B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

PRE BOARD 3 (2025-26)
MATHEMATICS:MARKING KEY

Class: XII | **Time: 3hrs**
Date: 17-01-26 | **Max Marks: 80**
Admission no: | **Roll no:**

General Instructions

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, Question number 1 to 18 are Multiple Choice Questions (MCQs) and Question number 19 and 20 are Assertion-Reason based questions of 1 mark each.**
4. **In Section B, Question number 21 to 25 are Very Short Answer (VSA) type questions carrying 2 marks each.**
5. **In Section C, Question number 26 to 31 are Short Answer (SA) type questions carrying 3 marks each.**
6. **In Section D, Question number 32 to 35 are Long Answer (LA) type questions carrying 5 marks each.**
7. **In Section E, Question number 36 to 38 are Case Study Based questions carrying 4 marks each.**
8. **There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and one sub-part each in 2 questions in Section E.**
9. **Use of calculator is NOT allowed.**

SECTION A (1 × 20 = 20 marks)
(MCQs & Assertion–Reason)
Only correct option to be awarded full marks. No partial marking.

Q. No.	Answer
1	(b) 2
2	(b) 54
3	(b) ₹10,000
4	(a) 6 h
5	(b) Order = 2, Degree = 2
6	(b) ₹35
7	(a) 21
8	(b) e^{-1}
9	(a) ₹3914.81
10	(a) 3
11	(c) 4 km/h
12	(a) 17.1%
13	(b)
14	(a)
15	(c) ₹15,000
16	(c) 2
17	(d) None of these
18	(b) inside (2, 3)
19	(b)
20	(c)

SECTION B (2 × 5 = 10 marks)
(Very Short Answer)

Q21.
Correct substitution and solving
Answer: x = 2
Marks: 1 (method) + 1 (answer)

Q22.
mean = 100 .S.D = 16 and n = 64
95% Confidence Interval:

$$100 \pm 1.96\left(\frac{16}{8}\right) = (96.08, 103.92)$$

Marks:

- **Formula – 1**
- **Correct limits – 1**

Q23.
(a) Value = 2
OR
(b) Value = 1
Marks:

- **Correct steps – 1**
- **Final answer – 1**

Q24.
(a) General solution obtained correctly
OR
(b) Producer's surplus = ₹50
Marks:

- **Formula / method – 1**
- **Final answer – 1**

Q25.
Maximum value = 12
Marks:

- **Evaluation of feasible points – 1**
- **Correct maximum value – 1**

SECTION C (3 × 6 = 18 marks)
(Short Answer)

Q26.

$$X = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

Marks:

- **Inverse method – 1**
- **Multiplication – 1**
- **Final matrix – 1**

Q27.
Mean = 4, Variance = 2

$$p = \frac{1}{2}, q = \frac{1}{2}$$
$$P(X \geq 6) = 0.1875$$

Marks:

- **Finding p, q – 1**

- **Probability calculation – 1**
- **Final answer – 1**

Q28.
Purchase price of bond

$$\approx ₹11,342$$

Marks:
- **Bond valuation formula – 1**
- **Substitution – 1**
- **Final answer – 1**

Q29.
Cash price of the house

$$\approx ₹20,64,000$$

Marks:
- **Rate & time – 1**
- **Present value formula – 1**
- **Final answer – 1**

Q30.
(a) Maximum value = 1
OR
(b) LHS = RHS, hence proved
Marks:
- **Correct method – 2**
- **Conclusion – 1**

Q31.
(a)

$$\frac{dV}{dt} = 48\pi \text{ cm}^3/\text{min}$$

OR
(b) Maximum profit = ₹1250
Marks:
- **Formula – 1**
- **Differentiation – 1**
- **Final answer – 1**

SECTION D (5 × 4 = 20 marks)
(Long Answer)

Q32.
(a) Pipe B alone fills tank in 24 hours
OR
(b) Capacity of tank = 240 gallons
Marks:
- **Equation formation – 2**
- **Solving – 2**
- **Final answer – 1**

Q33.
Maximum number of cakes = 60
Marks:
- **Constraints – 2**
- **Corner points – 2**
- **Optimal solution – 1**

Q34.

- **Annual depreciation = ₹16,000**
- **Rate of depreciation = 16% p.a.**

Marks:

- **Depreciation formula – 2**
- **Schedule – 2**
- **Rate – 1**

Q35.
(a) k = 1/6
OR
(b) Probability of success = 1/2
Marks:

- **Equation formation – 3**
- **Final value – 2**

SECTION E (4 × 3 = 12 marks)
(Case Study)
Q36.
(i) Trend for 1982 = 1.73
(ii) Moving average for 1985 = 2.83
(iii) Sum = 5.53
Marks:

- **Each part – 1 mark**

Q37.
Demand function:

$$x = 10p - 175$$

Supply function:

$$x = 10p - 70$$

Consumer Surplus = ₹31,250
OR
Producer Surplus = ₹25,000
Marks:

- **Demand – 1**
- **Supply – 1**
- **Surplus – 2**

Q38.
(a) Upstream speed = 8 km/h
(b) Downstream speed = 16 km/h
(c) Still water speed = 12 km/h, Stream speed = 4 km/h
OR
Speed of boat in still water = 6 km/h
Marks:

- **Each sub-part – 1 mark**

******************************BEST OF LUCK*****************************