

- 1.a i) Define electric and magnetic flux. (ii) Compare the electric and magnetic force and (iii) Define Lorentz relation and Ampere's law. 6
- b. Calculate the magnetic energy density of a Solenoid of length  $l$ , cross-sectional area  $A$  and carrying a current  $i$  4
- 2.a Describe the nature of light. What are coherent sources? How can we produce the coherent source? 2
- b. What properties of light can be proved by the interference of light? When two waves of monochromatic light are superimposed calculate the intensity of the resultant wave and explain when the intensity will be maximum and when it is minimum. 6
- 3.a Establish a relation between phase difference and path difference. 6
- b. What are Newton's Rings? Why they are circularly formed? In a Newton's rings experiment the diameter of the 15<sup>th</sup> ring was found to be 0.590 cm and that of the 5<sup>th</sup> ring was 0.336 cm. If the radius of the plano-convex lens is 100 cm, calculate the wavelength of light used. 6

Department of CSE, SUST

Term Test 2

Marks: 20

Time: 15 minutes

Describe the output that will be generated by each of the following programs:

a)

```
#include <stdio.h>
main()
{
    int i = 0, x = 0;
    for (i = 1; i < 10; ++i) {
        if (i % 2 == 1)
            x += 1;
        else
            x--;
        printf("%d", x);
    }
    printf("\n x = %d", x);
}
```

b)

```
#include <stdio.h>
int c[10] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 0};
main()
{
    int a, b = 0;
    for (a = 0; a < 10; ++a)
        if ((c[a] % 2) == 1) b += c[a];
    printf("%d", b);
}
```

Handwritten calculations for program a):

1 2 3 4 5 6 7 8 9 0

+ 2 3 1 2 1 2 1 2 1 2

2 3 1 2 1 2 1 2 1 2

3 2 1 0

Handwritten calculations for program b):

10 3 27 13 17 21