

JK Lakshmipat University Jaipur

INSTITUTE OF ENGINEERING AND TECHNOLOGY

Theory Examination-III, December 2023
BCA, Semester I

Roll No.....

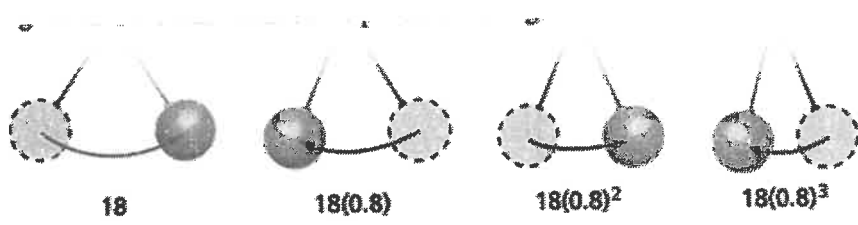
AS1111: Mathematics-I

Time: 2 hours

Max. Marks: 30

Instructions to students:

1. Do not write anything other than your roll number on the question paper.
2. Use of calculator is not allowed. Be Neat! Be Legible!! All the Best!!!

Q.1	Find the inverse function $f(x) = \frac{(3x+2)}{(x-1)}$	1.5 (CO4)
Q.2	If $f(x) = 4x^2 - 1$ and $g(x) = 1 + x$. Find $f \circ g(x)$ and $g \circ f(x)$. Also, check whether. $f \circ g(x) = g \circ f(x)$	1.5 (CO4)
Q.3	Express $5^3 = 125$ in logarithm form. Then, find x if $\log_5(x - 7) = 1$.	1.5 (CO3,4)
Q.4	Sketch the graph of exponential function $f(x) = 2^{x-1} + 3$.	1.5 (CO3,4)
Q.5	Determine whether the following relation is a function. State the domain and range of the relation. $\{(-4,2), (2,0), (3,5), (-3,1), (4,2)\}$	1.5 (CO2,3)
Q.6	Write the converse, inverse and contrapositive of below mentioned statement: I will give you a party only if I buy a good dress.	1.5 (CO1,3)
Q.7	A balloon is connected to a meteorological station by a cable of length 200 m inclined at 60° angle with the ground. Find the height of the balloon from the ground. (Imagine that there is no slack in the cable).	2 (CO2,3)
Q.8A	Show that proposition $q \rightarrow p$, and $\sim p \rightarrow \sim q$ is not equivalent to $p \rightarrow q$.	2 (CO3,4)
Q.8B	Write the truth table values of conjunction for the given two statements. A: x is an even number B: x is a prime number	2 (CO3)
Q.9	In how many ways can the letters of the word THOUGHTS be arranged so that the vowels always come together?	2 (CO1)
Q.10	Construct a truth table for the statement $(m \wedge \sim p) \rightarrow r$.	3 (CO3,4)
Q.11A	The total distance traveled by the pendulum is given by the infinite series. 	3 (CO1,4)

	$18 + 18(0.8) + 18(0.8)^2 + 18(0.8)^3 + \dots$ Find total distance traveled by the pendulum. Also, express the series in summation form.	
Q.11B	A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has (i) no girls (ii) at least one boy and one girl (iii) at least three girls	3 (CO1)
Q.12	What is the binomial expansion of $(x^2 + 1)^5$ using the binomial theorem?	4 (CO1,3,4)