DAV BR PUBLIC SCHOOL BINA (MP)

HALF YEARLY EXAMINATION 2024-25

PRACTICE PAPER

CLASS: XI (Commerce)   **SUBJECT: APPLIED MATHEMATICS**

TIME: 3HOURS   **MM= 80**

Read the following instructions very carefully and strictly follow them:
1. This Question paper contains 38 questions. All questions are compulsory.
2. This Question paper is divided into five Sections - A, B, C, D and E.
3. In Section A, Questions no. 1 to 18 are multiple choice questions (MCQs) and Questions no. 19 and 20 are Assertion-Reason based questions of 1 mark each.
4. In Section B, Questions no. 21 to 25 are Very Short Answer (VSA)-type questions, carrying 2 marks each.
5. In Section C, Questions no. 26 to 31 are Short Answer (SA)-type questions, carrying 3 marks each.
6. In Section D, Questions no. 32 to 35 are Long Answer (LA)-type questions, carrying 5 marks each.
7. In Section E, Questions no. 36 to 38 are Case study-based questions, carrying 4 marks each.

Use of calculators is not allowed

Section -A

1 Which of the following binary numbers is equivalent to decimal number 47   1
      (a) 1101111   (b) 10111   (c) 111111   (d) 11001

2 The decimal equivalent of the binary number 10101 is   1

      (a) 21   (b) 12   (c) 22   (d) 31

3 The value of $\frac{\log 625 - \log 5}{\log 125}$ 1

      (a) $\frac{2}{5}$ (b) $\frac{1}{4}$ (c) -$\frac{2}{5}$ (d) 1

4 Characteristic of 0.00003798 is   1
      (a)   3 (b) $\bar{5}$ (c)   4   (d) $\bar{4}$

5 The average of five numbers is 30. If one number excluded, their average becomes28. The excluded number is   1
      (a) 28   (b)   30   (c)   35   (d) 38

6 What was day on 15th August?   1
      (a) Friday   (b)   Saturday   (c)   Sunday   (d) Monday

7 How many odd days are there in a centuary ?   1
      (a) 2   (b) 3   (c) 4   (d) 5

8 At what time between 7O' clock and 8O'clock will the hands of a   1

clock make an angle of 10^0?

    (a) 07:35 (b) 07:40 (c) 07: 45 (d) 07:48

9   A train is running at 72km/h crosses a pole in 6 seconds. What is the length of train?   1

    (a) 100 m (b) 110 m (c)120 m (d) 130 m

10 If the ratio of the diameters of the two spheres is 5:3, then the ratio of their surface areas is   1

    (a) 3 : 5 (b) 25 : 9 (c) 27 : 125 (d) 9 : 25

11 The length of the longest pole that can be put in a room of dimensions (10mx5mx10m)   1

    (a) 15m (b) 16m (c) 10m (d) 12m

12 Number of proper subsets of a set containing 3 elements is   1

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

13 If n(A) =50, n(B) = 23, n(A∩B) =6, then n(A∪ $B)$ is   1

    (a) 76 (b) 67   (c) 27 (d) 57

14 If A= {a, b} and B = {x, y, z}, then the number of relations from B to A   1

    (a) 8 (b) 16 (c) 32 (d) 64

15 If A= {1, 2, 3, 4 }, then the number of subsets of A   1

    (a) 24   (b) 28   (c) 8 (d) 16

16 If n^{th} term of an A.P. is 3n+1, then sum of first 20 terms of this A.P. is   1

    (a) 450 (b) 650   (c) 660   (d) 680

17 If A= {1,2,3,4,} then the number of subsets of containing element 3   1

    (a) 24   (b) 28   (c) 8 (d) 16

18 If R = { (x, y): x, y ∈ N x +2y = 21} then range of R is   1

    (a) {1,2,3...7,8}

    (b) {1,2,3...9,10}

    (c) {1,3,5, 7,...19}

    (d) {1,3,5,7,...15}

19 Which of the following is finite set?   1

    (a) {x : x = 2n ,n∈ N}

    (b) {x : x is a prime number}

    (c) {x : x ∈ N, x is a factor of 128}

    (d) {x : x ∈ I, x ≤ 7}

20 If A =∅ . Then the cardinal number of P(P(A)).   1

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

21 Solve for equation : $\log x = \dfrac{\log 125}{\log \frac{1}{5}}$ 2

22 Find the angle between two hands of the clock at 7:20   2

23 If the ordered pairs $(x^2$-4x, y^2-y) and (-4,6) are equal, find x and y.   2

                Or

    If A X B= {(a, p), (b, q), (c, p), (a, q) (b, p), (c, p)}, find A and B.

24 Find the sum of first 100 natural numbers.   2
25 Baban and Ramsukh together erect a shed in 12 days. Baban alone   2
    can do it on 20 days. How much time would Ramsukh take
    working alone to erect the shed?
26 Three persons enter a railway carriage, where there are 5 vacant   3
    seats. In how many ways can they seat themselves.
27 The average marks of 15 students is 45. If average marks of first 8 3
    students is 48 and that of last 8 students is 42, then find marks
    obtained by 8th student.
28 Two trains are running in the same direction at 90km/h and   3
    126km/h respectively. The length of first train is 130m and time to
    cross each other is 25seconds from the time the meet. Find the
    length of the second train.
29 The area of a trapezium is 540cm². If the ratio of the parallel sides   3
    is 7:5 and the distance between them is 18 cm, find the length of
    parallel sides.
30 The ratio of the sums of m and n terms of an A.P. is m^2: n^2. Show   3
    that the ratio of mth term and n^{th} term is (2m-1): (2n-1)
31 Find the value of the following: 3
        (i) 7! - 5!
        (ii) $\frac{6!}{4!}$

32 Read the following information carefully and answer the questions   5
    given below it Eight friends J, K, L, M, N, O, P, and Q are sitting
    around a circular table facing towards centre, Q is not a neighbour
    of M. Also Q is sitting on the immediate left of J. P is the neighbor
    of N. O is on the immediate right to K. L is sitting between N and O.
        (i) Write the sitting arrangement.
        (ii) Write the neighbor of M.
        (iii)Write the person sitting just left O
33 If the sum of n terms of an A.P. is 3n²+5n and its mth term is 164 ,   5
    find the value of m.
                                Or
    How many terms of the sequence 3, $\frac{3}{2}$, $\frac{3}{4}$, … are added to give the
    sum $\frac{3069}{512}$?

34 A right triangle , with sides 15cm and 20cm,is made to revolve   5
    about its hypotenuse. Find the volume and the surface area of the
    double cone so formed.
                                Or
    From a circular cylinder of diameter 10 cm and height 12cm, a
    conical cavity of same base radius and of the same height is
    hollowed out. Find the volume and the whole surface of the
    remaining solid.

35 A piece of work is finished in 30 days by A. Since C is thrice as   5

good as A and A is twice as good as B. If A, B, C work together, then how many days will they take to finish the work?

36 Indian government has announced a complete lockdown for entire country from the mid night of 25th of March 2020 till the mid night of 14th April 2020 due to pendemic disease Covid -19 out break . But keeping in view the grim situation the lockdown was further extended till 3rd May 2020.   4
   (i) Calculate the total number of days for which the lockdown lasted.
   (ii) If 25th March 2020 is Wednesday , then find which day of the week will fall on 3rd May 2020.

37 In a survey of 60 people, it was found that 21 people liked product A,26 liked product B and 29 liked product C. If 14 people liked product A and B, 12 People liked product C and A, 14 people liked product B and C and 8 people liked all the three products, find   4
   (i) How many people liked product C only?
   (ii) How many like atleast one of the three products?
   (iii)How many people do not like any of the three products?

38 India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs. The production of TV sets in a factory increases uniformly by a fixed number every year. It produced 16000 sets in 6th year and 22600 in 9th year.   4

Based on the above information, answer the following questions:

1. Find the production during first year.

2. Find the production during 8th year.

3. Find the production during first 3 years.

4. In which year, the production is Rs 29,200.