

1. If $x^4 + 2x^3 - 3x^2 + x - 1$ is divided by $x - 2$, the remainder will be
- (A) 12. (B) 14.
(C) 16. (D) 21.
2. If $x^m y^n = (x + y)^{m+n}$, $\frac{dy}{dx} =$
- (A) $\frac{y}{x}$. (B) $\frac{x+y}{x}$.
(C) $\frac{x}{y}$. (D) $\frac{x+y}{y}$.
3. If the standard deviation of n observations x_1, x_2, \dots, x_n is s , then for real λ , the standard deviation of $\lambda^n x_1, \lambda^n x_2, \dots, \lambda^n x_n$ is
- (A) $\lambda^n s$. (B) $\lambda^{2n} s$.
(C) $|\lambda^n| s$. (D) $\lambda^{\frac{n}{2}} s$.
4. If $f(x) + 2f\left(\frac{1}{x}\right) = 3x$; $x \neq 0$ and $S = \{x \in \mathbb{R} : f(x) = f(-x)\}$, then S contains
- (A) no element.
(B) exactly one element.
(C) exactly two elements.
(D) more than two elements.
5. The number of real solutions of the equation $x^3 = \sin x$ is
- (A) 0. (B) 1.
(C) 3. (D) 2.

6. If we consider the observations -9.7, -0.1, -3.1, 2.4, 0.6, 3.7, -12.7, -2.3, -5.3, 4.3, -15.0, -12.7, 13.2, 13.7, 12.2, -0.3, -3.4, then choose the correct alternative from the followings:
- (A) The observations -0.1, 2.4, and 0.6 lie between the second and third quartiles.
 - (B) The observations -0.1 and 3.7 lie between the second and third quartiles.
 - (C) The observations 0.6 and 3.7 lie between the second and third quartiles.
 - (D) Four observations are lying between the second and third quartile.
7. If there exists two functions $f(x) = x|x|$ and $g(x) = |x|$, then
- (A) Both f and g are differentiable at $x = 0$.
 - (B) f is non-differentiable at $x = 0$.
 - (C) f is differentiable but g is non-differentiable at $x = 0$.
 - (D) We can't comment on the differentiability of both f and g at $x = 0$.
8. The area of the histogram for any frequency distribution is unity if we plot
- (A) relative frequency against the class boundary.
 - (B) frequency against the class boundary.
 - (C) relative frequency density against the class boundary.
 - (D) relative frequency against class limit.
9. If A and B are two events such that $P(A) = \frac{2}{5}$ and $P(A \cap B) = \frac{3}{20}$. Then the value of $P(A|A' \cup B')$ is
- (A) $\frac{1}{4}$.
 - (B) $\frac{5}{17}$.
 - (C) $\frac{8}{17}$.
 - (D) $\frac{17}{20}$.

10. Which of the following inequality is true for any natural number n ($= 1, 2, 3, \dots$)?

- (A) $(n + 1)^n \geq 2^n n!$
- (B) $(n + 1)^n < 2^n n!$
- (C) $\binom{2n}{n} < \binom{2n}{n+1}$
- (D) $\binom{2n}{n} + \binom{2n}{n-1} > \binom{2n+1}{n}$.

11. Each student of a class is asked to toss a coin 100 times and record the total number of heads (H) and tails (T) obtained. Let the observed values of (H, T) pairs for 50 students be recorded as $(H_1, T_1), (H_2, T_2), \dots, (H_{50}, T_{50})$. Based on these n -paired observations, what can we say about the correlation between H and T ?

- (A) Correlation is always 0.
- (B) Correlation is always 1.
- (C) Correlation is always -1 .
- (D) Correlation value cannot be determined exactly.

12. The question contains three statements. Four conclusions derived from the statements are either true or false. Choose the correct answer from the four given options.

Statement:

- (A) Some cows are lions.
- (B) All lions are tigers.
- (C) Some tigers are animals.

Conclusions:

- (I) Some animals are lions.
- (II) Some tigers are lions.
- (III) Some tigers are cows.
- (IV) Some animals are cows.

Option:

- (A) All follow.
- (B) Only III follows.
- (C) Only II and III follow.
- (D) Only IV follows.

13. If $AT = 20$, $OF = 90$, and $END = 280$; then $RUN =$

- (A) 1620.
- (B) 5292.
- (C) 4090.
- (D) 5268.

14. Find the mismatched number in the series 7, 11, 13, 17, 19, 21.

- (A) 7.
- (B) 17.
- (C) 21.
- (D) 19.

15. Pointing to a woman, Manish said, "She is the youngest daughter of my father-in-law's only daughter." How is Manish related to this youngest daughter's father?

- (A) Son.
- (B) Daughter.
- (C) Nephew.
- (D) Son-in-law.

16. The largest millet-producing state in India is

- (A) Maharashtra.
- (B) Uttar Pradesh.
- (C) Gujarat.
- (D) Rajasthan.

17. Red soil is also known as
- (A) Omnibus soil.
 - (B) Regular soil.
 - (C) Clayey earth.
 - (D) None of the above.
18. Which nutrient is digested in the mouth?
- (A) Protein.
 - (B) Vitamins and minerals.
 - (C) Carbohydrates.
 - (D) Lipid.
19. The use of microorganisms to remediate environmental pollutants is known as
- (A) Phytoremediation.
 - (B) Micro-remediation.
 - (C) Nano-remediation.
 - (D) Bioremediation.
20. Main purpose of buffer stock is
- (A) to save food grains from pest attacks.
 - (B) to stop price fluctuations.
 - (C) to meet the crisis of low production.
 - (D) both (B) and (C).
21. Antyodaya cards are given to the
- (A) Poor.
 - (B) poorest of the poor.
 - (C) people below the poverty line.
 - (D) people above the poverty line.

22. The increase in concentration of which gas is not responsible for Global Warming?
- (A) Sulphur dioxide.
 - (B) Nitrogen.
 - (C) Carbon dioxide.
 - (D) Methane.
23. The phenomenon of marble cancer is due to
- (A) soil particles.
 - (B) fog.
 - (C) CFCs.
 - (D) acid rain.
24. Salt-loving plants are called
- (A) Hydrophytes.
 - (B) Halophytes.
 - (C) Xerophytes.
 - (D) Epiphytes.
25. Excessive intake of calcium in our diet results in
- (A) Stroke.
 - (B) Diarrhoea.
 - (C) Constipation.
 - (D) Kidney stones.
26. Bacterial growth curve commonly exhibit the following sequences of phases
- (A) Stationary phase, Lag phase, Log phase, Decline phase.
 - (B) Log phase, Lag phase, Stationary phase, Decline phase.
 - (C) Stationary phase, Log phase, Lag phase, Decline phase.
 - (D) Lag phase, Log phase, Stationary phase, Decline phase.

Questions 27-30 pertain to the following passage.

The National Education Policy 2020 (NEP) of India envisions a broader transformative and affirmative approach by imbibing holistic education, which is rooted in Indian ethos. It aims to build a new education system by developing both cognitive skills and social and emotional skills, also referred to as ‘soft skills.’ Cognitive skills include the ‘foundational skills’ of literacy and numeracy and ‘higher order’ skills such as critical thinking and problem-solving, and social and emotional skills include cultural awareness and empathy, perseverance and grit, communication, teamwork, and leadership, amongst others. The NEP, which is founded on the five guiding pillars of access, equity, quality, affordability, and accountability, can contribute meaningfully to addressing diverse national and global challenges of both the present and the future. It talks about reforming the structure of education, including school regulation and governance, to align with the aspirational goals of 21st-century education along with India’s tradition, culture, and value system. Making ways for multidisciplinary and holistic education, institutional autonomy, technology integration, restructuring of governance, and regulatory architecture are among the key reform initiatives under the NEP. The NEP emphasizes quality education across all stages of School Education, which can positively impact citizenship through life-changing, mind-crafting, and character-building experiences. Empowered learners will be able to contribute to the growing developmental imperatives of the country and participate in creating a just and equitable society. Transforming India, that is Bharat, sustainably into an equitable and vibrant knowledge society, by providing high quality education to all, would lead India to a superpower.

27. Which of the following refers to a soft skill in the NEP?
- (A) Numeracy.
 - (B) Accounting.
 - (C) Leadership and communication.
 - (D) None of these.
28. The above passage does not merely stress upon which of the following?
- (A) Qualification.
 - (B) Value system.
 - (C) Holistic education.
 - (D) Quality education.
29. Reforms in education structure is aimed at developing
- (A) quality education.
 - (B) holistic and multi-disciplinary education.
 - (C) promoting cognitive and soft skills.
 - (D) All of the above.
30. Identify the mismatched word from the following that best conveys the meaning of perseverance.
- (A) Persistence
 - (B) Tenacity
 - (C) Endurance
 - (D) Uncertainty