H.P. BOSE
Sample Paper
(Session-2021-22)
Second Terminal Exam 2022
Mathematics

Time:3 Hrs   **Class : XI**   **M.M.: 50**

Q.No. 1 to 20 are of 1 marks each (MCQ)

Q.No. 21 to 26 are of 3 marks

Q.No. 27 to 28 are of 6 marks.

1. Number of middle term in the expansion of $\left(\dfrac{3-x^3}{6}\right)^7$ are

    a) 1   b) 2

    c) 3   d) 4   1

2. Find a_{17} in the sequence whose nth term is $a_n = 4n-3$

    a) 56   b) 65

    c) 68   d) none of these   1

3. The two geometric means (G.M.) between the number 1 and 64 are

    a) 1 and 64   b) 4 and 16

    c) 2 and 16   d) 8 and 16   1

4. The (A.M.) arithmetic mean between two number a and b is given by

a) $\dfrac{a+b}{2}$ 　　　　　 b) $\dfrac{a-b}{2}$

c) $\dfrac{a.b}{2}$ 　　　　　 d) $\sqrt{ab}$

5. For what value of x, the number $\dfrac{-2}{7}$, x, $\dfrac{-7}{2}$ are in G.P.

a) $x = \pm 1$ 　　　　　 b) $x = \pm 2$
c) $x = -1$ 　　　　　 d) $x = 0$

6. The 10th term of G.P. 5, 25, 125, ... is equal to
a) 5^9 　　　　　 b) 5^{10}
c) 5^7 　　　　　 d) 5

7. Find a_1, if $r = -2$ and $a_7 = 192$.
a) 3 　　　　　 b) 4
c) 2 　　　　　 d) None of these

8. The area (in square units) of the triangle formed by the points (2,2), (5,5) and (6,7) is

a) $\dfrac{9}{2}$ 　　　　　 b) 5

c) 10 　　　　　 d) $\dfrac{3}{2}$

48

9. The slope of the line passing through the points $(3,-2)$ and $(1,4)$ is

a) $\dfrac{2}{3}$

b) $-\dfrac{2}{3}$

c) $\dfrac{-3}{2}$

d) $\dfrac{1}{2}$

10. Find the value of the k for which the line

$(k - 3) x - (4 - k^2) y + k^2 - 7k + 6 = 0$ is parallel to x–axis

a) k = 3

b) k = ± 2

c) k = 0

d) k = –3

11. What is co-ordinate of the focus of the parabola $x^2 = 16y$

a) (–4, 0)

b) (0, –4)

c) (0, 0)

d) (0, 16)

12. The radius of the circle $(x + 5)^2 + (y - 3)^2 = 36$ equal to

a) 36

b) 6

c) –6

d) 5

13. What is length of latus rectum of the ellipse $\dfrac{x^2}{4} + \dfrac{y^2}{25} = 1$

a) $\dfrac{8}{5}$

b) $\dfrac{5}{8}$

c) 5

d) 8

14. $\displaystyle\lim_{x \to a} \frac{x^n - a^n}{x - a}$ is equal to

    a) a^{n-1} b) a^{n+1}

    c) na^{n-1} d) na^{n+1}

15. $\displaystyle\lim_{x \to \pi} \frac{\sin x}{x - \pi}$ is

    a) 1   b) 2

    c) –1   d) –2

16. What is the deriative of $x^2 - 2$ at $x = 10$

    a) 10   b) 20

    c) –20   d) –10

17. A and B are two events such that P(A)=0.42, P(B)=0.48 and P(A and B)=0.16. Then P(A or B) is

    a) 0.74   b) 0.52

    c) 0.48   d) 0.58

18. Three coins are tossed once. What is probability getting 3 heads.

    a) $\dfrac{1}{8}$ b) $\dfrac{3}{8}$

    c) $\dfrac{1}{2}$ d) $\dfrac{7}{8}$

19. If $\dfrac{2}{11}$ is the proability that an event will happen, what is the proability that it will not happen?

   a) $\dfrac{2}{13}$ b) $\dfrac{9}{11}$

   c) $\dfrac{2}{11}$ d) 1

20. A card is selected from a pack of 52 cards. How many points are there in the sample space?

   a) 52   b) 26

   c) 1   d) $\dfrac{1}{52}$

21. Find the 13th term in the expansion of $\left(9x - \dfrac{1}{\sqrt[3]{x}}\right)^{18}$, $x \neq 0$ using Binomial theorem Evaluate $(101)^4$

22. Sum of the first p, q and r terms of an A.P. are a, b and c, respectively. Prove that $\dfrac{a}{p}(q-r)+\dfrac{b}{q}(r-p)+\dfrac{c}{r}(p-q)=0$ 3

   or

   Find the sum to n terms of the sequence 8,88,888,.....

23. Find the angle betweem the lines $\sqrt{3}\,x + y = 1$ and $x + \sqrt{3}\,y = 1$

or

Find the equation of the line passing through (–3, 5) and perpendicular to the line through the points (2, 5) and (–3, 6).

3

24. Find the equation of the ellipse whose vertices (± 5, 0) and foci (± 4, 0).

or

Find the equation of circle passing through the points (4, 1) and (6, 5) and whose centre is an the line 4x+y=16.

3

25. Evaluate $\lim\limits_{x \to 3} \dfrac{x^4 - 81}{2x^2 - 5x - 3}$

or

Find the derivative of function f(x) = sinx. Using first principal. 3

26. In a class of 60 students, 30 opted for NCC, 32 opted for NSS and 24 opted for both NCC and NSS. If one of these students is selected at random, find the probability that

(i) The student opted for NCC or NSS

(ii) The student has opted NSS but not NCC.

3

27. Find the equation of the set of points P, the sum of whose distance from A(4,0,0) and B(–4,0,0) is equal to 10.

6

28. Calculate mean, variance and stamdard deviationfor the distribution.

classes	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
frequency	3	7	12	15	8	3	2