

NAME (Last, First, Init) :

Student No. :

Ollscoil na hÉireann

THE NATIONAL UNIVERSITY OF IRELAND

UNIVERSITY COLLEGE DUBLIN

MID-TERM EXAMINATION – WINTER 1998

MIS 387 : COMPUTER PROGRAMMING TECHNIQUES

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Answer all questions. 100 Marks
(15% of course grade)

1. (12 Marks) Mark with X those Pascal constructs that are **not valid**. Show correct form if possible

1. Writeln(Type in a number); _____
2. i DIV j = (1 + 2 + 3); _____
3. VAR CHARACTER : CHAR; _____
4. CONST x = 'x'; _____
5. x := y + .25; _____
6. a := 10 DIV 5 + a MOD 5 ; _____
7. FOR i:= 1 TO 10 DO BEGIN i:=i DIV 3; END; _____
8. IF y <> 10 THEN BEGIN y := 10;END; _____
9. VAR x = BigINTEGER; _____
10. CONST := VARIABLE; _____
11. CONST xyz=1+2+3; _____
12. WHILE 10 < 9 DO BEGIN i := 0; END; _____

2. (16 Marks) The following program 'draws' a picture. What is it?

```

program MystDraw98;
const
  ch = '*';
var
  i, j : INTEGER;
begin
  for i := 1 to 4 do BEGIN
    for j := 1 to i do BEGIN
      Write(ch);
    end; { FOR j }
    Writeln;
  end; { FOR i }
end;

```

Answer : _____

3. (15 Marks) Determine the output of the following program :

```

program Prog3;
var
  a, b, i, n : integer;
begin
  n := 6;
  a := 0;
  b := 1;
  i := 2;
  while i < n do begin
    a := a+b;
    b := a-b;
    i := i+1;
  end;
  Writeln(a, b);
end.

```

Answer : _____

4. (a) (14 Marks) Transform the following **for**-loop into a **while**-loop :

```
max := -maxint;  
for i := n downto -1 do begin  
  ReadLn(x);  
  if x > Max then begin  
    Max := x;  
  end;  
end;
```

- (b) (4 marks) Explain in one sentence what the program does.

Answer : _____

5. (15 Marks) Write a program fragment that interchanges the values of three integer variables *i*, *j*, *k*. For example, if the variables start with the values *i* = 5, *j* = 9, *k* = 3, then they finish with the the values *i* = 3, *j* = 5, *k* = 9

6. (8 Marks) Write a single Pascal statement that calculates the following expression:

$$y = \frac{\sin(x - \pi) + \cos(x + \pi)}{x^2 - 4 \sin 2x}$$

Answer : _____

7. (16 Marks) Evaluate each of the following expressions.

- | | |
|---|-------|
| 1. $6 + 4/2 + 3$ | _____ |
| 2. $(6 + 4)/(2 + 3)$ | _____ |
| 3. $2/3*4$ | _____ |
| 4. $(26 \text{ MOD } 4) + (26 \text{ DIV } 4)$ | _____ |
| 5. $(9 < 10) \text{ OR } (20 > 10)$ | _____ |
| 6. $('x' + 'y' + 'z')$ | _____ |
| 7. $((9 \text{ MOD } 4) + 2) > 4$ | _____ |
| 8. $(('a' < 'b') \text{ AND } ('x' > 'y'))$ | _____ |