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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS-2022

B.Tech-IV Semester (ECE)

COURSE CODE: 18B11MA413 MAX. MARKS: 25

COURSE NAME: DISCRETE MATHEMATICS

COURSE CREDITS: 3 MAX. TIME: 1 Hour 30 Min

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. (a) Using Horner's method evaluate the following polynomial at $x = 2$

$4x^5 - 3x^4 + 7x^3 + 6x^2 + 3x + 9$ [2M], (CO-1)

(b) Using Russian peasant method multiply 251 and 24. [2M], (CO-1)

Q2. Using Euclidean algorithm find the $gcd(864, 468)$. Also express the $gcd(864, 468)$ as integer linear combination of 864 and 468. [3 M] (CO-1)

Q3. Consider the set E of all even positive integers with usual relation $\geq$. Prove or disprove that $(E, \geq)$ is a poset. [3M], (CO-2)

Q4. Draw the Hasse diagram for the poset $(D_{12}, |)$. Also, find the minimal and maximal elements of this poset. [3M], (CO-2)

Q5. Construct the truth table for $p \wedge q \vee (\sim r)$. Moreover, identify whether given expression is a tautology, contradiction, or a contingency. [3M], (CO-2)

Q6. Test the validity of the following argument: [3M], (CO-2)

$p \vee (q \wedge r), \sim p \vdash q \wedge r$

Q7. Simplify the following expressions: [3M], (CO-2)

(i) $\sim [\forall x, \exists y\ (x^2 > y^2)]$ (ii) $\sim [\forall z, \exists x, \exists y\ (x^2 + y^2 = z^2)]$

Q8. Write the degree sequence of the following graph. Moreover, check whether it is a Euler graph or not by identifying a Euler circuit in it (if it exists). [3M], (CO-3)