

## MORE Test Questions

1. 10-8

2. 10-9

3. In the circuit of 10-8, if you wish to measure the current in the circuit, where would you attach an oscilloscope, why? [Hint, the generator as well as oscilloscope have one terminal grounded].

4. Why did Maxwell propose the existence of a displacement current?

4a. 10-11

5. Write down Maxwell's EQUATIONS FOR  $\vec{E}$  and  $\vec{B}$  fields. In each case clearly describe the quantities on the left side of the equation.

→ [This will not be discussed in the review. It is your responsibility to learn them thoroughly].

6. Show that the displacement current

through an air filled capacitor ( $C_0 = \frac{\epsilon_0 A}{d}$ )

may be expressed as  $I_D = C_0 \frac{\Delta V}{\Delta t}$  where

$\Delta V =$  potential difference between the plates].

7. What is a travelling wave?

8. 11-4

9. 11-5

10. 11-9

11. (1) The Earth's radius is about 6400 km

(2) and the mean Earth-sun distance is  $1.5 \times 10^8$  km.

What fraction of the electromagnetic radiation emitted by the sun is intercepted by the "disc" of the Earth? Why? (Solar radius  $7 \times 10^5$  km)

12. 11-10

13. If your radio can pick up an  $E$ -field of  $1 \mu\text{V/m}$ , what is the intensity of the radio wave? Why?

14. In order for geometrical optics to work what must be the size of the openings/obstacles? Why?

15. Use Fermat's principle to show that during reflection, angle of reflection must be equal to angle of incidence.

16. If you rotate a plane mirror by  $20^\circ$  by what angle will the reflected ray rotate? Why? (Draw a diagram to support your answer)

17. 11-12

18. 11-14

19. 12-4, 5

20. 12-7

21. 12-9

22. 12-11

23. 12-12