Federal Board HSSC-I Examination
MATHEMATICS
Model Question Paper
(Reduced Syllabus)
(2021 and Onwards)
SECTION-A (Marks 20)

Time: 25 Minutes **Marks: 20**

Note: Section-A is compulsory. All parts of this section are to be answered on the separately provided OMR Answer Sheet which should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q.1 Choose the correct answer i.e. A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there. Each part carries one mark.

1. In complex numbers, what is the multiplicative inverse of $2i$?

A. $\frac{-i}{2}$ B. $\frac{1}{2}$

C. $\frac{-1}{2}$ D. $\frac{i}{2}$

2. What is the contrapositive of the statement $\sim p \rightarrow q$?

A. $\sim q \rightarrow p$ B. $\sim q \rightarrow \sim p$

C. $q \rightarrow \sim p$ D. $\sim p \rightarrow q$

3. What is the value of α, if $\begin{vmatrix} 2 & 3 & 0 \\ 3 & 9 & 6 \\ 2 & 15 & 1 \end{vmatrix} = \alpha \begin{vmatrix} 2 & 1 & 0 \\ 1 & 1 & 2 \\ 2 & 5 & 1 \end{vmatrix}$.

A. 3 B. 6

C. 9 D. 15

4. What is the solution set of the quadratic equation $x^2 - 2x + 1 = 0$?

A. $\{1\}$ B. $\{-1, 1\}$

C. $\{0, -1\}$ D. $\{1, 2\}$

5. What are the partial fractions of $\frac{7x+25}{(x+3)(x+4)}$?

A. $\frac{3}{x+4} + \frac{3}{x+3}$ B. $\frac{3}{x+4} + \frac{4}{x+3}$

C. $\frac{4}{x+4} - \frac{3}{x+3}$ D. $\frac{-4}{x+4} + \frac{3}{x+3}$

6. What is the geometric mean between $\sqrt{2}$ and $3\sqrt{2}$?

A. $\frac{6}{\sqrt{2}}$ B. $6\sqrt{2}$

C. $2\sqrt{2}$ D. $\sqrt{6}$

7. Which of the following is the vulgar fraction of 2.232323....?

A. $\frac{22}{99}$ B. $\frac{222}{99}$

C. $\frac{221}{99}$ D. $\frac{211}{99}$

8. What are the first four terms of the sequence $a_n = (-1)^n n^2$?

A. $-1, 4, -9, 16$

B. $1, -4, 9, -16$

C. $1, 4, 9, 16$

D. $-1, -4, -9, -16$

9. For what value of n, is ${}^nP_2 = 12$?

A. 4 B. 3

C. 12 D. 6

10. Which one of the following is an expansion of $(1+x)^{-1}$?

A. $1 - x + x^2 - x^3 + \ldots$

B. $1 + x - x^2 + x^3 + \ldots$

C. $1 + x + x^2 + x^3 + \ldots$

D. $1 - x - x^2 - x^3 + \ldots$

11. Which of the following is the simplified form of $\frac{1}{1+\sin\theta} + \frac{1}{1-\sin\theta}$?

A. $\sec\theta$ B. $\sec^2\theta$

C. $2\sec^2\theta$ D. $2\sec\theta$

12. Which of the following is the simplified form of $\frac{\sin 2\theta}{\sin\theta} - \frac{\cos 2\theta}{\cos\theta}$?

A. $\cot\theta$ B. -1

C. $\sec\theta$ D. $\csc\theta$

13. Which of the following can be replaced by $\cos 2\theta$?

A. $2\sin\theta\cos\theta$ B. $\cos\theta + \sin\theta$

C. $2\cos 2\theta \sin 2\theta$ D. $\cos^2\theta - \sin^2\theta$

14. What is the period of a function $\sin\frac{\pi x}{2}$?

A. 2 B. 4 C. $\frac{1}{2}$ D. $\frac{1}{4}$

15. What is the range of a function $y = 2\sin x$?

A. $-2 < y < 2$ B. $-2 \leq y \leq 2$

C. $-2 \leq y \leq 2$ D. $-2 \leq y < 2$

16. In a triangle ABC, what will be the e-radius opposite to the vertex A?

A. $\frac{\Delta}{s-a}$ B. $\frac{\Delta}{s-b}$

C. $\frac{\Delta}{s-c}$ D. $\frac{s-a}{\Delta}$

17. What will be the value of S_{19} if terms of A.P. are $2 + \frac{7}{2} + 5 + \frac{13}{2} + \cdots + 19th$?

A. $\frac{129}{2}$ B. $\frac{529}{2}$ C. $\frac{829}{2}$ D. $\frac{589}{2}$

18. What is the value of $Sec[\sin^{-1}(-\frac{1}{2})]$?

A. $\frac{2}{\sqrt{3}}$ B. $\frac{-2}{\sqrt{3}}$

C. $\frac{1}{2}$ D. $-\frac{1}{2}$

19. If $\begin{bmatrix} a+b & 0 \\ 5 & a-b \end{bmatrix} = \begin{bmatrix} 8 & 0 \\ 5 & 4 \end{bmatrix}$ then find the values of a and b.

A. 8, 0 B. 4, 4

C. 6, 2 D. 5, 3

20. Which of the following is the solution set of $\text{Sin}\, x = \frac{1}{2}$ where $x \in [0, 2\pi]$?

A. $\{\frac{\pi}{6}, \frac{\pi}{2}\}$ B. $\{\frac{5\pi}{6}, \frac{3\pi}{2}\}$

C. $\{\frac{\pi}{6}, \frac{5\pi}{6}\}$ D. $\{\frac{\pi}{3}, \frac{5\pi}{3}\}$