



National University of Technology (NUTECH)

Program :

Pre Engineering

Duration :

3 Hrs

Total Questions :

200

Section: Mathematics

1. For what value of ____ will the equation have the sum of roots equal to the product of roots?
 - (a) 3
 - (b) -2
 - (c) -4
 - (d) 4
2. A set having only one element is called:
 - (a) An empty set
 - (b) Universal set
 - (c) A singleton set
 - (d) A power set
3. The ordered pairs (a, b) and (a, d) are equal if and only if:
 - (a) $b = d$
 - (b) $b = c$
 - (c) $b = a$
 - (d) $a = d$
4. The symbol used to denote the negation of a proposition is:
 - (a) $\sim$
 - (b) $-+$
 - (c) $\wedge$
 - (d) $\vee$
5. A square matrix $A = \{a_{ij}\}$ is a lower triangular matrix when:
 - (a) $a_{ij} = 0$ for all $i < j$
 - (b) $a_{ij} = 0$ for all $i > j$
 - (c) $a_{ij} \neq 0$ for all $i < j$
 - (d) $a_{ij} \neq 0$ for all $j < i$

6. For two independent events A and B, if $P(A) = 0.6$ and $P(B) = 0.3$, then $P(A \cap B)$ is:
- (a) 0.9
 - (b) 0.12
 - (c) 0.5
 - (d) 0.18
7. The property used in the equation $3 \times (7 \times 9) = (3 \times 7) \times 9$ is:
- (a) Closure property with respect to division
 - (b) Associative property with respect to multiplication
 - (c) Associative property with respect to addition
 - (d) Closure property with respect to addition
8. A straight-line angle is equal to:
- (a) 0.5 rotation
 - (b) π radians
 - (c) 180 degrees
 - (d) All of these
9. The power set of a set S containing six elements is the set whose elements are:
- (a) Three subsets of S
 - (b) Two subsets of S
 - (c) Five subsets of S
 - (d) All possible subsets of S
10. The set of odd numbers between 1 and 9 is:
- (a) $\{1, 3, 5, 7\}$
 - (b) $\{3, 5, 7, 9\}$
 - (c) $\{1, 3, 5, 7, 9\}$
 - (d) $\{3, 5, 7\}$

Section: Physics

11. Hadrons are the particles that experience:
- (a) The strong nuclear force
 - (b) The weak nuclear force

- (c) Only the gravitational force
- (d) Only the electromagnetic force

12. Mass differs from weight in that:

- (a) All objects have weight but some lack mass
- (b) Weight is a force and mass is not
- (c) The mass of an object is always more than its weight
- (d) Mass can be expressed only in the metric system

13. If an 800 N man hangs motionless from four vertical strands of rope, then the tension in each strand of rope is:

- (a) 0 N
- (b) 200 N
- (c) 400 N
- (d) 800 N

14. The work done by a non-conservative force around a closed path is:

- (a) Not zero
- (b) Zero
- (c) Maximum
- (d) Minimum

15. The force **F** applied to two bodies yields work **W** and **2W** respectively. The distance covered by the two bodies is:

- (a) d, d
- (b) d, 2d
- (c) 2d, d
- (d) d, d/2

16. Light with an intensity of 1 kW/m^2 falls normally on a surface and is completely reflected. The radiation pressure is:

- (a) 1 kPa
- (b) $3 \times 10^{11} \text{ Pa}$
- (c) $1.7 \times 10^{-6} \text{ Pa}$
- (d) $6.7 \times 10^{-6} \text{ Pa}$

17. A tuning fork A of frequency 256 Hz produces 3 beats per second with another tuning fork B. The frequency of tuning fork B is _____.
- (a) 256
 - (b) 253
 - (c) 256 ± 3
 - (d) 259
18. Hadrons are the particles that experience:
- (a) The strong nuclear force
 - (b) The weak nuclear force
 - (c) Only the gravitational force
 - (d) Only the electromagnetic force
19. Suitable units for the gravitational constant **G** are:
- (a) $\text{kg}\cdot\text{m}/\text{s}^2$
 - (b) $\text{kg}\cdot\text{m}/\text{s}$
 - (c) $\text{N}\cdot\text{m}/\text{s}$
 - (d) $\text{m}^3/(\text{kg}\cdot\text{s}^2)$
20. Mass differs from weight in that:
- (a) All objects have weight but some lack mass
 - (b) Weight is a force and mass is not
 - (c) The mass of an object is always more than its weight
 - (d) Mass can be expressed only in the metric system

Section: English

21. Antonym of *myopic* is:
- (a) Short-sighted
 - (b) Feeble-minded
 - (c) Foresighted
 - (d) Long-sighted
22. A person who constantly calls attention to his trials and sufferings is in danger of developing a martyr complex and impressing others that he is _____ seeking sympathy.

- (a) Consciously
- (b) Willingly
- (c) Purposefully
- (d) Emphatically

23. Although her report on the effects of electromagnetic radiation was lengthy, the presentation she _____ was rather succinct.

- (a) Held was
- (b) Held
- (c) Is held
- (d) Was held

24. The authorities, fearing a _____ of their power, called for a military state in the hopes of restoring order.

- (a) Subversion
- (b) Premonition
- (c) Predilection
- (d) Infusion

25. Hygrometer is to *humidity* as sphygmomanometer is to ————

- (a) Pressure
- (b) Blood pressure
- (c) Precipitation
- (d) Heartbeat