Chittagong Board 2016

Time — 35 minutes Marks — 35 **Higher Mathematics: MCQs** Subject Code | 1 | 2 | 6 |

*[Answer **all** the questions. Each question corries **one** mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Questions Examination. **Candidates are asked not to leave any mark or spot on the question paper.**]*

1. What is the variations and nature of the roots of a equation $x^2 + 4x - 3 = 0$?
a Real, unequal, irrational
b Real, equal
c Real, unequal, rational
d Not real

2. If the length of diagonal of a square is $8\sqrt{2}$ cm; what is the area of the square?
a 8 cm b $8\sqrt{2}$ cm
c 64 cm d 128 cm

3. What is the co-ordinates of the intersecting pont of the graph of the equation $x^2 - 5x + 4 = 0$ and x-axis?
a (0, 1), (4, 0) b (–1, 0), (–4, 0)
c (1, 0), (4, 0) d (–1, 0), (0, –4)

4. What is the solution of the equation $3^{ax-1} = 3b^{ax-2}$?
a $\frac{a}{2}$ b $\frac{-2}{a}$ c $\frac{1}{a}$ d $\frac{2}{a}$

5. What is the solution set of the inequality $x \le \frac{x}{3} + 4$?
a $s = \{x \in R : x > 6\}$
b $s = \{x \in R : x < 6\}$
c $s = \{x \in R : x \ge 6\}$
d $s = \{x \in R : x \le 6\}$

6. What is the value of U_{15} of a sequence $U_n = \frac{1-(-1)^n}{2}$?
a –1 b 0 c 1 d 2

7. The infinite geometric series—
i. If $|r| < 1$ then $S_\infty = \frac{a}{1-r}$
ii. If $|r| > 1$ then no sum of the infinite series
iii. If r = 1 then no limiting value of S_n
Which one of the following is correct?
a i and ii b i and iii
c ii and iii d i, ii and iii

8. The angles of a triangle are in arithmetical progression and the smallest angle is half of the largest angle. What is the value of largest angle in circular system?
a $\frac{\pi}{9}$ b $\frac{\pi}{3}$ c $\frac{\pi}{2}$ d $\frac{4\pi}{9}$

9. In which quadrant does in $\left(9.\frac{\pi}{2} - \theta\right)$ lie?
a 1st b 2nd c 3rd d 4th

10. If $y^{y\sqrt{y}} = (y^{\sqrt{y}})^y$ then what is the value of y?
a $\frac{2}{3}$ b $\frac{3}{2}$ c $\frac{9}{4}$ d $\frac{4}{9}$

11. If $x^a = y$, $y^b = z$ and $z^c = x$ then what is the value of abc = ?
a 0 b 1 c 2 d 3

12. If $a^x = n$ then x = what?
a $\log_n a$ b $\log_a n$ c $\log_n \frac{1}{a}$ d $\log_{a^n} \frac{1}{a^n}$

Answer to the question no. 13 and 14 from the above information:
In the expansion of $\left(y + \frac{1}{y^2}\right)^6$—

13. How many terms are there?
a 5 b 6 c 7 d 8

14. What is they free term in that expansion?
a 5th term b 4th term
c 3rd term d 2nd term

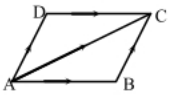
Answer to the question no. 15 and 16 from the above information:
The three points A(1, –1), B(2, 2) and C(4, r) are collinear.

15. What is the slope of the straight line AB?
a –1 b $\frac{1}{3}$ c 1 d 3

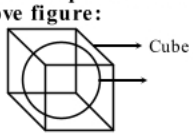
16. What is the value of r?
a 2 b 4 c 6 d 8

17. What is the equation of straight which passes through the point (2, 3) and having slope 4?
a y = 4x – 5 b y = 4x + 5
c y = 4x – 10 d y = 4x – 12

18. $\underline{V}$ is called the opposite vector of $\underline{U}$ if—
i. $|\underline{V}| = |\underline{U}|$
ii. lines of support of $\underline{U}$ and $\underline{V}$ are the same and parallel
iii. the direction of $\underline{V}$ is opposite of that of $\underline{U}$
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

19.


Which one is applicable of the parallelogram ABCD?
a $\overrightarrow{AB} + \overrightarrow{AC} = \overrightarrow{BC}$ b $\overrightarrow{AB} + \overrightarrow{AD} = \overrightarrow{AC}$
c $\overrightarrow{AD} + \overrightarrow{BC} = \overrightarrow{AC}$ d $\overrightarrow{AC} + \overrightarrow{DC} = \overrightarrow{AD}$

Answer to the questions No. 20 and 21 from the above figure:


Diameter of the sphere = edge of the cube 6 cm.

20. What is the volume of the sphere?
a 12π b 36π c 72π d 288π

21. What is volume of unoccupied portion of the cube in cubic cm?
a 194.79 b 152.38
c 102.90 d 39.40

22. Which one is the limit of probability?
a $0 < p < 1$ b $0 \le p \le 1$
c $0 < p \le 1$ d $0 \le p < 1$

Answer to the questions no. 23 and 24 from the above information:
In a bag there are 4 red, 5 black and 3 yellow balls. A ball is taken at random—

23. What is the probability of the ball to be green?
a 0 b $\frac{1}{3}$ c $\frac{1}{4}$ d $\frac{5}{12}$

24. What is the percentage of probability of the ball to be Black?
a 41.7% b 33.33%
c 25% d 20%

25. U is universal and the subsets of A, B and C which one of the following De Morgan's Law?
a $(A \cup B)' = A' \cap B'$
b $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
c $A \cup B = B \cup A$
d $A' \backslash B' = B \backslash A$

26. Which one of the following image set of $F(x) = x^2 - 2x$; for the domain $X = \{-1, 0, 1\}$?
a {–1, 0} b {3, 0, –1}
c {–1, 0, 3} d {–1, 0, 1}

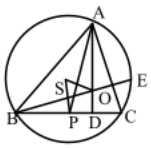
27. For the function $F(x) = \frac{x}{x-2}$
i. define $f(x)$ at x = 2
ii. its one-one function
iii. $F^{-1}(x) = \frac{2x}{x-1}$
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

28. i. The largest of the degrees of the terms appearing in a polynomial is called the degree of the polynomial
ii. The terms of a polynomial of the variable x, y, z have the from $cx^py^qz^r$
iii. Multiplication of two polynomial is always polynomial
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

29. Which one is improper fractions?
a $\frac{x+5}{(x-1)(x+2)}$ b $\frac{x-1}{(x-2)(x+5)}$
c $\frac{x^3}{(x-1)(x-2)(x-3)}$
d $\frac{x^3}{x^4+x^2-1}$

30. If $Q(x) = x^3 + 2x^2 + 2x + 1$ and $Q(-1) = 0$ then which one of the factors of Q(x)?
a x – 1 b x + 1
c $x^2 + x - 1$ d $x^2 - x + 1$

31. In ΔABC—
i. $\angle C > 90°$ then $AB^2 > AC^2 + BC^2$
ii. $\angle C = 90°$ then $AB^2 = AC^2 + BC^2$
iii. $\angle C < 90°$ then $AB^2 < AC^2 + BC^2$
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

32.


Which two triangles are equiangular?
a ΔABP and ΔADP b ΔAOG and ΔSPG
c ΔADC and ΔAOG d ΔADP and ΔADC

33. What is the point of concurrence of the medians of a triangle?
a Centroid b Circumcentre
c Nine point d Incentre

34. What is the length tangent of a point at a distance of 5cm from the centre of radius 2 cm?
a 3 cm b 4.6 cm
c 21 cm d 29 cm

35. i. A triangle cannot be drawn with any lengths of three sides
ii. A circle can be drawn only the radius
iii. At an any point on a circle only one tangent can be drawn
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

Ans.																																												
	1	a	2	c	3	c	4	d	5	d	6	c	7	d	8	d	9	a	10	c	11	b	12	b	13	c	14	c	15	d	16	d	17	a	18	d	19	b	20	b					
	21	c	22	b	23	a	24	a	25	a	26	b	27	c	28	a	29	c	30	b	31	d	32	b	33	a	34	b	35	a															