Model Question paper for online examination M.Sc. part 1

Q1. Which one of the following is not true for Cantor set?

A. Closed
B. Bounded
C. Compact
D. connected

Q2. Let f & g are the continuous functions from $\mathbb{R} \to \mathbb{R}$ Then the set $\{x : f(x) = g(x) + 1\}$ is always

A. Closed
B. Compact
C. Connected
D. Open

Q3. Let A be a real 3× 4 matrix of rank 2. Then the rank of A^tA, where denotes A^t the transpose A, is:

a. exactly 2
b. exactly 3
c. exactly 4
d. at most 2 but not exactly 2

Q4. The number of distinct equivalence classes of the relation of congruence modulo m is.

a) m
b) $m + 1$
c) $m - 1$
d) zero

Q5. The radius of convergence of the power series,
$\sum_{n=0}^{\infty}(4n^4 - n^3 + 3)z^n$ is,

a. 0
b. 1
c. 5
d. ∞

Q6. The length of the curve $\gamma(t) = 3e^{it}$, t ∈ [0, 2π] , is .....

a. 2π
b. π
c. π /2
d. 6π

Q7. The equation $x^3 + 6x^2 + 11x + 6 = 0$ has,

a. Three non-real roots.
b. Three real roots.
c. Two non-real roots and one real root.
d. Two real roots and one non-real root.

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Q8. What is the order of the subgroup generated by 20(mod30) in the cyclic group $\mathbb{Z}_{30}$?

a. 20
b. 10
c. 6
d. 3

Q9. A mixture of candies contains 6 mints, 4 toffees, and 3 chocolates. If a person makes a random selection of one of these candies, find the probability of getting a toffee or a chocolate.

a. 9/13
b. 10/13
c. 7/13
d. 13/7

Q10. Consider $y'' + P(x)y' + Q(x)y = 0$. If both $P(x)$ and $Q(x)$ are analytic at p then p is called ___

a. singular point
b. ordinary point
c. regular singular point
d. both regular and ordinary point