
SPSC TEST FOR SS (BPS-17)
Male / Female in School Educations
and Literacy Department

3rd June 2023

Time: 1 Hour

1. $A = \{a, b, c\}$ and $B = \{x, y, z\}$, then f defined as $f(a) = y$, $f(c) = x$ is:
 - A. One-to-One function
 - B. Onto function
 - C. One-One and Onto function
 - D. Not a function

2. Any polynomial $p(x)$ of degree $n \geq 1$ may be expressed as:
 - A. $p(x) = (x - r)q(x) + k$
 - B. $p(x) = (x + r)q(x) + k$
 - C. $p(x) = (x - r)q(x) - k$
 - D. $p(x) = (x - r)q(x)k$

3. For two vectors \vec{a} and \vec{b} which of the following is true?
 - A. $\vec{a} + \vec{b} = \vec{b} + \vec{a}$
 - B. $\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$
 - C. $|\vec{a} - \vec{b}| = |\vec{b} - \vec{a}|$
 - D. All of these

4. Commutative group is called:
 - A. Abelian group
 - B. Monoid
 - C. Semi group
 - D. All of these

5. A group (S, \circ) is a ... if $\forall a, b \in S$, $a \circ b = b \circ a$.
 - A. Commutative group
 - B. Monoid
 - C. Semi group
 - D. None of these

6. Let R be an integral domain. Which of the following statement is not true about R ?
- A. R is a commutative group
 - B. R has no zero divisor
 - C. If R is finite, then it is a field
 - D. R is a division ring
7. If $\int_C x^n dx = 0$ then C is equal to:
- A. Simple curve
 - B. Smooth curve
 - C. Closed curve
 - D. Analytic curve
8. If the correlation coefficient is 0, then two regression lines are:
- A. Parallel
 - B. Perpendicular
 - C. Coincident
 - D. None of these
9. Four persons are chosen at random from a group containing 3 men, 2 women, 4 children, the chance that exactly two of them will be children is:
- A. $({}^4C_2 \times {}^3C_2) / {}^9C_2$
 - B. $({}^4C_2 \times {}^5C_2) / {}^9C_2$
 - C. $({}^4C_2 \times {}^2C_2) / {}^9C_2$
 - D. None of these
10. $y = \sqrt{x-1}$ is:
- A. Implicit function
 - B. Even function
 - C. Explicit function
 - D. Odd function
11. If $R = \{(1, 1), (3, 1), (2, 3), (4, 2)\}$, then which of the following represents R^2 , where R^2 is R composite R ?
- A. $\{(1, 1), (3, 1), (2, 3), (4, 2)\}$
 - B. $\{(1, 1), (9, 1), (4, 9), (16, 4)\}$
 - C. $\{(1, 1), (2, 1), (4, 3), (3, 1)\}$
 - D. $\{(1, 3), (3, 3), (3, 4), (3, 2)\}$

12. If a function has a differential coefficient that vanishes for all values of x in the interval $a \leq x \leq b$, the function is:
- A. A constant
 - B. A continuous function
 - C. A discontinuous function
 - D. None of these
13. Which one is always correct?
- A. $H.M < G.M < A.M$
 - B. $A.M < G.M < H.M$
 - C. $H.M > G.M > A.M$
 - D. None of these
14. If Hessian matrix H is zero at any point, then the point is called:
- A. Hyperbolic
 - B. Elliptic
 - C. Parabolic
 - D. Both A and B
15. The total of the ages of Karim, Rahim and, Akbar is 80 years. What was the total of their ages three year ago?
- A. 72 years
 - B. 71 years
 - C. 70 years
 - D. 69 years
16. The sum of 4^{th} multiple of 3 and 6^{th} multiple of 2 is:
- A. 6^{th} multiple of 4
 - B. 3^{rd} multiple of 8
 - C. 2^{nd} multiple of 12
 - D. All of these
17. Does the parabola $y = 2x^2 - 13x + 5$ have a tangent whose slope is -1 . If so, then it will be:
- A. $y = x^2 - 1$
 - B. $y = 2x + 2$
 - C. $y = \frac{1}{x + 1}$
 - D. None of these

18. The integral $\int \sqrt{2x+1} dx$ will be:

- A. $\frac{1}{3}(2x+1)^{\frac{3}{2}} + C$
- B. $3(2x+1)^{\frac{3}{2}} + C$
- C. $(2x+1)^{\frac{2}{3}} + C$
- D. $\frac{1}{3}(2x+1)^{\frac{2}{3}} + C$

19. Average rate of change of function $f(x) = x^3 + 1$ over the interval $[2, 3]$ will be:

- A. 18
- B. 19
- C. 20
- D. 21

20. If $y = 5x$ and $\frac{dx}{dt} = 2$, then $\frac{dy}{dt}$ will be:

- A. 9
- B. 10
- C. 11
- D. 12

21. Solution of the separable differential equation $(1+x)dy - ydx = 0$ is:

- A. $y = c(1+x)$
- B. $y = c + (1+x)$
- C. $y = c^2 + (1+x)$
- D. $y = c(1-x)$

22. Area of an equilateral triangle as function of triangle's side length x will be:

- A. $\frac{1}{4}x$
- B. $\frac{1}{4}x^3$
- C. $\frac{\sqrt{3}}{4}x$
- D. $\frac{\sqrt{3}}{4}x^2$

23. $\lim_{x \rightarrow 0} \frac{\sqrt{x^2 + 100} - 10}{x^2}$ will be:

- A. ∞
- B. 1
- C. $\frac{1}{20}$
- D. does not exist

24. Let the function $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined as $f(x) = x^2$. Then $f^{-1}(-9) =$ will be:
- A. 3
 - B. -3
 - C. $\{-3, 3\}$
 - D. \emptyset
25. An experiment consists of throwing a die and the drawing a letter at random from the English alphabet. Then total number of points in sample space will be:
- A. 60
 - B. 156
 - C. 144
 - D. 18
26. Which of these sets is an ideal in the ring of integers?
- A. The odd numbers
 - B. The negative numbers
 - C. The positive numbers
 - D. The even numbers
27. Under Galois theory, the roots of a polynomial is solvable by radicals if and only if the polynomial's Galois group is:
- A. Abelian
 - B. Prime
 - C. Cyclic
 - D. Solvable
28. In the group $G = \{2, 4, 6\}$ under multiplication modulo 10, the identity element is:
- A. 6
 - B. 8
 - C. 4
 - D. 2
29. If every element of a group G is its own inverse then G is called:
- A. Abelian
 - B. Finite
 - C. Infinite
 - D. Cyclic

30. A tensor is a:
- A. Multilinear function
 - B. Linear function
 - C. Composite function
 - D. None of these
31. Synonym of Acrimonious is:
- A. Bitter
 - B. Cheap
 - C. Expensive
 - D. Momentary
32. Antonym of Abridge is:
- A. Extend
 - B. Easy
 - C. Shorten
 - D. Street
33. One that lives on another:
- A. Independent
 - B. Eligible
 - C. Parasite
 - D. Mercenary
34. My friend will accede ... my wishes in this matter.
- A. For
 - B. With
 - C. Of
 - D. To
35. My bike which ... was brought back only when a 20-pound-reward
- A. was stolen/was offered
 - B. has been stolen/has been offered
 - C. stole/offered
 - D. was stolen/has offered

36. Choose the correct spelling:

- A. Invairunment
- B. Environment
- C. Inwironment
- D. Environmen

37. Choose the correct spelling:

- A. Eliminate
- B. Elinenate
- C. Elmenate
- D. Elemenaite

38. "Castles in the air" means:

- A. Romantic designs
- B. Ideal projects
- C. Visionary projects
- D. Fanciful schemes

39. Synonym of Succinct is:

- A. Tranquil
- B. Ratify
- C. Concise
- D. Slowly

40. Antonym of Pernicious is:

- A. Parochial
- B. Permanent
- C. Beneficial
- D. Dangerous

41. A compound proposition that is always true, no matter what the truth values of the propositions that occur in it, is called:

- A. Equivalence
- B. Tautology
- C. Contradiction
- D. Contingency

42. Let S be a set. An order on S is a relation denoted by:
- A. \equiv
 - B. \approx
 - C. \cong
 - D. \leq
43. If $u = (2, -2, 3)$ and $v = (1, -3, 4)$, then $\| -2u + 2v \|$ is:
- A. $\sqrt{2}$
 - B. $\sqrt{3}$
 - C. $2\sqrt{3}$
 - D. 1
44. A consistent system of linear equation has
- A. No solution
 - B. At least one solution
 - C. Minimum two solutions
 - D. Maximum two solutions
45. From the data 3.4, 2.5, 4.8, 2.9, 3.6, 2.8, 3.3, 5.6, 3.7, 2.8, 4.4, 4.0, 5.2, 3.0, 4.8, the sample median will be:
- A. 3.7
 - B. 3.6
 - C. 5.2
 - D. 2.9
46. The probability of getting a total of 7 or 11 when a pair of the dice are tossed will be:
- A. $\frac{1}{9}$
 - B. $\frac{2}{9}$
 - C. $\frac{4}{9}$
 - D. $\frac{8}{9}$
47. If $z_1 = 3 - 4i$ and $z_2 = -4 + 3i$, then the acute angle between the vectors will be:
- A. $15^\circ 16'$
 - B. $16^\circ 16'$
 - C. $17^\circ 16'$
 - D. $18^\circ 16'$

48. By using finite approximation to estimate the area under the graph of the function using a lower sum with two rectangles of equal width of the function $f(x) = x^2$ in the interval $[0, 1]$ will be:
- A. 0.125
 - B. 0.2187
 - C. 0.625
 - D. 0.4687
49. If f is continuous at every point in $[a, b]$ and F is any antiderivative of f on $[a, b]$, then
- A. $f(c) = \frac{1}{b-a} \int_a^b f(x)dx$
 - B. $\int_a^b f(x)dx = F(b) - F(a)$
 - C. $F(b) - F(a) = \int_a^b F'(x)dx$
 - D. $A = \int_a^b f(x)dx$
50. Integral $\int (x^3 + x)^5(3x^2 + 1)dx$ will be:
- A. $\frac{(x^3 + x)^6}{6} + C$
 - B. $\frac{(x^3 + x)^6 + x}{6} + C$
 - C. $\frac{(x^3 + x)^6 + x^2}{6} + C$
 - D. $\frac{(x^3 + x)^6 + x^3}{6} + C$

Ayesha Mureed

Student of BS Mathematics
University of Jhang

Akhtar Abbas

Lecturer in Mathematics
University of Jhang
0332-6297570