Jaypee Institute of Information Technology, Noida

Test – 2 Examination
Special Semester (June-July 2021)
Course Name: Theoretical Foundation of Computer Science
Course Code: 15B11CI212
Maximum Marks: 20
Maximum Time: 01 Hr.

Imp Note:
1. This is a paper and pen examination. Answers have to be written on papers only in your own handwriting. No answers to be given on google form.

2. On the top of each page of your answer sheet, write your Name, Enrollment No., Batch, Date of Exam, Course Name, Course Code and Page No

3. Solve the questions in the same order as given in paper.

4. Answers should be uploaded collectively at the end of the examination in the form of one single PDF file.

5.Save the pdf file with name:
Regular Students: Batch_EnrollmentNumber_TFCS
Backlog Students: Backlog_EnrollmentNumber_TFCS

6. Keep your webcams open for the entire duration of exam

* Required

1. Email *

2. Enrollment Number *

3. Name *

4. Batch *

Mark only one oval.

- B5
- B6

5. Mobile Number *

6. Email (e.g. abc@mail.jiit.ac.in) *

Detailed Instructions

Note:
1. Attempt all the questions.

2. The paper contains total of 12 questions (10 objective questions and 2 subjective questions).
Note:

3. You need to answer all questions in your own handwriting on papers/pages.

4. Scan all the papers/pages of your answers and create a single PDF file

5. Each page of the single PDF file must contain following details: Name, Enrollment No., Batch, Date of Exam, Course Name, Course Code, and Page No

6. Following Nomenclature should be used for PDF file

Regular Students: Batch_EnrollmentNumber_TFCS
Backlog Students: Backlog_EnrollmentNumber_TFCS

7. Upload the Single PDF file (named as per the nomenclature given in point 6) at the end of the examination in the last block of this section.

8. Click Submit tab/button (available at the end of this section) to submit your Single PDF file

7. Objective Questions (Q1-Q5) of 1 mark each

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Q1. [CO2][1 mark] {1, i, -i, 1} is a _____ group under the multiplication operation.

Q2. [CO3][1 mark] "Everyone wants to learn astronomy." Domain for this can be _____ or _____.

Q3. [CO3][1 mark] Let the statement be "If n is not an odd integer then sum of n with some not odd number will not be odd.", then if P(n) is "n is an not an odd integer" and Q(n) is "sum of n with some not odd number will not be odd." A proof by contraposition will be _____

Q4. [CO3][1 mark] In proving √11 as irrational, we begin with assumption √11 is rational in which type of proof?

Q5. [CO2][1 mark] Negation of statement $(A \wedge B) \rightarrow (B \wedge C)$ is_____
a) $(A \wedge B) \rightarrow (\sim B \wedge \sim C)$
b) $\sim(A \wedge B) \vee (B \vee C)$
c) $\sim(A \rightarrow B) \rightarrow (\sim B \wedge C)$
d) None of the mentioned

8. Objective Question Q6 of 1 mark

Q6. [CO2][1 mark] If a * b = a such that a ∗ (b ∗ c) = a ∗ b = a and (a * b) * c = a * b = a then * is _____

9. Objective Questions (Q7-Q10) of 1 mark each and Subjective Question Q11 of 5 marks

Q7. [CO2][1 mark] Let $(A_7, \otimes_7)=(\{1, 2, 3, 4, 5, 6\}, \otimes_7)$ is a group. It has two sub groups X and Y. X={1, 3, 5}, Y={2, 3, 6}. What is the order of union of subgroups?

Q8. [CO2][1 mark] Let * be the binary operation on the rational number given by a*b=a+b+ab. Which of the following property does not exist for the group?

Q9. [CO2][1 mark] If (M, *) is a cyclic group of order 73, then number of generator of G is equal to _____

Q10. [CO3][1 mark] Which rule of inference is used, "Monica will work in a media office this winter. Therefore, this winter Monica will work in a media office or she will go swimming."

Q11 [CO3][5 marks] The following propositions are given:

- If the unicorn is mythical, then it is immortal, but if it is not mythical, then it is a mortal mammal.
- If the unicorn is either immortal or a mammal, then it is horned.
- The unicorn is magical if it is horned.

Can we prove that the unicorn is Mythical? Magical? Horned?

10. Subjective Question Q12 of 5 marks

Q12 [CO2][5 marks] The truth table involving 5 variables (A, B, C, D, E) is given below, where Y is the corresponding output in each row. Minimize it using K-map and give the answer in SOP form. Mention/Show all the steps.

	A	B	C	D	E	Y
0	0	0	0	0	0	0
1	0	0	0	0	1	1
2	0	0	0	1	0	0
3	0	0	0	1	1	1
4	0	0	1	0	0	1
5	0	0	1	0	1	1
6	0	0	1	1	0	1
7	0	0	1	1	1	1
8	0	1	0	0	0	0
9	0	1	0	0	1	0
10	0	1	0	1	0	0
11	0	1	0	1	1	0
12	0	1	1	0	0	0
13	0	1	1	0	1	0
14	0	1	1	1	0	0
15	0	1	1	1	1	0
16	1	0	0	0	0	1
17	1	0	0	0	1	1
18	1	0	0	1	0	0
19	1	0	0	1	1	1
20	1	0	1	0	0	1
21	1	0	1	0	1	0
22	1	0	1	1	0	0
23	1	0	1	1	1	0
24	1	1	0	0	0	0
25	1	1	0	0	1	0
26	1	1	0	1	0	0
27	1	1	0	1	1	0
28	1	1	1	0	0	1
29	1	1	1	0	1	1
30	1	1	1	1	0	1
31	1	1	1	1	1	1

11. Upload the single PDF file (named as per the nomenclature Name_Enrollment_Batch) containing your answers *

Files submitted: