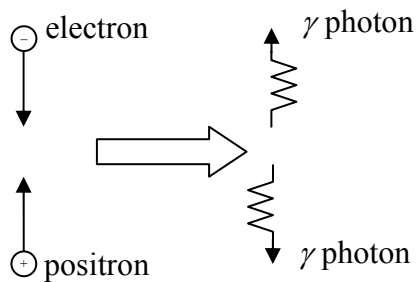
22. A frame of reference which remains at rest or moves with uniform velocity is called

- A. an inertial frame of reference.
- B. an uniform frame of reference.
- C. a non-inertial frame of reference.
- D. a non-uniform frame of reference.

23. The result obtained by interaction of γ -rays photons with a nuclear field is

- A. Compton effect.
- B. pair production.
- C. photo-electric effect.
- D. annihilation of matter.

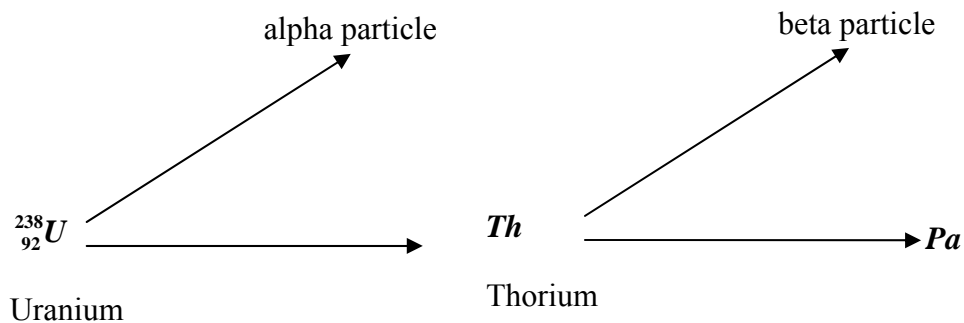
24. Which of the following phenomena is occurring in the given figure?



- A. Pair production
 B. Compton effect
 C. Pair annihilation
 D. Photoelectric effect
25. The wavelength of the spectral lines in the hydrogen atom's emission and absorption spectra are predicted by
- A. Rutherford's model.
 B. Maxwell's model.
 C. Dalton's model.
 D. Bohr's model.
26. Paschen series is obtained due to the transition of an electron in a hydrogen atom from any excited state to the
- A. fifth state.
 B. third state.
 C. second state.
 D. ground state.
27. The work done in emitting the electron from an atom or from a molecule is
- A. ionization energy.
 B. excitation energy.
 C. excitation potential.
 D. ionization potential.
28. The mass-energy equivalence equation is $E=mc^2$.
- What is represented by the symbol c in this equation?
- A. Critical angle
 B. Speed of a neutron
 C. Speed of light in a vacuum
 D. Specific heat capacity of the material

PLEASE TURN OVER THE PAGE

29. The Uranium nucleus ${}^{238}_{92}\text{U}$ emits an alpha-particle to become thorium, which then emits a beta-particle to become protactinium. What is the proton number (atomic number) of protactinium?



- A. 89
B. 90
C. 91
D. 95
30. Cosmic radiations come from
- A. radioactive material.
B. the earth's crust.
C. nuclear stations.
D. outer space.