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LITTORAL MATHEMATICS TEACHERS ASSOCIATION

GENERAL CERTIFICATE OF EDUCATION REGIONAL MOCK EXAMINATION

0575 Additional Mathematics 1

MARCH 2020 **ORDINARY LEVEL**

CENTRE NO & NAME	
Candidate No	
Candidate Name	

0570 MATHEMATICS 1: MULTIPLE CHOICE QUESTIONS PAPER

One and a half hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft **HB** pencil and an eraser for this examination.

1. **USE A SOFT HB PENCIL THROUGHOUT EXAMINATION**
2. **DO NOT OPEN THIS QUESTION PAPER UNTIL YOU ARE TOLD TO DO SO.**

Before the examination begins:

3. Check that this question booklet is headed "Ordinary **Level-0575 Additional Mathematics 1'**
4. Insert the information required in the spaces above
5. Insert the information required in the provided on the answer sheet using your HB pencil:
   Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number, Take care that you do not crease or fold the answer sheet or make any mark on it other than those asked for in these instructions.

How to answer questions in the examination:

6. Answer **ALL** the **50** questions. All questions carry equal marks.
7. Calculators are not allowed.
8. Each question has FOUR suggested answers: **A, B ,C and D** . Decide on which answer is correct. Find the number of the question on the answer sheet and draw horizontal line across the letter to join the square bracket to the answer you have chosen.
   For example, if C is your correct answer, mark C as shown here.

[A] [B] [C] [D]

9. Mark only one answer for each question. If you mark more tan one answer you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully then mark your new answer.
10. Avoid spending too much time on any one question. if you find a question difficult, move on to the next question. You can come back to this question later.
11. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
12. Mobile phones are **NOT** allowed in the examination room
13. **You must not take this booklet out of the examination room. All question booklets and answer sheets will be collected at the end of the examination**

1. Compute $\log_3 27$

[A] 9
[B] 3
[C] -9
[D] 24

2. $\log_y\left(\frac{x}{y}\right) \equiv$

[A] $\log_y x$
[B] $\log_y x - \log\left(\frac{1}{y}\right)$
[C] $\log_y x + 1$
[D] $\log_y x - 1$

3. $\left(3\sqrt{5}\right)^2$ is equal to:

[A] 45
[B] 15
[C] $9\sqrt{5}$
[D] $6\sqrt{5}$

4. The expression $4\sqrt{63} - 5\sqrt{28}$ is equal to:

[A] $2\sqrt{7}$
[B] $16\sqrt{7}$
[C] $-\sqrt{35}$
[D] $\sqrt{308}$

5. $\left(\frac{a^4 b}{c^2}\right)^{-\frac{1}{2}}$ is equivalent to:

[A] $-\frac{a^2\sqrt{b}}{c}$
[B] $\frac{a^{\frac{7}{2}} b^{-\frac{1}{2}}}{c^{\frac{1}{2}}}$
[C] $\frac{c\sqrt{b}}{a^2 b}$
[D] $\frac{c}{ba^4}1$

6. The discriminant of the quadratic $x^2 - 6x + 8 = 0$ is:

[A] 68
[B] 4
[C] -4
[D] 0

7. A function $y = ax^2 + bx + c$ is said to have a maximum turning point if and only if

[A] $a > 0$
[B] $a = 0$
[C] $a < 0$
[D] $a \neq 0$

8. If the sum of roots of a quadratic is 3 and its product is -2, then the equation is
[A] $x^2+3x-2=0$
[B] $x^2-3x+2=0$
[C] $x^2-3x-2=0$
[D] $x^2+3x+2=0$

9. If α and β are roots of the equation $x^2-3x+2=0$ the value of $\alpha^2+\beta^2$ is
[A] 11
[B] 13
[C] 5
[D] 21

10. If $h(x)=2x+5$, then $h\circ h(1)$ is equal to
[A] 55
[B] 29
[C] 19
[D] -2

11. The domain of the function $f(x)=\frac{x^2-1}{x}$ is
[A] $\mathbb{R}$
[B] $\mathbb{R}^+$
[C] $\mathbb{R}-\{0\}$
[D] $\mathbb{Z}$

12. If $f(x)=2\sin x$, then $f\left(\frac{\pi}{6}\right)=$
[A] 1
[B] $\sqrt{3}$
[C] -1
[D] $\frac{1}{2}$

13. If $1, y, 9$ are consecutive terms of a G.P where $y>0$, then $y=$
[A] 3
[B] -3
[C] 5
[D] 4

14. The 11th term of the progression 4, 8, 16,....is :
[A] 2^{11}
[B] 2^{10}
[C] 2^{12}
[D] 2^{13}

15. The sum of the first 10 terms of an A.P is 40 and the sum of the first 11 terms is 60, the 11th tem of the progression is
[A] 60
[B] 40
[C] 20
[D] 10

16. The sum of the first n terms of an A.P with first term 1 and common 2 is given as $S_n=$
[A] $n(n+1)$
[B] $(n+1)(n-1)$
[C] n^2+1
[D] $2n$

17. Given that A is an obtuse angle and that $\sin A = \frac{3}{5}$, then $\cos A =$

A. $\frac{3}{5}$

B. $-\frac{3}{5}$

C. $\frac{4}{5}$

D. $-\frac{4}{5}$

18. $\sin 160^0 \equiv$ is

[A] $\sin 20^0$

[B] $\sin 80^0$

[C] $\sin 10^0$

[D] $\sin(-20^0)$

19. $5\cos(2\theta) + 5\sin^2\theta =$

[A] $5\cos^2\theta$

[B] $\cos^2\theta$

[C] $5\cos\theta$

[D] $5\sin^2\theta$

20. $\cos(90^0 - \theta) \equiv$

[A] $\cos\theta$

[B] $\sin\theta$

[C] $\sin(90^o + \theta)$

[D] $\cos(90^o - \theta)$

21. A linear transformation is defined as $T(x, y) = (x - 2y, x + y)$. The transformation matrix $\mathbf{M} =$

[A] $\begin{pmatrix} 1 & -2 \\ 1 & 1 \end{pmatrix}$

[B] $\begin{pmatrix} 1 & 1 \\ -2 & 1 \end{pmatrix}$

[C] $\begin{pmatrix} 1 & 1 \\ 1 & -2 \end{pmatrix}$

[D] $\begin{pmatrix} 1 & 2 \\ 1 & 1 \end{pmatrix}$

22. The image of $(1,2)$ under the transformation $T(x, y) = (3x, x - y)$ is

[A] $(3,3)$

[B] $(3,1)$

[C] $(6,1)$

[D] $(3,-1)$

23. The reflection transformation matrix about the mirror line $y-axis$ is

[A] $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

[B] $\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$

[C] $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

[D] $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

24. The coefficient of y^3 in the expansion of $(1+y)^6$ is

[A] 120
[B] 15
[C] 60
[D] 20

25. The range of values of x for which the expansion of $\left(1-\frac{x}{2}\right)^{10}$ is valid is:

[A] $-2 < x < 2$
[B] $-2 \le x < 2$
[C] $-2 \le x \le 2$
[D] $-\frac{1}{2} \le x \le \frac{1}{2}$

26. The number of terms in the expansion of $\left(x^2+\frac{1}{x^2}\right)^{10}$ is

[A] 10
[B] 11
[C] 12
[D] 9

27. The value of k for which $k\mathbf{i}+4\mathbf{j}$ and $-\mathbf{i}+2\mathbf{j}$ are parallel is;

[A] -8
[B] 2
[C] -2
[D] 8

28. The position vector of the vector equation of the line $\mathbf{r}=(2\mathbf{i}+\mathbf{j})+\lambda(\mathbf{i}-\mathbf{j})$ is

[A] $\mathbf{i}-\mathbf{j}$
[B] $3\mathbf{i}$
[C] $2\mathbf{i}+\mathbf{j}$
[D] $\mathbf{i}+2\mathbf{j}$

29. Given that the magnitude of the vector $k\mathbf{i}+\mathbf{j}$ is $\sqrt{10}$ where $k<0$, the value of k is

[A] 10
[B] -3
[C] 1
[D] -1

30. Given the function f, defined by $f(x)=\frac{x^2}{2}+1$

The value of $f'(-3)$ is

[A] 2
[B] -2
[C] $\frac{11}{2}$
[D] -3

31. The area Acm^2 of an inkblot is increasing so that at time t seconds, $A=3t+3t^2$. The rate of increase of area, in cm^2, when $t=2$ is:

[A] $10cm^2/s$
[B] $24cm^2/s$
[C] $15cm^2/s$
[D] $12cm^2/s$

32. If the line $y=kx-3$ is a tangent to the curve at $y=2x^2-5$ then $(2,3)$ $k=$

[A] 8
[B] -8
[C] $-\frac{1}{8}$
[D] $\frac{1}{8}$

33. The line perpendicular to $x-2y+3=0$ and passing through the point (0,4) has as equation

A. $y=-2x+4$
B. $y=2x-4$
C. $2y=x+8$
D. $y=-2x-4$

34. The perpendicular distance from the origin to the line $4x+3y-10=0$ is

[A] -2
[B] 2
[C] -10
[D] -3

35. The line $x-2y=2$ cuts the $y-axis$ at the point

[A] $(0,-1)$
[B] $(2,-1)$
[C] $(-1,0)$
[D] $(-1,2)$

36. The number of factors of the polynomial $f(x)=ax^3+bx^2+cx+d$ is

[A] 2
[B] 1
[C] 4
[D] 3

37. The remainder when $f(x)=x^3-5x^2+12x+8$ is divided by $(x-1)$ is;

A. 16
B. 7
C. 3
D. 13

38.

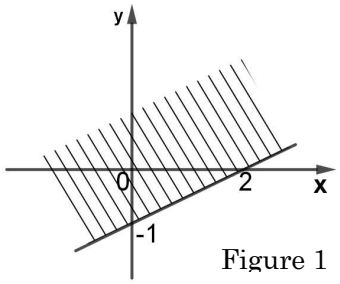

Figure 1

The shaded region for the graph in figure 1 above is represented by

[A] $x-2y<2$

[B] $2x-y\geq 0$

[C] $x-2y\leq 2$

[D] $x-2y-2>0$

39. The solution set for the inequality $\frac{2-3x}{5}\leq 1$ is

[A] $\{x:x\leq 1\}$

[B] $\{x:x\geq -1\}$ ///

[C] $\{x:x>1\}$

[D] $\{x:x<-1\}$

40. $|x-4|<2$ can be expressed as:

[A] $\{x:x<-2 \text{ or } x>6\}$

[B] $\{x:x<2 \text{ or } x>6\}$

[C] $\{x:2<x<6\}$ //

[D] $\{x:-2<x<6\}$

41. $\int_{-2}^{2}(x^3-x)dx\equiv$

[A] 18

[B] 12

[C] 4

[D] 0

42. The area between the curve $y=x^2$, the x-axis, the lines x = 0 and x = 3 is:

[A] 9

[B] 3

[C] 6

[D] 4.5

43. $\int_{0}^{\pi/2}\sin 2x dx\equiv$

[A] $-1/2$

[B] 1

[C] $3/2$

[D] -1

44. $2!3!=$

[A] 6

[B] 6!

[C] 12!

[D] 12

45. A family of 6 is to be seated in a row to take a photograph. The father and mother have to be at either ends. In how many ways can the family be arranged?
[A] 720
[B] 12
[C] 48
[D] 24

46. In how many ways can a committee of 4 men and 3 women be chosen from 7 men and 8 women if a particular man refuses to serve in the same committee as a particular woman?
[A] 1225
[B] 2065
[C] 840
[D] 1960

47. The binary operation $*$ is defined over $\mathbb{Z}$, the set of integers as $x * y = x + y - xy$. The identity element for the operation is
[A] 1
[B] -1
[C] 0
[D] 2

48. Given that $x * y = x^2 - 2y$, then $-3 * -2$ is
[A] -5
[B] 13
[C] 5
[D] -13

49. Let A and B be independent events such that $P(A \cup B) = 0.8$, $P(A) = 0.3$ then $P(B) =$
[A] 0.5
[B] 0.24
[C] 0.71
[D] 0.81

50. A random variable X has the following probability distribution.

x	0	1	2	3	4
$P(X = x)$	0.1	0.3	r	0.3	0.1

The value of r is
[A] 0.2
[B] 0.1
[C] 0.3
[D] 2