

Federal Board HSSC-I (2018)

MATHEMATICS HSSC-I

SECTION-A (Marks 20)

Time allowed: 25 Minutes

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 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.

- (i) What is the rank of $\begin{vmatrix} 1 & 2 & 5 \\ 0 & 0 & 0 \\ 3 & 2 & 0 \end{vmatrix}$
- A. 0 B. 3
C. 2 D. 1
- (ii) What is the value of i^{13} ?
- A. -1 B. -i
C. i D. 1
- (iii) How many inverse elements corresponds to each element group:
- A. Two B. At least two
C. Only one D. At least one
- (iv) If A is any matrices of order $m \times n$ then minor of matrices of anyone element has :
- A. $(m-1) \times (n-1)$ B. $m \times n$
C. $(m-1) \times n$ D. $m \times (n-1)$
- (v) What is the value of $(-1 + \sqrt{3}i)^4 + (-1 - \sqrt{3}i)^4$?
- A. -4 B. 16
C. -16 D. 4
- (vi) The partial fraction of $\frac{1}{1+x^3}$ will be in the form of:
- A. $\frac{A}{x+1} + \frac{Bx+C}{x^2+x+1}$ B. $\frac{A}{1-x} + \frac{Bx+C}{1+x+x^2}$
C. $\frac{A}{(x+1)} + \frac{B}{(1+x^2)}$ D. $\frac{A}{x+1} + \frac{C+Bx}{x^2-x+1}$
- (vii) What is the value of S_{19} if terms of A.P are $2 + \frac{7}{2} + 5 + \frac{13}{2} + \dots$ 19th:
- A. $\frac{589}{2}$ B. $\frac{129}{2}$
C. $\frac{529}{2}$ D. $\frac{829}{2}$
- (viii) What is the value of n, if ${}^nC_5 = {}^nC_{12}$?
- A. 20 B. 8
C. 12 D. 4
- (ix) What is the term independent of a in the expansion $(\frac{a}{2} + \frac{2}{a})^6$?
- A. 20 B. $\frac{15}{4}$
C. -20 D. $-\frac{15}{4}$
- (x) what is the Arc length if an arc subtends an angle with radius 18mm?
- A. 26.5 B. 20.6
C. 20.5 D. 18.5
- (xi) What is the value of $\sin 9\theta$?
- A. $4\sin 3\theta - 3\sin^3 \theta$
B. $4\cos^3 \theta - 3\cos^3 \theta$
C. $3\cos^3 3\theta - 4\cos 3\theta$
D. $3\sin^3 3\theta - 4\sin^3 3\theta$
- (xii) What is the value of $\cos(\frac{3\pi}{2} + \theta)$?
- A. $-\cos \theta$ B. $\cos \theta$
C. $\sin \theta$ D. $-\sin \theta$
- (xiii) In a triangle if $a=17, b=10, c=21$, then what is the value of R?
- A. $\frac{87}{8}$ B. $\frac{85}{8}$
C. $\frac{83}{8}$ D. $\frac{81}{8}$
- (xiv) What is the value of $\frac{\pi}{2} - \sin^{-1} x$?
- A. $-\cos^{-1} x$ B. $\sin^{-1} x$
C. $-\sin^{-1} x$ D. $\cos^{-1} x$
- (xv) What is the representation of a conjunction of two statements p and q?
- A. $p \leftrightarrow q$ B. $p \wedge q$
C. $p \vee q$ D. $p \rightarrow q$
- (xvi) If a sequence has condition $a_n - a_{n-1} = n$, $a_4 = 14$ then a_5 has
- A. 24 B. 16
C. 20 D. 26
- (xvii) $\sqrt{\frac{(s-b)(s-c)}{s(s-a)}} = ?$
- A. $\tan \frac{a}{2}$ B. $\sin \frac{a}{2}$
C. $\tan \frac{\beta}{2}$ D. $\tan \frac{\gamma}{2}$
- (xviii) What is the range of $\cot^{-1} x$:
- A. $-\frac{\pi}{2} < x < \frac{\pi}{2}$ B. $-1 < x < 1$
C. $0 < x < \pi$ D. $0 < x < \pi$
- (xix) What is the multiplicative inverse of $1 - 2i$?
- A. $\frac{1-2i}{\sqrt{5}}$ B. $\frac{1-2i}{4}$
C. $\frac{1+2i}{5}$ D. $\frac{1+2i}{\sqrt{5}}$
- (xx) The solution set of $\sin x + \cos x = 0$ in $[0, \pi]$
- A. $\frac{5\pi}{3}$ B. $\frac{5\pi}{4}$
C. $\frac{\pi}{3}$ D. $\frac{\pi}{4}$