ENTRANCE EXAMINATION - XI

DEFENCE CAREER ACADEMY,

CHH. SAMBHAJINAGAR

As an ISO 9001 : 2008 - Certified

SET
A

ENT : 2024-25	Sr. No.
TIME : 2.00 Hrs.	MAXIMUM MARKS : 100

QUESTION - BOOKLET

GENERAL INSTRUCTIONS

1. Do not carry any book, paper or any other material with you inside the Examination Hall.

2. Carry only writing material with you in the Examination Hall.

3. Keep the Hall Ticket with you ready for scrutiny.

4. Result of this Examination will be displayed on the Notice Board. The Result Sheet will include the successful/ qualified candidates ONLY.

5. All successful candidates indicated on the list shall present themselves for the interview on the same day.

6. This Test Booklet contains 100 items (Questions). Each item comprises four responses (Answers). You have to select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, Choose Only One response for each item.

7. All the answers must be marked on the Answer Sheet only. Do not write anything on this Test Booklet.

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

★ **DEFENCE CAREER ACADEMY** DCA **Entrance Examination - 2024-25** P.T.O.

8. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR QUESTION ETC. IF SO, GET IT REPLACED BY A NEW ONE.

9. Ask for a separate paper for rough work.

10. Read the questions carefully, Remember, answers are to be indicated in the Answer Sheet Only. Return the Test Booklet, Rough work papers and the Answer Sheet immediately when asked to do so. You are NOT permitted to take away with you any paper concerning the Examination.

ANSWER SHEET

11. The Answer Sheet contains 100 counts, each subdivided in four { (a) (b) (c) (d)} subdivisions for indicating the correct choice of answers. After having selected the correct choice from the test Booklet, you should indicate that choice by completely blackening the respective circle, DO NOT merely cross the circle. You should indicate correct answer by blackening ONLY ONE circle in each answer. Any answer having more than ONE blackened circle will be treated as WRONG answer.

12. Before starting the answering ensure that you have filled the complete information at the top of this Answer Sheet. Incomplete Answer Sheet will be regarded as invalid.

THANK YOU AND BEST OF LUCK

1. The decimal expansion of 22/7 is
   a) terminating
   b) non-terminating and repeating
   c) non-terminating and non-repeating
   d) none of these

2. For some integer n, the odd integer is represented in the form of :
   a) n
   b) n + 1
   c) 2n + 1
   d) 2n + 2

3. HCF of 26 and 91 is
   a) 15
   b) 13
   c) 19
   d) 11

4. If the zeros of the quadratic polynomial $ax^2 + bx + c$, $a \neq 0$ are equal, then
   a) c and b have opposite sign
   b) c and a have opposite signs
   c) c and b have same signs
   d) c and a have same signs

5. The degree of the polynomial, $x^4 - x^2 + 2$ is
   a) 2
   b) 4
   c) 1
   d) 0

6. The value of k for which the system of equation x + y - 4 = 0 and 2x + ky = 3 has no solution, is :
   a) -2
   b) 2
   c) 3
   d) -3

7. The pair of equations are : ax + by = a^2+b^2, x–y = a–b (where $a \neq b$) are
   a) Intersecting at (a, b)
   b) Parallel
   c) Coincident
   d) Intersecting at (b, a)

8. The equation $ax^2 + bx + c = 0$ is quadratic equation for
   a) all values of a
   b) all non-zero values of a
   c) all non-zero values of b
   d) all non-zero value of c

9. A quadratic equation has
   a) atmost two roots
   b) atleast two roots
   c) exactly two roots
   d) at least one roots

10. In an AP, if a = 28, d = -4, n = 7 then $a_n = \ldots..$
    a) 4
    b) 5
    c) 3
    d) 7

11. The sum of n terms of the series $\sqrt{3}+\sqrt{12}+\sqrt{27}+\sqrt{48}+\ldots.$ is
    a) $\dfrac{2n(n+1)}{\sqrt{3}}$
    b) $\dfrac{\sqrt{3}\ n(n-1)}{2}$
    c) $\dfrac{\sqrt{3}\ n(n+1)}{2}$
    d) $\dfrac{2n(n-1)}{\sqrt{3}}$

12. The nth term of an A.P. the sum of whose n terms is s_n, is
    a) $S_n + S_{n-1}$
    b) $S_n - S_{n-1}$
    c) $S_n + S_{n+1}$
    d) $S_n - S_{n+1}$

13. The line segment joining the points A(5, 3) and B(-3, 11) is divided by the point C(3, 5) in the ratio
    a) 1:3
    b) 3:1
    c) 2:3
    d) 3:2

14. The co-ordinates of the fourth vertex of the rectangle formed by the points O(0, 0), A(2, 0) and B(0, 3) are
    a) (3, 0)
    b) (0, 2)
    c) (2, 3)
    d) (3, 2)

15. If A(5, P), B(1, 5) C(2, 1) and D(6, 2) taken in order are the vertices of a square, then P = ...
    a) 7
    b) 3
    c) 6
    d) 8

16. If $\triangle ABC$ and $\triangle DEF$ are similar such that 2AB = DE and BC = 8 cm then EF = ?
    a) 16 cm
    b) 12 cm
    c) 8 cm
    d) 4 cm

17. In triangle ABC and DEF $\angle A = \angle E = 40°, AB : ED = AC : EF$ and $\angle F = 65°$ then $\angle B = \ldots.$
    a) 35°
    b) 65°
    c) 75°
    d) 85°

18. If ABC and DEF are similar triangles such that $\angle A = 47°$ and $\angle E = 83°$ then $\angle C = \dots$
    a) 50°   b) 60°   c) 70°   d) 80°

19. The length of the tangent AP, from an external point A is 24 cm, If the distance of the point A from the centre O of the circle is 25 cm , then the diameter of the circle is
    a) 15 cm   b) 14 cm   c) 7 cm   d) 12 cm

20. If AP and PB are two tangents to a circle with centre O such that $\angle AOB = 110°$ then $\angle APB$ is equal to
    a) 60°   b) 70°   c) 80°   d) 90°

21. If two tangents inclined at an angle of 60° are drawn to a circle of radius 3cm then length of each tangent is equal to
    a) $\dfrac{3\sqrt{3}}{2}$ cm   b) 6 cm   c) 3 cm   d) $3\sqrt{3}$ cm

22. Which of the following is not defined ?
    a) $\cos 0°$ b) $\tan 45°$ c) $\sec 90°$ d) $\sin 90°$

23. For $0° \le \theta < 90°$, the maximum value of $\dfrac{1}{\sec \theta}$ is
    a) 1   b) 0   c) Undefined   d) $\dfrac{\sqrt{3}}{2}$

24. If $\cos \theta = \dfrac{1}{2}$, then $\cos \theta - \sec \theta$ is equal to
    a) $\dfrac{3}{2}$ b) $\dfrac{-3}{2}$ c) $\dfrac{\sqrt{3}}{2}$ d) $\dfrac{-\sqrt{3}}{2}$

25. A ladders 15m long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, then the height of the wall is
    a) $15\sqrt{3}$ m   b) $\dfrac{15\sqrt{3}}{2}$ m   c) $\dfrac{15}{2}$ m   d) 15m

26. If the height of a vertical pole is $\sqrt{3}$ time the length of its shadow on the ground, then the angle of elevation of the sun at that time is
    a) 30°   b) 60°   c) 45°   d) 75°

27. If the angle of elevation of a tower from a distance of 100 meters from its foot is 60° then the height of the tower is
    a) $100\sqrt{3}\ m$ b) $\dfrac{100}{\sqrt{3}}m$ c) $50\sqrt{3}\ m$ d) $\dfrac{200}{\sqrt{3}}m$

28. In making 1000 revolutions a wheel covers 88 km. The diameter of the wheel is:
    a) 24m   b) 28m   c) 14m   d) 40m

29. If the sum of the areas of two circle with radii R_1 and R_2 is equal to the area of circle of radius R, then
    a) $R_1 + R_2 = R$ b) $R_1^2 + R_2^2 + R_0^2$ c) $R_1 + R_2 \angle R$ d) $R_1^2 + R_2^2 = R^2$

30. The area of a circle is 38.5 cm². The circumference of the circle is
    a) 6.2 cm   b) 12 cm   c) 11 cm   d) 22 cm

31. The probability of choosing a red ball from bag of 20 balls having 8 red and 12 blue balls is :

a) $\frac{4}{10}$　　　　　b) $\frac{2}{5}$　　　　　c) $\frac{8}{20}$　　　　　d) All of these

32. The probability of getting a doublet in a throw of a pair of dice is

a) $\frac{1}{36}$　　　　　b) $\frac{1}{6}$　　　　　c) $\frac{4}{9}$　　　　　d) $\frac{2}{3}$

33. The probability that will rain tomorrow is 0.85. What is the probability that will not rain tomorrow?

a) 1　　　　　b) 0.25　　　　　c) 0.85　　　　　d) 0.15

34. A cow is tied with a rope of length 14m at the corner of rectangular field of dimensions 20m x 16m. Find area of a field in which cow can graze.

a) 154m²　　　　　b) 116m²　　　　　c) 164m²　　　　　d) 156m²

35. A square OABC is inscribed in a quadrant OPBQ. of circle. If OA = 12 cm find the area of the shaded region.
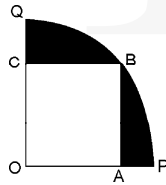
a) 352 cm²　　　　　b) 252cm²　　　　　c) 152 cm²　　　　　d) 136 cm²

36. If we cut a cone in two parts by a plane parallel to the base, then the bottom parts left is the :

a) Cone　　　　　b) Frustum of cone　　　　c) Sphere　　　　　d) Cylinder

37. If the mean of first n natural numbers is $\frac{3n}{5}$ then the value of n is:

a) 3　　　　　b) 4　　　　　c) 5　　　　　d) 6

38. If AM of a, a + 3, a + 6, a + 9 and a + 12 is 10 then a is equal to :

a) 1　　　　　b) 2　　　　　c) 3　　　　　d) 4

39. The mean of the following distribution is

x_i	11	14	17	20
f_i	3	6	8	7

a) 15.6　　　　　b) 17　　　　　c) 14.8　　　　　d) 16.4

40. The median of the data 13, 15, 16, 17, 19, 20, 15

a) $\frac{30}{2}$　　　　　b) $\frac{31}{2}$　　　　　c) $\frac{32}{2}$　　　　　d) $\frac{35}{2}$

41. The factorization of $x^2 - 9x + 20$ is

a) $(x - 2) (x - 10)$　　b) $(x + 4) (x + 5)$　　c) $(x - 4) (x + 5)$　　d) $(x - 4) (x - 5)$

42. Compound interest on ₹. 10000 for 3 years if rate of interest is 5% , 10% and 20% for first, second and third year resp is

a) ₹. 3310　　　　　b) ₹. 3500　　　　　c) ₹. 3860　　　　　d) ₹. 3980

43. The ratio of sides of two squares is 3:4. What is the ratio of their perimeters?

a) 3 : 4　　　　　b) 2 : 5　　　　　c) 4 : 5　　　　　d) 3 : 7

44. If the rent for grazing 40 cows for 20 days is ₹. 370, how many cows can graze for ₹. 111 for 30 days?

a) 60   b) 8   c) 25   d) 30

45. Two men and a boy can do a piece of work in 5 days. While a man and 2 boys can do it in 6 days. If a man is paid at the rate of ₹. 28 a week what should be the wages of a boy?

a) ₹. 10   b) ₹. 12   c) ₹. 16   d) ₹. 18

* **The following questions are splitted into parts using Alphabets (a, b, c & d), Here some parts of the sentences have errors and remaining are correct. Find out which part of a sentence has an error. The Alphabets of that part is the answer for that question. If a sentence is free from error, your answer is No error.**

46. I visited (a)/Ram's and Sita's house (b)/and found the couple missing. (c)/No error(d)

a) I visited   b) Ram's and Sita's house

c) and found the couple missing.   d) No error

47. (a) There should be/ (b) no furnitures/ (c) in my room./ (d) No error.

a) There should be   b) no furnitures   c) in my room.   d) No error

48. (a) I read the letter/ (b) and made him aware/ (c) of its content./ (d) No error.

a) I read the letter   b) and made him aware   c) of its content   d) No error

49. You should not put/ (b) your sign on any paper / (c) that you haven't read./ (d) No error.

a) You should not put   b) your sign on any paper c) that you haven't read   d) No error

50. (a) The table's legs / (b) have been / (c) elaborately carved./ (d) No error

a) The table's legs   b) have been   c) elaborately carved   d) No error

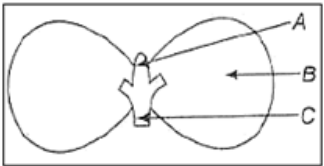* **Read the given passage and answer the following questions:**

Necessity, they say, is the mother of invention. And Indian doctors have been quite creative when hamstrung by few or no tools to perform specific surgeries. They simply design it themselves at one-fourth the price they are sold abroad. In fact, some of their innovations are priced at as much as hundreds of dollars abroad.

Take 47-year-old Dr Burjor P Banaji, pioneer of Lasik surgery in India. He's invented over a dozen surgical instruments. When this senior eye surgeon at Max Eye Care started Lasik, there were few surgeons doing it worldwide and no specific instruments were available either. "As I want things super-perfect, I designed a whole slew of instruments that made my surgery more efficient," says Banaji. The most popular instruments are Banaji Lasik Shield and Banaji Lasik Spatula and Cannula. "It was simple. I had the designs in my head. Putting them down on paper was the simplest thing," he says. Instruments manufacturers and large multinationals in the US snapped them up. "They would send me computer generated drawings which I would correct and send back. Their level of execution was astounding. Within two weeks of the designs being finalised, the instruments were in the world market."

His instruments are priced at hundreds of dollars each in the US, and are also sold in Switzerland, South America, Korea, Eastern Europe, Africa and Japan. They're available in India at a fraction of the price.

51. Why have some Indian doctors created their own surgical tools?

a) they have no tools to perform specific surgeries

b) they have a hamstring problem

c) the tools they get from abroad cost four times as much

d) they can sell these tools at a very high price.

52. What has Dr Burjor P Banaji created?

a) Lasik surgery

b) Max Eye Care Centre

c) Two surgical instruments called Banaji Lasik Shield and Banaji Lasik Spatula and Cannula

d) More than a dozen instruments for operating on the eye.

53. Where does Dr Banaji get the instruments manufactured?
    a) India b) The United States of America
    c) Switzerland d) Japan

54. The term hamstrung refers to ………
    a) restricted b) helped c) harmed d) liberated

55 What does the phrase slew of instruments refer to?
    a) a wide range of instruments b) instruments used for slaying
    c) tools of a similar nature d) surgical instruments

* Choose the correct antonym of the given word

56. Transmit
    a) Televise b) Withhold c) Reply d) Show

57. Choose the correct antonym of the given word : Revealed
    a) Naked b) Concealed c) Open d) Bare

* Choose the correct antonym of the given word

58. Heterogeneous
    a) Colourful b) Different c) Similar d) Homogeneous

59. Everyone _____ finished reading the fairy tale.
    a) have b) has c) is d) are

60. A pair of jeans _____ in the bathroom.
    a) have b) has c) is d) are

61. Rahul is playing football. What will be the correct passive voice of this sentence? –
    a) Football has been played by Rahul. b) Football is played by Rahul.
    c) Football is being played by Rahul. d) none of these

62. Sita found the chain. What will be the correct passive voice of this sentence? –
    a) the chain was found by Sita. b) Sita has been found the chain.
    c) the chain was being found by Sita. d) none of these

* Choose correct word:

63. It is necessary for good health to _____ excess weight.
    a) loss b) loosen c) loose d) lose

64. That good boy always speaks _____.
    a) Polite b) Politely c) Impolite d) Politeness

65. Change the noun into verb: Intention
    a) intension b) intent c) intensity d) intention

66. 'Shoes' is related to 'Leather' in the same way as Rubber' is related to
    a) Plastic b) polythene c) Latex d) chappal

67. Pituitary: Brain:: Thymus: ?
    a) Larynx b) sping Cord c) Thorst d) chest

68. 'Disease' is related to medicine in the same way as 'famine' is related to
    a) Drought b) Rainfall c) Waterfall d) clouds

69. Find the odd man out.
    a) DEHG b) 2MPQ c) JKNM d) RSVU

70. Find the odd man out.
    a) A8C b) D22G C) F34 J d) B36

71. Fruits are formed from
    a) Stamen   b) Stigma   c) Ovary   d) Ovule

72. Reproduction is essential for living organisms in order to ……………………
    a) Keep the individual organism alive   b) Fulfill their energy requirement
    c) Maintain growth   d) Continue the species generation after generation

73. The male reproductive parts of a flower, the stamens, are collectively known as
    a) Androecium   b) Filament   c) Anther   d) Gynoecium

74. In the below figure, parts A, B and C are sequentially

    a) Cotyledon, plumule and radicle
    b) Plumule, radicle and cotyledon
    c) Plumule, cotyledon and radicle
    d) Radicle, cotyledon and plumule

75. Which of the following diseases is transmitted sexually?
    a) Kala Azar   b) Jaundice   c) Cholera   d) Syphilis

76. Mendel conducted his famous breeding experiments by working on:-
    a) Drosophila   b) Escherichia coli   c) Pisum Sativum   d) All of these

77. Which section of DNA provides information for one protein?
    a) Nucleus   b) Chromosome   c) Trait   d) Gene

78. Which of the following is an example of genetic variation?
    a) One person has a scar, but his friend doesn't
    b) One person is older than the other
    c) Reeta eats meat, but her sister Geeta is a vegetarian
    d) Two children have different eye colour

79. In peas, a pure tall (TT) is crossed with a pure short plant (tt). The ratio of pure tall plants to pure short plants in the F2 generation is:
    a) 1:3   b) 3:1   c) 1:1   d) 2:1

80. Humans have two different sex chromosomes, X and Y. Based on Mendel's laws, a male offspring will inherit which combination of chromosomes?
    a) both the X chromosomes from one of its parents
    b) both the Y chromosomes from one of its parents
    c) combination of X chromosomes from either of its parents
    d) combination of X and Y chromosomes from either of its parents

81. The total income of the country divided by its total population is Called:
    a) National income   b) Per capita income   c) Total income   d) None of these

82. An entrepreneur is a:
    a) Scientist.   b) Preacher.
    c) Business person who takes a risk to make a profit.   d) Personal secretary

83. Which of the following laws created a favorable environment for women to secure freedom and self-development?
    a) Right to Information Act   b) Dowry Prohibition Act
    c) Food Security Act   d) None of these

84. Constituencies are created by ………………………. committee of the Election Commission.
    a) Selection   b) Delimitation   c) Voting   d) Time table

85. The ideology of the Communist Party of India is based on ……………………. Philosophy.
    a) Capitalist   b) Marxist   c) Democracy   d) Imperialist

86. Tribals in Bihar revolted against the British under the leadership of ………………… .
    a) Rajendrasinh Rana   b) Birsa Munda   c) Umaji Naik   d) Kajarsingh

87. Which country was defeated after the First World War?
    a) France   b) Germany   c) Russia   d) Britain

88. Which one of the following is not a food crop?
    a) Rice   b) Wheat   c) Cotton   d) Maize

89. Muskmelon grows in
    a) Rabi season   b) Kharif season   c) Zaid season   d) All the three seasons

90. It takes almost a year to grow
    a) Rice   b) Sugarcane   c) Maize   d) Bajra

91. The System of Panchayati Raj involves
    a) The village, block and district levels   b) The village, and state levels
    c) The village district and state levels   d) The village, state and Union levels

92. Which of the following subjects is not included in the state list?
    a) Law and order   b) National defence   c) Education   d) Agriculture

93. Which of the following government has two or more levels?
    a) Community Government   b) Coalition Government
    c) Federal Government   d) Unitary Government

94. In India seats are reserved for women in:
    A. Lok Sabha   B. State legislative assemblies
    C. Cabinets   D. Panchayati Raj bodies
    a) A, B and D   b) B, C and D   c) B and C   d) A and D

95. 'Feminist movements' are aimed at:
    a) Liberty   b) Equality   c) Participation   d) Power

96. External affairs Minister (EAM) S Jaishankar on 16 December 2022 announced the candidature of India for non-permanent membership at the United Nations Security Council (UNSC) for the ………………… term.
    a) 2025 - 26   b) 2026 - 27   c) 2027 - 28   d) 2028 - 29

97. The AIIMS, New Delhi has been declared a 'Tobacco-free-Zone' in December 2022. AIIMS New Delhi was established in which year ?
    a) 1948   b) 1952   c) 1956   d) 1960

98. According to World Athletics, who was the most written-about track and field athlete in 2022?
    a) Usain Bolt   b) Neeraj Chopra   c) Michael Johnson   d) Dutee Chand

99. Who Unveiled the Hockey World Cup trophy in New-Delhi on 16 December 2022?
    a) Kiren Rijiju   b) J.P. Nadda   c) Anurag Thakur   d) Prem Kumar Dhumal

100. When is Minority Rights day observed every year?
    a) 15 December   b) 16 December   c) 17 December   d) 18 December