

PERIODIC TEST – I

Grade XI _____ Subject Mathematics _____ Hrs 90 min _____ Marks 40 _____ 18/09/2020

General Instructions:

- ❖ In this questions paper comprises four sections – A, B, C and D. This question paper carries 20 questions. All the questions are compulsory.
- ❖ Section A: Q. No. 1 to 10 comprises of 10 questions of 1mark each.
- ❖ Section B: Q. No. 11 to 13 comprises of 3 questions of 2 marks each.
- ❖ Section C: Q. No. 14 and 17 comprises of 4 questions of 3 marks each.
- ❖ Section D: Q. No. 18 and 20 comprises of 3 questions of 4 marks each.

SECTION – A

- 1) If $A = \{1, 2\}$ then $n[P(A)] = ?$
 - a) 2
 - b) 6
 - c) 4
 - d) 16
- 2) If $A = \{1, 2, 3\}$ then relation $S = \{(1, 1), (2, 2)\}$ is
 - a) symmetric only
 - b) anti-symmetric only
 - c) both symmetric and anti-symmetric
 - d) an equivalence relation
- 3) $\tan \frac{3\pi}{2}$ is _____.
- 4) If $A \subset B$ and $A \neq B$, then B is called _____ of A.
- 5) The number of equivalence relations of the set $\{1, 2, 3, 4\}$ is _____.
- 6) _____ is the radian measure of the corresponding to the degree measure of 25° .
- 7) _____ is the degree measure of the corresponding to the radian measure of $\frac{7\pi}{6}$.
- 8) If A is a proper subset of B then $\{a\} \in \{a, b, c\}$. Whether the statements are true or false?
- 9) Which of the following statements is true?
 - a) Every equivalence relation is a partial-ordering relation.
 - b) Number of relations form $A = \{x, y, z\}$ to $B = \{1, 2\}$ is 64.
 - c) Empty relation ϕ is reflexive
 - d) Properties of a relation being symmetric and being anti-symmetric are negative of each other.
- 10) The minute hand of a watch is 1.5 cm long. How far does its tip move in 40 minutes? is 6.28 cm. Whether the statement is true or false?

SECTION – B

- 11) Find $|A \cup B|$ if $|A| = 14$, $|B| = 11$ and $|A \cap B| = 6$.
- 12) Find the values of x for which the functions $f(x) = 3x^2 - 1$ and $g(x) = 3 + x$ are equal?
- 13) Find the value of the T- Functions of $\sin 765^\circ$

SECTION – C

- 14) In a factory, 1000 light bulbs were subjected to two quality control test A and B. Five hundred and sixty passed tests A and 410 passed tests B, while 150 passed both tests. How many light bulbs:
 - a) Failed both tests?
 - b) Passed test A but not B?
 - c) Passed test B but not A?
- 15) Is $g = \{(1, 1), (2, 3), (3, 5), (4, 7)\}$ a function? Justify: If this is described by the relation $g(x) = \alpha x + \beta$, then what values should be assigned to α and β ?
- 16) Prove that $\frac{\sin(x+y)}{\sin(x-y)} = \frac{\tan x + \tan y}{\tan x - \tan y}$
- 17) If $\cot x = -\frac{5}{12}$, x lies in second quadrant, find the values of other five trigonometric functions.

SECTION – D

- 18) In a certain school, there are 180 pupils in Year 7. One hundred and ten pupils study French, 88 studies German and 65 studies Indonesian. Forty pupils study both French and German, 38 studies German and Indonesian and 26 studies both French and Indonesian, while 19 study German only. Find the number of pupils who study:
 - a) All three languages
 - b) Indonesian only
 - c) None of the languages
 - d) At least one languages
 - e) Either one or two of the language.
- 19) If $f(x) = y = \frac{ax-b}{cx-a}$ then prove that $f(y) = x$.
- 20) Prove that: $\frac{\sin 5x - 2\sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$.