

Comilla Board 2016

Time — 35 minutes Marks — 35

Higher Mathematics: MCOs

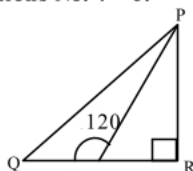
Subject Code

1	2	6
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[N. B.—Answer all the questions. Each question carries **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 $U = \{1, 3, 5, 6\}$, $A = \{3, 6\}$, what will be the number of elements of $P(A')$?
a 1 b 2 c 4 d 8
2. If $x^2 + 2x + 2 = 0$ is a quadratic equation, its—
i. discriminant -4
ii. roots are real and unequal
iii. roots are imaginary
- Which one of the following is correct?**
a i and ii b ii and iii
c i and iii d i, ii and iii
3. What is the degree of polynomials in two variables of $5x^3 + 3y^3 - 7xy + 4$?
a 2 b 3
c 4 d 5

In view of the given figure answer to the questions No. 4 – 6:



OS = 8cm, PS = 5cm, PR = 3cm.

4. Which one is the orthogonal projection of PS?
- a PR b PQ c QS d SR
5. $PQ^2 = ?$
- a $PS^2 + QS^2 - 2QS.SR$
b $PS^2 - QS^2 + 2QS.SR$
c $PS^2 + QS^2$
d $PS^2 + QS^2 + 2QS.SR$
6. What is the value of PQ in centimetre?
- a $\sqrt{55}$ b $\sqrt{73}$
c $\sqrt{135}$ d $\sqrt{153}$
7. If the discriminant of the quadratic equation $px^2 + qx + r = 0$ is zero, what are the roots of the equation??
- a $\frac{q}{p}, \frac{q}{p}$ b $\frac{2q}{p}, \frac{2q}{p}$
c $-\frac{q}{2p}, -\frac{q}{2p}$ d $\frac{q}{2p}, \frac{q}{2p}$
8. If $P = \frac{\pi}{4}$, $Q = \frac{3\pi}{4}$, what is the value of $\cos(P + Q)$?
- a -1 b 0 c 0.5 d 1
9. In zero vector—
- i. absolute value is zero
ii. no support line
iii. determine direction
- Which one of the following is correct?
- a i and ii b ii and iii
c i and iii d i, ii and iii
10. If the position vectors $\underline{a}$ of point P and the position vector $\underline{b}$ of point Q, then $\vec{PQ} = ?$
- a $\underline{a} - \underline{b}$ b $\underline{b} - \underline{a}$ c $\underline{b} + \underline{a}$ d $\underline{ab}$
11. Tossing throw two coin together, what is the probability of not getting two heads?
- a 1 b $\frac{3}{4}$ c $\frac{1}{2}$ d $\frac{1}{4}$

12. What is the sum up to infinity of the series $0.2 + 0.02 + 0.002 + \dots$?
 a $\frac{9}{2}$ b $\frac{2}{9}$ c $\frac{2}{11}$ d $\frac{1}{9}$
13. In an isosceles triangle equal angles are 70° . What is the other angle in radian?
 a $\frac{\pi}{9}$ b $\frac{9}{2\pi}$ c $\frac{9\pi}{2}$ d $\frac{2\pi}{9}$

Answer to the questions No. 14–16 according to the information given below:
 $x - 3y - 12 = 0$ is a equation of a straight line.

14. What is the gradient of the line?
- a 3 b $\frac{1}{3}$ c -3 d -4
15. If the line intersects A and B in the axis of x and y respectively, then AB = ?
- a 16 unit b $4\sqrt{10}$ unit
c $8\sqrt{2}$ unit d 8 unit
16. Find the area of the triangle produced by the line with the two axes in square unit?
- a 36 b 24 c 18 d 12
17. How many terms in the expansion of $(a + x)^4$?
- a 2 b 3 c 4 d 5

18. $1 + 0.1 + 0.01 + 0.001 + \dots$
- i. is a geometric series
 - ii. common ratio of the series is 0.1
 - iii. infinite sum of the series is
- Which one is correct?**
- | | |
|-------------|-----------------|
| a i and ii | b ii and iii |
| c i and iii | d i, ii and iii |

19. $\log_8 2 + \log_5 \sqrt{5} = ?$
 a $\frac{5}{6}$ b $\frac{6}{5}$ c $\frac{7}{2}$ d $\log_4 2\sqrt{5}$

20. What will be formed by joining circumcenter, the centroid and the orthocenter of a triangle?
- a Straight line b Triangle
c Rectangle d Cone

21. If B is a subset of universal set U, then —.
- i. $B \setminus B = \emptyset$ ii. $LAB = B'$
iii. $B \setminus (B \setminus B) = \emptyset$
- Which one is correct?**
- a i and ii b ii and iii
c i and iii d i, ii and iii

- 22. Which one is homogeneous expression?**
- a $a^3 + ab^2 + b^4$ b $a^3 + 3ab + b^2$
c $a^3 + ab^2 + b^5$ d $a^3 + a^2b + b^3$

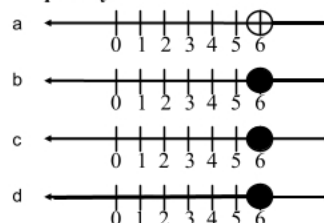
23. If $f(x) = \sqrt{1-2x}$, which one of the following is the domain of the function?
- $\text{Dom } F = \{x \in \mathbb{R} : x \leq \frac{1}{2}\}$
 - $\text{Dom } F = \{x \in \mathbb{E} : x < \frac{1}{2}\}$
 - $\text{Dom } F = \{x \in \mathbb{R} : x = \frac{1}{2}\}$
 - $\text{Dom } F = \{x \in \mathbb{R} : x \geq \frac{1}{2}\}$

Answer to the questions No. 24 and 25 on the basis of the information given below :

$$\frac{Z}{2} - 2 \leq 1.$$

- 24. Which one is the solution set of the inequality?**
- a $S = \{z \in \nabla : z \leq 6\}$
 - b $S = \{z \in \nabla : z < 6\}$
 - c $S = \{z \in \nabla : z \leq -6\}$
 - d $S = \{z \in \nabla : z < -6\}$

- 25. Which one of the number line of the inequality?**



26. Extension of any side of a equilateral triangle, which angle will produce?
a 30° b 60°
c 90° d 120°
27. Find the sum of the $(2n+2)$ terms of the series $2 - 2 + 2 - 2 + \dots$
a 2 b 1 c 0 d $2n+2$

Answer to the questions No. 28–30 according to the information given below :

A spherical ball which radius is 4 cm exactly fit into a cylinder.

28. If radius is π which one of the area of the surface of the sphere?
- a 4π sq. unit b $4\pi^3$ sq. unit
c $4\pi^2$ sq. unit d π^2 sq. unit

- 29. What is the volume of the cylinder?**
- a 16π cc b 32π cc
c 64π cc d 128π cc

30. What is the unoccupied portion of the cylinder?
- a $\frac{128\pi}{3}$ cc b $\frac{128\pi^3}{3}$ cc
- c 128π cc d $128\pi^3$ cc

31. Which one is the co-efficient of x^3 in expansion $\left(1 - \frac{x}{4}\right)^8$?
- a $-\frac{1}{64}$ b $-\frac{1}{4}$ c $-\frac{7}{8}$ d $-\frac{8}{7}$

32. An unbiased coin and an unbiased dice tossed, how many sample point we get?
a 8 b 12 c 16 d 32

33. Serially 1 to 10 numbered tickets mixed thoroughly and one ticket is drawn at random. What is the probability of multiple of 2 or 3?

34. $I^2 + m^2 + n^2$ expression is—
 i. symmetric ii. homogeneous
 iii. cyclic

- Which one of the following is correct?**
- a i and ii b ii and iii
c i and iii d i, ii and iii

35. If $\cos\theta + \sin\theta = \sqrt{2}$, what is the value of θ ?
a 30° b 45° c 60° d 90°

[illegible]