WEST BENGAL STATE UNIVERSITY

B.Sc. Honours Part-II Examination, 2020

ELECTRONICS

PAPER: ELTA-III-A

Time Allotted: 2 Hours | Full Marks: 50

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.

GROUP-A

1. Answer any ***five*** questions from the following: 2×5 = 10

   (a) What is an array?

   (b) What are the basic data types associated with C?

   (c) Why the programmers use different library functions in C Programming?

   (d) What is the difference between primitive cells and unit cells?

   (e) What are Miller indices?

   (f) What is Bragg's law in X-ray diffraction?

   (g) Define work function of a material.

   (h) What do you mean by density of states?

Answer any *two* from the following 20×2 = 40

2. (a) Write a C program to find the largest among three given numbers. 5

   (b) Write the output of the following C program: 4

```
#include<stdio.h>
int main()
    {
int r=4;
float pi=3.14, area, circumf;
area= pi*r*r;
printf("\n Area of the circle is:%f",area);
circumf= 2*pi*r;
printf("\n circumference of the circle is:%f",circumf);
return (0);
    }
```

(c) Explain with suitable example the difference between while statement and for loop. 5

(d) What do you mean by recursive function? Write a C program to find factorial of a number using recursive function. 1+5

3. (a) Describe any numerical method to determine the differentiation of a function. Derive the expression with explanation. 5+5

(b) Find the solution of the differential equation using Euler's method. 6+4

$y'(x) = dx^2 + 1$ with $y(1) = 2$ estimate $y(2)$ for $(i)\ h = 0.5$ and (ii) $h = 0.25$

Compare the accuracy issue of the Euler's Method.

4. (a) Determine the expressions of packing fractions of bcc and fcc lattices. $2\frac{1}{2} + 2\frac{1}{2}$

(b) Write a short note on Kronig-Penney model. 5

(c) Distinguish between a metal, semiconductor and insulator using their band diagram. 5

(d) Define a reciprocal lattice. How does it differ from the direct lattice? $2\frac{1}{2} + 2\frac{1}{2}$

5. (a) With suitable diagram explain the concept of Brillouinzone. 5

(b) What is Fermi Level? Explain the concept. 5

(c) Which semiconductors have better optical responses? Why? 4

(d) Hetero-junction structures are often preferred for optical system design. – What is its scientific reason? 6

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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