Barisal 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. If $\cos\theta = -\frac{1}{2}$ and $\pi < \theta \le \frac{3\pi}{2}$, then which one of the value of $\tan\theta$?
a $-\sqrt{3}$ b $\frac{1}{\sqrt{3}}$ c 1 d $\sqrt{3}$

2. If $\sin^2\theta - \cos^2 = \cos\theta$ (where $0° \le \theta \le \pi$) then—
i. $\theta = \pi$ ii. $\theta = \frac{\pi}{3}$
iii. $\theta = \frac{2\pi}{3}$
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

3. If $\cos\theta = \frac{b}{a}$ and $a > b > 0$, then—
i. $\sin\theta = \frac{\sqrt{a^2 - b^2}}{a}$ ii. $\cot\theta = \frac{b}{\sqrt{a^2 - b^2}}$
iii. $\cos\theta - \sec\theta = \frac{a^2 - b^2}{ab}$
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

4. If $a(x + b) < c$ and $a < \theta$, then which is correct?
a $x < \frac{c}{a} - b$ b $x < \frac{c}{a} + b$
c $x > \frac{c}{a} - b$ d $x > \frac{c}{a} + b$

5. $2x + 3y - 7 < 0$, the solution of inequalities graph is—
i. all points at the origin side of the line
ii. all points at the (3, 3) point side of the line
iii. the line passing through the point (–1, 3)
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

6. If $y^x = 9$, $y^2 = 3^x$, then (x, y) equal—
a $(2, 3), \left(-2, \frac{1}{9}\right)$ b $(2, \pm 3), \left(-2, \pm\frac{1}{3}\right)$
c $\left(2, \frac{1}{9}\right), (-2, -3)$ d $\left(-2, -\frac{1}{9}\right), (2, 3)$

7. If $y = 2x + 1$ and $y = 2x - 1$ are two straight line, then—
i. multiplication of slope is –4
ii. point of intersection is $\left(\frac{1}{4}, \frac{1}{2}\right)$
iii. bisector of y-axis respectively is 1, –1
Which one of the following is correct?
a i & ii b i & iii
c iii & iii d i, ii & iii

8. $2x - y + 7 = 0$ and $3x + ky - 5 = 0$ are parallel straight line, then the value of k is—
a 6 b 2 c $\frac{2}{3}$ d $\frac{-3}{2}$

9. If $(2, -1)$ $(a + 1, a - 3)$ and $(a + 2, a)$ three points are collinear, then the value of a is—
a $\frac{1}{3}$ b 2 c $\frac{1}{2}$ d –1

10. The equation of a straight line passing through origin and the point (x_1, y_1) is—
a $y = mx$ b $y = \frac{x_1}{y_1}x$
c $y = \frac{y_1}{x_1}x$ d $y - y_1 = m(x - x_1)$

11. Diameter of a ball is 3 cm, then what is the volume?
a 3π cm^3 b $\frac{9}{2}\pi$ cm^3
c 9π cm^3 d 36π cm^3

1`2. The length, breadth and height of a rectangular parallelopiped are respectively 5 cm, 4 cm and 3 cm, then the area of surfaces is —
a 30 cm^2 b 47 cm^2
c 60 cm^2 d 94 cm^2

13. If $\log_{\sqrt{8}} x = 5\frac{1}{3}$, then value of x is—
a 256 b $\frac{128}{3}$ c 32 d 8

14. If $9\underline{a} - 4\underline{b}$ and $-3\underline{a} - \underline{b}$ are respectively the position vectors P and Q with respect to a vector origin. Then $\overrightarrow{PQ}$ is—
a $6\underline{a} - 5\underline{b}$ b $12\underline{a} - 3\underline{b}$
c $-12\underline{a} + 3\underline{b}$ d $\frac{9\underline{a} - 4\underline{b}}{-3\underline{a} - \underline{b}}$

15. An unbiased dice and one coin thrown. What is the probability of getting an odd number and only one 7?
a $\frac{1}{2}$ b $\frac{1}{4}$ c $\frac{1}{6}$ d $\frac{1}{12}$

16. How may tangents can be drawn of a curcle from a point which is outsid that circle?
a 1 b 2 c 3 d infinite

17. When $\cos\theta = \frac{\sqrt{3}}{2}$, then $\sin 3\theta$ = ?
a 0 b $\frac{\sqrt{3}}{2}$ c $\frac{1}{2}$ d 3

18. If a member of the set number n, then the number of real subset is—
a $2^n + 2$ b 2^{n+2}
c $2^n - 1$ d $2^n - 2$

19. If P and q two polynomial, then—
i. P – Q is a polynomial
ii. PQ may not be the polynomial
iii. $\frac{P}{Q}$ may or may not be a polynomial
Which one of the following is correct?
a i & ii b ii & iii
c i & iii d i, ii & iii

20. $\sqrt{(x-1)(x-2)} + \sqrt{(x-3)(x-4)} = \sqrt{2}$. The solution is—
a (0, 2) b (0, 3)
c (2, 3) d (3, 5)

21. Probability tree is used to—
i. build the sample space
ii. make the shape of a tree
iii. find the probability of various event
Which one of the following is correct?
a i & ii b ii & iii
c i & iii d i, ii & iii

22. If $S = \{x : x \in \nabla, F(x) = \sqrt{2 - x}\}$, then dom S is—
a $\{x \in \nabla, x \ge 2\}$ b $\{x \in \nabla, x \le 2\}$
c $\nabla - \{2\}$ d $\nabla + \{2\}$

23. If $(x - 2)$ is a factor of $p(x) = x^4 - 5x^3 + 7x^2 - a$, then what is the value of 'a'?
a 2 b 4 c 5 d 6

24. $-\frac{1}{3}, 1, \frac{1}{5}, \frac{1}{9}$ ..... Which is the n-th term of the sequence?
a $\frac{1}{5n - 8}$ b $\frac{1}{3n - 6}$ c $-\frac{1}{3n}$ d $\frac{1}{4n - 7}$

Following information answer the question nos. 25 and no 26:
$\left(2x^2 - \frac{1}{2x}\right)^8$ is a binomial expansion.

25. What is the third term of the expansion?
a $-512x^{13}$ b $-224x^7$
c $256x^{10}$ d $448x^{10}$

26. Middle term of the expansion is—
a $70x^4$ b $14x^2$
c $-70x^4$ d $-224x^7$

27. If $b^2 - 4ac$ is not a perfect square, then what is the nature of roots?
a Real and rational b Real and irrational
c Real and equal d Imaginary

28. If $P(a) = 4a^4 + 12a^3 + 7a^2 - 3a - 2$, then which is the factor of P(a)?
a $(2a - 1)$ b $4a + 1$
c $a - 1$ d $4a - 1$

29. Any right angle triangle ABC with side a, b, c median d, e, f and $\angle C = 90°$, then which one is true?
a $2(d^2 + e^2 + f^2) = 3c^2$
b $2(d^2 + e^2 + f^2) = 3(a^2 + b^2)$
c $d^2 + e^2 + f^2 = 3c^2$
d $4(d^2 + e^2 + f^2) = 3(a^2 + b^2 + c^2)$

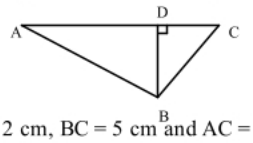
30. If $U = \{x : x \in N, x \le 10\}$; $A = \{x : x \in N, x \le 8$ and x even number$\}$, $B = \{x : x \in N$, x multiples of 3$\}$, then $A \cap B$ is—
a $\varnothing$ b $\{6\}$
c $\{6, 8\}$ d $\{2, 3, 4, 6, 8\}$

31. An infinite geometric series whose first term $\frac{1}{2}$ and sum of infinity $\frac{3}{4}$, then the common ratio is —.
a $\frac{3}{4}$ b $\frac{2}{3}$ c $\frac{1}{2}$ d $\frac{1}{3}$

32. If $f(x) = \frac{4x - 9}{x - 2}$, then value of $f^{-1}(3)$ is—
a 3 b 1 c $\frac{3}{5}$ d –3

33. The slope of a straight line passing through the point A(–5, 4), B(3, 7) is—
a $-\frac{1}{10}$ b $-\frac{2}{11}$ c $\frac{3}{8}$ d $\frac{8}{3}$

Answer to the question nos. 34 and 35 according to the information given below:



AB = 12 cm, BC = 5 cm and AC = 13 cm.

34. From the triangle ABC
i. Half of perimeter is 15 cm
ii. Area is 30 cm^2
iii. $\sin B = \frac{12}{13}$
Which one of the following is correct?
a i & ii b i & iii
c ii & iii d i, ii & iii

35. What is the length of BD?
a 4.62 cm b 9.23 cm
c 10 cm d 24 cm

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