



**Punjabi University Guru Kashi Campus, Damdama Sahib
(Talwandi Sabo)**

M.M.:90

Time: 90 Min

**ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ ਜੂਨੀਅਰ ਸਾਇੰਸ ਸਟਾਰ ਪ੍ਰਤਿਯੋਗਤਾ- 2023
PUNJABI UNIVERSITY JUNIOR SCIENCE STAR CONTEST**

QUESTION PAPER

ਜ਼ਰੂਰੀ ਹਦਾਇਤਾਂ/ Important Instructions

1. ਸਾਰੇ ਕਾਲਮਾਂ ਵਿੱਚ ਜਾਣਕਾਰੀ, ਵੱਡੇ ਅੱਖਰਾਂ ਵਿੱਚ, ਨੀਲੇ ਜਾਂ ਕਾਲੇ ਰੰਗ ਦੇ ਬਾਲ-ਪੋਆਇੰਟ ਪੈਨ ਨਾਲ ਇੰਗਲਿਸ਼ ਵਿੱਚ ਭਰੋ।

Fill all the in formation in various columns, in capital letters, with blue/black ball point pen in ENGLISH.

2. ਕਿਸੇ ਵੀ ਤਰ੍ਹਾਂ ਦੇ ਕੈਲਕੂਲੇਟਰ ਦੀ ਵਰਤੋਂ ਦੀ ਮਨਾਹੀ ਹੈ।

Use of any type of calculator is not allowed.

3. ਸਾਰੇ ਪ੍ਰਸ਼ਨ ਜ਼ਰੂਰੀ ਹਨ। ਗਲਤ ਉੱਤਰ ਲਈ ਨੈਗੇਟਿਵ ਮਾਰਕਿੰਗ ਨਹੀਂ ਹੈ।

All questions are compulsory. No negative marking for wrong answers.

4. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦਾ ਸਿਰਫ ਇੱਕ ਹੀ ਸਹੀ ਉੱਤਰ ਹੈ।

Each question has only one right answer.

5. ਕੱਟਿੰਗ ਕੀਤੇ ਹੋਏ ਜਾਂ ਇੱਕ ਤੋਂ ਵੱਧ ਆਪਸ਼ਨ/ਉੱਤਰ ਮਾਰਕ ਕੀਤੇ ਹੋਏ ਪ੍ਰਸ਼ਨ ਚੈੱਕ ਨਹੀਂ ਕੀਤੇ ਜਾਣਗੇ।

Questions attempted with over-writing or with more than one options/answers will not be evaluated

A. ਨਾਮ/Name: _____

B. ਪਿਤਾ ਦਾ ਨਾਮ/ Father's Name: _____

C. ਰੋਲ ਨੰ. /Roll No. : _____ Date: _____

D. ਸਕੂਲ/ School: _____

E. ਵਿਦਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ/ Signature of Student: _____

F. ਨਿਰੀਖਕ/ਨਿਗਰਾਨ ਦੇ ਹਸਤਾਖਰ / Signature of Invigilator: _____

MATHEMATICS

1. What is the decimal expansion of $\frac{17}{8}$

- (a) Terminating
- (b) Non-terminating Repeating
- (c) Prime
- (d) Co-prime

2. Which following number is rational number.

- (a) $\sqrt{2}$
- (b) $\sqrt{3}$
- (c) $\sqrt{4}$
- (d) $\sqrt{5}$

3. Sum of the zeroes of a Quadratic polynomial

$$ax^2 + bx + c,$$

- (a) $\frac{a}{b}$
- (b) $\frac{b}{a}$
- (c) $-\frac{a}{b}$
- (d) $-\frac{b}{a}$

4. Find the Sum of the zeroes of a polynomial

$$p(x) = x^2 + 1,$$

- (a) 2
- (b) 0
- (c) 1
- (d) 3

5. If graph of pair of linear equations intersect at one point then the solution of pair of linear equations are

- (a) One Solution
- (b) No Solution
- (c) Many Solution
- (d) None of these.

6. If pair of linear equations $kx - y = 2$ and $6x - 2y = 3$ have unique solution then find the value of k is

- (a) $k = 3$ (b) $k \neq 3$
 (c) $k = \frac{1}{3}$ (d) $k \neq \frac{1}{3}$

7. Which following equation is not a Quadratic Equation.

- (a) $x - \frac{3}{x} = 4$
 (b) $3x - \frac{5}{x} = x^2$
 (c) $x + \frac{1}{x} = 4$
 (d) $x^2 - 3 = 4x^2 - 4x$

8. If Quadratic Equation $ax^2 + bx + c = 0$ has no real roots, then

- (a) $D > 0$ (b) $D = 0$
 (c) $D \leq 0$ (d) $D < 0$

9. What is the nth term of an Arithmetic Progression (AP).

- (a) $2a + (n - 1)d$
 (b) $a + (n - 1)d$
 (c) $\frac{n}{2}(2a + (n - 1)d)$
 (d) $\frac{n}{2}(a + l)$

10. Find the ratio in which the line segment joining the points (- 3, 10) and (6, -8) is divided by (- 1, 6).

- (a) $2 : - 7$ (b) $2 : 7$
 (c) $- 2 : 7$ (d) $1 : 7$

11. Sides of two similar triangles are in the ratio 4 : 9. Find the ratio of area of these triangles.

- (a) 2:3 (b) 4:9
 (c) 81:16 (d) 16:81

12. The $\text{Sec}A (1 - \text{Sin}A)(\text{Sec}A + \text{tan}A) =$

- (a) - 1 (b) 0
 (c) 1 (d) 2

13. Mid point of the line segment A (x_1, y_1) and B (x_2, y_2) , is

- (a) $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
 (b) $(x_1 + x_2, y_1 + y_2)$
 (c) $\left(\frac{x_1-x_2}{2}, \frac{y_1-y_2}{2}\right)$
 (d) (x, y)

14. The sum of the odd numbers between 0 and 50.

- (a) 425 (b) 525
 (c) 625 (d) 725

15. The $\frac{\text{Cos}A}{1+\text{Sin}A} + \frac{1+\text{Sin}A}{\text{Cos}A} =$

- (a) $2\text{Cosec}A$ (b) $2 \text{Cos}A$
 (c) $2\text{Sec}A$ (d) $2\text{Sin}A$

16. If the sum of the first 14 terms of an A.P. is 1050 and its first term is 10, then 20th term is

- (a) 198 (b) 202
 (c) 196 (d) 200

17. A line intersecting a circle in two points is called a

- (a) Tangent (b) Diameter
 (c) secant (d) Radius

18. Area of the sector of angle =

- (a) $\frac{\theta}{360} \times \pi r^2$
 (b) $\frac{\theta}{360} \times 2\pi r$
 (c) $\frac{\theta}{720} \times \pi r^2$
 (d) $\frac{\theta}{720} \times 2\pi r$

19. If in triangle ΔABC , $AC^2 = AB^2 + BC^2$ then which angle of ΔABC will be right angles:

- (a) $\angle A$ (b) $\angle B$
 (c) $\angle C$ (d) None

20. The shadow of a tower standing on a level plane is found to be 50m longer when sun's altitude is 30° then when it is 60° . Then length of the tower is

- (a) $25\sqrt{3}$ (b) $\frac{25}{\sqrt{3}}$
 (c) $50\sqrt{3}$ (d) $\frac{50}{\sqrt{3}}$

21. Find the ratio of total surface area of sphere and volume of the Sphere.

- (a) $3 : r$ (b) $2 : r$
(c) $4 : 3$ (d) $1 : 3r$

22. If $\sin(A + B) = 1$, $\cos(A - B) = \frac{\sqrt{3}}{2}$ and $0^\circ < A + B \leq 90^\circ$, $A > B$ then find the value of A and B is

- (a) $45^\circ, 45^\circ$ (b) $30^\circ, 60^\circ$
(c) $0^\circ, 90^\circ$ (d) $60^\circ, 30^\circ$

23. If Mean denotes \bar{X} , Median denotes M and Mode denotes Z then which one is correct.

- (a) $\bar{X} = 2Z - 3M$
(b) $M = 2\bar{X} - 3Z$
(c) $Z = 2\bar{X} - 3M$
(d) $Z = 3M - 2\bar{X}$

24. Formula to find the median of grouped data is

- (a) $\frac{\sum f_i X_i}{\sum f_i}$
(b) $L + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$
(c) $L + \left(\frac{\frac{n}{2} - cf}{f}\right) \times h$
(d) None of these

25. The probability of an Event E + probability of the Event 'not E' = _____

- (a) 0 (b) 1
(c) 2 (d) None of these

26. A box contains 3 blue, 2 white 4 red marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be black colour.

- (a) $\frac{2}{9}$ (b) $\frac{4}{9}$
(c) 0 (d) 1

27. A dice throw once. The probability of getting prime number is

- (a) $\frac{1}{3}$ (b) $\frac{1}{2}$
(c) $\frac{2}{3}$ (d) $\frac{1}{6}$

28. Which term of A.P., 4, 9, 14, 19,.....is 146.

- (a) 15^{th} (b) 20^{th}
(c) 25^{th} (d) None

29. Find the value of $\alpha^3 + \beta^3$, if a quadratic equation has α and β as zeros satisfying the relation $\alpha + \beta = 3$, $\alpha - \beta = -1$.

- (a) 9 (b) 8
(c) 7 (d) 10

30. The graph of pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ is parallel if

- (a) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$
(b) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$
(c) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$
(d) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

ENGLISH

31. *The Rule of the Road* is written by

- (a) Robert Frost
(b) A. G. Gardiner
(c) John Lyly
(d) John Webster

32. N. V. Peale wrote:

- (a) *The Happy Prince*
(b) *The Home-Coming*
(c) *Secret of Happiness*
(d) *Ode to the West Wind*

33. Who is the ring-leader amongst the boys in *The Home-Coming*?

- (a) Makhan (b) Phatik
(c) Mohan (d) Parteek

34. *When she goes hunting flesh and bone?*

The tigress Razia lives in fear.

A greater dread, when will again

The poachers with their guns appear?

These lines have been taken from the poem written by:

- (a) Salik Shah
(b) Keki N Daruwalla

- (c) Sarojini Naidu
(d) Mirza Galib
35. Della only has ____ to spend on a Christmas present for her husband.
(a) \$1.87 (b) \$2.37
(c) \$8.21 (d) \$3.50
36. Which one is a creation of Jawaharlal Nehru?
(a) *The Idea of India*
(b) *India: A History*
(c) *The Making of the Earth*
(d) *Annihilation of Caste*
37. Who is the author of *How Much Land Does a man Need?*
(a) Leo Tolstoy (b) R.K Narayan
(c) Raja Rao (d) Khushwant Singh
38. Who is author of *Where is Science Taking Us?*
(a) Carl Sagan
(b) Stephen Hawking
(c) Philip Plait
(d) Dr. S.W. Pennycuick
39. What was the colour of Pertab Singh's house?
(a) Robin- Blue
(b) Sea- Green
(c) Golden- Yellow
(d) Rose- Red
40. Who is the poet of *Where the Mind is Without Fear?*
(a) Rabindranath Tagore
(b) Sukanto Bhattacharya
(c) Nazrul Islam
(d) Premendra Mitra
41. We met a girl -----a basket of flowers. (Present Participle)
(a) carrying (b) will carry
(c) carried (d) has carried
42. -----is my hobby. (Gerund)
(a) dance (b) dancing
(c) having danced (d) to dance
43. Youimprove your spelling. (Modal)
(a) could (b) should
(c) must (d) can
44. -----! We have won the match. (Narration)
(a) Alas (b) Hurrah
(c) ouch (d) Oh
45. All that glitters is not ----- . (Idiom)
(a) silver (b) gold
(c) diamond (d) brass
46. I have -----him for a long time. (Choose the correct verb)
(a) knew (b) know
(c) known (d) been knowing
47. One who loves his or her country. (One word substitution)
(a) traitor (b) patriot
(c) spy (d) soldier
48. The synonym of 'hate' is:
(a) dislike (b) love
(c) like (d) bless
49. The antonym of 'precious' is:
(a) costly (b) cheap
(c) rare (d) simple
50. The river flows under the bridge. (Find out the verb)
(a) river (b) flows
(c) under (d) the

GENERAL KNOWLEDGE

51. Who is the first lady Chief Minister of Punjab?
(a) Bibi Jagir Kaur
(b) Kiran Bedi
(c) Rajinder Kaur Bhattal
(d) Ms. Seema Roy
52. Kaleidoscope was invented by?
(a) John Barber
(b) Tim Berners Lee
(c) Alan Blumlein
(d) David Brewster

53. Where was the headquarters of Punjab school Education Board?

- (a) Morinda (b) Chandigarh
(c) Mohali (d) Ropar

54. What is the old name of Punjab?

- (a) Sapta Sindhu (b) Sapta Rishi
(c) Sapta-Aba (d) Panj-Ab

55. Who was the first Sikh ruler of Punjab?

- (a) Guru Nanak Dev Ji
(b) Maharaja Ranjit Singh
(c) Bhai Lakha Singh
(d) Maharaja Kamaljit Singh

56. Cobalt is a component of which of the following Vitamins?

- (a) Vitamin A (b) Vitamin D
(c) Vitamin E (d) Vitamin B12

57. Exposure to sunlight helps a person improve his health because

- (a) resistance power increases
(b) the infrared light kills bacteria in the body
(c) the ultraviolet rays convert skin oil into Vitamin D
(d) the pigment cells in the skin get stimulated and produce a healthy tan

58. Entomology is the science that studies

- (a) The origin and history of technical and scientific terms
(b) Behaviour of human beings
(c) Insects
(d) The formation of rocks

59. Golf player Vijay Singh belongs to which country?

- (a) India (b) Fiji
(c) UK (d) USA

60. Who invented Television?

- (a) J. L. Baird
(b) Aristotle
(c) James Clerk Maxwell
(d) Nikola Tesla

SCIENCE

61. Concave lens produces which type of image:

- (a) Virtual, inverted and magnified
(b) real, upright and magnified
(c) real, inverted and diminished
(d) virtual, upright and diminished

62. An electric bulb is connected with a 220 V generator. If 0.50 A current flows through a bulb, what is the power of a bulb?

- (a) 440 W (b) 220 J/s²
(c) 110 J/s (d) 220 W

63. The SI unit of resistance is:

- (a) Volt (b) Faraday
(c) Ampere (d) Ohm

64. Copper is used in electric transmission lines because it has:

- (a) High resistivity
(b) Beautiful color
(c) High conductivity
(d) High brittleness

65. Which among the following has refractive index closest to air?

- (a) Alcohol (b) Water
(c) Ice (d) Benzene

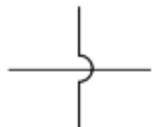
66. Which of the following is not correct related to Myopia?

- (a) Inability to see nearby objects clearly
(b) Increase in radius of curvature of eye-lens
(c) Elongation of eye-ball
(d) Use of concave lens for treatment

67. Why stars twinkle?

- (a) due to scattering of light
(b) due to refraction of light
(c) due to reflection of light
(d) due to dispersion of light

68. What does a following symbol represent in an electric circuit?



- (a) wires joint
- (b) wire crossing without joint
- (c) close plug
- (d) open plug

69. A person infected with which of the following disease cannot donate eyes?

- (a) Hepatitis B or C
- (b) Tetanus
- (c) Meningitis
- (d) All of the above

70. Which country is called the "Country of Winds"?

- (a) Denmark
- (b) China
- (c) India
- (d) Canada

71. When green coloured ferrous sulphate crystals are heated, the colour of the crystal changes because

- (a) it is decomposed to ferric oxide
- (b) it loses water of crystallisation
- (c) it forms SO_2
- (d) it forms SO_3

72. The brown gas evolved on heating of copper nitrate is

- (a) O_2
- (b) NO_2
- (c) N_2
- (d) NO

73. Which of the following reactions will not take place?

- (a) $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$
- (b) $2\text{KBr} + \text{Cl}_2 \rightarrow 2\text{KCl} + \text{Br}_2$
- (c) $\text{Zn} + \text{MgSO}_4 \rightarrow \text{ZnSO}_4 + \text{Mg}$ 1.
- (d) $\text{Mg} + \text{FeSO}_4 \rightarrow \text{MgSO}_4 + \text{Fe}$ 2.

74. The self linkage property is maximum in

- (a) Carbon
- (b) Silicon
- (c) Sulphur
- (d) phosphorus

75. Tomato is a natural source of which acid?

- (a) Acetic acid
- (b) Citric acid
- (c) Tartaric acid
- (d) Oxalic acid

76. Which of the following ore is concentrated by Froth floatation process?

- (a) ZnCO_3
- (b) ZnS
- (c) ZnO
- (d) Na_2S

77. Phenolphthalein is

- (a) yellow in acidic medium, pink in basic medium
- (b) pink in acidic medium, colourless in basic medium
- (c) colourless in acidic medium, pink in basic medium
- (d) pink in acidic medium, yellow in basic medium

78. The metal which is hard and has high melting point and used in filaments of electrical bulbs is

- (a) Fe
- (b) W
- (c) Cu
- (d) Pt

79. A soap molecule has a

- (a) hydrophobic head and hydrophobic tail
- (b) hydrophobic head and hydrophilic tail
- (c) hydrophilic head and hydrophilic tail
- (d) hydrophilic head and hydrophobic tail

80. In Mendeleev's Periodic Table, gaps were left for the elements to be discovered later.

Which of the following elements found a place in periodic table later?

- (a) Germanium
- (b) Chlorine
- (c) Oxygen
- (d) Silicon

81. In humans, what is the name of the process in which Kidneys take part?

- (a) Respiration
- (b) Transportation
- (c) Excretion
- (d) Nutrition

82. _____ part of plant involved in vegetative propagation
(a) Root (b) Leaves
(c) Stem (d) All of the above
83. Which of the following hormones prepares the body for emergency situations?
(a) Adrenaline
(b) Thyroxine
(c) Insulin
(d) Testosterone
84. What happens with Iodine deficiency in our nutrition?
(a) Goitre
(b) Malaria
(c) typhoid
(d) Diabetes Mellitus
85. Which instrument is used to measure blood pressure?
(a) Manometer
(b) Sphygmomanometer
(c) Thermometer
(d) Barometer
86. Who is the Father of Genetics?
(a) Darwin
(b) Johansen
(c) Mendel
(d) None of the above
87. Which technique is used to produce disease free plants?
(a) Spore formation
(b) Vegetative propagation
(c) Budding
(d) Tissue culture
88. Which from the following is a plant hormone
(a) Insulin
(b) Thyroxine
(c) Estrogen
(d) Cytokinin
89. What is necessary for Autotrophic nutrition
(a) Carbondioxide and water
(b) chlorophyll
(c) Sunlight
(d) All of the above
90. How many pair of chromosomes are present in humans.
(a) 23 (b) 22
(c) 44 (d) 46