All questions are compulsory. Each question carry 1 mark.

1. Who is known as the father of C Language
   a) James A. Sosling
   b) Vjarne Stroustrup
   c) Dennis Ritchie
   d) E. F. Codd

2. Name the loop that executes at least once.
   a) for
   b) if
   c) do-while
   d) while

3. What is an array?
   a) An array is a collection of variables that are of the dissimilar data type.
   b) An array is a collection of variables that are of the same data type.
   c) An array is not a collection of variables that are of the same data type.
   d) None of the above.

4. Which of the following shows the correct hierarchy of arithmetic operations in C
   a) $* + - =$
   b) $* / \% + -$
   c) $* + \% - /$
   d) None of the above

5. What will be the output of the following arithmetic expression?
   $$5+3*2\%10-8*6$$
   a) -37
   b) -42
   c) -32
   d) -28

6. The S.I. unit of spring constant is
   a) Nm
   b) Nm-1
   c) Nm2
   d) N-1m

7. For a particle executing S.H.M. the phase difference between displacement and velocity is
   a) $\pi/2$
   b) π
   c) 0
   d) $-\pi/2$

8. If ω be the natural frequency and r the damping then damped motion will be oscillatory if
   a) $r=\omega$
   b) $r > \omega$
   c) $r < \omega$
   d) none of these

9. The relaxation time τ for a mechanical oscillator is related to damping constant r as
   a) $\tau = r/2m$

b) $\tau=2m/r$

c) $\tau=2mr$

d) $\tau=r/m$

10. In case of forced oscillations at very low driving frequency the amplitude depends on
    a) the spring constant
    b) both spring constant and damping constant
    c) on mass of the oscillator
    d) none of these

11. Arrange the following fundamental force according to ascending order of their strength
    a) Strong, weak, electromagnetic and gravitation.
    b) Strong, electromagnetic, weak and gravitation.
    c) Gravitation, weak, electromagnetic, strong.
    d) Gravitation, electromagnetic, weak, strong.

12. The gravitational force of attraction does not depend on the following factor
    a) Masses
    b) Distance between the bodies.
    c) Shape of the bodies.
    d) None of the above.

13. The gravitational mass of a body is proportional to the gravitational of what
    a) Field
    b) Intensity
    c) Force
    d) All of the above

14. In the case of central force field which of the following is not true
    a) Force is a negative gradient of potential
    b) Potential is a function of distance
    c) Non conservative
    d) All of the above

15. A inertial frame of reference is that frame which is
    a) At rest
    b) Moving with uniform velocity
    c) Rotating
    d) Both I and II

16. A non inertial frame of reference is that frame which is
    a) Moving with uniform velocity
    b) Accelerated with respect to fixed frame of reference
    c) At rest
    d) None of the above

17. Pseudo force arises in
    a) Non inertial frame of reference
    b) Inertial frame of reference
    c) Moving frame of reference
    d) None of the above

18. Which one is invariant under Galelian Transformation
    a) Velocity
    b) Acceleration
    c) Momentum
    d) Potential Energy

19. Coriolis Force arises

a) In a rotating frame of reference
b) In a inertial frame of reference
c) In a rotating frame of reference and the body also in motion in the rotating frame
d) All the above

20. Ether drift is the relative velocity of
    a) Light w.r.t Ether
    b) Earth w.r.t Ether
    c) Earth w.r.t Light
    d) None of Above

21. Theoretical path difference calculated by Michelson-Morley was
    a) $\dfrac{dv^2}{c\lambda^2}$
    b) $\dfrac{dv^2}{\lambda c^2}$
    c) $\dfrac{dv^3}{c\lambda^2}$
    d) $\dfrac{dv^2}{c\lambda^3}$

22. The differential equation $\dfrac{d^2y}{dx^2} + \dfrac{dy}{dx} + 4y = e^x$ is
    a) Nonlinear homogeneous
    b) Nonlinear nonhomogeneous
    c) linear homogeneous
    d) linear nonhomogeneous

23. The particular integral of the differential equation $y'' + y' + 2y = 2x$ is
    a) $x - \dfrac{1}{2}$
    b) $x^2 + 2$
    c) $x + \dfrac{1}{2}$
    d) $2x - \dfrac{1}{2}$

24. General solution of the differential equation $\dfrac{d^2x}{dt^2} + 4\dfrac{dx}{dt} + 4x = 0$ is
    a) $(A + Bx)e^{-2x}$
    b) $(A + Bt)e^{-2t}$
    c) $(A + Bx)e^{-2t}$
    d) $(A + Bt)e^{2t}$

25. Integrating factor of the linear differential equation $x^2\dfrac{dy}{dx} + 2y = 5x$ is
    a) $-\dfrac{2}{x}$
    b) $e^{-\frac{3}{x}}$
    c) $e^{\frac{2}{x}}$
    d) $e^{-2/x}$