Question 1 Choose the correct answer **(40 points)**

1. Given a private key {1, 2, 4, 10, 20, 40}, m= 31, n=110 which of the following is the cipher message corresponding to the plain massage 36
   a) 121
   b) 11
   c) 111
   d) 16

2. In RSA cryptosystem, a participant A uses two prime numbers p=13 and q=17 .If the public key of A is 35, then the private key of A is:
   a) 11
   b) 7
   c) 15
   d) 13

3. For the following RC4 algorithm, line vii is:

```
 i. for i = 0 to 255
ii.       S[i] = i
iii.      T[i] = key[i (mod N)]
iv. next i
 v. j = 0
vi. for i = 0 to 255
vii. ----------
viii.     swap(S[i], S[j])
 ix. next i
  x. i = j = 0
 xi. i = (i + 1) mod 256
xii. ----------
xiii. swap(S[i], S[j])
xiv. ----------
 xv. keystreamByte = S[t]
```

   a) j = (j + S[i] + T[i]) mod 256
   b) i = (i + S[j] + T[j]) mod 256
   c) j = (j + T[i]) mod 256
   d) j = (S[i] + T[i]) mod 256

4. For the previous RC4 algorithm, line xii is:
   a) j = (S[i]) mod 256
   b) j = (j + S[j]) mod 256
   c) j = (i+ S[i]) mod 256
   d) j = (j + S[i]) mod 256

5. For the previous RC4 algorithm, line xiv is
   a) t = S[i] mod 256
   b) t = (S[i] + S[j]) mod 256
   c) t = (S[i] + T[j]) mod 256
   d) t = (S[i+j]) mod 256

6. In DES, each of the S-boxes matrix is with size ----------
   a) 4 × 4
   b) 4 × 16
   c) 8 × 8
   d) 4 × 8

7. Users A and B use the Diffie-Hellman key exchange technique with a common prime q = 7 and generator a=3. If user A has private key XA = 2, If user B has private key XB = 5. What is the shared secret key?
   a) 3
   b) 4
   c) 5
   d) 6

8. A set of numbers is called super increasing knapsack if:
   a) each element is greater than previous element
   b) each element is greater than sum of all the previous elements
   c) each element is greater than the average of all elements
   d) each element is lesser than the sum of all the elements

9. A Brute Force attack on a Simple substitution cipher written in Arabic would require a maximum of ----------trials.
   a) 25!
   b) 26!
   c) 2^{88}
   d) 28!

10. Suppose that an Affine cipher is used to enciphers h as X and q as Y. Find the key.
   a) (5,10)
   b) (23,7)
   c) (9,12)
   d) (3,2)

11. The number of tests required to break the DES algorithm are
   a) 2.8×10^{14}
   b) 4.2×10^{9}
   c) 1.84×10^{18}
   d) 7.2×10^{16}

12. Using one time pad, the key that encrypts APPLE modulo 26 to yield ciphertext QJKES is:
   a) QGFHW
   b) KGFHM
   c) OGTNI
   d) QUVTO

13. What will be the cipher text corresponding to plain text "attack at four" if Double Transposition Cipher is used with matrix of size 3×4, permute rows from $(1, 2, 3) \rightarrow (3, 2, 1)$, permute columns from $(1, 2, 3, 4) \rightarrow (4, 2, 1, 3)$
   a) ROFUTKCAATAT
   b) UORFAKTCTTAK
   c) FOURCKATATTA
   d) RUORTAKCATTA

14. What will be the plain text if rail fence cipher is used for decrypting the cipher text "SANFOUNDRY" with the key value given to be 3?
   a) SFROAUYNND
   b) SUANNDFROY
   c) SORAFUDYNN
   d) SNONRAFUDY

15. Which of the following ciphered text would have NOT used transposition cipher for encryption of the plain text "CIPHER"?
   a) EPIHRC
   b) EHIPCR
   c) TIPDRC
   d) HRIPEC

16. Which of the following is not a characteristic of a good hash function?
   a) Collision resistance
   b) Takes a variable-sized message as input and produces a fixed-length output
   c) Reversibility
   d) Deterministic

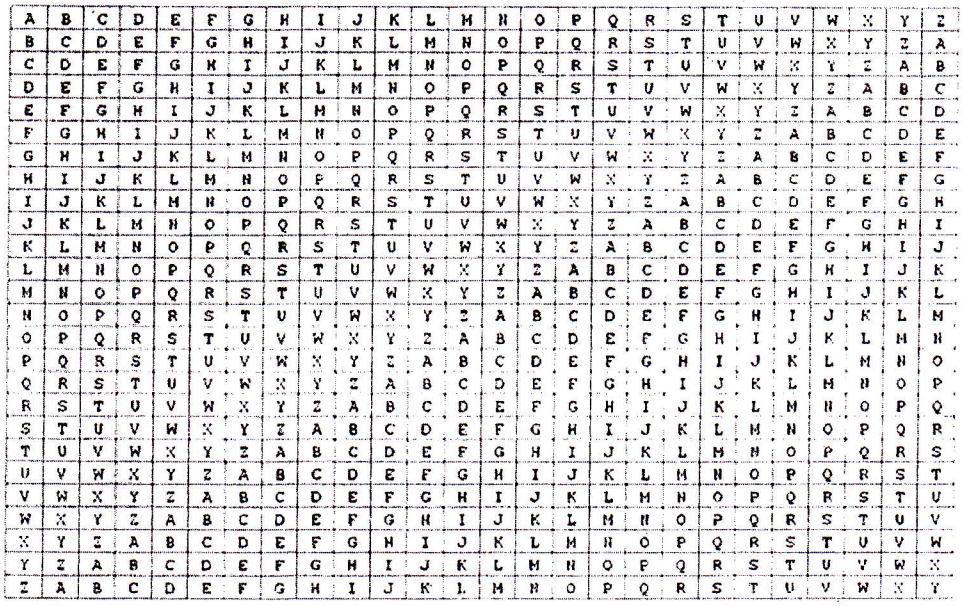
17. In public-key cryptography, sender can encrypt the message
   a) using only receiver's public key
   b) using only sender's private key
   c) using only sender's public key
   d) using only receiver's private key

18. In RC4 , variable-length key of size _____ is used
   a) 1 to 256 bits
   b) 8 to 1024bits
   c) 1 to 256 bytes
   d) 64 to 128 bits

19. What will be the plain text corresponding to cipher text "BPKLFQ" if playfair cipher is used with keyword as "SECRET"
   a) INDIAN
   b) WORLD
   c) DOIKRL
   d) ODLMLY

20. Apply the Vigenère Tableau Cipher to decrypt the Ciphertext: "ZIC" using the Key "dec"

a) EWA
b) CME
c) WEA
d) FGE



Question 2 True or False **(10 points)**

21. Symmetric key Cryptography is advantageous over Public key Cryptography because of Speed.

22. Stream Cipher is inspired by hill cipher

23. In DES, the output of each S-box is 6 bits.

24. In Hill Cipher, if the keyword is "short example" and the size of the key matrix is 3×3, we would only take the first 9 letters of the keyword and ignore the remaining letters.

25. In Feistel cipher, decryption uses the same algorithm as encryption with the same order of the subkeys.

26. In A5/1 cipher, the key is used as the initial fill of two registers

27. You are supposed to use hill cipher for encryption technique. You are provided with the following matrix, $A = \begin{bmatrix} 4 & 2 \\ 2 & 1 \end{bmatrix}$. The given matrix 'A', is a valid key to be used for encryption.

28. The number of columns in the table used for encryption in columnar transposition cipher when a given keyword is "SECRET" and plain text is "SANFOUNDRY" is 2

29. In RSA, we select a value 'e' that lies between 1 and euler (Φ) and it is relatively prime to Φ.

30. Triple DES with K1 and K2 are independents, and K3 = K1 is stronger than Double DES.

Department of Mathematics		قسم الرياضيات
Faculty of Science		كلية العلوم

الامتحان النهائي للفصل الدراسي الاول ٢٠٢٣ / ٢٠٢٤

الفرقة : الاولى علوم

اسم المقرر: رياضيات (٢)	الدرجة الكلية : ٥٠ درجة	التاريخ: ١٨ / ١ / ٢٠٢٤ م
رقم المقرر ورمزه: ١٠٥ ر		الزمن: ساعتان

أجب عن عشرة فقرات فقط مما يلي (خمس درجات عن كل فقرة)

(١) أحسب قيم التكاملات: $(i)\int 5e^x\sqrt{1+e^x}\,dx$ $(ii)\int \sin^3 x\,dx$

(٢) أوجد المساحة المحصورة بين المنحنين : $y=x-3,\quad y^2=x-1$

(٣) أحسب قيم التكاملات: $(i)\int \sec x\,dx$ $(ii)\int \frac{1}{x\ln x}\,dx$

(٤) أوجد قيمة : $(i)\int \tan^{-1}x\,dx$ $(ii)\int \sin^4 x\cos^3 x\,dx$

(٥) أحسب قيم التكاملات: $(i)\int_0^{\pi} e^x\sin e^x\,dx$ $(ii)\int_0^1 \sqrt{1-x^2}\,dx$

(٦) أوجد المساحة المحصورة بين المنحنيين: $y=\sqrt{x}\quad,\quad y=x^2$

(٧) أحسب قيم التكاملات: $(i)\int_0^{\frac{\pi}{2}} \cos^5 x\,dx$ $(ii)\int_0^1 \frac{x-\sin^{-1}x}{\sqrt{1-x^2}}dx$

(٨) أوجد معادلة الخط المستقيم المار بالنقطة $(1,5)$ ويكون عمودياً على المستقيم $5x-4y+1=0$

(٩) أوجد مركز ونصف قطر الدائرة الأتية: $r^2+3r\cos\theta+3r\sqrt{3}\sin\theta=10$

(١٠) اذا كان المقطع العرضي للوح للطاقة الشمسية هو مرآه على شكل قطع مكافئ معادلته $x^2=16y$ وتعمل المرآه على تركيز اشعة الشمس على مستقبل خطي يقع عند بؤرة القطع. ادرس خصائص هذا المقطع.

(١١) حمام سباحة على شكل قطع ناقص مركزه نقطة الاصل طوله **20 m** واختلافه المركزي $\frac{1}{2}$.

إدرس خصائص هذا الحمام.

(١٢) اوجد الخطوط التقاربية وطول الوتر البؤرى العمودى للقطع الزائد

$$16x^2-9y^2-18x-64y-89=0$$

مع دعواتنا لكم بالتوفيق والنجاح

أ.د. خلف عبد الحكيم & أ.د. حمدى نور الدين

Assiut University
Faculty of Science
Department of Mathematics
Time: 2 hours, Grade: 50 marks

Final Exam - 1st Semester 2023/2024
Computer Science (**MC100**), 1st Level
Date: 15/01/2024

The questions are in FOUR pages, 50 questions only are required.

Choose the best answer: (1 mark for each point)

1. The daily life problems are introduced to computer as:

a) inputs b) outputs c) commands d) rules

2. The ..... is halfway between plain English and the programming language.

a) algorithm b) flowchart c) pseudocode d) subroutine

3. The ..... needs a specific language to build in.

a) code b) algorithm c) pseudocode d) flowchart

4. The ..... is a graphical method shows the information flow.

a) diagram b) streamlines c) flowmap d) flowchart

5. The ..... manages the relation between memory and the arithmetic & logic unit.

a) mainframe b) keyboard c) control unit d) remote sensor

6. The expression "CON<I AND CON>k" is analyzed by:

a) centrifuge b) calculator c) logic unit d) injector

7. To describe your problem well, all possible states and values should be stored at:

a) memory b) board c) CD d) book

8. The place where the M-file is running is known from ..... panel.

a) command history b) command window c) current folder d) workspace

9. To call a function in Matlab you need:

a) its name and arguments b) its outputs c) its inputs d) the tool box

10. Workspace is the place where you can:

a) see your variables b) see outputs c) supply inputs d) discover errors

11. Type ..... to display the current workspace variables.

a) load b) who c) clc d) find

12. Command used to display the value of variable x:

a) disp x b) display x c) disp(x) d) vardisp(x)

13. To stop the execution of a MATLAB command, the used keys are:

a) ctrl+e b) ctrl+s c) ctrl+b d) ctrl+c

14. Which is the invalid variable name in MATLAB?

a) x4 b) xX c) 7x d) x_x

15. Expect the result of: a=[1 1 0 0], b=a', c=a*b?

a) [1 1 0 0]' b) [0 0 0 0] c) 0 d) 2

16. All MATLAB computations are done in:

a) single precision b) double precision c) linear accuracy d) multi-level care

17. Which symbol is used to initialise a variable?

a) => b) = c) = = d) init

18. ..... is used to keep the workspace variables at W.mat file.

a) keep (W.mat) b) whos (W.mat) c) save (W.mat) d) what (W.mat)

19. To load all variables from Y.mat file, you will use the command:

a) open ('Y.mat') b) import ('Y.mat') c) save ('Y.mat') d) load ('Y.mat')

20. (CLEAR ALL) is a command used to eliminate:

a) workspace variables b) script commands c) all errors d) new updates

21. plot(Y(5:60)); the data on the horizontal axis are:

a) 0,1,2,... b) y(5)→y(60) c) 5,6,...,60 d) 5,60,115,...

22. The command "close all" means:

a) close all figures b) close all panels c) close all files d) close Matlab

23. The command "clf" means:

a) clear figure b) see figure c) stop running d) activate a panel

24. What is the output of the expression in Matlab: (2*9*Inf)+(9-1*Inf)?

a) Inf b) Nan c) 0 d) error

25. Evaluate the expression: a=5*9; b=a*a/a*a; c=sind(30)+1/2;d=1-c; e=a+b*c-d

a) 0 b) 45 c) 2025 d) 2070

26. What is the output of the following code: X=(log(0) = = Inf)?

a) 0 b) 1 c) Inf d) Nan

27. The argument "ans" is a/an:

a) absolute function b) default variable c) constant value d) unknown

28. The value 'eps' has the reserved value:

a) 2.2204e-16 b) 3.1415926 c) zero d) none of them

29. zeros(1,m)*zeros(n,1) equal:

a) zero scalar b) mxn zero matrix c) mxn identity matrix d) non of them

30. Evaluate the result of: a=55; b=5485.45; fprintf('%d%d', a, b);

a) 55 5485	b) 55 5485.45	c) 555485.45	d) 555.485450e+03

31. ones(3,2)*zeros(2,3) gives:

a) zeros(3,3) b) ones(3,3) c) zero d) zeros(2,3)

32. ones(3,1)*rand(1,3) may contain the entry:

a) 1.258 b) 126.453 c) 9.999 d) 30000

33. Given a=[9 1 0;3 6 2;5 4 7], a(3,2:3) displays:

a) [5 4 7] b) [2 7]` c) [4 7] d) [0 2 7]`

34. What's the wrong at the line: function x=x+test(A,b)?

a) 'x+' b) 'function' c) 'test' d) '(A,c)'

35. What's the wrong at the line: function [x,y]=range(n2-n1)?

a) [x,y] b) function c) n2-n1 d) range

36. diag([6 6 6]) equal:

a) 3*6 b) 6*ones(3,3) c) 6*6*6 d) 6*eye(3)

37. x=-1:0.2:0 is equivalent to:

a) x=linspace(-1,0,6) b) x=linspace(-1,0.2,0) c) for x=-1:0:0.2 d) none of them

38. Evaluate the result of: i=1; j=26.5845; fprintf('%d%8.3f', i, j)

a) 1 26.585 b) 1 26.58400 c) 10026.585 d) 1 0026.585

39. Let: A=3, B=30. In code, C=A+B; B=C-B; A=C-B; therefore, after processing:

a) A=3, B=0 b) A=0, B=33 c) A=30, B=3 d) A=27, B=3

40. The following code is to find the series: $1-X+X^2-X^3+\ldots$:

1) Syms (Q 40); 2) N=input('Enter the highest power:¥n');	3) I=1; sum=(Q 41); term= (Q 42); 4) While (I Q 43 N) 5) term= -1*term*X;	6) sum= (Q 44); 7) I= I+1; 8) End

What would you type at (Q 40) position?

a) N b) X c) I d) term

41. At code (question 40), what's the value of (Q 41) position

a) -1 b) 0 c) N d) 1

42. At code (question 40), what's the logic expression at Q 42 position ?

a) -1 b) 0 c) N d) 1

43. At code (question 40), (Q 43) points to:

a) < b) > c) <= d) =>

44. At code (question 40), (Q 44) points to:

a) sum+N b) sum+1 c) sum+I d) sum+term

45. At code (question 40), in case of N=4, subs(sum, -1) gives:

a) -1 b) 1 c) 4 d) 5

46. X= (mod(N,2) ~ = 0); if X=1, this means:

a) N is odd b) N is even c) N not-a-number d) N<2

47. At loop: for I=zeros(3,7) , the number of iterations is

a) 7 b) 3 c) zero d) 21

48. Evaluate the result of: a=10; b=0.2645; fprintf('%e%d', b, a);

a) 0.2345e+0010	b) 2.645000e-0110	c) 2.645e+01 10	d) 10 0.2645

49. At s=`how-old-are-you`; the s(11) is

a) 'o' b) 'a' c) '-' d) 'e'

50. Inside for loop, the following IF condition exists: b=` `; s=`ftxhfinkoxutx `; if(s(i)~=f || s(i)~=x){ b=[b s(i)]; end} Could you identify b?

a) 'thinkout' b) 'thfinox' c) 'thinxtx' d) '.....'

********** *With best wishes, Dr. Mohammed Ahmed Yousof* **********

The Egyptian Arabic Republic
Ministry of Higher Education
Assuit Unvirsity
Faculty of Science
Mathematics Department

Final Examination for General Mathematics 100r

First semester of the year 2023/2024
Date: Thursday 18/01/2024
Groups: First Science
Period: 09-11
Time: Two hours

الاختبار النهائي لمادة الرياضيات العامة 100ر (التفاضل والجبر)

First: The differential (25 marks)

أولاً: التفاضل

Answer only five of the following questions

أجب عن خمسة أسئلة فقط من الأسئلة الآتية

السؤال الاول: - أوجد $\frac{dy}{dx}$ للدوال الاتية: (أجب عن ثلاثة فقرات فقط) **(5 درجات)**

$(a)\ y = (sin^{-1} 4x)^{tanh\, 2x}$

$(b)\ y = (lnx)^{lnx}$

$(c)\ y = x^{12} ln(sec\, x + tan\, x^3) + \frac{e^{sinh\, x}}{ln(x^2+5)}$

$(d)\ ln\, x^{y^4} + sin\,(yx^3) + e^{xy} = 3yx^3$

السؤال الثاني: - **(5 درجات)**

(1) أوجد معادلة المماس والعمودي للدالة $y = sin\, \frac{x}{4}$ عند النقطة $(2\pi, 1)$.

(2) أوجد مفكوك مكلورين للدالة $y = ln(2x+3)$ حول النقطة $x = 0$.

السؤال الثالث: - (أجب عن ثلاثة فقرات فقط) **(5 درجات)**

أوجد المشتقة النونية $y^{(n)} = \frac{d^n y}{dx^n}$ للدوال الاتية: -

$(a)\ y = x^2 ln\,(2x+3)$

$(b)\ y = x^3 e^{-5x}$

$(c)\ y = e^{3x}\, cos4x$

$(d)\ y = 10^{4x}\, sin\, 9x$

السؤال الرابع: - **(1)** باستخدام تعريف المشتقة الأولى للدالة $f(x)$ أوجد $\frac{dy}{dx}$ لكلاً من الدوال الاتية:- **(5 درجات)**

$(i)\ y = 5x^3$

$(ii)\ y = cos\, 3x$

(2) باستخدام تعريف النهاية اثبت أن: -

$\lim_{x\to 2} (x^2-3) = 1$

السؤال الخامس: - **(5 درجات)**

إذا كانت $y = f(x) = e^{3sinh^{-1}x}$ فاثبت أن:-

$(a)\ (1+x^2)\frac{d^2y}{dx^2} + x\frac{dy}{dx} - 9y = 0$

وباستخدام نظرية ليبتز أثبت أن:-

$(b)\ (1+x^2)y^{(n+2)} + (2n+1)xy^{(n+1)} + (n^2-9)y^{(n)} = 0$

وبوضع $x = 0$ في (b) أثبت أن:-

$(c)\ y^{(n+2)}(0) + (n^2-9)y^{(n)}(0) = 0$

السؤال السادس: - أوجد النهايات الاتية باستخدام قاعدة لوبيتال **(5 درجات)**

$(a)\ \lim_{x\to 0} \frac{x - sin\, x}{tan\, x - x}$

$(b)\ \lim_{x\to \frac{\pi}{4}} (tan\, 2x - sec 2x)$

$(c)\ \lim_{x\to 0} \frac{3x^3}{4^x - e^{-2x}}$

أنظر في الخلف (الجبر)

الاختبار النهائي لمادة الرياضيات العامة 100ر (التفاضل والجبر)

ثانياً: الجبر (25 درجة)

أجب عن خمسة أسئلة فقط من الأسئلة الآتية

Second: Algebra (25 marks)

Answer only five of the following questions

السؤال الأول: - (5 درجات)

باستخدام نظرية الاستنتاج الرياضي برهن أن:- $1 + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \cdots + \frac{1}{\sqrt{n}} > n\,,\ n > 1$.

السؤال الثاني: - (5 درجات)

حلل الكسر الآتي إلى مجموع كسوره الجزئية:- $\frac{3x+1}{(x-1)(x^2-1)}$

السؤال الثالث: - (5 درجات)

بتطبيق نظرية ذات الحدين أوجد القيمة التقريبية: - $\sqrt{4.004}$

السؤال الرابع: - (5 درجات)

أوجد مجموع المتسلسلة التالية الى مالانهاية:

$$\frac{1}{1\cdot 4} + \frac{1}{4\cdot 7} + \cdots + \frac{1}{(3n-2)(3n+1)} + \cdots.$$

السؤال الخامس: - (5 درجات)

أختبر تقارب وتباعد المتسلسلة الاتية:

$$\sum_{n=1}^{\infty} \frac{n-1}{n^2+n-3}$$

السؤال السادس: - (5 درجات)

باستخدام طريقة جاوس للحذف حل نظام المعادلات الخطية غير المتجانسة الآتية:-

$$x - 3y + 5z = 1, \quad 2y + 4z = 3, \quad 3x - y - z = 1$$

"With our best wishes" Dr. Soad Aly Hassan && Dr. Sayed Attia Ahmed

Faculty of Science Object Oriented Programming - 2nd Level

Assiut University Time: 2 Hours

1st Semester 2023 Marks: 50

Question 1: Choose the correct answer (10 Points)

1. The .....cannot be used in identifiers.
   a) Letters. b) Underscore. c) Spaces. d) Digits.
2. The.....is used to print a backslash character.
   a) \\ b) // c) \t d) None of these.
3. The single-line comment can be added using.....
   a) \\ b) /* */ c) // d) None of these.
4. Which of the following is NOT a reserved word in C++?
   a) return b) int c) const d) num
5. Which of the following loops will definitely execute at least once even if the condition is not satisfied?
   a) for b) do-while c) while d) None of these.
6. The memory space taken for a double type data is..... bytes.
   a) 8 b) 4 c) 2 d) None of these.
7. The.....manipulator is used to control the output of floating-point numbers to a specific number of decimal places.
   a) showpoint b) setprecision c) fixed d) scientific
8. Which of the following expressions correctly determines that x is greater than 10 and less than 20?
   a) 10 < x < 20 b) x > 10 && x < 20 c) x > 10 || x < 20 d) None of these.
9. Which of the following statements can be used to call the function

```
void Sample(int a, int b = 0, int c = 0) {   }
```

   a) Sample(30,40); b) Sample(10,20,30); c) Sample(50); d) All of these.
10. Expression `static_cast<int>(7.8 + static_cast<double>(15/2))` evaluates to.....
    a) 14 b) 15 c) 13 d) None of these.

Question 2: Choose the correct answer (40 Points)

11. What is the output of the following code fragment?

```
double a = 2.5;
int b = 3;
b = a;
cout << b;
```

a) 2 b) 2.5 c) 3 d) Error.

12. What is the output of the following code fragment?

```
int x = 1, y = 2;
cout << x - y + 3 * 4 % 5 << endl;
```

a) -1 b) 2 c) 1 d) 11

13. What is the output of the following program?

```
int main()
{
  int y, x = 5;
  y = ((100 % x == 0) ? x + 1 : x - 1);
  cout << "y = " << y << ", x = " << x << endl;
  return 0;
}
```

a) y = 6, x = 6 b) y = 6, x = 5 c) y = 4, x = 5 d) None of these.

14. What is the output of the following code fragment?

```
int x[4]={10,9};
for (int i = 0; i < 4; i++)
  cout << x[i] << " ";
```

a) 10 9 0 0 b) 10 9 garbage garbage c) Error. d) None of these.

15. What is the output of the following code fragment?

```
bool x = (10 > 3);
cout << x << endl;
```

a) 10 b) true c) 1 d) Error.

16. What is the output of the following program?

```
int main()
{
  const int x = 1;
  x += 5;
  cout << x;
  return 0;
}
```

a) 1 b) 6 c) Error. d) None of these.

17. What is the output of the following program?

```
int main()
{
  int i = 10;
  if (i = 12)
    cout << "I am in True";
  else
    cout << "I am in false";
  return 0;
}
```

a) It will printing nothing. b) I am in True c) I am in false d) Error.

18. What is the output of the following program?

```
int x = 10, y = 0;
void mFunction()
{
   y = (x > 0) ? x++ : x--;
}
```

```
int main()
{
  mFunction();
  cout << x << "  " << y;
  return 0;
}
```

a) 10 0 b) 10 10 c) 11 10 d) Error.

19. What is the output of the following program?

```
int main()
{
  int i = 0;
  for (;;)
    cout << ++i << " ";
  return 0;
}
```

a) 1 b) Infinte loop. c) Error. d) None of these.

20. What is the output of the following program?

```
void mFunction(int& a, int& b, int& c)
{
  a *= 2;
  b *= 2;
  c *= 2;
}
int main()
{
  int x = 2, y = 5, z = 7;
  mFunction(x, y, z);
  cout << "x =" << x << ", y =" << y << ", z =" << z;
  return 0;
}
```

a) x =2, y =5, z =7 b) x =3, y =6, z =5 c) x =4, y =10, z =14 d) None of these.

21. What is the output of the following program?

```
int main ()
{
   int n = 10;
   do
   {
     n /= 2;
     cout << n * n << "  ";
   } while (n != 0);
   return 0;
}
```

a) 25 b) 25 4 1 0 c) 25 4 1 d) Error.

22. What is the output of the following program?

```
int main()
{
  int i = 1, j = 1;
  while(true)
  {
    if (i > 3)
      break;
    else
      j += i;
    cout << j << "  ";
    i += j;
  }
  return 0;
}
```

a) 2 3 b) 2 5 c) Error. d) None of these.

23. How many times "Hi" is get printed?

```
int main()
{
  for(int x=0;x<=5;x++)
  {
    if (x < 3)
      continue;
    else
      break;
    cout << "Hi" << endl;
  }
  return 0;
}
```

a) 3 times b) 5 times c) 6 times d) 0 times

24. What is the output of the following program?

```
int main()
{
  int num[] = {10,9,4,5,-1,3,2};
  int result = 0, i = 0;
  while (num[i] != -1)
    result += num[i++];
  cout << result << endl;
  return 0;
}
```

a) 33 b) 32 c) 28 d) None of these.

25. What is the output of the following program?

```
void mFunction(int a, int &b)
{
  a = 1;
  b = 2;
}
```

```
int main ()
{
  int x = 0;
  mFunction(x, x);
  cout << x << endl;
  return 0;
}
```

a) 0 b) 1 c) 2 d) None of these.

26. What is the output of the following program?

```
int main()
{
  for (int i = 1; i <= 3; i++)
  {
    for (int j = 1; j <= i; j++)
      cout<<"1";
    cout << "\n";
  }
  return 0;
}
```

a) 1
11
111

b) 111111

c) 111
11
1

d) 1
1
1

27. What is the output of the following program?

```
int main()
{
  int i = 0;
  for (i = 0 ; i <= 5 ; i++);
    cout << i << " ";
  return 0;
}
```

a) 0 1 2 3 4 5 b) 0 c) 6 d) Error.

28. What is the output of the following program?

```
int array1[] = { 1200, 200, 2300, 1230, 1543 };
int array2[] = { 12, 14, 16, 18, 20 };
int temp, result = 0;
int main()
{
  for (temp = 0; temp < 4; temp++)
    result += array1[temp];
  for (temp = 0; temp < 4; temp++)
    result += array2[temp];
  cout << result;
  return 0;
}
```

a) 5010 b) 6553 c) 4990 d) None of these.

29. What is the output of the following program?

```
int main()
{
  int i = 4;
  switch (i)
  {
    default: i += 5;
    case 3: i -= 4; break;
    case 8: break;
  }
  i += 5;
  cout << i << endl;
  return 0;
}
```

a) 4 b) 9 c) 5 d) 10

30. What is the output of the following program?

```
int main()
{
  int s = 0;
  while(s++ < 5)
  {
    if(s > 3 && s < 5)
      continue;
    cout << s << " ";
  }
  return 0;
}
```

a) 0 1 2 3 4 5 b) 0 1 2 3 4 c) 1 2 3 4 d) 1 2 3 5