

Model Question Paper
Class : 11TH
Subject : Mathematics

Time : 3 Hrs.

Max. Marks : 80

Special Instructions :

1. This Question Paper contains 5 sections A, B, C, D & E. Each section is compulsory.
2. Section A has 16 MCQ's of 1 marks each.
3. Section B has 2 Assertion/Reason based questions of 2 marks each i.e. Q.17 to Q. 18 and 6 Very Short answer / Short answer questions of 3 marks each i.e. Q.19 to Q. 24.
4. Section C has 1 very short answer/ Short answer questions of 2 sub parts of 2 marks each and 3 short answer questions of 4 marks each i.e. Q.25 to Q.28.
5. Section D has 4 Long answer questions of 5marks each i.e. Q.29toQ.32.
6. Section E has 1 short answer questions of 6 mark of case based study i.e. Q.33.
7. All questions are compulsory.
8. Internal choices have been provided in some questions. You have to attempt only one of the choices in such questions.
9. Try to answer the questions in serial order as far as possible.

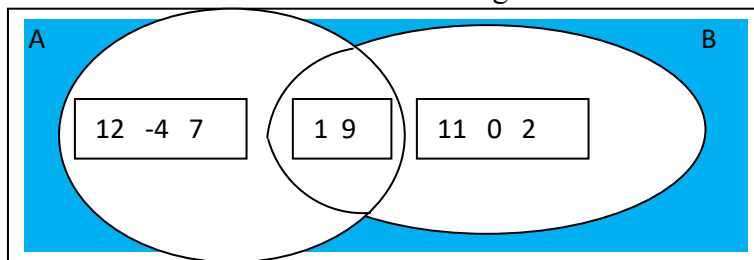
Note: - Question no. 17, 18 are Assertion/Reason based questions and Question no. 33 is Case based Study question.

Section- A

Multiple Choice Questions

1 x 16 = 16

- Q.1 Find the value of 'A-B' in the following indicated VENN diagram :



- (a) {11,0,2} (b) $\emptyset$ (c) {12,-4,7} (d) {12,-4,7,1,9, 11,0,2}

- Q.2 Match the following sets in column I with the intervals in column II:

Column -I	Column -II
A. $\{x : x \in \mathbb{R}, a < x < b\}$	1. $(a, b]$
B. $\{x \in \mathbb{R} : a \leq x \leq b\}$	2. $[a, b)$
C. The set of real numbers x such that $a \leq x < b$	3. (a, b)
D. $\{x : x \in \mathbb{R} \text{ and } a < x \leq b\}$	4. $[a, b]$

- Codes: A B C D
- (a) 4 1 2 3
- (b) 2 3 4 1
- (c) 1 2 3 4
- (d) 3 4 2 1

- Q.3 Which of the following are disjoint sets:

- (a) $\{a, b, c\}$ & $\{b, c, a\}$ (b) $\{a, e, b, d\}$ & $\{d, a, b, e\}$
 (c) $\{2, 5, m, n\}$ & $\{n, m, 5, 2\}$ (d) $\{(2, 4, 6, 8)\}$ & $\{x: x \text{ is an even number}\}$
- Q.4 If A is the set of even natural number less than 8 and B is the set of prime number less than 7, then the number of relations from A to B is
 (a) 2^9 (b) 9^2 (c) 3^2 (d) $2^9 - 1$
- Q.5 The value of $\sin(X-Y)$ is
 (a) $\cos x \cos y + \sin x \sin y$ (b) $\cos x \cos y - \sin x \sin y$
 (c) $\sin x \cos y - \cos x \sin y$ (d) $\sin x \cos y + \cos x \sin y$
- Q.6 The value of $i^{122} + i^{123} + i^{124} + i^{125} =$
 (a) 0 (b) -1 (c) 1 (d) 2
- Q.7 Solve $7x < 24$ when $x \in \mathbb{N}$
 (a) $\{1, 2, 3, 4\}$ (b) $\{0, 2, 3, 4\}$ (c) $\{1, 2, 3\}$ (d) $\{0, 2, 3, 4\}$
- Q.8 If ${}^nC = {}^nC$, then n =
 (a) 0 (b) 10 (c) 8 (d) 2
- Q.9 The total number of terms in the expansion of $(x + a)^{51}$ is
 (a) 50 (b) 51 (c) 49 (d) 52
- Q.10 If the nth term of an AP is $3n - 4$, the 10th term of AP is
 (a) 12 (b) 22 (c) 26 (d) 30
- Q.11 Two lines having slope m_1 and m_2 are parallel if
 (a) $m_1 = m_2$ (b) $m_1 \cdot m_2 = 1$ (c) $m_1 \cdot m_2 = -1$ (d) $m_1 \neq m_2$
- Q.12 Eccentricity of parabola is:
 (a) 0 (b) 1 (c) 1.5 (d) 0.5
- Q.13 In which plane does the point (0, y, z) lie ?
 (a) XY Plane (b) XZ Plane (c) YZ Plane (d) None of these
- Q.14 $\lim_{x \rightarrow 1} \frac{x^{15} - 1}{x - 1}$ is equal to:
 (a) 12 (b) 15 (c) 11 (d) 1
- Q.15 The variance of the data is 121, then the standard deviation of the data is
 (a) 12 (b) 121 (c) 10 (d) 11
- Q.16 If $P(E \cup F) = P(E) + P(F)$ then the events E & F are
 (a) Exhaustive Events (b) Impossible Events
 (c) Sure Events (d) Mutually Exclusive Events

Section – B

Each of these questions contains two statements, Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

- (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.
 (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion
 (c) Assertion is correct, reason is incorrect
 (d) Assertion is incorrect, reason is correct.

- Q.17 **Assertion** : Probability of an Event can be $\frac{3}{2}$.
Reason : For any event A, $0 \leq P(A) \leq 1$.
- Q.18 **Assertion** : $\tan 5A - \tan 3A - \tan 2A = \tan 5A \tan 3A \tan 2A$
Reason : If $x = y + z \Rightarrow \tan x - \tan y - \tan z = \tan x \tan y \tan z$.
- Q.19 Find the domain of the function $f(x) = \frac{x^2 + 3x + 5}{x^2 - 5x + 4}$.

Q.20 Let $z_1 = 2 - i$, $z_2 = -2 + i$. Find $\operatorname{Re} \frac{z_1 z_2}{z_1}$

OR

The conjugate of the complex number $\frac{2+5i}{4-3i}$

Q.21 The marks obtained by a student of Class XI in first and second terminal examination are 62 and 48, respectively. Find the minimum marks he should get in the annual examination to have an average of at least 60 marks.

OR

Solve the inequalities for real x $3(x - 1) \leq 2(x - 3)$

Q.22 In how many ways can one select a cricket team of eleven from 17 players in which only 5 players can bowl if each cricket team of 11 must include exactly 4 bowlers?

Q.23 The sum of first three terms of a G.P. is $\frac{39}{10}$ and their product is 1. Find the common ratio and the terms.

OR

The 4th term of a G.P. is square of its second term, and the first term is -3 . Determine its 7th term.

Q.24 How many numbers lying between 100 and 1000 can be formed with the digits 0, 1, 2, 3, 4, 5, if the repetition of the digits is not allowed?

Q.25 If the origin is the centroid of the triangle PQR with vertices P (2a, 2, 6), Q (−4, 3b, −10) and R(8, 14, 2c), then find the values of a, b and c.

OR

Find the equation of the set of points which are equidistant from the points (1, 2, 3) and (3, 2, −1).

Q.26 A) Evaluate $\lim_{x \rightarrow 2} \frac{x^3 - 4x^2 + 4x}{x^2 - 4}$

B) If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $A = \{2, 4, 6, 8\}$ and $B = \{2, 3, 5, 7\}$. Verify that (i) $(A \cup B)' = A' \cap B'$

Q.27 Find $(x + 1)^6 + (x - 1)^6$. Hence or otherwise evaluate $(\sqrt{2} + 1)^6 + (\sqrt{2} - 1)^6$

OR

Expand the expression $(x^2 + \frac{3}{x})^4$, $x \neq 0$

Q. 28 Find the coordinates of the foot of perpendicular from the point (−1, 3) to the line $3x - 4y - 16 = 0$.

OR

By using the concept of equation of a line, prove that the three points (3, 0), (−2, −2) and (8, 2) are collinear.

SECTION –D

Q.29 Prove that $\frac{\cos(\pi+x) \cos(-x)}{\sin(\pi-x) \cos(\frac{\pi}{2}+x)} = \cot^2 x$

OR

$$(\cos x - \cos y)^2 + (\sin x - \sin y)^2 = 4 \sin^2 \frac{x-y}{2}$$

Q.30 Find the equation of the parabola which is symmetric about the Y-axis, has its vertex at the origin, and passes through the point (4, −2). Also, find the coordinates of its focus, the equation of the directrix, and the length of the latus rectum.

OR

Find the equation of the ellipse whose center is at the origin, major axis is along the X-axis, and passes through the points (4, 3) and (6, 2). Also, find its eccentricity and the coordinates of its foci.

Q.31 Find the sum of the sequence, 7, 77, 777, 7777,..... to n terms.

OR

150 workers were engaged to finish a job in a certain number of days. 4 workers dropped out on second day, 4 more workers dropped out on third day and so on. It took 8 more days to finish the work.

Find the number of days in which the work was completed.

Q.32 Find the mean deviation about the mean for the following data:

X_i	2	5	6	8	10	12
F_i	2	8	10	7	8	5

Section – E

Q.33 Two candidates Shekhar and Ahana appeared in a written test for a job position in a company. The probability that Shekhar will qualify the test is 0.05 and that Ahana will qualify the test is 0.10. The probability that both will qualify the test is 0.02. Based on the given information, answer the following questions.



(i) Find the probability that both Shekhar and Ahana will not qualify the test.

(ii) Determine the probability that only one of the candidates will qualify the test.

The set $A = \{x: x \in \mathbb{R}, x^2=25\}$ is equal to:

- (a) $\{-5, 5\}$ (b) Φ (c) $\{5\}$ (d) $\{-5\}$

Proforma for Analysing Question Papers

Part I: General Information

1. Name of Examination:	Model Question Paper
2. Year of Examination:	2026-27
3. Class:	10+1
4. Subject:	MATHEMATICS
5. Question Paper Number:	
6. Maximum Marks:	80
7. Time Allotted:	3 Hours
8. Sections, if any:	A, B, C, D, E

Part -II (A): General Item General Analysis of Question of a Question Paper.

S. no	Objective	Specification	Content	Unit/ Sub- Unit No.	Form of Question	Marks Allotted	Estimated time (min)
1	Understanding	Chp.1 Graphical	Sets	1	MCQ	1	3
2	Knowledge	Chp.1	Sets	1	MCQ	1	3
3	Knowledge	Chp.2	Relation and Function	1	MCQ	1	3
4	Application	Chp.2	Relation and Function	1	MCQ	1	3
5	Knowledge	Chp.3	Trigonometric function	1	MCQ	1	3
6	Knowledge	Chp.4	Complex Number	2	MCQ	1	3
7	Application	Chp.5	Linear Inequality	2	MCQ	1	3
8	Knowledge	Chp.6	Permutation and Combination	2	MCQ	1	3
9	Knowledge	Chp.7	Binomial Theorem	2	MCQ	1	3
10	Knowledge	Chp.8	Sequence and Series	2	MCQ	1	3
11	Knowledge	Chp.9	Straight lines	3	MCQ	1	3
12	Knowledge	Chp.10	Conic Sections	3	MCQ	1	3
13	Knowledge	Chp.11	Introduction to Three Dimensional Geometry	3	MCQ	1	3

14	Understanding	Chp. 12	Limits and Derivatives	4	MCQ	1	3
15	Knowledge	Chp.13	Statistics	5	MCQ	1	3
16	Application	Chp.14	Probability	5	MCQ	1	3
17	Knowledge	Chp.10 (Assertion/ Reason)	Probability	5	Very Short Answer	2	4
18	Creation	Chp.3 (Assertion/ Reason)	Trigonometric function	1	Very Short Answer	2	4
19	Understanding	Chp.1	Relation and Function	1	Short Answer	3	7
20	Evaluation	Chp 4	Complex Number	2	Short Answer	3	7
21	Application	Chp.5	Linear Inequality	2	Very Short Answer	3	4
22	Application	Chp.6	Permutation and Combination	2	Short Answer	3	7
23	Creation	Chp.8	Sequence and Series	2	Short Answer	3	7
24	Creation	Chp.6	Permutation and Combination	2	Short Answer	3	7
25	Understanding	Chp.11	Introduction to Three Dimensional Geometry	3	Short Answer	4	7
26 (A)	Understanding	Chp.12 Sub part	Limits and Derivatives	4	Very Short Answer	2	2
26 (B)	Application	Chp.1 Sub part	Sets	1	Short Answer	2	7
27	Understanding	Chp.7	Binomial Theorem	2	Short Answer	4	7
28	understanding	Chp.9	Straight lines	3	Short Answer	4	7
29	Understanding	Chp.3	Trigonometric function	1	Long Answer	5	12
30	Analysis	Chp.10	Conic Sections	3	Long Answer	5	12
31	Understanding	Chp.8	Sequence and Series	2	Long Answer	5	12
32	Creation	Chp. 14	Statistics	5	Long Answer	5	12
33	Creation	Chp.14	Probability	5	Short Answer	6	7

FORMAT OF BLUEPRINT (Subject other than language)

Subject Mathematics Class 10+1

Unit/Paper: Model Question Paper

Max Marks 80

Time : 3 Hours

S. N o.	Objective	Knowledge					Understanding					Application					Analysis					Evaluation					Creation					Total Row Wise
	Form of Questions																															
Content Unit/ Sub Unit	E/ LA	S A	VS A	O	E / LA	S A	V S A	O	E / LA	S A	VS A	O	E/ LA	S A	VS A	O	E/ LA	S A	VS A	O	E/ LA	S A	VS A	O								
1	Unit – I Sets and Functions	0	0	0	3	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	5						
2	Unit – II Algebra	0	0	0	4	1	1	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	2	0	2						
3	Unit – III Co-ordinate Geometry	0	0	0	3	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	11						
4	Unit – IV CALCULUS	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11						
5	Unit – V Statistics and Probability	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	0	1						
	Sub Total	0	0	0	12	3	4	1	2	0	1	2	3	1	0	0	0	0	1	0	0	1	3		0	33(2 SUB PARTS 1QUESTION)						
	Total Column	0(0)	0(0)	2(2)	11(11)	10(2)	17(4)	2(1)	2(2)	0(0)	3(1)	5(2)	3(3)	5(1)	0(0)	0(0)	0(0)	0(0)	0(0)	3(1)	0(0)	0(0)	5(1)	12(3)	2(1)	0(0)	33(2 SUB PARTS IN 1QUESTION)					
	Wise	13(Marks Total)					31(Marks Total)					11(Marks Total)					5(Marks Total)					3(Marks Total)					19(Marks Total)					80 (Marks Total)

Notes: Figures within brackets to indicate the number of questions and figures outside the brackets to indicate marks. Denotes that marks have been combined to form one question.

Summary:	Essay (E)	No. 4	:Marks 20	Pattern of Options	Internal Choice
	Short Answer (SA)	No.10	:Marks35		
	Very Short Answer (VSA)	No.4	Marks9	Scheme of Sections	A,B,C,D,E
	Objective (O)	No. 16	Marks 16		
	Steps: A , B				