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ARAB REPUBLIC OF EGYPT

Ministry of Education and Technical Education

General Secondary Education Certificate Examination – First Session 2022

Third Year Secondary

Physics **Time: 3 hours**

الفيزياء بالإنجليزية (الدور الأول ٢٠٢٢) (الإجابة فى نفس كراسة الأسئلة)

(الأسئلة فى احد عشر صفحة)

Answer the following questions:

Group one: Questions from (1 - 9)

1) Answer (A) or (B):

(A) Choose the correct answer:

The induced currents in the metallic cores of coils which are connected to a source of alternating current are called……..

1) Direct currents 2) Eddy currents 3) Rectified currents

(B) Choose the correct answer:

The measuring unit of the self-induction coefficient of a coil is the……

1) Webber 2) Tesla 3) Henry

2) Answer (A) or (B):

(A) Write down the scientific term for the following:

"The scale deflection per unit current intensity passing through the coil of galvanometer"

……..

B) Write down the scientific term for the following:

"The magnetic flux density, which will exert a force of one Newton on a current carrying wire of one meter length perpendicular to the field when the current is one Ampere"

……..

3) Answer (A) or (B):

(A) Choose the correct answer:

If the self-induction coefficient of a coil equals 0.2 H, and the rate of change in The intensity of the electric current passing through the coil equals 40A/s then the magnitude of the induced e.m.f. in the coil equals ……

1) 8 Volts **2) 6 Volts** **3) 4 Volts**

(بقية الأسئلة فى الصفحة الثانية)

B) Choose the correct answer:

If the rate of change in the intensity of the electric current passing through a coil equals 20 A/s., An electromotive force of 5 Volts is induced in the neighboring coil so that the mutual induction coefficient between the two coils is.....

1) 0.15H **2) 0.25H** **3) 0.35H**

4) Choose the correct answer:

The magnetic flux density at the center of a spiral coil carrying an electric current can be calculated from the relation .....

1) $\frac{\mu NI}{2r}$ **2)** $\frac{\mu I}{2\pi d}$ **3)** $\frac{\mu NI}{L}$

5) Choose the correct answer:

The direction of the electric current passing through the coil of direct current motor is changed During rotation each ..... From the perpendicular position.

1) One complete cycle. **2) Half cycle.** **3) Quarter cycle.**

6) Choose the correct answer:

Four similar resistors each of (8Ω) are connected in parallel with an electric cell of negligible internal resistance so that the total resistance of the circuit is.....

1) 8Ω **2) 4Ω** **3) 2Ω**

7) Choose the correct answer:

Two straight parallel wires each of length (1m), the perpendicular distance between them equals (1m), the first wire carries an electric current of(1A) and the second wire carries an electric current of (1A) so that the magnitude of the mutual force between the two wires is .....

1) 5×10^{-6} **N** **2)** 5×10^{-7} **N** **3)** 2×10^{-7} **N**

8) Choose the correct answer:

The step down transformer causes.....

1) the increase in the intensity of current and decreasing the potential difference.

2) the decrease in the potential difference and the constancy of the current intensity.

3) the increase in the potential difference and decreasing the current intensity.

(بقية الأسئلة فى الصفحة الثالثة)

9) Choose the correct answer:

A photon has a momentum 1.75 X 10^{-27} Kg.m/s., fell on a certain surface causing a force of 7 X 10^{-7} N. Then the time rate of the incident photons is.....

1) 4X10^{-17} photon/s.

2) 3X10^{-20} photon/s.

3) 2X10^{-20} photon /s.

Group two: Questions from (10 – 18)

10) Answer (A) or (B):

A) Write down the scientific term for the following:

"**The** opposition of the conductor to the flow of the electric current through it".

.....

.....

B) Write down the scientific term for the following:

"The reciprocal of the resistivity"

.....

.....

11) Answer (A) or (B):

(A) Choose the correct answer:

The electric transformers exist near to the power stations are used to stepdown .....

1) Potential difference 2) Current intensity 3) Power

(B) Choose the correct answer:

If the induced e.m.f. in dynamo's coil when the perpendicular to the plan of the coil makes an angle 45° to the magnetic field lines equals approximately 141.4 volts then the induced e.m.f. when the perpendicular to the plan of the coil makes an angle 90° to the magnetic field lines is .....

1) Zero **2) 200 Volts** **3) 282.8 Volts**

12) Answer (A) or (B):

(A) Choose the correct answer:

The equivalent unit to the Henry .....

1) Ω.s. **2) V.s.** **3) Ω.C.**

(بقية الأسئلة فى الصفحة الرابعة)

(B) Choose the correct answer:

A straight wire of length one meter moves in a uniform magnetic field of intensity 0.4 T With a velocity 2 m/sec so that the angle between the direction of motion and the magnetic field lines equal 30° then the magnitude of the induced e.m.f. between the terminals of the wire is .....

1) 1.5 Volt **2) 0.8 Volt** **3) 0.4 Volt**

13) Choose the correct answer:

The linear momentum of the photon can be calculated from the relation.....

1) hυ **2)** $\frac{h\upsilon}{C^2}$ **3)** $\frac{h\upsilon}{C}$

14) Choose the correct answer:

The scale of the moving coil galvanometer is uniform due to the exist of .....

1) the spring coils **2) concave magnetic boles** **3) metallic cylinder**

15) Choose the correct answer:

When the pointer refers to the middle of the scale of ohmmeter then the value of the measured resistor equals .....

1) half the internal resistance of the device
2) double the internal resistance of the device
3) to the internal resistance of the device

16) Write down the scientific term for the following:

The current produced from the coil of the dynamo on replacing the two slip rings by a hollow metallic cylinder splitted into two isolated halves .

.....

17) Choose the correct answer:

A wire of length (ℓ) and cross sectional area (A) , if the length of the wire is increased to the double and the cross sectional area is decreased to the half then the specific resistance of the wire will .....

1) Increased to the double
2) Decreased to the half
3) Remains constant

(بقية الأسئلة فى الصفحة الخامسة)

18) Choose the correct answer:

A galvanometer has a coil of resistance 50 Ω , measures a current of maximum intensity 20 mA then the magnitude of the shunt resistor needed to be connected in parallel with its coil to measure a current of maximum intensity 10 A equals approximately .....

1) 0.5 Ω **2) 0.2 Ω** **3) 0.1 Ω**

The third group questions from (19 - 27)

19) Answer (A) or (B):

A) Write down the scientific term for the following:

A stream of electric charges flow through the conductor.

.....

B) Write down the scientific term for the following:

The potential difference between the terminals of the source when no current passes through the circuit.

.....

20) Answer (A) or (B):

(A) Choose the correct answer:

On inserting an iron rod inside a coil carrying alternating current, then the self-induction coefficient of the coil will .....

1) decrease **2) increase** **3) remain constant**

(B) Choose the correct answer:

On increasing the rate of change in the intensity of the current passing through a coil , then the self-induction of the coil will .....

1) decrease **2) increase** **3) remain constant**

21) Answer (A) or (B):

(A) Choose the correct answer:

Three resistors $R_1 = 20\ \Omega$, $R_2 = 10\Omega$, $R_3 = 5\Omega$ connected to each other in eries and connected to a source of electromotive force and a switch , when the switch is closed the magnitude of the electric current intensity passes in each resistor will .....

1) increase with the increase in the value of each resistor.

2) decrease with the increase in the value of each resistor.

3) not change whatever the value of each resistor.

(بقية الأسئلة فى الصفحة السادسة)

(B) Choose the correct answer:

Three resistors $R_1 = 12\ \Omega$, $R_2 = 6\ \Omega$, $R_3 = 2\ \Omega$ connected to each other in parallel and connected to a source of electromotive force and a switch , when the switch is closed the magnitude of the electric current intensity passes in each resistor will.....

1) increase with the increase in the value of each resistor.
2) decrease with the increase in the value of each resistor.
3) not change whatever the value of each resistor.

22) Choose the correct answer:

A straight wire of length one meter carries an electric current of intensity 2 A, placed in uniform magnetic field of intensity 0.3 T so that the angle included between the wire and the direction of the magnetic field lines equals 30° then the wire is affected by a magnetic force equals .....

1) 0.6N **2) 0.3N** **3) 0.1N**

23) Choose the correct answer:

A light beam falls on a metallic surface as a result an electron is released from the surface of the metal with a kinetic energy (K.E.) , if another photon has energy equals double the energy of the first one falls on the surface of the same metal , then the energy of the released electron will be .....

1) less than 2 K.E. **2) 2 K.E.** **3) greater than 2 K.E.**

24) Choose the correct answer:

When a silicon crystal is doped with an element from the fifth group then the major charge carriers in the crystal are .....

1) free electrons **2) holes** **3) negative ions**

25) Choose the correct answer:

The code $(1101)_2$ in the binary system represents the digit ..... in the decimal system

1) 15 **2) 13** **3) 11**

26) Choose the correct answer:

A copper wire is reshaped in the form of a circular ring and connected to an electric cell, a magnetic flux of density B is produced at the center of the ring. if the wire is reshaped in the form of circular coil consists of three terms and connected to the same electric cell. so that the magnetic flus density at the center of the coil is .....

1) 3B **2) 6B** **3) 9B**

(بقية الأسئلة فى الصفحة السابعة)

27) Choose the correct answer:

Alternating current dynamo's coil of face area $0.2m^2$ and a number of turns 50 turn revolves in a uniform magnetic field with a frequency 10Hz, as a result a maximum electromotive force of 220V.is induced in the coil, so that the magnetic flux density in which the coil revolves is.....

1) 0.5 T **2) 0.35 T** **3) 0.14 T**

Fourth group (28 -36)

28) Answer (A) or (B):

(A) Choose the correct answer:

If the value of α_e in transistor equals 0.99 and the current intensity of the emitter equals 40 mA. Then the current intensity of the collector is.....

1) 40.4 mA. **2) 39.6 mA.** **3) 38.6 mA.**

(B) Choose the correct answer:

If the value of β_e in transistor equals 50 and the current intensity of the base equals 80 μA. Then the current intensity of the collector is.....

1) 400 mA. **2) 40 mA.** **3) 4 mA.**

29) Answer (A) or (B)

(A) Choose the correct answer:

The longest wave length in series of atomic spectral lines produced from excited Hydrogen atom exists in .....

1) Lyman's series **2) Paschen's series** **3) Pfund's series**

(B) Choose the correct answer:

On passing a continuous spectrum produced from a hot glowing source through a cold gas and receive the resulted spectrum on a photographic plate, so that the received spectrum is.....

1) Continuous emission spectrum.

2) Line emission spectrum.

3) Line absorption spectrum.

(بقية الأسئلة فى الصفحة الثامنة)

30) Answer (A) or (B):

(A) Choose the correct answer:

Fleming's right hand rule is used to.....

1) determine the direction of the induced e.m.f. in a straight wire.
2) determine the direction of the induced e.m.f. in a circular coil.
3) determine the direction of the magnetic flux around a straight wire carrying current.

(B) Choose the correct answer:

Lenz's rule is used to.....

1) determine the direction of the induced e.m.f. in a straight wire.
2) determine the direction of the induced e.m.f. in a circular coil.
3) determine the direction of the magnetic flux around a straight wire carrying current.

31) Choose the correct answer:

On increasing the frequency of the incident light on a metallic surface to the double, so that the critical frequency of this metal will.....

1) Decrease to the half.
2) Increase to the double.
3) Remains constant.

32) Choose the correct answer:

To avoid the electric noise, we use at the transmitter.....

1) Analog digital converters.
2) Digital analog converters.
3) Ideal electric transformer.

33) Choose the correct answer:

To convert the pure silicon crystal into p-type crystal, the element that is used in doping the crystal is from group..... in the periodic table of elements.

1) three. **2) four.** **3) five.**

34) Choose the correct answer:

If the potential difference that is used to produce X-Rays equals 8281.25 V. then the wave length of the produced wave is.....

Knowing that: ($h = 6.625 \times 10^{-34}$ J.s , $C = 3 \times 10^{8}$ m/s. , $e^{-} = 1.6 \times 10^{-19}$ C.)

1) 3×10^{-10} m. **2) 2×10^{-10} m.** **3) 1.5×10^{-10} m.**

(بقية الأسئلة فى الصفحة التاسعة)

35) Choose the correct answer:

Step down ideal transformer the ratio between the number of turns of its primary coil and its secondary coil as 1/ 5, on connecting the primary coil with a direct current source of electromotive force 24 V. then the potential difference between the terminals of its secondary coil is .....

1) 120 V. **2) 4.8 V.** **3) Zero V.**

36) Choose the correct answer:

A rectangular coil consists of 440 turn of surface area 5 X 10^{-3} m^2 revolves in a uniform magnetic flux of 0.25 T with a rate of 50 cycle/s, so that the average induced e.m.f. in the coil during half cycle starting from a position parallel to the magnetic field lines is .....

1) 220 V **2) 440 V** **3) Zero V**

Fifth group (37 – 45)

37) Answer (A) or (B):

A) Choose the correct answer:

The scientific idea of the action of the ohmmeter depends on .....

1) Faraday's Law **2) Amber's circuital Law** **3) Ohm's Law for closed ircuit**

(B) Choose the correct answer:

To determine the direction of the magnetic flux produced due to a current passes in a circular coil , we use .....

1) Fleming's left hand rule
2) Fleming's right hand rule
3) Right-hand screw rule

38) Answer (A) or (B):

(A) Choose the correct answer:

The rotation of the electric motor coil continues even when the torque acting on it vanishes due to .....

1) The principal of conservation of linear momentum
2) The principal of conservation of energy
3) The principal of inertia

(بقية الأسئلة فى الصفحة العاشرة)

(B) Choose the correct answer:

When the alternating current reaches its maximum value 120 times in one second , so that the frequency equals .....

1) 50 Hz **2) 60 Hz** **3) 120 Hz**

39) Answer (A) or (B):

(A) Choose the correct answer:

Amper's right hand rule is used to determine the direction of .....

1) the magnetic field around a straight wire carrying a current

2) the induced e.m.f in a coil

3) the induced e.m.f in straight wire

(B) Choose the correct answer:

A galvanometer its zero position is at the middle and deflects with an angle 40 degree to reach to the end of the scale where the reading is 20 μA, so that the sensitivity of the galvanometer equals .....

1) 0.5 μA/degree **2) 40 degree/μA** **3) 2 degree/μA**

40) Choose the correct answer:

The energy of the photon that produced due to the transfer of an electron from the third energy level in hydrogen atom to the second level is .....

1) 0.85 e^- .V. **2) 3.4 e^- . V.** **3) 1.89 e^- .V.**

41) Choose the correct answer:

The induction furnaces is considered as one of the application of .....

1) the self-induction **2) the mutual induction** **3) the eddy currents**

42) Choose the correct answer:

The electric power dissipated in the transmission lines of electric energy can be calculated from the relation

1) $\frac{I^2}{R}$ **2)** $I^2 R$ **3)IR**

(بقية الأسئلة فى الصفحة الحادية عشر)

43) Choose the correct answer:

In Ruby Laser, the atoms of the active medium are excited by using .....

1) Electric energy

2) Light energy

3) Thermal energy

44) Choose the correct answer:

Two light sources the path difference between the beam produced from the first source and the beam produced from the second source equals λ/π , so that the phase difference between the two light beams equals .....

1) 2π **2) λ/π** **3) 2**

45) Choose the correct answer:

The ohmic resistors are made of double wound wires

1) to decrease the resistance of the wire

2) to avoid self-induction

3) to facilitate the connection process

(انتهت الأسئلة)