مـــدرسـة دلهـــي الخـاصـة ذ.م.م.
DELHI PRIVATE SCHOOL L.L.C.
Affiliated to C.B.S.E., DELHI
(Approved & Recognized By Ministry of Education - United Arab Emirates)
DPS SHARJAH

HY/MAQP/1121/B **28-NOV-2021**

HALF YEARLY EXAMINATION (2021-22)

SET B

Subject: MATHEMATICS **Max. Marks:40**

Grade: 11 **Time: 90 MINUTES**

Name: **Section:** **Roll No:**

General Instructions:

- *This question paper consists of 6 printed pages.*
- *This question paper contains three sections - A, B and C. Each part is compulsory.*
- *Section - A has 20 MCQs, attempt any 16 out of 20.*
- *Section - B has 20 MCQs, attempt any 16 out of 20*
- *Section - C has 10 MCQs, attempt any 8 out of 10.*
- *All questions carry equal marks.*

Section-A

1. Let A = {1, 2, 3, 4, 5}, B= {2,3, 6, 7,} Then the number of elements in $(A\times B)\cap(B\times A)$ is

a. 0 **b.** 2

c. 3 **d.** 4

2. If A = {ϕ, {ϕ}} then the power set of A is

a. { ϕ, {ϕ}, {{ϕ}}, A} **b.** A

c. {ϕ, {ϕ}, A} **d.** ϕ

3. The least positive integer n for which $\frac{(1+i)^n}{(1-i)^{n-2}}$ is a real number is

a. 2 **b.** 1

c. 3 **d.** 5

4. If (1 + i) (1 + 2i) ..... (1 + ni) = x + iy, then the value of 2.5.10 .... $(1 + n^2)$ =

a. $\frac{\sqrt{x}}{2}+\frac{\sqrt{y}}{2}$ **b.** $\frac{\sqrt{x}+\sqrt{y}}{\sqrt{x}-\sqrt{y}}$

c. $x^2 + y^2$ **d.** $x^2 - y^2$

5. The principal value of the amplitude of $-1 + i\sqrt{3}$ is

a. $\frac{\pi}{2}$ **b.** $\frac{\pi}{3}$

c. $\frac{2\pi}{3}$ **d.** π

6. If $i^2 = -1$ then $i + i^2 + i^3 + - - - - - - - - +$ up to 1000 terms

a. 1 **b.** -1

c. i **d.** 0

7. The sum of first 24 elements of A.P., a_1, a_2, a_3…., if it is known that $a_1 + a_5 + a_{10} + a_{15} + a_{20} + a_{24} = 225$, is

a. 865 **b.** 930
c. 950 **d.** 900

8. If n^{th} element of a G.P is 128 and the sum of its n term is 225. If its common ratio is 2, then its first term is

a. 1 **b.** 2
c. 3 **d.** 4

9. If 5, x, y, z, 405 are in G.P., then z =

a. 15 **b.** 25
c. 45 **d.** 135

10. $9^{\frac{1}{3}}.9^{\frac{1}{9}}.9^{\frac{1}{27}}.....to\infty$ I

a. 1 **b.** 3
c. 9 **d.** 10

11. Sum of two-digit numbers which when divided by 4 yields unity as remainder is

a 1200 **b** 1210
c 1250 **d** 1350

12 The midpoints of the sides BC, CA, AB of a triangle ABC are (7, 2), (-1, 4), (3, -6). Then A is

a (-5, -4) **b** (5, 4)
c (-5, 4) **d** (5, -4)

13. The equation of the line which is perpendicular to the line 2x+y+3 = 0 and makes an intercept 7/3 units on the x-axis

a 3x-6y-7 = 0 **b** 6x-y-14 = 0
c 3x-6y+7 = 0 **d** 3x+6y+7 = 0

14. The equation of the line passing through (-2, 5) and making on the axes intercepts equal in magnitude and opposite in sign is

a x + y + 7 = 0 **b** x - y + 6 = 0
c x - y + 7 = 0 **d** none

15. The ratio in which the line joining (2, 2), (-4, 1) is divided by the line 2x+8y+1=0 is

a 11: 2 **b** 11: 4
c 4 :11 **d** -21 : 1

16. If $f(x)$ = 2x-1 if (x > 2)
= 9 - 3x if (x < 2) then $\underset{x\to 2}{Lt}\, f(x)$ =

a 0 **b** 1
c 2 **d** 3

17. $\underset{x\to 0}{Lt}\frac{(\operatorname{cosec} x - \cot x)}{x} =$

a 2 **b** 1
c 1/2 **d** 0

18 $\underset{x\to 0}{Lt}\left(\frac{7x - \sin 7x}{x}\right) =$

a 0 **b** 7
c 1/7 **d** -1/7

19. $\lim_{x \to 0} \frac{\sqrt{\frac{1-\cos 2x}{2}}}{x} =$

a 0 **b** 1

c -1 **d** Does not exist

20. The coefficient of variation is computed by:

a $\frac{Mean}{S.D.}$ **b** $\frac{S.D}{Mean}$

c $\frac{S.D.}{Mean} \times 100$ **d** $\frac{Mean}{S.D.} \times 100$

Section-B

.21. Domain of $\sqrt{x^2 - 3x + 2}$ is

a R **b** (1,2)

c R - (1, 2) **d** R - [1, 2]

22. If A = {a, b, c}, B = {b, c, d} and C = {a, c, d} then (A-B) X ($B \cap C$) =

a {(a, b), (c, d)} **b** {(a, c), (a, d)}

c {(a,c), (a,d), (b,d)} **d** {(c,a), (d,a)}

23. If $\left(\frac{1+i}{1-i}\right)^3 - \left(\frac{1-i}{1+i}\right)^3$ = a + ib then (a, b) =

a (0, 2) **b** (0, -2)

c (2, 0) **d** (0, 1)

24. $\left|\frac{(1+2i)(2-i)}{3+4i}\right|$ =

a 5 **b** $\sqrt{5}$

c 1 **d** $\frac{1}{\sqrt{5}}$

25. The amplitude of $\frac{1+i\sqrt{3}}{\sqrt{3}+i}$ =

a $\frac{\pi}{3}$ **b** $\frac{\pi}{6}$

c $\frac{\pi}{4}$ **d** $\frac{\pi}{8}$

26. The sum of an A.P is 525. If its first element is 3 and last element is 39, then the common difference is

a 3/2 **b** 1

c 1/2 **d** 5/4

27 The product of 10 geometric means between 1 and 9 is

a 7^9 **b** 7^8

c 7^{10} **d** 7^{11}

28 The sum of an infinite series of G.P is 3 and sum of their squares is $\frac{y}{2}$. Then the sum of their cubes of their elements is

a $\frac{105}{13}$ **b** $\frac{103}{13}$

c $\frac{108}{13}$ **d** $\frac{113}{13}$

29. The sum of an infinite G.P, is 4 and the sum of the cubes of its elements is 92. The common ratio of the original G.P is

a $\frac{1}{2}$ **b** $\frac{2}{3}$

c $\frac{1}{3}$ **d** $-\frac{1}{2}$

30. The lines 2x+3y+4=0, 5x+7y+10=0, 3x+11y+k=0 are concurrent. Then K =

a 14 **b** 6

c -14 **d** -6

31. (2, 1) is the vertex of an equilateral triangle and the equation of the opposite side is 3x+4y-1=0. Then the length of the side of the triangle is

a $\frac{6\sqrt{3}}{5}$ **b** $\frac{2\sqrt{3}}{5}$

c $\frac{\sqrt{3}}{5}$ **d** none

32. A (2, 3), B(7, -2), C(1, 4) are collinear points. The ratio in which C divides AB is

a 1 : 6 **b** – 1 : 6

c 6 : 1 **d** 1 : 1

33. A = (5, 3), B=(11, -5), C=(12, t). If $\angle ACB = 90^0$, then t =

a 4 **b** -4

c -2 **d** none

34. The equation of the line passing through the point (2, 3) and perpendicular to 5x-2y+1=0 is

a 5x-2y-4 = 0 **b** 5x+2y-16 = 0

c 2x-5y+11 = 0 **d** 2x+5y-19 = 0

35. $\underset{x\to a}{Lt}\frac{\sqrt{a+2x}-\sqrt{3x}}{\sqrt{3a+x}-2\sqrt{x}}(a\neq 0)=$

a $\frac{a}{3}$ **b** $\frac{2}{3\sqrt{3}}$

c $-\frac{2}{3\sqrt{3}}$ **d** $\frac{2a}{3\sqrt{3}}$

36. $\underset{x\to 0}{Lt}\left(\frac{a^x+a^{-x}-2}{x^2}\right)(a>0)=$

a log a **b** $\log a^2$

c $(\log a)^2$ **d** $\log_a e$

37. $\underset{x\to 1}{\text{Limit}}\ \frac{\tan\left(x^2-1\right)}{x-1}=$

a $\frac{1}{2}$ **b** 2

c -1 **d** -2

38. $\lim_{x\to 0}\left[\frac{(1+x)^n-1}{x}\right]=$

a n **b** $1/n$

c 0 **d** n-1

39. What is the value of mean deviation about mean for the following observations?
50, 60, 50, 50, 60, 60, 60, 50, 50, 50, 60, 60, 60, 50.

a 5 **b** 7

c 35 **d** 10

40. If the variance of a data is V, then its standard deviation is

a $\sqrt{V}$ **b** $\pm\sqrt{V}$

c $-\sqrt{V}$ **d** V^2

Section-c

41. The complex numbers $x^2 - 8i$ and $ix^3 + 4$ are conjugates of each other if

a. $x = \pm 2$ **b.** $x=2$

c. $x=-2$ **d.** $x \neq 2$

42. Let S_n denote the sum of the first n terms of an A.P. If $S_{2n} = 3S_n$ then $S_{3n}:S_n$ is equal to

a. 4 **b.** 6

c. 8 **d.** 10

43. The area of the figure formed by the lines $|x| + |y| = 1$ in sq. units is

a. 1 **b.** 2

c. 4 **d.** none

44. $\lim_{x\to 0}\left[\frac{\sqrt[3]{8+x}-2}{x}\right]=$

a. 1/12 **b.** -1/12

c. 12 **d.** -12

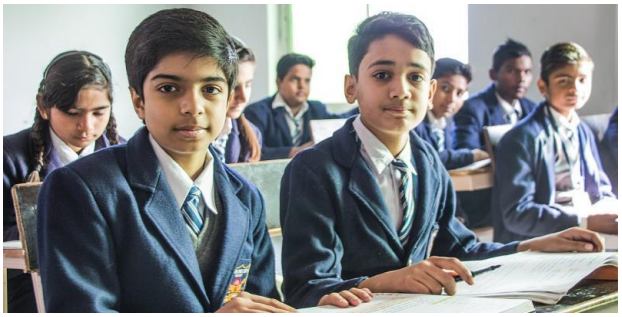
45. If the mean of numbers 27, 31, 89, 107, 156 is 82, then the mean of 130, 126, 68, 50, 1 is

a. 75 **b.** 157

c. 82 **d.** 80

. **CASE STUDY QUESTION**

In a survey of 200 students of a school, it was found that 120 study Mathematics, 90 study Physics and 70 study Chemistry, 40 study Mathematics and Physics, 30 study Physics and Chemistry, 50 study Mathematics and Chemistry and 20 none of these subjects.



Based on the above information answer any 4 of the following:

46. The number of students who study at least one of the three subjects

a 180 **b.** 20

c 200 **d.** 160

47. Number of students who study all the three subjects

a 30 **b.** 28

c 20 **d.** 10

48. The number of students who study Mathematics. And Physics

a 40 **b.** 10

c 30 **d.** 12

49 The number of people who study mathematics only

a 40 **b.** 30

c 20 **d.** 50

50. The number of students who study Physics only

a 6 **b.** 10

c 12 **d.** 40

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