

Summative Assessment III - Model Paper

Mathematics

(English Version)

Time : 15 Min + 2 hr. 30 min.

Paper-I

Max. Marks : 40

- Instructions :**
1. Read the whole question paper and understand every question thoroughly, without writing any thing. 15 minutes of time is allotted for this.
 2. Answer all the questions.
 3. Write answers to the objective type questions on answer sheet, but at same place.

I. Answer to all the following questions

7×1 = 7

Each question carries 1 mark.

1. Determine the value of $\log_{12}^{18} +$ (Problem solving)
2. If $A = \{1, 2, 3, 4\}$ and $B = \{2, 4, 6, 8\}$, then find $n(A \cap B)$ (Problem solving).
3. Verify whether -3 and 2 are the zeroes of the polynomial $x^3 - x^2 + x - 6$. (Reasoning Proof).
4. Difference between a two digit number and the number formed by interchanging its digits is 36. Express this data as an algebraic equation. (Communication)
5. Explain the characteristic of a line passing through points (-5, 2), (0, 2), (3, 2), (5, 2). (Communication)
6. Find the roots of $6x^2 - 2x + 5 = 0$. (Problem solving)
7. Prove that $\sqrt{2}$ is an irrational number. (Reasoning Proof)

II. Answer all the following questions. Each question carries 2 marks.

6 × 2 = 12

8. Find the area of a rectangle whose length and breadth are the roots of the quadratic equation $x^2 - 6x + 8 = 0$ (Connection)
9. Mark a point on the second quadrant which is equidistant from coordinate axes. (Representation)
10. If $(3 \times 4 \times 5 \times 7) + (19 \times 21 \times 23)$ a composite number. Justify your answer. (Reasoning Proof)

11. If 6th term of a G.P. is 46875 and its 4th term is 375. Find its 9th term. (Problem solving)
12. Find the points of trisection of the segment joining the points (3, -2) and (-9, 4) (Problem solving)
13. How can you say that the points (1, -5), (3, -2), (7, 4) are collinear ? (Reasoning proof)

III. Every question has internal choice in the following.

Answer to any one alternative. Each question carries 4 marks.

4×4 = 16

14. (a) If 1 and 2 are the zeros of the polynomial find $x^4 - 4x^3 - 15x^2 + 58x - 40$, find other zeroes if any. (Problem solving)

OR

- (b) Find the polynomials whose zeroes are (i) 3, - 4 and (ii) $\sqrt{3}$,
15. (a) Find the sum of all the multiples of 2 or 3 between 100 and 200 (100 and 200 are not included). (Problem solving)

OR

- (b) If the third and sixth terms of a geometric progression are 12 and 96, then find the number of terms in the progression, which are less than 2000.
16. (a) While a helicopter is descending vertically an aviation kit dropped from it. If the height of the helicopter when the kit dropped is 590 m. Find how much time does the kit reach the ground, also find its final velocity before it touches the ground. (Connection)

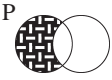
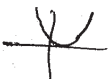
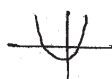
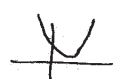

OR

- (b) If Ganesh is 2 years elder to his sister, in how many years does he become a voter ?
17. (a) Neelesh went to market to buy mangoes. He had enough money to buy number of mangoes which are five times the cost of each mango. If the cost of each mango is 2 less, he would have get 12 more mangoes. With this data draw a graph to find the cost of each mango and the number of mangoes. (Visualisation)

OR

- (b) Check whether the following pairs of lines are intersecting, parallel or coincident lines. $3x + 5y + 2 = 0$, $2x - y + 10 = 0$. Mark their solution on the graph.

IV. Choose the correct alternative for the following problems and write your answer A, B, C or D on the answer sheet. Each question carries $\frac{1}{2}$ mark. $10 \times = 5$

18. Standard form of $2^6 \times 5^5$ is (Communication) []
 A) 64×3225 B) 200000 C) 20×10^4 D) 2.0×10^5
19. In the rational form of a terminating decimal number prime factor of the denominator is (Reasoning proof) []
 A) 5 only B) 2 only C) 2 or 5 only D) Any prime
20. Staded Region represented by the vern diagram  (Communication) []
 A) P Q B) P Q C) P-Q D) Q-P
21. If 2 is the zero of a polynomial $ax^3 + bx^2 + cx + d$, then the possible value of 'd' will be (Reasoning Proof) []
 A) 1 B) -1 C) 2 D) 0
22. Linear equation is two variable among the following is (Reasoning Proof) []
 A) $(x+1)(y+2) = 0$ B) $(2x+1)(y-1) = 0$
 C) $(x-1) + (2y - 5) = 0$ D) $x(y+1) = 0$
23. In a quadratic equation discriminant is zero then the roots are (Communication) []
 A) real B) distinct C) imaginary D) none
24. Graph of a quadratic equation with two distinct roots (Communication) []
 A)  B)  C)  D) 
25. Common difference of an AP is 3. If 2 is added to every term of the progression, then the common difference new AP (Problem solving) []
 A) 5 B) 6 C) 3 D) 2
26. Co-ordinates of a point on X-axis, which is at 5 units away from (2, 0) is (Problem solving)
 A) (-3, 0) B) (7, 0) C) both A and B D) (2, 5) []
27. If slopes of line segments AB and BC are equal then the area of ΔABC is []
 (Reasoning Proof)
 A) Positure B) Zero C) Negative D) Imaginary



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Time : 15 Min + 2 hr. 30 min.

Paper-II

Max. Marks : 40

- Instructions :**
1. Read the whole question paper and understand every question thoroughly, without writing any thing and 15 minutes of time is allotted for this.
 2. Answer all the questions.
 3. Write answers to the objective type questions on answer sheet, but at same place.

I. Answer to all the following questions. Each question carries 1 mark.

1. In $\triangle ABC$, D and E are points on AB & AC so that $\frac{AD}{AB} = \frac{AE}{AC} = \frac{1}{2}$. Represent this data diagrammatically and label it. (Rep V)
2. How many tangents can be drawn to a circle from a point outside the circle ? Justify your answer. (R & P)
3. How much cloth is required to set up a conical shaped tent with height 4 meters and radius 10.5 meters. (PS)
4. Which has greater value among $\cos 6^\circ$ or $\cos 60^\circ$? Why ? (R & P)
5. Length and breadth of a rectangle paper are in the ratio $\sqrt{3} : 1$. Then what is the angle made by its diagonal with its length. (PS)
6. Find the probability of getting a prime number when a die is rolled once. (PS)
7. Explain the procedure to find median of ungrouped data. (Com)

II. Answer all the questions. Each question carries 2 marks.

8. In a right angle triangle ABC right angled at B, a line $BD \perp AC$ is drawn and again $DE \perp BC$ is drawn. Then prove that _____ with reasons. (R & P)
9. If a line drawn through a point on a circle is perpendicular to radius of the circle to that point, then prove that it is tangent to the circle. (R & P)

10. If radius of a cylinder and a cone are equal and height of cone is double of that of cylinder, then find the relation between their volumes in the form of a ratio. (PS)
11. If $\sec \theta + \tan \theta = 1$, then find value of $\sin \theta$ in terms of 1. (PS)
12. If unbiased coin is tossed 4 times. Then what is the probability of getting no head anytime ? (PS)
13. Draw a ogive curve for the following data (R & V)

Age intervale	0-5	5-10	10-15	15-20	20-25	25-30
No of persons	2	5	11	15	10	3

III. Answer all the questions. Each question carries 4 marks. There is internal choice for each question.

- 14(a) Construct a triangle with sides $AB = 4\text{cm}$, $BC = 4.5\text{cm}$, $CA = 5\text{cm}$, and also construct another triangle with $2/3$ of corresponding sides of ΔABC (Rep & V)

(OR)

- (b) Draw a circle of radius 4cm and construct tangents from a point 7 cm away from centre of the circle. (Rep & V)

- 15(a) A cylindrical tank has two hemispheres at its two ends. The length of axis at its centre is 11m and radius of a hemisphere is 3.5 m. Then find the capacity of the tank in litres.

(OR)

- (b) A conical shaped tent has to set up on a cylindrical tent with its radius of base and height in the ratio 2 : 1. The heights of cylinder and cone are equal and ratio are 7 cm. Then how much cloth is required to set up the tent. (Con)

- 16(a) Two men on the same side of a tall building notice the angle of elevation to the top of the building to 30° and 60° respecting. If the height of the building is known to be $h = 60\text{m}$ find the distance between the two men. (PS)

(OR)

- (b) A man is watching a tower from a window of the hotel at the height 5m. The angle of elevation of top of the tower is 60° and the angle of depression of foot of the tower is 45° . Find the height of the tower. (PS)



17(a) The marks of students of x class in a mathematics exam are given here. Find median of the data by drawing a ogive curve. (PS)

Marks interval	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
No of students	2	4	6	7	10	9	5	4	3

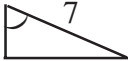
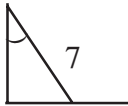
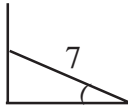
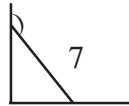
(OR)

(b) The information of members of a club with their ages are given here. Find median of the members ages by drawing two ogive curves. (PS)

Ages interval	21-23	24-26	27-29	30-32	33-35	36-38	39-41
No of members	3	13	22	21	23	14	4

IV. Write correct choice of the answer in the corresponding bracket. Each answer carries $\frac{1}{2}$ mark.

18. In ΔABC the points E and F are on the sides AB and AC respectively. If $AE = 4\text{cm}$, $EB = 4.5\text{ cm}$, $AF = 8\text{ cm}$ and $FC = 9\text{ cm}$, then (Rep & V) ()
 A) $EF \perp BC$ B) $EF \perp AB$ C) $EF \parallel BC$ D) $EF \perp AC$
19. p : Every angle in an equilateral triangle is 60°
 q : Every angle in an equilateral triangle is not 60° then (Con) ()
 A) $q \quad p$ B) $p \quad \sim(\sim q)$ C) $\sim p \quad q$ D) $p = q$
20. In a ΔABC are D, E and F are mid points of AB, BC and CA respectively. If $\Delta ABC = 16\text{ cm}^2$ then are $\Delta DEF = \dots\dots\dots$ then (PS) ()
 A) 4 Cm^2 B) 16 Cm^2 C) 64 Cm^2 D) 32 Cm^2
21. If the radius of two sphere are in the ratio $1 : 3$, then their volumes are in the ratio (PS)
 A) $1 : 3$ B) $3 : 1$ C) $3 : 6$ D) $1 : 27$ ()
22. In a right angle ΔABC right angled at B, then the relation exist (R & P) ()
 A) $\sin (90-A) = \sin C$ B) $\cos (90-A) = \sin C$
 C) $\cos (90-C) = \cos C$ D) $\sin A = \sin C$

23. For an acute angle A, $\sin A = \cos A$ then (R & P) ()
 A) $\angle A = 30^\circ$ B) $\angle A = 45^\circ$ C) $\angle A = 60^\circ$ D) $\angle A = 75^\circ$
24. A stick of 7 m is leaning with a wall by making 30° angle with the ground. Then the diagram representing the data is (Rep & V) ()
- A)  B)  C)  D) 
25. The set of total mutually exclusive and exhaustive events of a random experiment is called (R & P) ()
 A) Complete set B) Sample space
 C) Compulsory Event D) No set occurs
26. The probability of an event is always lie (Com) ()
 A) in between -1 and 1 B) From 0 to 1
 C) more than 1 D) less than -1
27. The middle most value of data is called (R & P) ()
 A) Mean B) Median C) Mode D) No value exists



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I. Answer every question. Each question carries one mark.

1. Find centroid of the triangle formed by A(-1, 2), B(0, 3), C(-2, 4) (P.S.)
2. How do you find the distance between two points on the line parallel to x-axis. Explain. (R & P)
3. If the slope of line segment joining P(-2, 3), Q(x, 6) is -1, then find x. (P.S.)
4. Simplify $\log_9 243$. (Com)
5. Explain the nature of roots of $3x^2 - 2x + 16 = 0$ with reasons. (Com)
6. Find cubic polynomial with the zero values -7, 1, 2. (P.S.)
7. Can $x+2$, $x+4$ and $x+9$ be in A.P. Justify your answer. (R & P)

II. Answer every question. Each question carries 2 marks.

8. How many two digit numbers are divisible by 7 ? (Com)
9. Show that $2\sqrt{3}$ is irrational number. (R & P)
10. If $A = \{1, 3, 6, 9\}$, $B = \{1, 2, 3, 4, 5, 6\}$ then show $A \cap B$ and $A - B$ as Venn diagrams. (Rep & V)
11. Are sets of multiples of 3 and multiples of 2 disjoint sets. Justify your answer ? (R & P)
12. Find the ratio in which y-axis divides the line segments joining the points A(3, 2), B(-1, 2). (P.S.)
13. Find the area of quadrilateral formed by the points A(2, 1), B(4, 3), C(-1, 3), D(-3, 1) (P.S.)

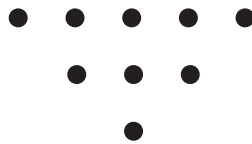
III. Answer every question. Each question carries 4 mark.

14(a) The length and breadth of a rectangular metal sheet are in the ratio 7 : 5. Four $3\text{cm} \times 3\text{cm}$ squares have been separated from the corners of that rectangle and it has been moulded into a cuboid of 96 cm^3 of volume. Find the area of the rectangular metal sheet taken in the beginning. (Connection)

(OR)

(b) A stone is thrown vertically upwards from a building of 96 ft high with a initial velocity of 116 ft/sec. If the acceleration due to gravity is 32 ft/sec^2 , then after how many seconds the stone will reach the ground. (Connection)

15(a) Rama has arranged 256 dots to draw a rangoli in the following ways. In how many rows has she arranged the dots. (P.S.)



(OR)

(b) In a nuclear fusion reaction a U^{235} Nuclous will split two lighter nuclear creates 3 Neutrons and 200 MeV of energy. These three Neutrons will again split three U^{235} Nucleas. Find the energy released if this process continuous for 10 stages. (P.S.)

16(a) Draw the graph of $p(x) = x^2 - 12x + 35$ and find the zeroes of the polynomial of it.

(OR)

(b) The product of two consecutive multiples of 3 is 81. Form a quadratic equation and by using this information draw its graph. (Rep & V)

17(a) Solve $\frac{1}{x+y} + \frac{2}{x-y} = \frac{1}{15}$

$$\frac{1}{3(x+2y)} - \frac{1}{3(x-2y)} = \frac{-8}{45} \text{ (P.S.)}$$

(OR)

(b) 5 women and 3 men having same capacity can complete a work in 6 days. And 3 men, 3 women of same capacity together complete the same work in 9 days, then in how many days a woman or a man can complete the work. (P.S.)



IV. Choose the wright answer, and write the correct answer in the brackets.

18. The decimal form of $\frac{1}{400}$ is (Comm) ()
 A) 0.25 B) 0.025 C) 0.0025 D) 0.00025
19. $A = \{1, 2, 3, 4, 5, 6\}$, $B = \{2, 4, 6\}$ then (Comm) ()
 A) $B \subset A$ B) $A \subset B$ C) $B \supset A$ D) $A \supset B$
20. If there is no x term in a cubic polynomial then (R & P) ()
 A) $\alpha + \beta + \gamma = 0$ B) $\alpha\beta + \beta\gamma + \alpha\gamma = 0$ C) $\alpha\beta + \beta\gamma = 0$ D) Not possible
21. If $2x - 5y = 17$ and $4x - 10y = 8$ then these equation are (R & P) ()
 A) Consistant B) Inconsistant C) Equal D) none of the above
22. The product of two consecutive numbers is 56. Then quadatic equation formed by this is (Comm) ()
 A) $x^2 + x - 56 = 0$ B) $x^2 - x + 56 = 0$
 C) $x^2 + x + 56 = 0$ D) $x^2 - x - 56 = 0$
23. If x-coordinates of two points are zero. Then slope of the line segment joined by these two points is (R & P) ()
 A) 0 B) 1 C) -1 D) not defined
24. 1, -2, 4, -8, is (P.S.) ()
 A) AP B) GP C) Both D) None of these
25. $A = \{x : x \in \mathbb{N}; x = 0\}$ then (Comm) ()
 A) $A = \{0\}$ B) $A = 0$ C) $A = \{\phi\}$ D) $A = \phi$
26. Discriminant of $\alpha x^2 + \beta x + \gamma = 0$ (P.S.) ()
 A) $b^2 - 4ac$ B) C) $\beta^2 - 4\alpha\gamma$ D) $\beta^2 + 4\alpha\gamma$
27. The ratios of corresponding co-efficients and constants in 2 two variable linear equations are equal. Then the equations show the lines (R & P) ()
 A) Inter-secting lines B) Coinsiding lines
 C) Parallel lines D) none of the above

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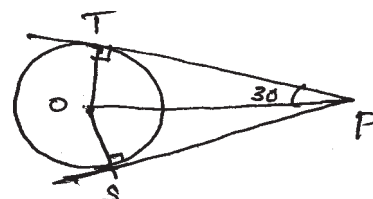
I. Answer to all the following questions. Each question carries 1 mark. $7 \times 1 = 7$

1. State the formula to find Median for a grouped data and explain the terms. (Comm)
2. The information related to the health tests conducted for students of a class are as follows :

Blood Group	A	AB	B	O
Number of Students	10	13	12	5

If a student is selected at random from this class, then find the probability for the blood group of that selected boy to be 'B'. (P.S.)

3. When a line segment is drawn with two midpoints of two sides of a triangle. Then relate the line segment with the third side ? Justify your answer. (R & P)
4. If a cone, hemisphere, cylinder are on the same base and having the same height, then what is the ratio of their volumes. Justify your answer. (R & P)
5. Write trigonometric identity in $\tan \theta$ and $\sec \theta$. (Comm)
6. If the length of shadow of a tower is $\sqrt{3}$ times its height, then the angle with which a person standing at the end of the shadow will see the top of the tower. (P.S.)
7. For a circle with centre 'o', 'p' is an external point. If PS and PT are tangents drawn to the circle, then find . (P.S.)



POS

II. Answer all questions. Each question carries 2 marks.

6×2 = 12

8. Prepare ascending cumulative frequency table for given below.

In a company the salaries of employees and their number like this. (Comm)

Employees salary	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Number of employees	4	45	20	13	9	7	2

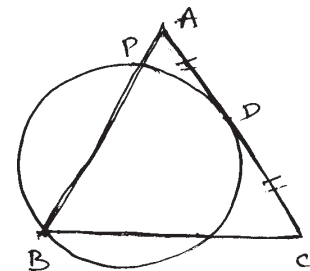
9. If $\tan \theta + \sin \theta = m$, $\tan \theta - \sin \theta = n$, then express the value of $m^2 - n^2$ in terms of m and n . (Comm)

10. In a leap year find the probability of getting 53 Sundays. Similarly find the probability of getting 54 Sundays. Justify your answer. (R & P)

11. A square of side 25 cm is divided into n^2 equal small squares. If circles are drawn in each of these small squares touching all the sides, then find the area of the given square not covered by these circles. (P.S.)

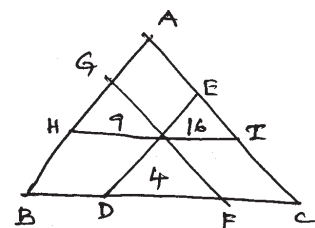
12. If there spheres of radius 3 cm, 4 cm and 5 cm are melted and cast into a large sphere, then find the radius of the large sphere so formed. (P.S.)

13. Triangle ABC is an isosceles triangle in which $AB = AC$. Point D is mid point of AC. If a circle is drawn passing through B, intersecting AB at P and 'D' as point of contact so that AC is a tangent to the circle at D, then prove that $AP = \frac{1}{4} AB$. (R & P)



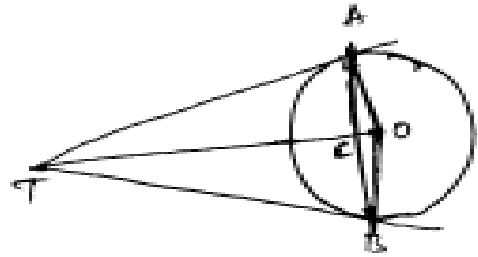
III. Every question is provided with internal choice. Each question carries 4 marks.

14(a) From any point in the interior of the triangle, lines are drawn parallel to the sides of it. If the areas of the three small triangles thus formed are 4, 9 and 16 square units then find the area of the given larger triangle. (P.S.)



(OR)

- (b) For a circle with centre 'o', point 'T' is an external point. TA and TB are tangents drawn to the circle from T. Chord AB intersects \overline{AO} at C. If



then find the value of

AB. (P.S.)

- 15(a) The Crop yielding for a hectar of 100 farmers of a village is given as follows :

Crop yielding (in quintols)	30-35	35-40	40-45	45-50	50-55	55-60
No. of farmers	4	6	12	24	32	22

Represented the above data in the form of a less than cumulative frequency curve.

(Rep & V)

(OR)



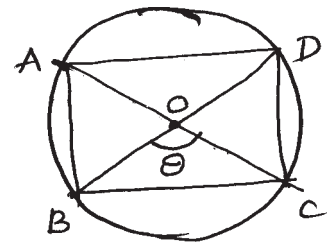
$$\frac{1}{TA^2} = \frac{1}{36}$$

- (b) Draw a line segment AB of length 10 cm. With 'A' as centre and 5 cm radius draw a circle. With 'B' as centre and 3 cm radius draw another circle. Draw tangents from centre of each circle to the other circle. (Rep & V)

- 16(a) The perpendicular sides of a right triangle are 6 cm and 8 cm. If it is rotated about its hypotenure, then find the volume of the double cone so formed. (Comm)

(OR)

- (b) A rectangle ABCD is discribed in a circle of radius 6 cm. Diagonals of that rectangle interscit at 'o' and one of the angles thus B formed is 'θ' then find the area of the rectangle ABCD in terms of 'θ'. (Comm)



- 17(a) A tree was broken by a wind and top of the tree is touching the ground making an angle of 30° . If the point where top touches the ground to the bottom of the tree is 20m, then find the height of the tree before it was broken. (P.S.)



(OR)

(b) Find Arithmetic mean for the following data. (P.S.)

Marks	0-9	10-19	20-29	30-39	40-49	50-59
Number of students	3	8	14	21	9	5

IV. Answer all questions. Each question carries $\frac{1}{2}$ mark. 10 × = 5

18. In ΔABP , if 'c' is a point on BP such that _____ ,
then PC.PB is equal to (Comm) _____
- A) AP^2 B) AC^2 C) AB^2 D) BC^2 []
19. The average of 13 scores is 8. If one of the scores 20 is deleted from them, then the average of the remaining scores is (P.S.) _____ []
- A) 7 B) 5 C) 21 D) 12
20. If the base radius of a right circular cylinder is 14 cm and its height is 21 cm, then its curved surface area is (P.S.) _____ []
- A) 616 cm^2 B) 1848 cm^2 C) 3080 cm^2 D) 12936 cm^2
21. Which value among the following is not possible for $\sin \theta$ (R & P) _____ []
- A) _____ B) _____ C) _____ D) _____
22. which one of the following is equal to $\sin x$ is (Comm) _____ []
- A) _____ B) $\frac{\tan x}{\sqrt{1-\tan^2 x}}$ C) $\frac{\sin x}{\sqrt{1-\sin^2 x}}$ D) $\frac{\sqrt{1+\cos^2 x}}{\cos x}$
23. Which one of the following is true (R & P) _____ []
- A) When two coins are tossed there are three possible outcomes, two heads, two tails, one head and one tail so its probability is $\frac{1}{3}$
- B) When a dice is rolled the possible outcome is an even number or odd number so its probability is _____
- C) A deck of 52 cards contain 4 suits. So the probability of a selected card to become ace is _____

in a year is 3.65

24. ABCD is a quadrilateral and a circle touches the sides of it at points P, Q, R and S respectively then which one of the following is true. (R & P)

- A) $AB + CD = BC + DA$ B) $AB + AD = BC + CD$
 C) $AD + DC = AD + BC$ D) $AB + BC + CD < AD$ []

25. In ΔPQR , E and F are points on sides PQ and PR respectively. In which of the following situations we set $EF \parallel QR$ (R & P) []

- A) $\frac{PQ}{PE} = \frac{PR}{PF}$ B) C) D)

26. If $P(E) = 0.05$ then express the probability of "Not E" in percentage is (Comm) []

- A) 5% B) 95% C) 0.95% D) 0.05%

27. In the formula of mode

mode = , f_0 represents (Comm) []

$\frac{PE}{ED} = \frac{QE}{ER} \left[\frac{f_1 - f_0}{2f_0 - f_0 - f_2} \right] \times h$

- A) frequency of preceding model class
 B) frequency of succeeding model class
 C) frequency of model class
 D) frequency of zero model class.

