

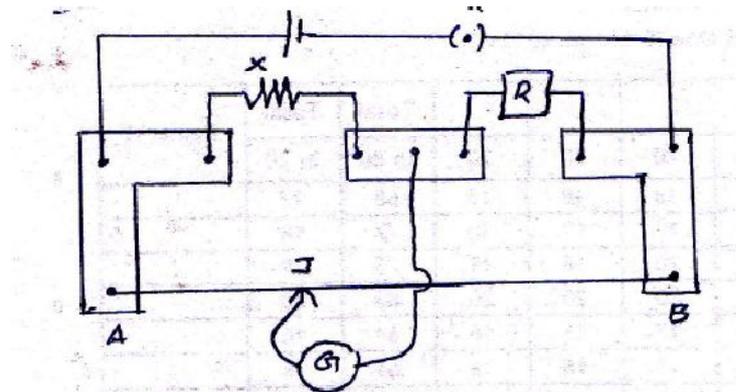
HIGHER SECONDARY MODEL EXAMINATION 2011-12
PHYSICS

TIME:2:15HRS |
SCORE:60

HSE-II

1. A polythene piece rubbed with wool is found to have a negative charge of $3 \times 10^{-7} \text{C}$
 - a) estimate the number of electrons transferred (from which to which) (1)
 - b) Is there a transfer of mass from wool to polythene (1/2)
 - c) Explain the meaning of the statement electric charge of a body is quantized (1)
2. You are given three capacitors of capacitance $2\mu\text{F}$, $3\mu\text{F}$ and $5\mu\text{F}$ show how will you combine them to get
 - a) maximum capacitance (1)
 - b) Minimum capacitance (1)
3. The electric field of the pair of charges at any point in space can be found out from coulomb's law
 - a) what is an electric dipole (1)
 - b) Obtain an expression for electric field at any point on the axis of an electric dipole (1 1/2)
 - c) a comb runs through dry hair attracts small pieces of paper why? (1)

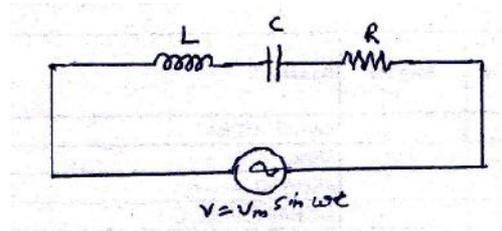
4.



- a) if the bridge is balanced at J which are the arms corresponding to P Q R and S in a balanced whetstones' bridge (1)
 - b) If r is the resistance per unit length of the meter bridge wire what is the resistance of AJ and BJ (1)
5. Resistivity of copper, constantan and silver are $1.7 \times 10^{-6} \text{ cm}$, $39.1 \times 10^{-6} \text{ cm}$ and 10^{-6} cm respectively
 - a) which is the best conductor? (1/2)
 - b) Give reason for your answer (1)
 - c) Define resistivity (1)
 - d) Which material is used for potentiometer wire? Why? (1 1/2)
 6. A conductor of length dl carrying a current I is placed in air
 - a) give an expression for magnetic field dB produced at a distance r from the conductor (1)
 - b) Find out the magnetic field at a point on the axis of a current carrying circular coil (3)
 7. Answer the following questions regarding earths magnetism
 - a) Which are the elements of earths magnetic field (1 1/2)

b) a compass needle whose magnetic moment is 60AM^2 pointing geographic north at a certain place where the horizontal component of earth's magnetic field is 40 wb/m^2 experiences a torque of $1.2 \times 10^{-3}\text{Nm}$ what is the declination of the place (2 ½)

8.



- a) Write down the voltage law of the above circuit (1)
 b) Draw the phasor diagram and find the impedance of the circuit (3)
 c) at resonance find out the frequency of the circuit (2)
 d) what is the phase difference between voltage and current at resonance (1)

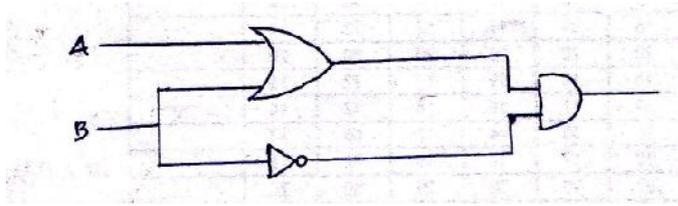
9.

Match the following

Radio wave	high energy electrons	destroys cancer cells
Infrared waves	radio active nuclei	radar systems
x-rays	accelerated motion of charges in conducting wires	green house effect
Gamma ray	hot bodies and molecules	Cellular Phone
	Special vacuum tubes	diagnostic purpose

(2)

10. Sunlight falls on the still surface of a swimming pool (refractive index of water is 1.33) the light gets partially reflected and partially transmitted
 a) Draw a ray diagram which shows the partial reflection and partial transmission (1 ½)
 b) At what angle of reflection is the light completely polarized and what is the corresponding angle of refraction of the transmitted rays (2)
 c) during night an under water flood light is turned ON in the pool find the angle of reflection for which the light reflected back to the water completely plane polarized (1 ½)
11. a) in a compound microscope both the objective and eyepiece are of short focal length why? (2)
 b) What is the resolving power of human eye (1)
 c) what happens if the objective of the microscope is immersed in oil (2)
12. When light of suitable frequency falls on metal surface electrons are emitted
 a) Name the phenomenon (1)
 b) what happens when potential increases and decreases (2)
 c) all the photo electrons are not emitted with same energy give reason (2)
13. a) is the density of nucleus constant give reason (1)
 b) give the expression for the radius of a nucleus (1)
 c) what is the ratio of the nuclear radii of ${}_{79}\text{Au}^{197}$ and ${}_{47}\text{Ag}^{107}$ (3)
14. a) construct the truth table for the following circuit



(2)

b) explain the working of zener diode as a voltage regulator (2)

c) what is the effect of forward bias voltage on

i) thickness of the depletion layer

ii) resistance of the junction (1)

15. the height of a transmitting antenna is zoom radius of earth is 6.4×10^6 m

a) which one of the following is used in TV transmission

i) sky wave ii) space wave iii) ground wave (1/2)

b) find the range up to which the above antenna gives transmission signal (1 1/2)

c) why is it necessary to use satellite for long distance transmission (1)

Thirur Cluster

PREPARED BY

1. LIJI S L	11150
2. SHYLAJA.R	11156
3. CHANDNI.KP	11004
4. SUVARNA.O	11156
5. PREETHI.K	11233
6. RINDA GEORGE	11229
7. PRIYA.V N	11150
8. MAYA.K A	11125
9. AMBILI.S	11152