BHU MCA ENTRANCE EXAM 2015

1. The value of $\frac{9}{20}-\left[\frac{1}{5}+\left\{\frac{1}{4}+\left(\frac{5}{6}-\overline{\frac{1}{3}+\frac{1}{2}}\right)\right\}\right]$ is equal to :

(a) 0 (b) 4 (c) $\frac{9}{10}$ (d) $\frac{9}{20}$

2. The solution of simultaneous equation $x+\frac{1}{y}=\frac{3}{2}$ and $y+\frac{1}{x}=3$ is :

(a) $x=1, y=\frac{1}{2}$ (b) $x=\frac{1}{2}, y=1$

(c) x = 1, y = 2 (d) x = 1, y = – 1

3. If $1, \omega, \omega^2, ..., \omega^{n-1}$ are nth roots of unity, then $(1-\omega)(1-\omega^2)(1-\omega^3).....(1-\omega^{n-1})$ is equal to :

(a) n (b) 1

(c) 0 (d) n

4. The value of $7\log\frac{16}{15}+5\log\frac{25}{24}+3\log\frac{81}{80}$ is equal to

(a) Unity (b) Zero

(c) Log 2 (d) 0.2

5. The nth term of the series

$2\frac{1}{2}+1\frac{7}{13}+1\frac{1}{9}+\frac{20}{23}+.....$ is

(a) $\frac{20}{5n^2+3}$ (b) $\frac{2}{5n-3}$

(c) 20 (5 n + 3) (d) $\frac{20}{5n+3}$

6. The number of subsets of a set containing n distinct object is

(a) ${}^nC_1+{}^nC_2+{}^nC_3+{}^nC_4+.....+{}^nC_n$

(b) ${}^nC_0+{}^nC_1+{}^nC_2+....+{}^nC_n$

(c) 2^n-1

(d) 2^n+1

7. In the binomial expansion of $(a-b)^n, n\geq 5$. The sum of 5th and 6th a terms is zero. Then $\frac{a}{b}$ equals :

(a) $\frac{n-5}{6}$ (b) $\frac{n-4}{5}$

(c) $\frac{5}{n-4}$ (d) $\frac{6}{n-5}$

8. If $\Delta=\begin{vmatrix}0 & c & b\\ c & 0 & a\\ b & a & 0\end{vmatrix}$, then $\Delta=$

(a) $\begin{vmatrix}b^2+c^2 & 1 & 1\\ 1 & a^2+b^2 & 1\\ 1 & 1 & a^2+b^2\end{vmatrix}$

(b) $\begin{vmatrix}ab+bc & bc & ab\\ ab & bc+ca & bc\\ ca & ab & ca+ab\end{vmatrix}$

(c) $\begin{vmatrix}b^2+c^2 & a^2 & a^2\\ b^2 & c^2+a^2 & b^2\\ c^2 & c^2 & a^2+b^2\end{vmatrix}$

(d) 0

9. If, $A\begin{bmatrix}-1 & 2\\ 3 & 1\end{bmatrix}=\begin{bmatrix}-4 & 1\\ 7 & 7\end{bmatrix}$, then A equals to :

(a) $\begin{bmatrix}1 & 1\\ -2 & 3\end{bmatrix}$ (b) $\begin{bmatrix}-1 & 1\\ 2 & 3\end{bmatrix}$

(c) $\begin{bmatrix}1 & 1\\ 2 & 3\end{bmatrix}$ (d) $\begin{bmatrix}1 & -1\\ 2 & 3\end{bmatrix}$

10. The equations :

3x + y + 2z = k

x + 2y + 3z = l

2x + 3y + z = m

(a) have a unique solution

(b) are inconsistent

(c) have a trivial solution

(d) have infinitely many non-trivial solutions.

11. If A = {0, 1, 3, 5}, $B=\left\{1,,\frac{1}{3},\frac{1}{5},\frac{1}{7}\right\}$ and $C=\left\{\frac{1}{5},3\right\}$, then the value of $(A\cup B)\cup C$ is equal to :

(a) $\left\{0,1,3,5,\frac{1}{7}\right\}$ (b) $\left\{0,1,3,\frac{1}{3},\frac{1}{5},\frac{1}{7}\right\}$

(c) $\left\{0,1,3,5,\frac{1}{3},\frac{1}{5},\frac{1}{7}\right\}$ (d) $\left\{0,3,\frac{1}{3},\frac{1}{5},\frac{1}{7}\right\}$

12. For all sets A, B and C, if $A\subseteq B$ and $B\subseteq C$ and $C\subseteq A$, then:

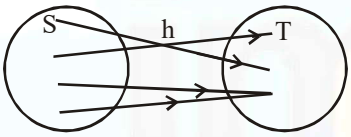
(a) B = C (b) $B\neq C$

(c) A = 0 (d) $B\neq\phi$

13. If A = {1, 2, 3, 4), B = (2, 4, 6, 8) and C = (3, 4, 5, 6), then $(A \cap B) \cap C$ is equal to :
(a) {2 } (b) {4}
(c) {6} (d) ϕ

14. Which of the following statements is true ?
(a) $A \subset B \Rightarrow A \cup B = A$ (b) $A \subset B \Rightarrow A \cap B = \phi$
(c) If $A \subset B$, then $A \cap (A - B) = \phi$
(d) $A \cap B = \phi$ implies either $A = \phi$ or $B = \phi$

15. The mapping $h : S \to T$ in the following diagram is :



(a) Many-one into (b) One-one into
(c) One-one onto (d) Many - one onto

16. If A = {– 2, –1, 0, 1, 2} and the function f : A → R be defined by the formula f(x) = x^2 + 1, then the range off is :
(a) { 0, 5, 2, 1} (b) { 5, 2, 1)
(c) {0,5,2} (d) { 0, 2, 1}

17. If A, B, C be sets and $R \subseteq A \times B$ and $S \subseteq B \times C$, then the value of $(SOR)^{-1}$ is equal to :
(a) $R^{-1}O\,S^{-1}$ (b) $R^{-1}O\,A^{-1}$
(c) $S^{-1}O\,B^{-1}$ (d) $A^{-1}O\,C^{-1}$

18. It A be the set of all triangles in a plane and R be the relation in A defined by $x\,Ry$ if and only if x is congruent to $y, x \in A, y \in A$ A, then R is an :
(a) Reflexive relation
(b) Anti-symmetric relation
(c) Transitive relation
(d) Equivalence relation

19. If M is the mid point of the side BC of the triangle ABC, then:
(a) $AB^2 + AC^2 = AM^2 + BM^2$
(b) $AB^2 + AC^2 = 2AM^2 + 2BM^2$
(c) $AM^2 + MB^2 = 2AC^2$
(d) $2AB^2 + 2AC^2 = AM^2 + BM^2$

20. A straight line passes through the point (x_1, y_1). If its portion intercepted between the ares is divided at (x_1, y_1) in the ratio m n, then its equation is :
(a) $mx\,x_1 + ny\,y_1 = m + n$
(b) $n\,x\,x_1 + my\,y_1 = m + n$
(c) $\frac{mx}{x_1} + \frac{my}{y_1} = m + n$
(d) $\frac{nx}{x_1} + \frac{my}{y_1} = m + n$

21. The equation of the straight line passing through the point of intersection of $4x + 3y = 8$ and $x + y = 1$, and the point (– 2, 5) is :
(a) 9x + 7y – 17 = 0 (b) 4x + 5y + 6 = 0
(c) 3x – 2y + 19 = 0 (d) 3x – 4y – 7 = 0

22. The equation of the circle passing through (– 1, 2) and concentric with $x^2 + y^2 - 2x - 4y - 4 = 0$ is :
(a) $x^2 + y^2 - 2x - 4y + 8 = 0$ (b) $x^2 + y^2 - 2x - 4y + 4 = 0$
(c) $x^2 + y^2 - 2x - 4y + 1 = 0$ (d) $x^2 + y^2 - 2x - 2y + 2 = 0$

23. The angle between two straight lines represented be the equation $6x^2 + 5xy - 4y^2 + 7x + 13y - 3 = 0$ is
(a) $\tan^{-1}\frac{3}{5}$ (b) $\tan^{-1}\frac{5}{3}$
(c) $\tan^{-1}\frac{2}{11}$ (d) $\tan^{-1}\frac{11}{2}$

24. The focal distance of a point on the parabola $y^2 = 8x$ is 4. Its ordinates are :
(a) ± 1 (b) ± 2
(c) ± 3 (d) ± 4

25. The line $y = mx + c$ touches the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ if c is equal to :
(a) $\pm\sqrt{a^2 - m^2b^2}$ (b) $\pm\sqrt{a^2m^2 + b^2}$
(c) $\pm\sqrt{a^2 + m^2b^2}$ (d) $\pm\sqrt{a^2m^2 - b^2}$

26. The line $x\cos 0 + y\sin\theta = p$ will touch the hyperbola $\frac{x^2}{a^2} = \frac{y^2}{b^3} = 1$
(a) $p^2 = a^2\cos^2\theta - b^2\sin^2\theta$ (b) $p^2 = a^2\sin^2\theta - b^2\cos^2\theta$
(c) $p^2 = a^2\cos^2\theta + b^2\sin^2\theta$ (d) $p^2 = a^2\sin^2\theta + b^2\cos^2\theta$

27. If x_1, x_2, x_3 as well as y_1, y_2, y_3 are in A.P., then the points $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ are :
(a) concylic
(b) collinear
(c) Three vertices of a parallelogram
(d) The virtues of a triangle

28. If bx + ay = ab touches the circle $x^2 + y^2 = r^2$, then the point $\left(\frac{1}{a}, \frac{1}{b}\right)$ lies on :

(a) a circle (b) an ellipse
(c) a straight line (d) a parabola

29. The $\lim_{x\to 0}\left[(1+x)^n - 1\right]$ is equal to

(a) $\frac{1}{n}$ (b) $-\frac{1}{n}$

(c). n^2 (d) n

30. The function $f(x) = \frac{x-1}{1+e^{(x-1)}}, x \neq 0$ is continuous for x = 1 when $f(1)$ equals :

(a) – 1 (b) 0
(c) 1 (d) 2

31. If $\sin(x+y) = xy$, then $\frac{dy}{dx}$ is equal to

(a) $\frac{x+\cos(x+y)}{\sin(x+y)+y}$ (b) $\frac{x-\cos(x+y)}{\sin(x+y)-y}$

(c) $\frac{x+\sin(x+y)}{\cos(x+y)+y}$ (d) $\frac{x+\sin(x+y)}{\cos(x+y)-y}$

32. The equation of tangent to the curve $y^2 = 2x^3 - x^2 + 3$ at the point (1, 4) is :

(a) x = 2y (b) x = 4y
(c) y = 2x (d) y = 4x

33. Let $f'(c) = 0 = f''(c) = ... = f^{n-1}(c)$ and $f^n(c) \neq 0$. If n is even, then :

(a) f(c) is not an extreme value

(b) f(c) is a minimum value if $f^n(c) = 0$

(c) f (c) is a minimum value if $f^n(c) > 0$

(d) f(c) is a maximum value if $f^n(c) > 0$

34. The value of $\int e^x\left(\frac{1 - x\log x}{x}\right)dx$ is equal to : x

(a) $x\,e^x$ (b) $e^x \log x$

(c) $\frac{e^x}{x}$ (d) $e^x + \log x$

35. The value of $\int_0^{\pi/2} \log(\tan x)\,dx$ is equal to : 0

(a) 0 (b) $\frac{x}{4}$

(c) $\frac{x}{2}$ (d) π

36. The value of $\int \frac{1}{e^x - 1}\,dx$ is equal to

(1) $\log(e^x - 1) - x\log x$ (2) $\log(e^x + x) + x\log x$

(3) $\log(e^x - 1) - x$ (4) $\log(e^x - 1) + x$

37. The volume and surface of a spherical cap of height h cut off from a sphere of radius r are :

(a) $\frac{2}{3}h^2\left(r - \frac{1}{3}h\right); \frac{2}{3}rh$ (b) $2h^2\left(r - \frac{1}{3}h\right); 2rh$

(c) $\frac{1}{3}h^2\left(r - \frac{1}{3}h\right); \frac{1}{3}rh$ (d) $\frac{1}{2}h^2\left(r - \frac{1}{3}h\right); \frac{1}{2}rh$

38. If f(x) and all its derivatives upto the $(n-1)^{th}$ order be continuous in [a, a + h] and $f^n(x)$ exists in) a, a + h [, then there exists a real numbers $\theta, 0 < \theta < 1$, such that :

(1) $f(a+h) = f(a) + h\,f'(a) + \frac{h^2}{2!}f'(a) + ... + \frac{h^n}{(n-1)!}f^{n-1}(a)$

$\frac{h^n}{(n-1)!}(1-\theta)^{n-1} f^n(a + \theta h)$

(2) $f(a+h) = f(a) + h\,f'(a) + \frac{h^2}{2!}f'(a) + ... + \frac{h^{n-1}}{(h-1)!}f^{n-1}(a)$

$+\frac{h^n}{n!}f^n(a + \theta h)$

(c) either (a) or (b)
(d) Neither (a) nor (b)

39. The order of a differential equation is defined as :
(a) the power of highest derivative in the equation
(b) the power of lowest derivative in the equation
(c) the order of lowest derivative occurring in the equation
(d) the order of highest derivative occurring in the equation

40. The degree of the differential equation :

$$\left[3 + 4\left(\frac{dy}{dx}\right)^2 + 5\left(\frac{d^2y}{dx^1}\right)\right]^{2/3} = \left(\frac{d^3y}{dx^3}\right)^2$$

(a) 6 (b) 5
(c) 4 (d) 3

41. The auxiliary equation of the differential equation

$3\frac{d^3y}{dx^3}+4\frac{d^2y}{dx^2}-3y=e^x+\sin^{-1}x$ is

(a) $3\frac{d^3y}{dx^3}+4\frac{d^2y}{dx^2}-3y=e^x$

(b) $3\frac{d^3y}{dx^3}+4\frac{d^2y}{dx^2}-3y=\sin^{-1}x$

(c) $3\frac{d^3y}{dx^3}+4\frac{d^2y}{dx^2}-3y=0$

(d) $3\frac{d^3y}{dx^3}+4\frac{d^2y}{dx^2}-3y=e^x\sin^{-1}x$

42. The general solution of the linear differential equation

$a_c\frac{d^ny}{dx^n}+a_1\frac{d^{n-1}y}{dx^{n-1}}+a_2\frac{d^{n-2}y}{dx^{n-2}}+.....+a_{n-1}\frac{dy}{dx}+ay=x$

(a) y = complementary function (C. F.)
(b) y = particular integral (P. I.)
(c) y - C. P. × P.I.
(d) y = C.F. + P.I.

43. The particular integral of the differential equation

$\frac{d^2y}{dx^2}-y\frac{dy}{dx}+13y=24e^{2x}\sin 3x$

(a) $-8e^{2x}\sin 3x$ (b) $-8e^{2x}\cos 3x$

(c) $-4e^{2x}\cos 3x$ (d) $-4e^{2x}\sin 3x$

44. The solution of $\frac{dy}{dx}=\frac{xy+y}{xy+x}$ is given by ;

(a) $cy=x\,e^{y-x}$ (b) $c\,x=y\,e^{y-x}$

(c) $c\,x=x\,e^{x-y}$ (d) $c\,x=y\,e^{x-y}$

45. Which one of the following differential equations is linear :

(a) $4y\left(\frac{dy}{dx}\right)^2+\frac{d^2y}{dx^2}=\left(\frac{dy}{dx}\right)^4+3$

(b) $\left(\frac{d^3y}{dx^3}\right)^2+2\left(\frac{dy}{dx}\right)^4+yx=0$

(c) $(2xy+2x^3)\frac{dy}{dx}y^2+6x^2y=0$

(d) $\frac{d^2y}{dx^2}+x^2\frac{dy}{dx}-y=0$

46. Which one of the following provides a general solution of the differential equation $\sec^2 x\tan y\,dx+\sec^2 y\tan x\,dy=0$?

(a) $\tan x\tan y=c$ (b) $\tan x+\tan y=c$

(c) $\sec x\sec y=c$ (d) $\sec x+\sec y=c$

47. Let the vectors a be the position vectors of the vertices P, Q, R of a triangle respectively. Which of the following represents the area of triangle ?

(a) $\frac{1}{2}\left|\vec{a}\times\vec{b}\right|$ (b) $\frac{1}{2}\left|\vec{b}\times\vec{c}\right|$

(c) $\frac{1}{2}\left|\vec{c}\times\vec{a}\right|$ (d) $\frac{1}{2}\left|\vec{a}\times\vec{b}+\vec{b}\times\vec{c}+\vec{c}\times\vec{a}\right|$

48. If ABC is a triangle, then the value of $\overrightarrow{AB}+\overrightarrow{BC}+\overrightarrow{CA}$ is equal to

(a) 0 (b) 1
(c) 2 (4) 3

49. The value of λ so that the unit vectors $\frac{2\hat{i}+\lambda\hat{j}+\hat{k}}{\sqrt{5+\lambda^2}}$ and $\frac{\hat{i}-2\hat{j}+3\hat{k}}{\sqrt{14}}$ are orthogonal is

(a) $\frac{3}{7}$ (b) $\frac{5}{2}$

(c) $\frac{2}{5}$ (d) $\frac{2}{7}$

50. The vector $(\vec{a}-\vec{b})\times(\vec{a}+\vec{b})$ is equal to

(a) $\frac{1}{2}(\vec{a}\times\vec{b})$ (b) $\vec{a}+\vec{b}$

(c) $2(\vec{a}+\vec{b})$ (d) $2(\vec{a}+\vec{b})$

51. If $\vec{a},\vec{b},\vec{c}$ are non-coplanar vectors and $\vec{d}=\lambda\vec{a}+\mu\vec{b}+\gamma\vec{c}$, then λ is equal to

(a) $\frac{\left[\vec{a}\,\vec{b}\,\vec{c}\right]}{\left[\vec{b}\,\vec{a}\,\vec{c}\right]}$ (b) $\frac{\left[\vec{b}\,\vec{c}\,\vec{d}\right]}{\left[\vec{b}\,\vec{c}\,\vec{a}\right]}$

(c) $\frac{\left[\vec{b}\,\vec{d}\,\vec{c}\right]}{\left[\vec{a}\,\vec{b}\,\vec{c}\right]}$ (d) $\frac{\left[\vec{c}\,\vec{b}\,\vec{d}\right]}{\left[\vec{a}\,\vec{b}\,\vec{c}\right]}$

52. The position vectors of the points A,B,C and D are $3\hat{i}-2\hat{j}-\hat{k},2\hat{i}+3\hat{j}-4\hat{k},-\hat{i}+\hat{j}+2\hat{k}$ and $4\hat{i}+5\hat{j}+\lambda\hat{k}$. It is know that these points are coplanar, then $\vec{\lambda}$ is equal to

(a) $-\frac{146}{17}$ (b) $-\frac{137}{17}$

(c) $-\frac{154}{17}$ (d) $-\frac{164}{17}$

53. The position vectors $60\hat{i}+3\hat{j}, 40\hat{i}-8\hat{j}, a\hat{i}-52\hat{j}$ are collinear if

(a) 20 (b) – 20 (c) 40 (4) – 40

54. The value of $\vec{a}\times(\vec{b}\times\vec{c})$ is equal to :

(a) $(\vec{a}\cdot\vec{b})\vec{a}+(\vec{a}\cdot\vec{b})\vec{c}$ (b) $(\vec{b}\cdot\vec{c})\vec{a}-(\vec{b}\cdot\vec{c})\vec{b}$

(c) $(\vec{a}\cdot\vec{c})\vec{b}-(\vec{a}\cdot\vec{b})\vec{c}$ (d) $(\vec{c}\cdot\vec{a})\vec{a}-(\vec{b}\cdot\vec{a})\vec{c}$

55. The shortest distance between two straight lines whose vector equation are

$\vec{r}=\hat{i}+\hat{j}+\lambda(2\hat{i}-\hat{j}+\hat{k})$ and

$\vec{r}=2\hat{i}+\hat{j}-\hat{k}+\mu(3\hat{i}-5\hat{j}+2\hat{k})$

(a) $\frac{5}{\sqrt{59}}$ (b) $\frac{10}{\sqrt{59}}$

(c) $\frac{\sqrt{59}}{5}$ (d) $\frac{\sqrt{59}}{10}$

56. The angle between straight line

$\vec{i}=(\hat{i}+2\hat{j}-\hat{k})+\lambda(\hat{i}-\hat{j}+\hat{k})$

and plane $\vec{r}=(2\hat{i}-\hat{j}+\hat{k})=4$

(a) $\sin^{-1}\left(\frac{2\sqrt{2}}{3}\right)$ (b) $\cos^{-1}\left(\frac{2\sqrt{2}}{3}\right)$

(c) $\sin^{-1}\left(\frac{3\sqrt{2}}{2}\right)$ (d) $\cos^{-1}\left(\frac{3\sqrt{2}}{2}\right)$

57. The value of $\frac{\tan A+\sec A-1}{\tan-\sec A+1}$ is equal to :

(a) $\frac{1+\cos A}{\sin A}$ (b) $\frac{1-\cos A}{\sin A}$

(c) $\frac{1+\sin A}{\cos A}$ (d) $\frac{1-\sin A}{\cos A}$

58. The value of $2\sin^2\beta+4\cos(\alpha+\beta)\sin\alpha\sin\beta+\cos 2(\alpha+\beta)$ is equal to :

(a) $\sin 2\alpha$ (b) $\cos 2\alpha$ (c) $1+\sin\alpha$ (d) $1+\cos\alpha$

59. The value of θ in the trigonometric equation $\sin^2\theta-\cos\theta=\frac{1}{4}$ in the interval $0\le\theta\le 2\pi$ are :

(a) $\frac{\pi}{4},\frac{5\pi}{4}$ (b) $\frac{3\pi}{4},\pi$

(c) $\frac{2\pi}{3},\frac{4\pi}{3}$ (d) $\frac{\pi}{3},\frac{5\pi}{3}$

60. If $\sin A=\sin B$ and $\cos A=\cos B$, then the values of A in terms of B is :

(a) $A=2n\pi-B$ (b) $A=2n\pi+B$

(c) $A=n\pi-B$ (d) $A=n\pi+B$

61. In any triangle ABC, the value of $\frac{b^2-c^2}{a^2}$ is equal to :

(a) $\frac{\sin(B-C)}{\sin(B+C)}$ (b) $\frac{\sin(B+C)}{\sin(B-C)}$

(c) $\frac{\cos(B-C)}{\cos(B+C)}$ (d) $\frac{\cos(B+C)}{\cos(B-C)}$

62. If p_1, p_2, p_3 are the altitudes of a triangle from the vertices A, B, C and Δ the area of the triangle, then value of $\frac{1}{p_1}+\frac{1}{p_2}+\frac{1}{p_3}$ is

(a) $\frac{ab}{(a+b+c)\Delta}\cos^2\frac{1}{2}C$ (b) $\frac{ab}{(a+b+c)\Delta}\sin^2 C$

(c) $\frac{2ab}{(a+b+c)\Delta}\cos^2\frac{1}{2}C$ (d) $\frac{2ab}{(a+b+c)\Delta}\sin^2\frac{1}{2}C$

63. If in a $\Delta ABC, \angle C=90°, a=3, b=4$ and D is a point on AB so that $\angle BCD=30°$, then the tenth CD is equal to :

(a) $\frac{5}{7}(3\sqrt{2}+5)$ (b) $\frac{5}{7}(3\sqrt{2}-5)$

(c) $\frac{8}{13}(4\sqrt{3}+3)$ (d) $\frac{8}{13}(4\sqrt{3}-3)$

64. If a = 5, b = 4 and cos (A – B) = $\frac{31}{32}$ then the third side C will be

(a) 7 (b) 6 (c) 5 (d) 4

65. A persion standing on the bank of a river observes that the angle subtended by a tree on the opposite bank is 60°, when he retires 40 feet from the bank the finds the angle to be 30°. The height of the tree and the breadth of the river are :

(a) 20 $\sqrt{3}$, 20 (b) 10 $\sqrt{3}$, 10

(c) $20\sqrt{2}$, 15 (d) $10\sqrt{2}$, 15

66. If $\sin^{-1}\left(\frac{1}{3}\right)+\sin^{-1}\left(\frac{2}{3}\right)=\sin^{-1}x$, then x is equal to :

(a) $\frac{4+\sqrt{5}}{9}$ (b) $\frac{4\sqrt{2}+\sqrt{5}}{9}$

(c) $\frac{\sqrt{3}+1}{6}$ (d) 1

67. The chance of throwing an ace in the first only of two successive throws with an ordinary die is :

(a) $\frac{1}{6}$ (b) $\frac{5}{36}$

(c) $\frac{1}{36}$ (d) $\frac{25}{36}$

68 There are six letters and six addressed envelops. What is the probability that all the letters are not dispatched in the right envelops ?

(a) $\frac{5}{7}$ (b) $\frac{6}{7}$

(c) $\frac{713}{720}$ (d) $\frac{719}{720}$

69. The average of n number $x_1, x_2, x_3, ..., x_n$ is A. If x_n is replaced by $(n+1)x_n$ then the new average is :

(a) $\frac{(n-1)A + nx_n}{n}$ (b) $\frac{nA + (n+1)x_n}{n}$

(c) $\frac{(n+1)A + nx_n}{n}$ (c) $A + x_n$

70. Secondary data :
(a) should be used after careful scrutiny
(b) should be used without any scrutiny
(c) should be used after finding out its source
(d) should never be used

71. How many classed should be taken while forming a grouped frequency distribution ?
(a) Five
(b) Less than five
(c) Between five and ten
(d) Any number

72. A frequency distribution can be presented graphically by a
(a) pie diagram (b) histogram
(c) pictogram (d) cartograrn

73. Which one of the following is not the measures of dispersions:
(a) Range (b) Average deviation
(c) Standard deviation (d) Complex number

74. The coefficients of skewness is equal to :

(a) $\frac{\text{Mean} - \text{Mode}}{\text{Standard deviation}}$ (b) $\frac{\text{Mean} - \text{Median}}{\text{Standard deviation}}$

(c) $\frac{\text{Median} + \text{Mean}}{\text{Standard deviation}}$ (d) $\frac{2\,(\text{Mean} + \text{Mode})}{\text{Standard deviation}}$

75. Normal curve $y = y_0 e^{-x^2/2\sigma^2}$ is
(a) Symmetrical about the x-axis
(b) Symmetrical about the y-axis. The mean, median and mode coincide at the origin
(c) It is not a unimodal curve
(d) The points of inflection of normal curve are equidistant for the mean

76. For Poission's distribution $M\,\sigma\, r_1 r_2$ is :
(a) < 1 (b) > 1 (c) 0 (d) 1

77. If $8x - 10y + 66 = 0$ and $40x - 18y = 214$ are two regression lines, then the coefficient of correlation between x and y is :
(a) 0.6 (b) 0.8 (c) 0.45 (d) 0.3

78. If r, σ_x, σ_y have their usual meaning and θ is the acute angle between the two regression lines in case of two variables x and y, then the value of $\tan\theta$ is equal to :

(a) $\frac{1+r^2}{r}\frac{\sigma_x\sigma_y}{\sigma_x+\sigma_y}$ (b) $\frac{1+r}{r}\frac{\sigma_x\sigma_y}{\sigma_x-\sigma_y}$

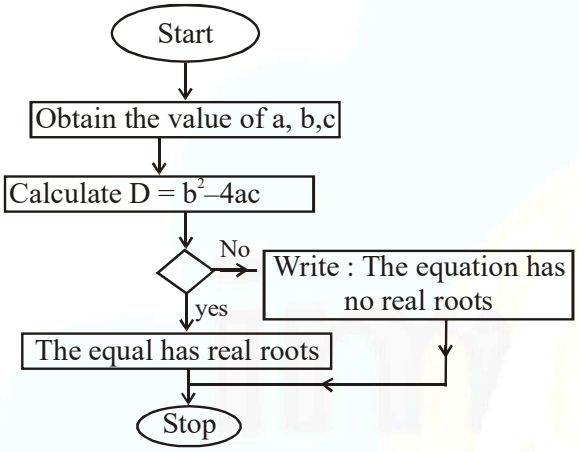
(c) $\frac{1-r^2}{r}\frac{\sigma_x\sigma_y}{\sigma_x^2+\sigma_y^2}$ (d) $\frac{1-r}{r}\frac{\sigma_x\sigma_y}{\sigma_x^2-\sigma_y^2}$

79. In simplex method, when the number of non-zero variables is equal to the number of constraints, the set of values is said to form a :
(a) basic solution (b) feasible solution
(c) iso-cost solution (d) optimal solution

80. Solve the following linear programming problems by Simplex method :
Maximize P = 3x + 7y + 6z Subject to
2x + 2y + 2z ≤ 8.
x + y ≤ 3.
x, y, z ≥ 0
(a) 21 (b) 23 (c) 25 (d) 27

81. What is the symbolic form of the following statement ?
"If wind is form the North and there is halo round the moon, then there will be rains"
(a) $(p \vee q) \Rightarrow r$ (b) $p \wedge q \Rightarrow r$
(c) $p \Rightarrow q \vee r$ (d) $q \Rightarrow p \vee r$

82. In the following flow chart for finding the roots of the quadratic equation $ax^2 + bx + c = 0, a \neq 0$, what should be written in the empty box to make the flow chart correct ?



(a) is D = 0 (b) is $D \geq 0$

(c) is $D \leq 0$ (d) is $D = 1$

83. The base of the binary number system is
(a) 2 (b) 16
(c) 8 (d) 10

84. A computer executes at a time :
(a) millions of instructions (b) only ten instructions
(c) only two instructions (d) only one instruction

85. The WHILE -DO control structure executes the loop at least :
(a) trice (b) twice
(c) once (d) None of these

86. ABCDE is a pentagon. Forces acting on a particle are represented in magnitude and direction by $\overrightarrow{AB}, \overrightarrow{BC}, \overrightarrow{CD}, 2\overrightarrow{DE}, \overrightarrow{AD}$ and $\overrightarrow{AE}$. Their resultant is given by :

(a) $\overrightarrow{AE}$ (b) $2\overrightarrow{AE}$

(c) $3\overrightarrow{AE}$ (d) $4\overrightarrow{AE}$

87. If the line of action of the resultant of two forces P and Q divides the angle between them in the ratio. 1 : 2, then the magnitude of the resultant is :

(a) $\frac{P^2 - Q^2}{Q}$ (b) $\frac{P^2 - Q^2}{P}$

(c) $\frac{P^2 + Q^2}{Q}$ (d) $\frac{P^2 + Q^2}{P}$

88. P and Q are two parallel forces acting at A and B respectively. If they interchange position, then the point of application of the resultant is displaced along AB through a distance :

(a) $\frac{P+Q}{P-Q}AB$ (b) $\frac{P-Q}{P+Q}AB$

(c) $\frac{PQ}{P-Q}AB$ (d) $\frac{PQ}{P+Q}AB$

89. Two parallel forces not having the same line of action form a couple if they are :
(a) like and unequal (b) like and equal
(c) unequal and unlike (d) equal and unlike

90. Like parallel forces act at the vertices A, B, C of a triangle and are proportional to the lengths BC, CA and AB respectively. The centre of the forces is at the :
(a) centroid (b) circum centre
(c) in-centre (d) mid of one of the side

91. ABCD is a square. Equal forces P are acting along AB, CB, AD and DC. Their resultant is a force 2P acting :
(a) along DC
(b) along AB
(c) along AC
(d) parallel to AB through the centre of square

92. If six forces of relative magnitudes 1, 2, 3, 4, 5 and 6 act along the sides of a regular hexagon taken in order, then the single equivalent force is of relative magnitude is :
(a) 1 (b) 3
(c) 5 (d) 6

93. To a man walking at 2km/hr the rain appears to fall vertically, when he increases his speed to 4km/hr it appears to meet him at an angle of 45°, Then the actual velocity of the rain is ;

(a) $2\sqrt{2}$ km/hr (b) $2\sqrt{3}$ km/hr

(c) $\sqrt{2}$ km/hr (d) $\sqrt{3}$ km/hr

94. Displacement has :
(a) magnitude only (b) sence only
(c) both sense and magnitude (d) absolute quantity

95. Acceleration of a moving point is :
(a) a negative quantity (b) a vector quantity
(c) a single number (d) a positive number

96. The law of motion is a straight line being $s = \frac{1}{2}vt$, the acceleration is :
(a) constant (b) variable
(c) uniform (d) unknown

97. If a body is falling freely under gravity, then the acceleration :
(a) varies as the inverse of the distance travelled
(b) varies as the square of the distance travelled
(c) is uniform
(d) is zero

98. The equation of motion P = ma, is due to :
(a) Newton's first law of motion
(b) Newton's second law of motion

(c) Newton's third law of motion
(d) Newton's first and second law of motion

99. The time of flight of a particle, which is projected with the velocity u in a direction making an angle a, is given by :
(a) $2u$ g $sin\ a$ (b) 2u g $cos\ a$
(c) $\frac{2u \sin a}{g}$ (d) $\frac{2u \cos a}{g}$

100. If a particle is projected with a velocity u at an angle $\alpha = 45°$, then
(a) the range is minimum
(b) the range is maximum
(c) the range is maximum and equals $\frac{u^2}{2g}$
(d) the time to the highest point is $\frac{u^2}{2g}$

101. How many such letter-pairs are there in the word MONKEY having same no. of letters left between them as they have in the series ?
(a) 4 (b) 3
(c) 2 (d) 1

102. Which is the 8th letter to the right of 15th letter your left in the following series ?
A B C D E F G HI J K L M N O P Q R S T U V W X Y Z
(a) G (b) H
(c) V (d) W

103. If KEDIV is coded as EKDYG then how will LIGHT be coded?
(a) ILHTG (b) ILGHT
(c) ILGTH (d) THG1L

104. If Hand is coded as Leg, Leg is coded .as car, car is coded as Nose, Nose is coded as Eyes, then by which part of body you walk on the earth ?
(a) Nose (b) Leg
(c) Hand (d) Ear

105. As 'House' is related to the 'Mason', similarly 'Furniture' is related to what ?
(a) Magician (b) Carpenter
(c) Sailor (d) Tailor

106. Letters of which of the alternative answers when placed at the blank places one after another will complete the given letter series ?
a — bbc — aab — ccei — bbcc
(a) acba (b) bacb
(c) caba (d) abba

107. Ankita is at 25th place from one end in a group of 35 students. What is his position from the other end ?
(l) 10 (b) 11
(c) 12 (d) 15

108. Priya goes 25 km towards south from her fixed place. Then after turning to her right she goes 30 km and then again turning her left she goes 10 km. In the end after turning to her left she goes 30 Ian, How far is she from her starting point ?
(a) 30 km (b) 40 km
(c) 35 km (d) 45 km

109. If 25 is related with 52 in the same way 29 is related to which of the following numbers ?
(a) 11 (b) 18
(c) 92 (d) 22

110. In the following question two statements are given and four conclusions II, III and IV are given under them. The given statements may be contrary to the universal opinion, even then you have to assume them as true. Then decide which conclusion on the basis of given statement is logically valid.
Statements : AII kings are beggars.
All beggars are monks.
Conclusions I. All beggars are kings.
II. All kings are monks.
III. Some monks are beggars
IV. No monk is beggar
(a) only (b) All come
(c) only HI and IV (d) only iI and III come

111. Introducing Priyanka. Saroj says that her mother is the only daughter of my mother. How is Saroj related to Priyanka ?
(a) Mother (b) Sister
(c) Daughter (d) Aunt

112. If + means +, + mean –, – means × and × means +, then the value of 48 + 16 – 4 – 2 × 8 is :
(a) 3 (b) 6
(c) – 28 (d) 112

113. **Directions.** In the following question are statement is followed by two assumptions. On the basis of the statement choose which is/are implicit.
Statement. "Please issue a circular to all the officers to assemble in the conference Hall for attending a notice." Director tells his secretary.
Assumptions. (I) All the officers will fallow the instruction.
(II) Some officers may not attend the meeting.
(a) Only assumption II is implicit
(b) Only assumption I is implicit
(c) Either I or II is implicit
(d) Both II and I arc implicit

114. **Direction**. In the following question, four alternatives are given. One of these four shows the most essential component, Hence find out the correct answer. In the desert it is necessary :
(a) camel (b) sand
(c) watermelon (d) Wind

115. Four person P, Q, R and S read a book turn by turn. R reads just before P, Q reads after P but before S. Who does read first ?
(a) P (b) Q
(c) R (d) Q or R

116. As 'class' is related to 'student' in the same way 'Train' is related to
(a) Wheel (b) Rails
(c) Passenger (d) Driver

117. The following letter-series which one of the following alternative would replace the question - mark ?
BE, DO, Fl, HK, ?
(a) KM (b) KN
(c) LO (d) JM

Directions. Q 118-132: Data on the candidates, who took an examination in Social Sciences, Mathematics and Science are given below :

Passed in all subjects 167 Failed in all subjects 60

Failed in Social Sciences 175 Failed in Mathematics 199
Failed in Science 199 Passed in Social Science only 62
Passed in Mathematics only 48 Passed in Science only 52
Answer the following questions based on above data

118. How many failed in one subject only ?
(a) 56 (b) 61 (c) 144 (d) 152

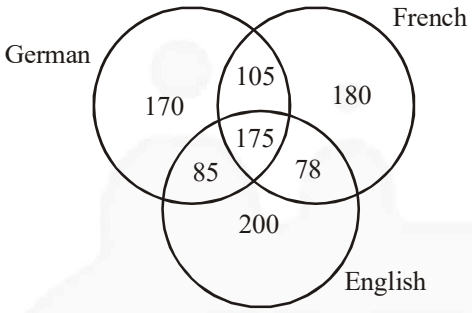
119. How many failed in two subject only ?
(a) 56 (b) 61 (c) 144 (d) 162

120. How many failed in social sciences only ?
(a) 15 (b) 21 (c) 30 (d) 42

121. How many passed at least in one subject ?
(a) 167 (b) 304 (c) 390 (d) 450

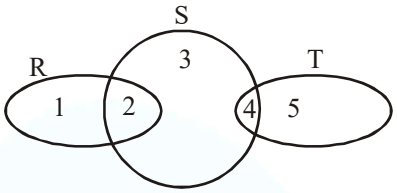
122. How many passed in Mathematics and at least in one more subject ?
(a) 94 (b) 170 (c) 203 (d) 210

123. A survey was conducted on a sample of 1000 persons with reference to their knowledge of English, French and German. The result is presented in the Venn diagram. The ratio of the number of persons who do not know the three languages to those who know all the three languages is :



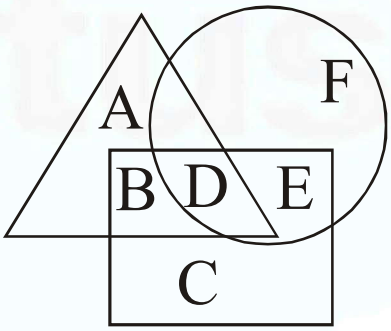
(a) $\frac{1}{27}$ (b) $\frac{1}{25}$ (c) $\frac{7}{550}$ (d) $\frac{175}{1000}$

124. In the following diagram, R represents businessmen, S represents rich men, T represents honest men. Which number will- represent honest rich men ?



(a) 2 (b) 3 (c) 5 (d) 4

125. In the given figure, the triangle represents, the square represents sports persons and circle represents coaches. The portion in the figure which represents girls who are sports persons but not coaches is labelled :



(a) A (b) B (c) D (d) E

Directions : Q. 126-130. In each of the questions from 126 to 130, four alternatives are given. One of these four shows the most essential components Hence find out the correct answer :

126. In a desert it is necessary
(a) camel (b) sand
(c) watermelon (d) wind

127. In a man it is necessary
(a) Heart (b) Teeth
(c) Fingers (d) Eyes

128. 1n a tree it is necessary
(a) Leaves (b) Fruits
(c) Mowers (d) Roots

129. In a country it is necessary -
(a) Prime Minister (b) Army
(c) Area (d) Industry

130. The most essential for a hospital is -
(a) Air (b) Nurse
(c) Telephone (d) Doctor

Directions Q. 131-132 In the questions 131 and 132, choose the-word, which is most nearly the same in meaning to the **bold** word and mark it.

131. His style is quite **transparent** :
(a) verbose (b) involved
(c) lucid (d) witty

132. **High**
(a) Tall (b) Short
(c) Fat (d) Thin

Diroctions. Q. 133-134: In the questions 233 and 134, choose the word which is most nearly the OPPOSITE in meaning to the **bold** wo.id and mark it.

133. Lucy is a **smart** girl.
(a) active (b) indecent
(c) casual (d) lazy

134. **Day:**
(a) year (b) month
(c) night (d) hour

Direction. Q. 135 : In the following questions 135, sentences are given with blanks to be filled in with appropriate words. Choose correct alternative out of the four and mark it.

135. He granted the request because he was to..... .his friend :
(a) sure, displeasure (b) unwilling, please
(c) reluctant, disappoint (d) bound, hurt

136. The heart and the nerve centre of a computer is its
(a) C.P.U. (c) output unit
(b) memory (d) input unit

137. A finite sequence of steps needed to solve a problem is called a/an :
(a) method of solution (b) process
(c) algorithm (d) flow-chart

138. Main memory unit of a computer :
(a) performs arithmetic
(b) stares a small amount of data and instructions
(c) stores bulk of data and instructions
(d) supervises the working of all the units

139. The symbolic statement i = i + a is true, if here i stands for multiplicative identity.
(a) not true in any algebra
(b) in both the algebras
(c) only in ordinary algebra
(d) only in Boolean algebra

140. If a, b, c are elements of a Boolean algebra, then
$ab + c(a' + b')$ will be equal to
(a) a + be (b) ab + c
(c) ac + b (d) $a' + bc$

141. A CPU consist of :
(a) input, output unit
(b) memory unit
(c) arithmetic and logical unity control unit
(d) back-up devices

142. C is a :
(a) Middle level language
(b) High level language
(c) Low level language
(d) None of the above

143. Which of the following shows the correct hierarchy of arithmetic operations in C :
(a) ( ), **, * or /, + or – (b) ( ), **, * /, +, –
(c) ( ), **, /, *, +, – (d) ( ), /, or *, – or +

144. Which of the following is a storage class specification of C ?
(a) Automatic (b) External
(c) internal (d) All of the above

145. In C, structive values can be passed as arguments to functions by :
(a) passing each number of the structure as an actual argument of function code
(b) passing a copy of the entire structure to the called function
(c) passing the structure as an argument using pointers
(d) All of the above

146. Which newspaper has the motto ..... Journalism of courage ?
(a) The Hindustan Times (b) The Washington Post
(c) The Indian Express (d) The Guardian

147. The Indian Railways is one of the largest railway systems with an extensive network of over 63,000 route kilometers, Approximately..... of the network is electrified.
(a) 50% (b) 25%
(c) 45% (d) 60%

148. The National Literacy Mission (NLM) seeks to achieve full literacy i,e. a sustainable threshold level of 75% literacy by year :
(a) 2005 (b) 2010
(c) 2015 (d) 2020

149. Who appointed the Governor of a State ?
(a) The President of India (b) Chief Justice of India
(c) Prime Minister of India (d) Vice-President of India

150. Bhopal gas tragedy is associated with the leakage of :
(a) ethylcyanide (b) phenyl isocyanate
(c) methyl isocyanate (d) methyl isocyanide

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1.	(a)	**2.**	(b)	**3.**	(a)	**4.**	(c)	**5.**	(d)	**6.**	(b)	**7.**	(b)	**8.**	(wrong)	**9.**	(d)	**10.**	(a)
11.	(c)	**12.**	(a)	**13.**	(b)	**14.**	(c)	**15.**	(d)	**16.**	(b)	**17.**	(a)	**18.**	(d)	**19.**	(b)	**20.**	(c)
21.	(a)	**22.**	(c)	**23.**	(d)	**24.**	(d)	**25.**	(b)	**26.**	(a)	**27.**	(b)	**28.**	(a)	**29.**	(d)	**30.**	(b)
31.	(b)	**32.**	(wrong)	**33.**	(c)	**34.**	(b)	**35.**	(a)	**36.**	(c)	**37.**	(b)	**38.**	(b)	**39.**	(d)	**40.**	(a)
41.	(c)	**42.**	(d)	**43.**	(b)	**44.**	(b,c)	**45.**	(d)	**46.**	(a)	**47.**	(d)	**48.**	(a)	**49.**	(b)	**50.**	(c)
51.	(b)	**52.**	(a)	**53.**	(d)	**54.**	(c)	**55.**	(b)	**56.**	(b)	**57.**	(c)	**58.**	(b)	**59.**	(d)	**60.**	(d)
61.	(a)	**62.**	(b)	**63.**	(c)	**64.**	(b)	**65.**	(a)	**66.**	(b)	**67.**	(b)	**68.**	(d)	**69.**	(d)	**70.**	(a)
71.	(c)	**72.**	(b)	**73.**	(d)	**74.**	(a)	**75.**	(b)	**76.**	(d)	**77.**	(1)	**78.**	(c)	**79.**	(b)	**80.**	(d)
81.	(b)	**82.**	(b)	**83.**	(a)	**84.**	(a)	**85.**	(c)	**86.**	(c)	**87.**	(a)	**88.**	(b)	**89.**	(d)	**90.**	(c)
91.	(d)	**92.**	(d)	**93.**	(a)	**94.**	(c)	**95.**	(b)	**96.**	(c)	**97.**	(c)	**98.**	(b)	**99.**	(c)	**100.**	(b)
101.	(d)	**102.**	(d)	**103.**	(c)	**104.**	(d)	**105.**	(b)	**106.**	(a)	**107.**	(b)	**108.**	(c)	**109.**	(c)	**110.**	(d)
111.	(a)	**112.**	(wrong)	**113.**	(d)	**114.**	(b)	**115.**	(c)	**116.**	(c)	**117.**	(d)	**118.**	(b)	**119.**	(d)	**120.**	(a)
121.	(c)	**122.**	(c)	**123.**	(b)	**124.**	(d)	**125.**	(b)	**126.**	(b)	**127.**	(a)	**128.**	(d)	**129.**	(c)	**130.**	(a)
131.	(c)	**132.**	(a)	**133.**	(d)	**134.**	(c)	**135.**	(c)	**136.**	(a)	**137.**	(c)	**138.**	(b)	**139.**	(d)	**140.**	(b)
141.	(c)	**142.**	(a)	**143.**	(a)	**144.**	(d)	**145.**	(d)	**146.**	(c)	**147.**	(b)	**148.**	(a)	**149.**	(a)	**150.**	(c)

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1.	(a)	**2.**	(b)	**3.**	(a)	**4.**	(c)	**5.**	(d)	**6.**	(b)	**7.**	(b)	**8.**	(wrong)	**9.**	(d)	**10.**	(a)
11.	(c)	**12.**	(a)	**13.**	(b)	**14.**	(c)	**15.**	(d)	**16.**	(b)	**17.**	(a)	**18.**	(d)	**19.**	(b)	**20.**	(c)
21.	(a)	**22.**	(c)	**23.**	(d)	**24.**	(d)	**25.**	(b)	**26.**	(a)	**27.**	(b)	**28.**	(a)	**29.**	(d)	**30.**	(b)
31.	(b)	**32.**	(wrong)	**33.**	(c)	**34.**	(b)	**35.**	(a)	**36.**	(c)	**37.**	(b)	**38.**	(b)	**39.**	(d)	**40.**	(a)
41.	(c)	**42.**	(d)	**43.**	(b)	**44.**	(b,c)	**45.**	(d)	**46.**	(a)	**47.**	(d)	**48.**	(a)	**49.**	(b)	**50.**	(c)
51.	(b)	**52.**	(a)	**53.**	(d)	**54.**	(c)	**55.**	(b)	**56.**	(b)	**57.**	(c)	**58.**	(b)	**59.**	(d)	**60.**	(d)
61.	(a)	**62.**	(b)	**63.**	(c)	**64.**	(b)	**65.**	(a)	**66.**	(b)	**67.**	(b)	**68.**	(d)	**69.**	(d)	**70.**	(a)
71.	(c)	**72.**	(b)	**73.**	(d)	**74.**	(a)	**75.**	(b)	**76.**	(d)	**77.**	(1)	**78.**	(c)	**79.**	(b)	**80.**	(d)
81.	(b)	**82.**	(b)	**83.**	(a)	**84.**	(a)	**85.**	(c)	**86.**	(c)	**87.**	(a)	**88.**	(b)	**89.**	(d)	**90.**	(c)
91.	(d)	**92.**	(d)	**93.**	(a)	**94.**	(c)	**95.**	(b)	**96.**	(c)	**97.**	(c)	**98.**	(b)	**99.**	(c)	**100.**	(b)
101.	(d)	**102.**	(d)	**103.**	(c)	**104.**	(d)	**105.**	(b)	**106.**	(a)	**107.**	(b)	**108.**	(c)	**109.**	(c)	**110.**	(d)
111.	(a)	**112.**	(wrong)	**113.**	(d)	**114.**	(b)	**115.**	(c)	**116.**	(c)	**117.**	(d)	**118.**	(b)	**119.**	(d)	**120.**	(a)
121.	(c)	**122.**	(c)	**123.**	(b)	**124.**	(d)	**125.**	(b)	**126.**	(b)	**127.**	(a)	**128.**	(d)	**129.**	(c)	**130.**	(a)
131.	(c)	**132.**	(a)	**133.**	(d)	**134.**	(c)	**135.**	(c)	**136.**	(a)	**137.**	(c)	**138.**	(b)	**139.**	(d)	**140.**	(b)
141.	(c)	**142.**	(a)	**143.**	(a)	**144.**	(d)	**145.**	(d)	**146.**	(c)	**147.**	(b)	**148.**	(a)	**149.**	(a)	**150.**	(c)