

HIGHER SECONDARY MODEL EXAMINATION 2011-12
PHYSICS

TIME:2:15HRS |
SCORE:60

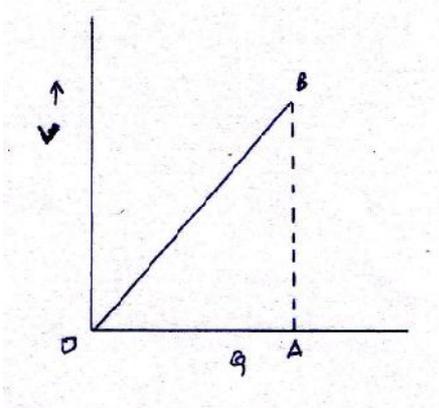
HSE-II

1. Match the following

EM waves	source	size
Microwave	-----	radar communication
X-rays	bombardment of target by electron	-----
-----	Nucleus of atom	cancer treatment
Infrared	-----	distant photography

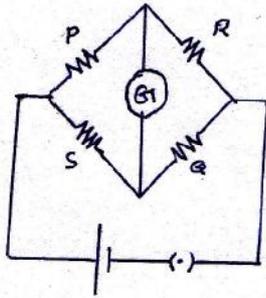
(1/2x4=2)

2. The electric field inside a charged spherical shell is zero
- a) Identify the law which explains the above statement (1)
- b) State the law (2)
- c) Show that the above statement is true based on the law (2)
3. The graph drawn between charge and potential in a capacitor is given below



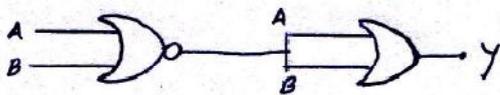
- a) how can you find energy stored in the capacitor from the graph (1)
- b) Three capacitors each of capacitance 9PF are connected in series. If the combination is connected to a 120v supply. What is the potential difference across each capacitor (2)
4. light+ light not always gives light, it sometimes gives darkness
- a) State the phenomenon behind this comment (1)
- b) Derive an expression for bandwidth in yang's double slit experiment (3)
- c) What happens to the bandwidth when yang's double slit apparatus is immersed in water (1)
5. a tank is filled with water to a height of 12.5cm. the apparent depth of a needle lying at the bottom of the tank is measured by a microscope to be 9.4cm. what is the refractive index of water? If water is replaced by a liquid of refractive index 1.63 up to the same height, by what distance would the microscope have to be moved to focus on the needle again? (3)
6. An eye doctor prescribes a lens of power -1.25diopter to his patient
- a) Identify the defect (1)
- b) What is focal length of prescribed lens (1)
7. Lenz's law is given by $E = -d\phi/dt$
- a) what does the negative sign signifies (1)

- b) State that Lenz's law is consistent with law of conservation of energy (2)
8. for an LCR circuit
- a) Derive an expression for current in the circuit (2)
- b) Find value of inductance at resonance (1)
- c) Give an expression for resonance frequency (1)
9. Kirchhoff's laws are used for the analysis of electrical network
- a) State Kirchhoff's laws (2)
- b) From the figure given below. Obtain the mathematical condition for the Galvanometer connected to be zero



(3)

10. Ohm's law is not a universal law. Justify with examples (2)
11. Cyclotron is a particle accelerator used to produce high energy particles. Explain principle and working of cyclotron (4)
- Electrons cannot be accelerated by a cyclotron. Why? (2)
12. Conductor of length l carrying current I is bent in the form of a circle by joining their ends find the magnetic moment (2)
13. When light of suitable frequency falls on a photosensitive metal electrons are found to be emitted
- a) Name the phenomenon (1)
- b) Arrive at an expression phenomena concerned (2)
- c) what does the graph between kinetic energy of photo electrons and frequency represent (2)
- 14.



- 1) Name the gates in combination (1)
- 2) Identify the logic operation of the whole gate (2)
- 3) Give the truth table (2)
15. Considering the fission reaction,

Calculate the value of Q from the following data

$m_{\text{U}} = 238.05079$

$m_{\text{Ba}} = 139.90543$

$m_{\text{Kr}} = 1.008665$

$m_{\text{He}} = 98.90594$

(5)

16. Is it necessary for a transmitting antenna to be the same height as that of receiving antenna for line of sight communication? A TV transmitting antenna is 81m tall. How much service area can it cover if the receiving antenna is at the ground level
(3)

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