MAULANA AZAD NATIONAL INSTITUTE OF TECHNOLOGY

Mid Sem Examination — May 2022

Course – B.Tech. **Sem – II** **Section - F/G/H/I/J**
Subject Name- Computer Programming **Subject Code CSE104**
Time- 1.30 hours **Max.Marks- 20**
Note- Answer all questions

S.No	Questions	Marks

Q1	Find the output of the given program.
	
	`#include <stdio.h>`
	`int main()`
	`{`
	`  int a=4, b=12,c=-3,res;`
	`  res=a>b&&a<c; // EXPRESSION LINE 1`
	`  printf("res1=%d\n",res); // OUTPUT LINE 1`
	`  res=a==c||a>b; // EXPRESSION LINE 2`
	`  printf("res2=%d\n",res); // OUTPUT LINE 2`
	`  res=b>10||b && c<0 || a>0; // EXPRESSION LINE 3`
	`  printf("res3=%d\n",res); // OUTPUT LINE 3`
	`  res=(a/2.0==0.0&&b/2.0!=0.0)||c<0.0; // EXPRESSION LINE 4`
	`  printf("res4=%d\n",res); // OUTPUT LINE 4`
	`  return 0;`
	`}`
	Justify your output with respect to EXPRESSION LINE and OUTPUT LINE in one-two lines. NO MARKS will be awarded without explanation.
		4

Q2	Write a C program to print following pattern using any loop (use %5d in printf to make right justify of the output): j=1 j=2 j=3 j=4 j=5 i=1 1 2 3 4 5 i=2 2 8 24 64 160 i=3 3 18 81 324 1215 i=4 4 32 192 1024 5120 i=5 5 50 375 2500 15625 $j \times i^j$	4

Roll No -

Name -

Q3 **Draw the flowchart for the following algorithm.** 4

pseudo code of Algorithm

```
Step 0 : Start

Step 1 :  //Sensor Resistance in fresh air (This is not an input from sensor)
          float R0 = 11.820;

          //Read analog values of gas sensor
          float sensorValue = analogRead(gas_sensor);

Step 2: //Convert analog values to voltage
          sensor_volt = sensorValue*(5.0/1023.0);

Step 3:  //Get value of RS in a gas
          RS_gas = ((5.0*10.0)/sensor_volt)-10.0;

Step 4: // Get ratio RS_gas/RS_air
          ratio = RS_gas/R0;

Step 5: //Get ppm value in linear scale according to the the ratio value
          double ppm_log = (log10(ratio)-b)/m;

Step 6:  //Convert ppm value to log scale
          double ppm = pow(10, ppm_log);

Step 7:
          //Check if ppm value is greater than 2000
          if(ppm>2000)
     {
          Step 7a. //Turn LED on
                    digitalWrite(led, HIGH);

          Step 7b.     //Turn buzzer on
                    digitalWrite(buzzer, HIGH);
     }
     else //Case ppm is not greater than 2000
     {
          Step 7c. //Turn LED off
                    digitalWrite(led, LOW);
          Step 7d. //Turn buzzer off
                    digitalWrite(buzzer, LOW);
     }

Step 8 : Exit
```

Name -

Roll No -

Q4	Suppose, after the admission process of MANIT is over, hostel allocation is done. H10 and H7 are officially allocated to boys students and girls students of MANIT respectively. Also their names are registered in the respective hostels (H10 / H7) based on their allocated room. Imagine that MANIT has given laptops to all 1st year hosteller students to access the internet inside the hostel area (H10 / H7) for programming practice and online classes. The default **user id and password** for boys students is **(Roll_No and h10_manit)** whereas for girls students it is **(Roll_No and h7_manit)**. No one can change user id and password except system admin. Once a student switches on the laptop and enters the correct user id and password, the following message **"Welcome to MANIT"** is displayed, otherwise **"Wrong user-id/password entered"** is displayed till the student enters the correct password. To limit unauthorized access of internet, every **WiFi** has a user id and password which are ONLY known to all MANIT students. The **user id and password of WiFi** as follows **(H7_MANIT, h7_manit)** , **(H10_MANIT, h10_manit)**. **"Wrong WiFi user-id/password entered"** is displayed if the student enters the incorrect user id and password of WiFi. To restrict further use of laptops outside their allotted hostels, every WiFi is configured (based on **MAC_ADDRESS** of laptop) by System Admin in a way that the laptop of H7 will not be able to connect to WiFi of H10 or vice versa. An alert message **"You are unauthorized to access H7 / H10 WiFi"** is generated if any students try to cross check the security settings by trying to connect with WiFi of other hostels where they are not registered by entering the correct user id and password of WiFi. If the user enters the correct user id and password of WiFi and tries to join the correct registered WiFi of their registered hostel, then a welcome message is displayed **"Welcome to the World of Internet"**. **Write an algorithm for the above scenario (from registration process of students at hostel to access internet at their registered hostel) and display the messages accordingly.**	4

Name -

Roll No -

Q5	Write a program to convert a two digit **hexadecimal number to a binary number** where the user **will provide individual digits** of the hexadecimal number. You may use Table 1 to find the equivalent binary number for a particular digit. Your program must generate below sample output for the given sample input.4 **Use of switch-case is compulsory in your program.** Sample Output : Enter two individual digits of hexa-decimal numbers 1 A Binary number 0001 1010 Enter two individual digits of hexa-decimal numbers 0 E Binary number 0000 1110	4

Table 1: Hex to binary

digit	0	1	2	3	4	5	6	7	8	9
binary	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001
digit	A	B	C	D	E	F				
binary	1010	1011	1100	1101	1110	1111				