DO NOT OPEN THE BOOKLET UNTIL YOU ARE TOLD TO DO SO.

RGIPT DIPLOMA ADMISSION TEST (DAT-2026)

SET – A

Full Marks: 100   **Time: Three Hours**

MODEL QUESTION PAPER

Read the following instructions carefully before you begin to answer the questions.

INSTRUCTIONS TO CANDIDATE

1. Immediately after receiving the test booklet you should check that this 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. This booklet contains 100 questions to be answered in a separate OMR Answer Sheet using Black Ball Point Pen in circles only as shown below ●

3. Read the questions carefully before marking your answer. Candidates are **strongly advised not to change or erase** once the answer is marked.

4. All questions are compulsory and carry 1 mark each.

5. You will be supplied the Answers Sheet separately by the **invigilator**. You must complete the details of particulars asked for, all are mandatory.

6. Answers must be shown by completely blackening the corresponding circles in the Answer Sheet against the relevant question number by **Black Ball Point Pen**.

   Example:
   Supposing the following question is asked:
   The unit of resistance is
   (A) Watt   (B) Ampere   (C) Volt   (D) **Ohm**

   You will have four alternatives in the Answer Sheet for your response corresponding to each question of the Question Booklet as below:
   (A)(B)(C)(D)

   In the above illustration, if your chosen response is alternative (D) i.e. Ohm, then the same should be marked on the Answer Sheet by blackening the relevant circle with a Black Ball Point Pen only as below:
   (A)(B)(C) ●

   WHICH IS THE ONLY CORRECT METHOD OF ANSWERING.

7. Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any one question.

8. FOR EVERY INCORRECT ANSWER, 0.25 MARKS WILL BE DEDUCTED AS PART OF THE NEGATIVE MARKING SCHEME, WHILE NO MARKS WILL BE AWARDED OR DEDUCTED FOR UNANSWERED QUESTIONS.

9. The OMR Answer Sheet must be handed over to the invigilator before you leave the Examination Hall.

10. No rough work is to be done on the OMR Answer Sheet. Space for rough work has been provided in the question booklet.

11. Examination will be cancelled if a candidate is found to adopt unfair means, in any form.

SET – A

Full Marks: 100   **Time: Three Hours**

There are 100 questions in this question booklet. 1–15 in Part-I, 16–50 in Part-II, and 51–100 in Part-III. Each question carries 1 (one) mark. For each of the following questions from 1 to 100, four answers are provided, out of which only one is correct. Darken the circle against the correct answer with **Black Ball Point Pen**. Darkening more than one circle will be considered as wrong answers.

PART – I

MENTAL ABILITY TEST

[No. of Questions = 15]

1.   Complete the series: 0, 2, 3, 5, 8, 10, 15, 17, 24, 26, ...
A.   35
B.   32
C.   30
D.   28

2.   ACE : FHJ: : OQS : ?
A.   PRT
B.   RTU
C.   TVX
D.   UWY

3.   In a code language, if SUGAR is coded as ZN and TEA is coded as FLD, how would you code GRATE in the same code language.
A.   BNDFL
B.   MBDFL
C.   LDZMN
D.   FLDZB

4.   How many 7s are there in the following number series which are preceded by 9 and also followed by 6?
     7 8 9 7 6 5 3 4 2 8 9 7 2 4 5 9 2 9 7 6 4 7
A.   Two
B.   Three
C.   Four
D.   Five

5.   Anil introduces Rohit as the son of the only brother of his father's wife. How is Rohit related to Anil?

A.   Cousin

B.   Son

C.   Uncle

D.   Son-in-law

6.   If × stands for –, ÷ stands for +, + stands for ÷, and – stands for ×, which one of the following equations is correct?

A. $15 - 5 \div 5 \times 20 + 10 = 6$

B. $8 \div 10 - 3 + 5 \times 6 = 8$

C. $6 \times 2 + 3 \div 12 - 3 = 15$

D. $3 \div 7 - 5 \times 10 + 3 = 10$

7.   Deepa moved a distance of 75 metres towards the north. She then turned to the left turned to the right at an angle of 45°. In which direction was she moving finally?

A.   North-east

B.   North-west

C.   South

D.   South-west

8.   Which of the following diagrams correctly represents the relationship among tennis fans, cricket players and students.

A.
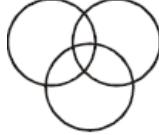
B.
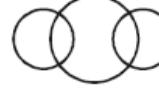
C.

D.

9. Monday falls on 4th April, 1998. What was the day 3rd November, 1987?

A. Monday

B. Sunday

C. Tuesday

D. Wednesday

10. Find the number in place of question mark (?) in the following matrix

3	5	7	9	11	13
8	26	48	82	?	170

A. 121

B. 120

C. 119

D. 111

11. In the following problem figure changes in design from the preceding one. The answer figure set contains 4 figures marked A, B, C, D. You are required to choose the correct answer figure which would best continue the series.
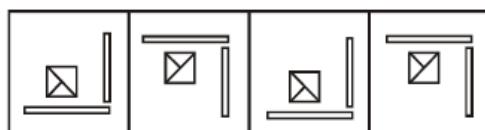
A.

B.

C.

D.

Choose the figure which is different from the others.

12.

A.

B.

C.

D.

13. Find the correct option for the mirror image for the following problem:

9 : 00
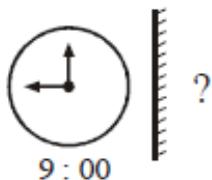
A. 12:00

B. 5:00

C. 3:00

D. 6:00

14. A dice has been thrown four times and produces the following results.

(i)   (ii)   (iii)   (iv)
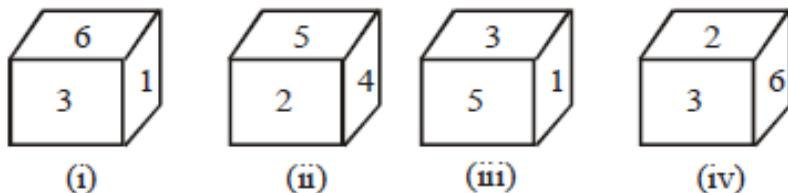
Which number will appear opposite to the number 3?

A. 4

B. 5

C. 6

D. 1

15. On a shelf are placed six volumes side by side labelled A, B, C, D, E and F; B, C, E and F have green covers while others have yellow covers. A, D, B are new volumes while the rest are old volumes. A, C, B, are law reports while the rest are medical extracts. Which two volumes are old medical extracts and have green covers?

A. B, C

B. C, D

C. C, E

D. E, F

PART – II

GENERAL MATHEMATICS

[No. of Questions = 35]

16. The radii of two circles are 19 cm and 9 cm respectively. Find the radius of the circle which has a circumference equal to the sum of the circumferences of the two circles.

   A. 12 cm

   B. 14 cm

   C. 16 cm

   D. 28 cm

17. In an arithmetic progression (AP), if the first term is 6 and the common difference is 3, what is the 5th term?

   A. 15

   B. 18

   C. 21

   D. 24

18. What is the sum of the first 22 terms of the AP: 8, 3, -2,...?

   A. -979

   B. 979

   C. -879

   D. 879

19. Which of the following lists of numbers forms an arithmetic progression?

   A. 6, 9, 12, 15, ...

   B. 1, 1, 2, 3, 5, ...

   C. 2, 4, 8, 16, ...

   D. 0, -4, -8, -12, ...

20. What is the relationship between a tangent at any point of a circle and the radius through that point?

   A. They are parallel.

   B. They are perpendicular.

   C. They intersect at a 45-degree angle.

   D. They have no specific relationship.

21. A line segment of length 7.6 cm is divided in the ratio 5:8. What is the length of the shorter segment?

   A. 2.67 cm

   B. 3.8 cm

   C. 2.92 cm

   D. 3.04 cm

22. What are the coordinates of a point on the x-axis?

    A. (x, y)
    B. (0, y)
    C. (x, 0)
    D. (0, 0)

23. Find the distance between points A(4, 0) and B(6, 0).

    A. 0 units
    B. 1 unit
    C. 2 units
    D. 4 units

24. Using the distance formula, what is the distance between points $P(x_1, y_1)$ and $Q(x_2, y_2)$?

    A. $\sqrt{(x_2 + x_1)^2 + (y_2 + y_1)^2}$
    B. $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
    C. $\sqrt{(x_2 - x_1)^2 - (y_2 - y_1)^2}$
    D. $\sqrt{(x_2 + x_1)^2 - (y_2 + y_1)^2}$

25. In a right-angled triangle ABC, right-angled at B, if AB = 24 cm and BC = 7 cm, what is the value of sin A?

    A. 7/25
    B. 24/25
    C. 7/24
    D. 24/7

26. If tan A = 4/3, what is the value of cosec A?

    A. 3/5
    B. 4/5
    C. 5/3
    D. 5/4

27. What is the value of sin 30°?

    A. 1
    B. √3/2
    C. 1/2
    D. √2/2

28. What is the general form of a pair of linear equations in two variables x and y?

    A. ax + by = c
    B. $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$
    C. y = mx + c
    D. x = my + c

29. If the lines representing a pair of linear equations are parallel, what can be said about the number of solutions?

   A. There is a unique solution.
   B. There are infinitely many solutions.
   C. There is no solution.
   D. There are two solutions.

30. In the substitution method for solving a pair of linear equations, what is the first step?

   A. Substitute the value of one variable into the other equation.
   B. Eliminate one variable by addition or subtraction.
   C. Pick either equation and write one variable in terms of the other.
   D. Graph both equations and find their intersection point.

31. Which of the following pairs of equations represents intersecting lines?

   A. $x + 2y - 4 = 0$ and $2x + 4y - 12 = 0$
   B. $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$
   C. $x - 2y = 0$ and $3x + 4y - 20 = 0$
   D. None of the above

32. What is the degree of the polynomial $5x^3 - 4x^2 + x - \sqrt{2}$?

   A. 1
   B. 2
   C. 3
   D. 4

33. Which of the following is a quadratic polynomial?

   A. $2x - 3$
   B. $x^3 + 1$
   C. $2x^2 + 3x - 5$
   D. $x + 1/x$

34. What is the probability of an impossible event?

   A. 1
   B. 0.5
   C. 0
   D. 1/2

35. A bag contains 4 red balls and 6 blue balls. What is the probability of drawing a red ball?

   A. 1/2
   B. 2/5
   C. 3/5
   D. 1/10

36. In a single throw of a fair die, what is the probability of getting a number greater than 4?

   A. 1/6
   B. 2/6
   C. 3/6
   D. 4/6

37. What is the standard form of a quadratic equation?

   A. $ax + b = 0$
   B. $ax^2 + bx + c = 0, a \neq 0$
   C. $ax^3 + bx^2 + cx + d = 0$
   D. $a + bx + c = 0$

38. Find the roots of the quadratic equation $6x^2 - x - 2 = 0$ by factorization.

   A. $x = 2/3, x = -1/2$
   B. $x = -2/3, x = 1/2$
   C. $x = 1, x = 2$
   D. $x = -1, x = -2$

39. What is the discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$?

   A. 8
   B. -8
   C. 0
   D. 16

40. According to Euclid's division lemma, given positive integers 'a' and 'b', what condition must be satisfied by the integers 'q' and 'r'?

   A. $a = bq + r$, where $r \geq b$
   B. $a = bq + r$, where $0 \leq r < b$
   C. $a = bq + r$, where $r < 0$
   D. $a = bq + r$, where $r = b$

41. What is the HCF of 420 and 130 using Euclid's algorithm?

   A. 10
   B. 20
   C. 30
   D. 40

42. Which of the following statements is TRUE about the Fundamental Theorem of Arithmetic?

   A. Every composite number can be expressed as a product of primes in a non-unique way.
   B. Every composite number can be expressed as a product of primes in a unique way, except for the order in which the prime factors occur.
   C. Only prime numbers can be expressed as a product of primes.
   D. Composite numbers cannot be expressed as a product of primes.

43. What is the formula for calculating the mode of grouped data?

   A. Mode $= l + (f_1 - f_0) / (2f_1 - f_0 - f_2) \times h$

   B. Mode $= l + (f_1 + f_0) / (2f_1 + f_0 + f_2) \times h$

   C. Mode $= l + (f_1 - f_0) / (f_1 - f_0 - f_2) \times h$

   D. Mode $= l + (f_1 + f_0) / (f_1 + f_0 + f_2) \times h$

44. In a grouped frequency distribution, what is the class with the maximum frequency called?

   A. Median class

   B. Modal class

   C. Mean class

   D. Range class

45. If n is even, how is the median calculated for ungrouped data?

   A. Median $= (n + 1) / 2$th observation

   B. Median $=$ average of the $n/2$th and $(n/2 + 1)$th observations

   C. Median $= n/2$th observation

   D. Median $= (n/2 + 1)$th observation

46. Two cubes, each with a volume of 64 cm³, are joined end to end. What is the surface area of the resulting cuboid?

   A. 128 cm²

   B. 160 cm²

   C. 240 cm²

   D. 192 cm²

47. A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm, and the diameter of the base is 4 cm. What is the volume of the toy (Take $\pi = 3.14$)?

   A. 25.12 cm³

   B. 50.24 cm³

   C. 12.56 cm³

   D. 100.48 cm³

48. Two figures having the same shape but not necessarily the same size are called:

   A. Congruent figures

   B. Similar figures

   C. Identical figures

   D. Equal figures

49. In two similar triangles, the ratio of their corresponding sides is 2:3. What is the ratio of their areas?

   A. 2:3

   B. 4:9

   C. 3:2

   D. 9:4

50. If a line divides any two sides of a triangle in the same ratio, then the line is:

    A. Perpendicular to the third side

    B. Parallel to the third side

    C. Intersects the third side at 45 degrees

    D. None of the above

PART – III (A)

CHEMISTRY

[No. of Questions = 25]

51. Which of the following substances turns blue litmus paper red?

    A. Sodium hydroxide

    B. Lemon juice

    C. Baking soda

    D. Ammonium hydroxide

52. What is the chemical formula for baking soda?

    A. NaCl

    B. NaOH

    C. $NaHCO_3$

    D. Na_2CO_3

53. What is formed when an acid reacts with a metal?

    A. Hydrogen gas and water

    B. Hydrogen gas and salt

    C. Salt and water

    D. Oxygen gas and salt

54. Which of the following is a strong acid?

    A. Acetic acid

    B. Citric acid

    C. Hydrochloric acid

    D. Lactic acid

55. What is the pH range for a neutral solution?

    A. Less than 7

    B. Greater than 7

    C. Exactly 7

    D. Between 0 and 14

56. What is the common name for ethanoic acid?

   A. Formic acid

   B. Acetic acid

   C. Butanoic acid

   D. Propionic acid

57. Which of the following is a saturated hydrocarbon?

   A. Ethene

   B. Ethyne

   C. Ethane

   D. Propene

58. What type of bond is formed by the sharing of electrons between two atoms?

   A. Ionic bond

   B. Hydrogen bond

   C. Covalent bond

   D. Metallic bond

59. What is the general formula for alkenes?

   A. C_nH_{2n+2}

   B. C_nH_{2n}

   C. C_nH_{2n-2}

   D. C_nH_n

60. Which substance is used as a catalyst in esterification?

   A. Sodium hydroxide

   B. Hydrochloric acid

   C. Concentrated sulfuric acid

   D. Potassium permanganate

61. Which of the following is an example of a decomposition reaction?

   A. $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$

   B. $2FeSO_4(s) \rightarrow Fe_2O_3(s) + SO_2(g) + SO_3(g)$

   C. $CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(aq)$

   D. $Fe(s) + CuSO_4(aq) \rightarrow FeSO_4(aq) + Cu(s)$

62. In a combination reaction, what happens?

   A. A single substance decomposes to form two or more substances.

   B. Two or more substances combine to form a new single substance.

   C. Two substances exchange ions.

   D. An element is displaced by another element.

63. What is formed when calcium oxide reacts with water?

    A. Calcium carbonate
    B. Calcium hydroxide
    C. Calcium chloride
    D. Calcium sulphate

64. What type of reaction is represented by the equation: $Zn(s) + CuSO_4(aq) \rightarrow ZnSO_4(aq) + Cu(s)$?

    A. Combination reaction
    B. Decomposition reaction
    C. Double displacement reaction
    D. Displacement reaction

65. Which of the following is an example of an exothermic reaction?

    A. Decomposition of calcium carbonate
    B. Burning of natural gas
    C. Photosynthesis
    D. Electrolysis of water

66. Which of the following is NOT a general property of ionic compounds?

    A. They are solids and somewhat hard.
    B. They have high melting and boiling points.
    C. They are generally good conductors of electricity in solid state.
    D. They are generally soluble in water.

67. What is the process of forming a thick oxide layer of aluminum called?

    A. Rusting
    B. Galvanization
    C. Anodising
    D. Alloying

68. Which metal is known as the most ductile metal?

    A. Iron
    B. Copper
    C. Aluminum
    D. Gold

69. Which of the following metals reacts violently with cold water?

    A. Calcium
    B. Magnesium
    C. Iron
    D. Potassium

70. What is the chemical formula for copper (II) oxide?

    A. CuO
    B. Cu_2O
    C. Cu_2O_3
    D. CuO_2

71. Who is credited with arranging elements in increasing order of their atomic masses and according to their chemical properties, even predicting the existence of some undiscovered elements?

    A. John Newlands
    B. Dmitri Ivanovich Mendeleev
    C. Johann Wolfgang Döbereiner
    D. Henry Moseley

72. Which of the following groups of elements forms Döbereiner's triads?

    A. N, P, As
    B. Ca, Sr, Ba
    C. Cl, Br, I
    D. All of the above

73. What is the name given to the vertical columns in Mendeleev's Periodic Table?

    A. Periods
    B. Groups
    C. Series
    D. Octaves

74. According to Newlands' Law of Octaves, every eighth element has properties similar to:

    A. The element before it
    B. The element after it
    C. The first element
    D. A random element

75. What fundamental property did Henry Moseley show to be more important than atomic mass for arranging elements in the periodic table?

    A. Atomic weight
    B. Valency
    C. Atomic number
    D. Electronegativity

PART – III (B)

PHYSICS

[No. of Questions = 25]

76. What is the SI unit of electric charge?

   A. Ampere
   B. Volt
   C. Coulomb
   D. Ohm

77. A continuous and closed path of an electric current is called:

   A. an electric circuit
   B. an open circuit
   C. a short circuit
   D. a parallel circuit

78. If a net charge of 10 Coulombs flows across a cross-section of a conductor in 5 seconds, what is the current?

   A. 0.5 A
   B. 2 A
   C. 5 A
   D. 10 A

79. What instrument measures electric current in a circuit?

   A. Voltmeter
   B. Ammeter
   C. Ohmmeter
   D. Galvanometer

80. What is the unit of electric potential difference?

   A. Ampere
   B. Ohm
   C. Volt
   D. Coulomb

81. How much work is done in moving a charge of 3 C across two points having a potential difference of 6 V?

   A. 6 J
   B. 12 J
   C. 18 J
   D. 24 J

82. According to Ohm's law, if the potential difference across a resistor is doubled while the resistance remains constant, what happens to the current?

   A. It is halved.

   B. It remains the same.

   C. It is doubled.

   D. It becomes zero.

83. What is the focal length of a spherical mirror whose radius of curvature is 20 cm?

   A. 10 cm

   B. 20 cm

   C. 40 cm

   D. 5 cm

84. A convex mirror always produces an image that is:

   A. Real and inverted

   B. Virtual and inverted

   C. Real and erect

   D. Virtual and erect

85. The SI unit of power of a lens is:

   A. Watt

   B. Joule

   C. Dioptre

   D. Newton

86. What is the magnification produced by a spherical mirror if the height of the image (h') is 2cm and the height of the object (h) is 4 cm?

   A. 2

   B. 1

   C. 0.5

   D. 4

87. What is the name of the unit of magnetic field strength named after a 19th-century scientist?

   A. Ampere

   B. Tesla

   C. Oersted

   D. Gauss

88. What observation did Hans Christian Oersted make in 1820?

   A. A compass needle deflects when a current flows through a nearby wire.

   B. Unlike poles of magnets repel each other.

   C. Like poles of magnets attract each other.

   D. Electric current produces heat.

89. What is the region around a magnet where its force can be detected called?

    A. Magnetic field
    B. Electric field
    C. Gravitational field
    D. Electromagnetic field

90. What do the lines along which iron filings align themselves represent?

    A. Electric field lines
    B. Magnetic field lines
    C. Gravitational field lines
    D. Force lines

91. In which direction do magnetic field lines emerge from and merge at in a bar magnet?

    A. Merge at the north pole, emerge from the south pole
    B. Emerges from the north pole, merges at south pole
    C. Emerges from both poles
    D. Merges at both poles

92. What determines the pattern of the magnetic field generated by a current through a conductor?

    A. The voltage of the battery
    B. The material of the conductor
    C. The shape of the conductor
    D. The length of the conductor

93. What rule is used to find the direction of the magnetic field around a current-carrying conductor?

    A. Fleming's left-hand rule
    B. Fleming's right-hand rule
    C. Right-hand thumb rule
    D. Left-hand thumb rule

94. What is a coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder?

    A. Electromagnet
    B. Solenoid
    C. Transformer
    D. Inductor

95. What is the magnetic field like inside a solenoid?

    A. Non-uniform
    B. Radial
    C. Uniform
    D. Circular

96. What rule describes the direction of force on a current-carrying conductor in a magnetic field?

    A. Right-hand thumb rule
    B. Fleming's right-hand rule
    C. Fleming's left-hand rule
    D. Left-hand thumb rule

97. What is a device that converts electrical energy into mechanical energy called?

    A. Generator
    B. Motor
    C. Transformer
    D. Switch

98. What is the process by which a changing magnetic field in a conductor induces a current in another conductor called?

    A. Electromagnetic induction
    B. Electric induction
    C. Magnetic induction
    D. Self-induction

99. What type of current is produced by a device that reverses the direction of current flow through a circuit?

    A. Direct current
    B. Alternating current
    C. Both AC and DC
    D. None

100. What is the name of a device that converts mechanical energy into electrical energy?

    A. Motor
    B. Generator
    C. Transformer
    D. Battery

END OF QUESTION PAPER

SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

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