OLUSEGUN AGAGU UNIVERSITY OF SCIENCE AND TECHNOLOGY, OKITIPUPA.

SCHOOL OF SCIENCE.
DEPARTMENT OF PHYSICAL SCIENCES
2019/2020 SECOND SEMESTER B. Tech. (Degree) MID SEMESTER EXAMINATION
COURSE CODE/ TITLE PHY 102 – GENERAL PHYSICS II   DURATION: 25 MINS
INSTRUCTION: ANSWER ALL QUESTIONS (SHADE THE RIGHT BOX TO INDICATE YOUR ANSWER)

Name. ....

Matric Number_____   Department/Program_____

	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1			✓		6					11				✓	16	✓	✓		
2		✓			7					12			✓		17	✓			
3			✓		8			✓		13		✓			18			✓	
4			✓		9		✓			14					19				
5				✓	10		✓			15			✓		20				✓

1. A magnet is similar to a bi-polar charged system in the following aspects:- (I) It has two opposite poles – N and S poles. (II) The earth's magnetic N-pole is close to the geographic S-pole and the earth's magnetic S-pole is close to the geographic N-pole. (III) The force of attraction or repulsion between opposite or like poles obeys a law identical in form to Coulomb's law for electric charges. Which of the above statements is (are) true? (a) I only (b) II only (c) I and III only (d) I, II and III

2. Which of the following methods cannot be used to convert a steel bar into magnet? (I) Passing of an electric current through a solenoid (II) Repeated stroking of the steel bar with a magnet (III) Heating of the steel bar (IV) Hammering the steel bar in the earth's magnetic field (a) I and II only (b) III and IV only (c) I, II and III only (d) I, II and IV only

3. Which law describes how the magnetic field lines encircle an area through which a current is passing? a. Gauss's law for electricity b. Gauss's law for magnetism c. Ampere's- Maxwell law d. Faraday's law

4. The speed of electromagnetic waves in free space is-----

a. $c = \frac{\mu_o}{\epsilon_o}$ b. $c = \sqrt{\frac{\mu_o}{\epsilon_o}}$ c. $c = \frac{1}{\mu_o \epsilon_o}$ d. $c = \frac{1}{\sqrt{\mu_o \epsilon_o}}$

5. The electromagnetic waves travel in a vacuum at what speed?
a. 300000m/s   b. 3000000m/s   c. 30000000m/s   d. 300000000m/s

6. Infrared radiation is produced by _____
a. Hot bodies and Molecules b. Cold bodies c. Gaseous bodies   d. Non radiating bodies

7. What is the potential at distance 0.1 m from a charge of 2 μC? (a) 1.8×10^{5} V (b) 1.8×10^{-6} V (c) 1.8×10^{3} V (d) 1.8×10^{11} V

8. How much charge is stored on a 0.47 μF capacitor when a potential difference of 12 V is applied to it? (a) 56.4μC (b) 5.64 μC (c) 3.92×10^{-8} C (d) 5.64 C

9. An electric bulb is rated 60 W, 220 V Calculate the resistance of its filament when it is operating normally. (a) 806.67 Ω (b) 230.4 Ω (c) 234.98 Ω (d) 288.5 Ω.

10. Which of the following methods will effectively demagnetize a bar magnet? (I) Passing an electric current through the magnet (II) Bringing its N-pole in contact with the N-pole of a strong magnet (III) Heating the magnet (a) I only (b) III only (c) I and III only (d) I, II and III

11. Which the following statements about magnetism are true? (a) A freely suspended bar magnet comes to rest in the geographic north-south direction (b) Like poles attract (c) Iron filings will concentrate mainly around the ends of a bar magnet (d) Lodestone is a non-magnetic material

12. Which of the following are magnetic materials? (a) Copper, Steel and Iron (b) Iron, Lead and Brass (c) Steel, glass and lead (d) Nickel, steel and iron

13. The angle which the earth's magnetic field makes with the horizontal is called the (a) magnetic declination (b) magnetic meridian (c) angle of dip (d) angle of deviation

14. At a location on earth where the declination is 15'E, a compass needle indicates the direction N50'E. The true geographic bearing is (a) N65'E (b) N50'E (c) N35'E (d) N15'E

15. Current Carrying conductor sets up a _____ around it.
    a. Electrical field b. Atomic field c. Magnetic field d. radiating field

16. $\oint_{s} E_{n}\, dA = \frac{1}{\epsilon_{o}} Q$ is

    a. Gauss's law for electricity b. Gauss's law for magnetism c. Stoke's law d. Ampere's law

17. Which Maxwell's equation states that the flux of the Magnetic field vector $\vec{B}$ is zero through any closed surface
    a. Gauss's law for electricity b. Gauss's law for magnetism c. Ampere's-Maxwell law d. Faraday's law

18. An electric heater with a resistance of 120 Ω operates on 240 V mains. Calculate the power it dissipated. (a) 480 watts (b) 2 watts (c) 360 watts (d) 60 watts.

19. A parallel-plate capacitor has an area 2×10^{-4} m^2 and a plate separation d=0.001 m. Find its capacitance (a) 1.77×10^{-15}F (b) 1.77×10^{-12}F (c) 1.77×10^{15}F (d) 1.77×10^{15}F.

20. What is the effective resistance of two (2) 2 Ω resistors connected in parallel to each other. (a) 4 Ω (b) 2 Ω (c) 1 Ω (d) 1/2 Ω.