E-JUST Entrance Exam model

Faculty of Engineering, Computer Science and Information Technology, (Art & Design) (sustainability Architecture)

Subject: Physics

Time: 20 minutes

Student Name:.....

Application ID No:.....

Undergraduate Entrance Examination Instructions

1. Examinees will be provided with question booklet and answer sheet.

2. Questions are on both the front and back of the page.

3. Question booklet contains scratch papers for use in solving exams.

4. Answer ALL questions to the best of your abilities. Be sure to write legibly and choose your answers clearly using HB or B pencil, not pen.

5. Question booklet will be collected back.

Choose the right answer:

1. Which of the following is an example of a vector quantity?
    a) Mass
    b) Distance
    c) Energy
    d) Velocity

2. What is the principle of conservation of energy?
    a) Energy cannot be created or destroyed, only transformed
    b) Energy can be created from nothing
    c) Energy is always increasing
    d) Energy decreases as it is used

3. What is the photoelectric effect in physics?
    a) The emission of light from a heated object
    b) The emission of electrons from a material due to light exposure
    c) The interaction between charged particles and electric fields
    d) The change in color of an object under different lighting conditions

4. Which phenomenon causes a pencil placed in a glass of water to appear bent at the water's surface?
    a) Reflection
    b) Diffraction
    c) Dispersion
    d) Refraction

5. What is the term for the rate of change of velocity?
    a) Speed
    b) Acceleration
    c) Displacement
    d) Momentum

6. Which of the following is a unit for measuring frequency?
    a) Hertz
    b) Ampere
    c) Newton
    d) Kelvin

7. Which fundamental force is responsible for the structure of atomic nuclei?
    a) Gravitational force
    b) Electromagnetic force
    c) Strong nuclear force
    d) Weak magnetic force

8. What is the term for the energy stored in an object due to its position or height from the Earth's surface?
    a) Kinetic energy
    b) Potential energy
    c) Thermal energy
    d) Electrical energy

9. When a neutral particle moves parallel to a magnetic field, what type of force does it experience?
    a) Gravitational force
    b) It will not be affected by force
    c) Magnetic force
    d) Electric force

10. What is the term for the number of cycles per second in a wave?
    a) Amplitude
    b) Frequency
    c) Wavelength
    d) Speed

11. What is the path followed by a charged particle moving perpendicular to a magnetic field?
    a) Straight line along the magnetic field lines
    b) Circular path
    c) Parabolic path
    d) Hyperbolic path

12. What is the SI unit of power?
    a) Newtons per meter
    b) Joules
    c) Watts
    d) Kilograms per second

13. If the voltage across a resistor is doubled while the resistance remains constant, how does the current change?
    a) It doubles
    b) It becomes half
    c) It remains the same
    d) It becomes zero

14. How does the kinetic energy of an object change if its mass is doubled while its velocity remains constant?
    a) It doubles
    b) It becomes half
    c) It remains the same
    d) It becomes zero

15. When light reflects off a smooth surface, the angle of reflection is:
    a) Equal to the angle of incidence
    b) Half the angle of incidence
    c) Twice the angle of incidence
    d) Unrelated to the angle of incidence

16. Which of the following has the greatest wavelength?
a) photons of Orange color
b) photons of Red color
b) photons of Blue color
d) photons of Yellow color

17. The phenomena of self-induction in a coil has an application in _____.
a) permanent magnets
b) tungsten lampes
c) fluorescence lamps
d)none of the above

18. When a current flow, with intensity I=100 A, in a metallic wire, what is the expected magnetic field strength generated at any point located on this wire?

(A) 5 Tesla
(B) infinity "∞"
(C) zero
(D) none of the above

Note that: Permeability of free space, $\mu = 4x10^{-7}$ weber.m^{-1}.A^{-1}

19. **Interaction between the constituents of Hydrogen atom follows, _____.**

a) Coulomb's law but not the general gravitational law
b) general gravitational law and Coulomb's law
c) general gravitational law but not Coulomb's law
d) none of the above

20. In order to use a Galvanometer device to measure current, then a resistor R has to be connected to the Galvanometer. The value of R should be _____.

a) small
b) zero
c) high
d) none of the above