Booklet Serial No. : 733

***DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO***

**TEST BOOKLET SERIES**

# *TEST BOOKLET*

## *PGT(MATHEMATICS)-2016*

**A**

Time Allowed : 2 Hours] [Maximum Marks : 100

*All* questions carry equal marks.

## *INSTRUCTIONS*

1. Immediately after the commencement of the examination, you should check that test booklet does not have any unprinted or torn or missing pages or items, etc. If so, get it replaced by a complete test booklet.
2. **Encode clearly the test booklet series A, B, C or D as the case may be in the appropriate place in the answer-sheet.**
3. Write your Roll Number only in the box provided alongside. Do not write anything else on the Test Booklet.
4. This Test Booklet contains **100** items (questions). Each item comprises four responses (answers). Choose only one response for each item which you consider the best.
5. After the candidate has read each item in the Test Booklet and decided which of the given responses is correct or the best, he has to mark the circle containing the letter of the selected response by blackening it completely with Black or Blue ball pen. In the following example, response "C" is so marked :


6. Do the encoding carefully as given in the illustrations. While encoding your particulars or marking the answers on answer sheet, you should blacken the circle corresponding to the choice in full and no part of the circle should be left unfilled. After the response has been marked in the ANSWER SHEET, no erasing/fluid is allowed.
7. You have to mark all your responses ONLY on the ANSWER SHEET separately given according to 'INSTRUCTIONS FOR CANDIDATES' already supplied to you. *Responses marked on the Test Booklet or in any paper other than the answer sheet shall not be examined.*
8. All items carry equal marks. Attempt all items. Your total marks will depend only on the number of correct responses marked by you in the Answer Sheet. There will be no negative marking.
9. Before you proceed to mark responses in the Answer Sheet fill in the particulars in the front portion of the Answer Sheet as per the instructions sent to you.
10. If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct.
11. After you have completed the test, hand over the Answer Sheet only, to the Invigilator.

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Time Allowed : 2 Hours] [Maximum Marks : 100

1. If $u = \sin^{-1}\dfrac{x + 2y + 3z}{x^8 + y^8 + z^8}$, then the value of $x\dfrac{\partial u}{\partial x} + y\dfrac{\partial u}{\partial y} + z\dfrac{\partial u}{\partial z}$ is :

(A) $\tan u$ (B) $5 \tan u$

(C) $6 \tan u$ (D) $-7 \tan u$

2. If $u = f(2x - 3y, 3y - 4z, 4z - 2x)$, then the value of $\dfrac{1}{2}\dfrac{\partial u}{\partial x} + \dfrac{1}{3}\dfrac{\partial u}{\partial y} + \dfrac{1}{4}\dfrac{\partial u}{\partial z}$ is :

(A) $x + y + z$ (B) $2x - 3y + z$

(C) $3x + 2y + 4z$ (D) $0$

3. The radius of curvature at the point $(3a/2, 3a/2)$ of the curve $x^3 + y^3 = 3axy$ is :

(A) $\dfrac{3a}{\sqrt{2}}$ (B) $\dfrac{3a}{2\sqrt{2}}$

(C) $\dfrac{3a}{5\sqrt{2}}$ (D) $\dfrac{3a}{8\sqrt{2}}$

4. The value of the integral $\int_0^{2a} x^3\sqrt{2ax - x^2}\,dx$ is :

(A) $\dfrac{7\pi a^5}{8}$ (B) $\dfrac{7\pi a^5}{9}$

(C) $\dfrac{7\pi a^5}{10}$ (D) $\dfrac{7\pi a^5}{11}$

5. The area of the cardioid $r = a(1 - \cos\theta)$ is :

(A) $\frac{3\pi a^2}{2}$ (B) $\frac{\pi a^2}{3}$

(C) $\frac{3\pi a^2}{4}$ (D) $3\pi a^2$

6. The area of the plane region bounded by the parabola $y^2 = 4ax$ and the latus rectum, is :

(A) $\frac{2}{3}a^2$ (B) $\frac{4}{3}a^2$

(C) $\frac{5}{3}a^2$ (D) $\frac{8}{3}a^2$

7. The surface of the solid formed by revolving the cardioid $r = a(1 + \cos\theta)$ about the initial line is :

(A) $\frac{\pi a^2}{5}$ (B) $\frac{16\pi a^2}{5}$

(C) $\frac{32\pi a^2}{5}$ (D) $\frac{48\pi a^2}{5}$

8. The semi-vertical angle of a cone of maximum volume and of given slant height is :

(A) $\tan^{-1}\sqrt{3}$ (B) $\tan^{-1}\sqrt{5}$

(C) $\tan^{-1}\sqrt{2}$ (D) $\tan^{-1}\sqrt{6}$

9. The value of the integral $\int \frac{dx}{x\left(x^n+1\right)}$ is :

(A) $\frac{1}{n}\log\frac{x^n}{x^n+1}+c$ (B) $\frac{1}{n}\log\frac{x^n+1}{x^n}+c$

(C) $\frac{1}{n}\log x^n+c$ (D) $\frac{1}{n}\log\frac{1}{x^n+1}+c$

10. If $I_n=\int_0^{\pi/3}\tan^n x\,dx$, then :

(A) $(n+1)\left(I_n-I_{n-2}\right)=\left(\sqrt{3}\right)^{n-1}$ (B) $(n-1)\left(I_n+I_{n-2}\right)=\left(\sqrt{3}\right)^{n-1}$

(C) $(n+1)\left(I_n+I_{n-2}\right)=\left(\sqrt{3}\right)^{n+1}$ (D) $n\left(I_n+I_{n-2}\right)=\sqrt{3}$

11. The value of the integral $\int_0^{\pi/6}\cos^6 3\theta\sin^2 6\theta\,d\theta$ is :

(A) $\frac{\pi}{384}$ (B) $\frac{5\pi}{384}$

(C) $\frac{7\pi}{384}$ (D) $\frac{9\pi}{384}$

12. The value of the double integral $\iint xy\,dx\,dy$ over the region in the positive quadrant for which $x+y\le 1$, is :

(A) $\frac{1}{6}$ (B) $\frac{1}{12}$

(C) $\frac{1}{18}$ (D) $\frac{1}{24}$

13. The equation of the plane through the point $(-1, 2, 4)$ and parallel to the plane $2x + 3y - 5z + 6 = 0$ is :

(A) $2x + 3y - 5z + 16 = 0$ (B) $2x + 3y - 5z + 17 = 0$

(C) $2x + 3y - 5z + 18 = 0$ (D) $2x + 3y - 5z + 19 = 0$

14. The coordinate of the point where the line joining the points $(2, -3, 1)$ and $(3, -4, -5)$ cuts the plane $2x + y + z = 7$ is :

(A) $(1, -2, 7)$ (B) $(1, 2, 7)$

(C) $(-1, 2, -7)$ (D) $(-1, -2, 7)$

15. The volume of tetrahedron whose vertices are $(a, 1, 2)$, $(3, 0, 1)$, $(4, 3, 6)$ and $(2, 3, 2)$ is :

(A) $6 - a$ (B) $6 - 2a$

(C) $6 - 3a$ (D) $6 - 4a$

16. The centre and radius of the sphere $x^2 + y^2 + z^2 - 2x + 4y - 6z = 11$ are :

(A) $(1, -2, 3)$ and 5 (B) $(1, -2, -3)$ and 5

(C) $(1, -2, -3)$ and 15 (D) $(-1, -2, -3)$ and 25

17. The equation of the tangent plane to the central conicoid $3x^2 - 5y^2 + z^2 + 2 = 0$ at the point (1, 1, 0) is :

(A) $2x + 5y - 7 = 0$ (B) $3x - 5y + 2 = 0$

(C) $x + 5y - 6 = 0$ (D) $x + y - 2 = 0$

18. The angle between the surfaces $x \log z = y^2 - 1$ and $x^2y = 2 - z$ at the point (1, 1, 1) is :

(A) $\cos^{-1}\frac{1}{\sqrt{30}}$ (B) $\sin^{-1}\frac{1}{\sqrt{30}}$

(C) $\tan^{-1}\frac{1}{\sqrt{30}}$ (D) $\cot^{-1}\frac{1}{\sqrt{30}}$

19. The inverse Laplace transform of the function $\frac{s}{\left(s^2 + a^2\right)^2}$ is :

(A) $\frac{t \sin at}{2a}$ (B) $\frac{t \cos at}{2a}$

(C) $\frac{\sin at + \cos at}{2a}$ (D) $\sin at \cos at$

20. The Fourier cosine transform of $\frac{1}{1 + x^2}$ is :

(A) $\frac{\pi}{2}e^{-s}$ (B) $\pi e^{-s}$

(C) $e^{-s}$ (D) $e^{s}$

21. The inverse $z$-transform of the function $\frac{z}{(z+2)(z+3)}$ is :

(A) $(-2)^n + (-3^n)$ (B) $(-2)^n - (-3^n)$

(C) $(-2)^n - 3^n$ (D) $2^n - 3^n$

22. The value of the $\lim_{x \to 0} \frac{(1+x)^{1/x} - e}{x}$ is :

(A) $\frac{e}{3}$ (B) $-\frac{e}{2}$

(C) $\frac{e}{4}$ (D) $e$

23. The function $f(x) = \sin x + \cos x$ is :

(A) increasing in interval $(0, 5\pi/4)$

(B) decreasing in interval $(0, \pi/4)$

(C) decreasing in interval $(5\pi/4, 2\pi)$

(D) decreasing in interval $(\pi/4, 5\pi/4)$

24. The maximum and minimum value of the function $f(x) = \sin x + \frac{1}{2}\sin 2x + \frac{1}{3}\sin 3x$ for all $x \in [0, \pi]$ are :

(A) $\frac{4\sqrt{2}+3}{6}$ and $\frac{\sqrt{3}}{4}$ respectively

(B) $\frac{4\sqrt{2}-3}{6}$ and $\frac{\sqrt{3}}{4}$ respectively

(C) $\frac{4\sqrt{2}-3}{6}$ and $\frac{\sqrt{5}}{4}$ respectively

(D) $\frac{4\sqrt{2}-3}{2}$ and $\frac{\sqrt{3}}{2}$ respectively

25. In a plane triangle ABC, the maximum value of $\cos A \cos B \cos C$ is :

(A) 1/2 (B) 1/4

(C) 1/6 (D) 1/8

26. The volume of the greatest rectangular parallelopiped that can be inscribed in the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$ is :

(A) $8abc$ (B) $8abc/3$

(C) $8abc/\sqrt{3}$ (D) $8abc/\left(3\sqrt{3}\right)$

27. The function $f(x) = x^2$ is :

(A) uniformly continuous on $[0, \infty)$

(B) uniformly continuous on $(-\infty, 0]$

(C) uniformly continuous on $(-\infty, \infty)$

(D) uniformly continuous on every closed and finite interval

28. The function $f(x) = \dfrac{2[x]}{3x - |x|}$

(A) is continuous at $x = 1$ and discontinuous at $x = -1/2$

(B) is discontinuous at $x = 1$ and continuous at $x = -1/2$

(C) is continuous at $x = -1/2, 1$

(D) is discontinuous at $x = -1/2, 1$

29. The function $f(x) = \dfrac{x - |x|}{x}$ is *not* continuous at :

(A) $x = 0$ (B) $x = 1$

(C) $x = 2$ (D) $x = 3$

30. Rolle's theorem does *not* holds for the function :

(A) $f(x) = 1 - (x - 1)^{2/3}$ on $[0, 2]$

(B) $f(x) = \sqrt{1 - x^2}$ on $[-1, 1]$

(C) $f(x) = x^3 - 4x$ on $[-2, 2]$

(D) $f(x) = \cos x$ on $[-\pi/2, \pi/2]$

31. For the set G = {–2, –3/2, –4/3, .....}, which one of the statements is *true* ?

(A) G is unbounded

(B) inf G = –2 and sup G = ∞

(C) inf G = –3/2 and sup G = –1

(D) inf G = –2 and sup G = –1

32. Which one of the following inequalities is *not* true ?

(A) $(1 + x) < e^x < 1 + xe^x$ for all $x > 0$

(B) $\frac{x}{1+x} < \log(1 + x) < x$ for all $x > 0$

(C) $|\tan^{-1} x - \tan^{-1} y| \leq |x - y|$ for all $x, y \in \mathbf{R}$

(D) $|\sin x - \sin y| \geq |x - y|$ for all $x, y \in \mathbf{R}$

33. Which one of the following set is *not* closed ?

(A) **R**

(B) **Q**

(C) empty set

(D) every closed and finite interval

34. Which one of the following is countable ?

(A) **R\Q** (B) **Q\Z**

(C) **R\Z** (D) **R\N**

35. Which one of the set is open in $\mathbf{R}$ ?

(A) $\mathbf{Z}$ (B) $\mathbf{R}\setminus\mathbf{Z}$

(C) $\mathbf{Q}$ (D) $\mathbf{R}\setminus\mathbf{Q}$

36. Which one of the following statements is *not* true ?

(A) Every point of the set Q of rational is a limit point

(B) Every point of the closed interval $[a, b]$ is its limit point

(C) a finite set has at least one point

(D) $\left\{\frac{1}{n} : n \in \mathbf{N}\right\}$ has only one limit point

37. The sequence $\left\langle 1 + (-1)^n \right\rangle$ :

(A) converges (B) diverges

(C) oscillate finitely (D) oscillate infinitely

38. An infinite series $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{1}{n}$

(A) converges to $\log 2$ (B) converges to $\log 3$

(C) converges to 1 (D) converges to $2 \log 2$

39. The sum of an infinite series $\frac{5}{1.2.3} + \frac{7}{3.4.5} + \frac{9}{5.6.7} + \ldots\ldots\ldots$ is :

(A) $3 \log 2 - 1$

(B) $\log 2 - 1$

(C) $\log 2$

(D) $3 \log 2$

40. The series $\sum \left( \frac{1}{n} + \frac{(-1)^n}{\sqrt{n}} \right)$ is :

(A) convergent

(B) divergent

(C) oscillate finitely

(D) oscillate infinitely

41. The solution of the differential equation $\frac{dy}{dx} = \frac{\sin y + y \sin x}{\cos x - x \cos y}$ is :

(A) $y \cos x + x \sin y = c$

(B) $2y \cos x - x \sin y = c$

(C) $y \cos x - x \sin y = c$

(D) $x \cos x - y \sin x = c$

42. The general solution of the differential equation $(D - 2)^3 y = e^{2x}$ is :

(A) $(A + Bx + Cx^2 + x^2/4)e^{2x}$

(B) $(A + Bx + Cx^2 + x^2/6)e^{2x}$

(C) $(A + Bx + Cx^2 + 1/4)e^{2x}$

(D) $(A + Bx + Cx^2 + x/4)e^{2x}$

43. The particular solution of the differential equation $(D^2 - 1)y = x^2 \cos x$ is :

(A) $x \sin x + (1 - x^2) \cos x$

(B) $x \sin x + (1 - x^2) \frac{\cos x}{3}$

(C) $x \sin x + (1 - x^2) \frac{\cos x}{2}$

(D) $x \sin x + (1 - x^2) \frac{\cos x}{4}$

44. Which one of the following is an elliptic partial differential equation ?

(A) $\frac{\partial^2 z}{\partial x^2} - 6\frac{\partial^2 z}{\partial x \partial y} + \frac{\partial^2 z}{\partial y^2} = 0$

(B) $\frac{\partial^2 z}{\partial x^2} + 2\frac{\partial^2 z}{\partial x \partial y} + \frac{\partial^2 z}{\partial y^2} = 0$

(C) $\frac{\partial^2 z}{\partial x^2} - \frac{\partial^2 z}{\partial x \partial y} + \frac{\partial^2 z}{\partial y^2} = 0$

(D) $\frac{\partial^2 z}{\partial x^2} - 4\frac{\partial^2 z}{\partial x \partial y} + \frac{\partial^2 z}{\partial y^2} = 0$

45. The general solution of the partial differential equation $(y + z)p + (z + x)q = x + y$ is :

(A) $\phi\left(\frac{x-y}{x-z}, (x-y)^2 (x-y-z)\right) = 0$

(B) $\phi\left(\frac{x-y}{x-z}, (x-y)^2 (x-y+z)\right) = 0$

(C) $\phi\left(\frac{x-y}{x-z}, (x-y)^2 (x+y+z)\right) = 0$

(D) $\phi\left(\frac{x-y}{x+z}, (x-y)^2 (x+y-z)\right) = 0$

46. The cube roots of the complex number $-i$ are :

(A) $i, \pm\frac{\sqrt{3}}{2} - \frac{1}{2}i$

(B) $-i, \pm\frac{\sqrt{3}}{2} - \frac{1}{2}i$

(C) $i, \pm\frac{\sqrt{3}}{2} + \frac{1}{2}i$

(D) $i, 1, \frac{\sqrt{3}}{2} + \frac{1}{2}i$

47. The function $f(z) = e^z$; $z \in \mathbf{C}$ is :

(A) bounded

(B) increasing

(C) periodic

(D) decreasing

48. Which of the following complex valued function is *not* analytic ?

(A) $\cos z$

(B) $\sin z$

(C) $e^z$

(D) $\tan z$

49. The complex valued function $\log z$ has a branch point at :

(A) $z = 0$

(B) $z = 1$

(C) $z = 2$

(D) $z = \infty$

50. The value of the contour integral $\oint_{|z|=1} \frac{dz}{2 - \bar{z}}$ is :

(A) $\pi i$

(B) $2\pi i$

(C) $\pi i/2$

(D) 0

51. The radius of the convergence of the power series $\sum_{n=1}^{\infty} \frac{(-1)^{n+1} n}{5n^2+3}(z-z_0)^n$ is :

(A) 0 (B) 1

(C) 2 (D) 3

52. For the complex valued function $f(z) = \frac{e^z}{z - \sin z}$, the point $z = 0$ is :

(A) a branch point (B) removable singularity

(C) an essential singularity (D) a pole of order 3

53. The bilinear mapping which maps the upper half of the $z$-plane on to the right half of the $w$-plane is :

(A) $w = \frac{2iz}{z+1}$ (B) $w = \frac{2z}{z-1}$

(C) $w = \frac{2i}{z+1}$ (D) $w = \frac{iz}{2z+1}$

54. The bilinear transformation $w = \frac{az+b}{cz+d}$; $ad - bc \neq 0$ is *not* conformal at :

(A) $z = c$ (B) $z = d$

(C) $z = 0$ (D) $z = \infty$

55. Under the mapping $w = 1/z$, the image of the circle $|z - 3| = 5$ is a :

(A) hyperbola (B) circle

(C) square (D) strip

56. Let A(1, –2), B(–3, 4) and C(2, 2) be the three vertices of the triangle ABC. Then the length of the median from C to the side AB is :

(A) $\sqrt{5}$ (B) $\sqrt{10}$

(C) $\sqrt{15}$ (D) $\sqrt{20}$

57. The trace of a 3 matrix is 2. Two of its eigen values are 1 and 2. Then the third eigen value is :

(A) –1 (B) 0

(C) 1 (D) 2

58. The matrix $\begin{pmatrix} 1 & 1 & 3 \\ 5 & 2 & 6 \\ -2 & -1 & -3 \end{pmatrix}$ is :

(A) an involutary (B) nilpotent

(C) an idempotent (D) skew-symmetric

59. The system of simultaneous equations $x + y + z = 3$, $x + 2y + 3z = 4$, $x + 4y + kz = 6$ has infinite number of solutions if :

(A) $k = 7$ (B) $k = 1$

(C) $k = 2$ (D) $k = 3$

60. If a tree stands vertically on a hill side which makes an angle of 22° with the horizontal. From a point on the ground 35 metre down the hill from the base of the tree, the angle of elevation of the top of the tree is 45°, then the height of the tree is :

(A) 19 metre (B) 19.2 metre

(C) 19.4 metre (D) 19.6 metre

61. In a class, if 30 students are studying mathematics, 25 students are computer science and 15 students are studying both, then total number of students in the class is :

(A) 30 (B) 40

(C) 55 (D) 70

62. The variance of 20 observations is 5. If each observation is multiplied by 2, then the new variance of the resulting observation is :

(A) 15 (B) 20

(C) 25 (D) 30

63. If one of the regression coefficient is greater than 1, then other must be :

(A) greater than 2 (B) less than 1

(C) equal to 1 (D) equal to 2

64. A die is tossed. If the number is odd, then the probability that it is prime, is :

(A) $\frac{1}{4}$ (B) $\frac{1}{2}$

(C) $\frac{2}{3}$ (D) $\frac{3}{4}$

65. The set S = {1, 5, 7, 11} is a group with respect to multiplication modulo :

(A) 5 (B) 7

(C) 9 (D) 12

66. In the multiplicative group $G = \{1, -1, i, -i\}$, the order of an element $-i$ is :

(A) 1 (B) 2

(C) 3 (D) 4

67. For a finite group G, Lagrange theorem states that the :

(A) order of an element divides order of G

(B) order of any subgroup divides order of G

(C) sum of orders of elements in G is the order of G

(D) order of G equals order of identity element

68. If $H_1$, $H_2$ are subgroups of a group G, then which one of the following is a subgroup of G ?

(A) $H_1 \cup H_2$ (B) $H_1 \cap H_2$

(C) $H_1 \backslash H_2$ (D) $H_1H_2$

69. The quotient group is always defined except possibly when the group is :

(A) abelian (B) cyclic

(C) a group of prime order (D) non-abelian

70. Which one of the following is *not* a ring with respect to usual addition and multiplication ?

(A) the set of even integers

(B) the set of integers which are multiple of 3

(C) the set of positive integers

(D) the set of integers

71. In the ring $\mathbf{Z}_{10}$, the divisor of 0 is :

(A) 1 (B) 2

(C) 3 (D) 7

72. Consider $A = \{q \in \mathbf{Q} : q^2 \leq 2\}$ as a subset of $(\mathbf{Q}, d)$, where $d(x, y) = |x - y|$. Then A is :

(A) closed but not open in $\mathbf{Q}$

(B) open but not closed in $\mathbf{Q}$

(C) neither open nor closed in $\mathbf{Q}$

(D) both open and closed in $\mathbf{Q}$

73. The set of all integers $\mathbf{Z}$ considered as a subspace of $(\mathbf{R}, d)$ where $d(x, y) = |x - y|$, is :

(A) closed but not complete (B) complete but not closed

(C) both closed and complete (D) neither closed nor complete

74. The closure $\bar{Y}$ of a totally bounded subset Y of a metric space X :

(A) is totally bounded

(B) may not be totally bounded even if X is complete

(C) is totally bounded if and only if X is complete

(D) is totally bounded if and only if X is compact

75. Let X, Y be metric spaces and let $f : X \to Y$ be a continuous function. Then the image $f(A)$ of a bounded subset A of X is bounded :

(A) always

(B) if A is also open

(C) if A is compact

(D) if A is complete

76. Let U be subset of connected metric space X which is both open and closed. Then U is :

(A) neither $\phi$ nor X

(B) X

(C) $\phi$

(D) either $\phi$ or X

77. The image of a connected metric space under a continuous real-valued function is :

(A) **R**

(B) a bounded subset of **R**

(C) an interval in **R**

(D) not an interval in **R**

78. Let X be a normed linear space. Then which one of the following is *false* ?

(A) If X has a Schauder basis, then X is separable

(B) Every separable space has Schauder basis

(C) $l_1$ has a Schauder basis

(D) $l_2$ has a Schauder basis

79. Which one of the following is *false* ?

(A) A compact subset of a metric space is closed and bounded

(B) A closed and bounded subset of metric space is compact

(C) A compact subset of a finite dimensional normed space is closed and bounded

(D) A closed and bounded subset of a finite dimensional normed space is compact

80. The dual of $l_p$ is itself if :

(A) $p = 1$ (B) $p = \frac{1}{2}$

(C) $p = 2$ (D) $p = \infty$

81. Which lake is the source of Parbati river of Kullu ?

(A) Surajtal (B) Sketi

(C) Mantilai (D) Karali

82. Which river's tributaries are Malahat Khad, Garni Khad and Hum Khad ?

(A) Beas (B) Swan

(C) Giri (D) Pabbar

83. To which ancient tribe did King Shambar, who fought against the Aryan King Divodas, belong ?

(A) Kinnars (B) Khasas

(C) Kirats (D) Dasas

84. Who is the author of *Catalogue of the Bhuri Singh Museum, Chamba* ?

(A) J. Ph. Vogel (B) G.T. Vigne

(C) C.F. Massy (D) J.B. Lyall

85. The Kullu Princely State under the rajas consisted of seven Waziris. In which one of them was Kullu proper included ?

(A) Rupi
(B) Lag Sari
(C) Parol
(D) Lag Maharaj

86. Which place near Dharamsala town of H.P. is called 'Little Israel' ?

(A) Sidhbari
(B) Mataur
(C) Shahkot
(D) Dharamkot

87. Which cement company has a big cement plant at Barmana in Bilaspur District of H.P. ?

(A) Ambuja
(B) CCI
(C) Japee
(D) ACC

88. At which place in Shimla is the office of Chief Information Commissioner of H.P. ?

(A) Richmond Villa
(B) Del Villa
(C) Revenswood
(D) Armsdale Building

89. Around which year was Bishop Cotton School, Shimla shifted from its original site, Jutogh ?

(A) 1846 (B) 1866

(C) 1876 (D) 1886

90. In which of the following Districts of H.P. Kishori Shakti Yojana is *not* functioning ?

(A) Sirmaur (B) Kinnaur

(C) Solan (D) Una

91. With which sport is OP Jaisha associated ?

(A) 800 mtr. race (B) 1500 mtr. race

(C) 20 km walk (D) Marathon

92. Who is Farooq Khan ?

(A) Leader of All Party Hurriyat Conference

(B) Leader of National Conference

(C) Administrator of Lakshadweep Union Territory

(D) None of the above

93. Which day is observed in India as Nirbhaya Day ?

(A) July 14

(B) October 01

(C) November 14

(D) December 16

94. Which state of India is also known as Indrakil, the garden of Indra, the war god ?

(A) H.P.

(B) Uttarakhand

(C) Sikkim

(D) J & K

95. Which railway station in North India is named after a Sufi saint ?

(A) Faridabad

(B) Gaziabad

(C) Ferozabad

(D) Nizamuddin

96. Where is Raqqa, the stronghold of Islamic State ?

(A) A city in Iraq

(B) A town in Afghanistan

(C) A city in Iran

(D) A city in Syria

97. When did the People's Republic of Kampuchea change its name to Cambodia ?

(A) 1970 (B) 1975

(C) 1989 (D) 1992

98. Who was crowned Miss Universe 2015 ?

(A) Pia Alonzo Wurtzbach (B) Aniporn Chalermburanawong

(C) Ariadna Gutierrez (D) Olivia Jordan

99. Which Chinese city is the venue of G-20 Summit to be held in September 2016 ?

(A) Shanghai (B) Shenzhen

(C) Hangzhou (D) Biejing

100. At which place was Mother Teresa born ?

(A) Bitola (B) Skopje

(C) Tirana (D) Tetovo