REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie

MINISTERE DES ENSEIGNEMENTS SECONDAIRES

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REPUBLIC OF CAMEROON
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MINISTRY OF SECONDARY EDUCATION

TEACHERS' RESOURCE UNIT
REGIONAL BRANCH FOR THE NORTH WEST

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MARCH 2022

The Teachers' Resource Unit and the Regional Inspectorate of Pedagogy, in collaboration with MTA	SUBJECT CODE NUMBER 0575	PAPER NUMBER 1
GENERAL CERTIFICATE OF EDUCATION REGIONAL MOCK EXAMINATION		
CANDIDATE NAME: CANDIDATE NUMBER:.. CENTRE NUMBER: ...	SUBJECT TITLE ADDITIONAL MATHEMATICS	
ORDINARY LEVEL		

Time Allowed: One and a half hours

INSTRUCTIONS TO CANDIDATES:

Mobile phones are **NOT ALLOWED** in the examination room.

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

Before the Examination begins:

3. Check that this question booklet is headed "Ordinary level –0575 code and subject title—ADDITIONAL MATHEMATICS - Paper 1".
4. Insert the information required in the spaces above.
5. Without opening the booklet, pull out the answer sheet carefully from inside the front cover of this booklet. Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.
6. Insert the information required in the spaces provided on the answer sheet using your HB pencil:

Candidate Name, Centre Number, Candidate Number, Subject Code Number, and Paper number

How to answer questions in this examination:

7. Answer ALL the 50 questions in this examination. All questions carry equal marks.
8. Non-programmable calculators are allowed.
9. For each question there are four suggested answers, A, B, C and D. Decide which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen. For example, if C is your correct answer, mark C as shown below:

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

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

1. $a^p \div a^q =$
   A. $a^p - a^q$
   B. $a^{\frac{p}{q}}$
   C. a^{p-q}
   D. $a^p \times q^a$

2. Given that $\log_b a^n = c$, then:
   A. $a^n = b^c$
   B. $a^n = bc$
   C. $bc = an$
   D. $a^n = c^b$

3. $(a - b\sqrt{c})(a + b\sqrt{c}) =$
   A. $a^2 - b^2c$
   B. $2a + 2bc$
   C. $a^2 + b^2c$
   D. $2a - 2b\sqrt{2}$

4. Given that α and β are the roots of the equation $3x^2 - 4x - 7 = 0$, then the sum of the roots is
   A. $\frac{7}{3}$
   B. $\frac{4}{3}$
   C. $-\frac{4}{3}$
   D. $-\frac{7}{3}$

5. The condition for which the quadratic equation $px^2 - qx = -r$, has real roots where p, q and r are constants is:
   A. $q^2 - 4p(-r) \geq 0$
   B. $q^2 + 4pr > 0$
   C. $-q^2 - 4p(-r) > 0$
   D. $q^2 - 4pr \geq 0$

6. The quadratic equation $x^2 - bx + c = 0$ has roots α and β. The value of $\alpha^2 + \beta^2$ is:
   A. $b^2 + c^2$
   B. $b^2 - 2c$
   C. $b^2 + 2c$
   D. $c^2 + b^2$

7. The remainder when $2x^3 - 3x^2 + mx - 4$ is divided by $(x - 2)$ is zero. The value of m is:
   A. 32
   B. 8
   C. -16
   D. 0

8. The quotient when $x^3 - x^2 - 4x + 4$ is divided by $(x - 1)$ is:
   A. $(x - 2)(x + 2)$
   B. $(x - 2)(x - 2)$
   C. $(x + 2)(x + 2)$
   D. $(x - 1)(x + 2)$

9. If the *nth* term of the progression $2, 5, 8, \ldots$ is 65. Then the value of n is :
   A. 50
   B. 15
   C. 22
   D. 20

10. The sum of the first n terms of a sequence is : $S_n = 2n^2 + 3n, U_2 =$
   A. 5
   B. 9
   C. 13
   D. 14

11. The sum to infinity of a G.P with first term 12 and common ratio $\frac{3}{4}$ is:
   A. 9
   B. 3
   C. $\frac{51}{4}$
   D. 48

12. $\sum_{r=1}^{4}(3r + 1) =$
   A. 13
   B. 4
   C. 10
   D. 34

13. The coefficient of x^2 in the binomial expansion of $(1 - 2x)^{10}$ is:
   A. 180
   B. -180
   C. 360
   D. -360

14. The term independent of x in the binomial expansion of $(2 + x)^5$ is:
   A. 2
   B. 5
   C. 32
   D. 6

15. The number of ways in which the letters of the word "CHARACTER" can be arranged is:
   A. 9!
   B. $\frac{9!}{2!2!2!}$
   C. $\frac{9!}{2!2!}$
   D. $\frac{9!}{6!}$

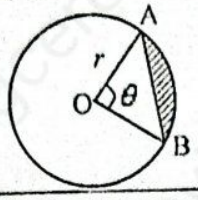
16. The number of ways in which an executive of 3 is to be chosen from 5 boys is:
   A. $\frac{5!}{3!}$
   B. $\frac{5!}{2!}$
   C. $\frac{5!}{3!2!}$
   D. $\frac{3!}{2!}$

17. $cos2\theta =$
   A. $cos^2\theta + sin^2\theta$
   B. $2cos^2\theta - 1$
   C. $sin2\theta$
   D. $\frac{1}{2}sin2\theta$

18. $\frac{5\pi}{6}$ in degrees is:
   A. 300^0
   B. 180^0
   C. 270^0
   D. 150^0

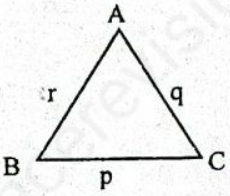
19. The quadrant in which $cosx$ and $tanx$ are both negative is:
A. First quadrant
B. Second quadrant
C. Third quadrant
D. Fourth quadrant

20. The area of the segment of a circle with radius r that subtends an angle θ at the centre, O, is:
A. $r\theta$
B. $\frac{1}{2}r^2\theta$
C. $\frac{1}{2}r^2(\theta - sin\theta)$
D. $r^2\theta$



21. The value of $0° \leq \theta \leq 180°$, for which $sin\theta = \frac{\sqrt{3}}{2}$ is:
A. 30^0
B. 60^0
C. 90^0
D. 120^0

22. From the diagram, the angle B is given by
A. $\frac{sinA}{p} = \frac{sinB}{q} = \frac{sinC}{r}$
B. $\frac{p}{sinA} = \frac{sinB}{q} = \frac{sinC}{r}$
C. $\frac{p}{sinA} = \frac{B}{sinq} = \frac{sinC}{r}$
D. $\frac{p}{sinA} = \frac{B}{sinq} = \frac{C}{sinr}$



23. Given that the midpoint of the line joining the points $P(a,5)$ and $Q(3,-7)$ is $(-2,-1)$. The value of a is:
A. -7 B. -2
C. 1 D. 3

24. The distance between the points $(-3,-2)$ and $(-1,-5)$ is:
A. $\sqrt{65}$
B. 13
C. 1
D. $\sqrt{13}$

25. The equation of the straight line joining the points $(-1,6)$ and $(5,-3)$ is
A. $3x + 2y = -15$
B. $3x + 2y = -9$
C. $3x + 2y = 9$
D. $3x + 2y = 15$

26. The angle θ between two lines $L_1: y = m_1x + c_1$ and $L_2: y = m_2x + c_2$ with gradients m_1 and m_2 is:
A. $tan\theta = \frac{m_2}{m_1}$
B. $tan\theta = \frac{m_2 - m_1}{1 + m_1m_2}$
C. $tan\theta = \frac{m_2 + m_1}{1 - m_1m_2}$
D. $tan\theta = m_1m_2$

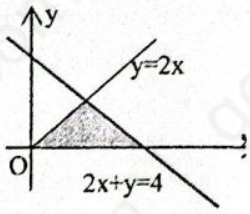
27. The perpendicular distance from the point $(3,4)$ to the line $2x - y - 3 = 0$ is:
A. $\frac{\sqrt{5}}{5}$ B. $-\frac{\sqrt{5}}{5}$
C. $\frac{8}{\sqrt{5}}$ D. $-\frac{8}{\sqrt{5}}$

28. The range of values of x for which $3 < 2x + 5 \leq 9 + x$ is:
A. $-2 < x < 5$
B. $-2 \leq x \leq 5$
C. $-2 \leq x < 5$
D. $-2 < x \leq 5$

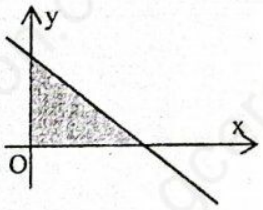
29. The range of values of x for which $(2x + 1)(x - 3) > 0$ is:
A. $-\frac{1}{2} < x < 3$
B. $x < -\frac{1}{2} \cup x > 3$
C. $x < -\frac{1}{2} \cup x < -3$
D. $x < -3 \cup x > \frac{1}{2}$

30. The range of values of x for which $|2x + 5| \leq 11$ is:
A. $-8 \leq x \leq 3$
B. $x \leq -8$ or $x \geq 3$
C. $x > 8$ or $x < -3$
D. $-8 < x < 3$

31. The set of inequalities that satisfies the shaded region is:
A. $\{y: y \geq 0, y \leq 2x, 2x + y < 4\}$
B. $\{y: y \geq 0, y \leq 2x, 2x + y \geq 4\}$
C. $\{y: y \geq 0, y \leq 2x, 2x - y < 4\}$
D. $\{y: y \geq 0, y \leq 2x, 2x + y \leq 4\}$



32. The shaded region is bounded by the inequalities $x \geq 0, y \geq 0$ and $x + y \leq 5$. The maximum value of the objective function $f = 2x + 3y$ is:
A. 0
B. 10
C. 15
D. 25



33. Given that the functions f and g are such that $f: x \mapsto 2x + 3$ and $g: x \mapsto x^2 - 1$, where $x \in R$, then $fg(2)$:
A. 39
B. 3
C. 48
D. 9

34. Given the function $f: x \mapsto \sqrt{x^2 + 1}$, $f^{-1}(x) =$
A. $\sqrt{x^2 + 1}$
B. $x^2 - 1$
C. $x^2 + 1$
D. $\sqrt{x^2 - 1}$

35. Given the matrix $\begin{pmatrix} 2 & -5 \\ 1 & -3 \end{pmatrix}$, the image of the point $(3,5)$ under this transformation is:
A. $(9,-40)$
B. $(-19,-12)$
C. $(31,18)$
D. $(21,18)$

36. A transformation T is defined by $T:(x,y) \rightarrow (4x-3y,-2x)$. The matrix represented by T is:

A. $\begin{pmatrix} 4 & 0 \\ -2 & -3 \end{pmatrix}$

B. $\begin{pmatrix} 4 & -3 \\ -2 & 0 \end{pmatrix}$

C. $\begin{pmatrix} 4 & 3 \\ 2 & 0 \end{pmatrix}$

D. $\begin{pmatrix} 4 & 2 \\ -3 & 0 \end{pmatrix}$

37. Which of the following is an invariant point under the transformation matrix T where $T = \begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$ is:

A. $(1,1)$

B. $(1,-1)$

C. $(-1,-1)$

D. $(2,2)$

38. The binary operation $*$ is defined over the set of real numbers, **R** by $m * n = n * m$. The operation $*$ is:

A. Commutative B. Associative

C. Distributive D. Closed

39. Given that the binary operation $*$ is defined over the set of real numbers, **R** as $a * b = \frac{ab}{2}$. The identity element is:

A. 1

B. 0

C. 2

D. $\frac{1}{2}$

40.

$*$	f_1	f_2	f_3	f_4
f_1	f_1	f_2	f_3	f_4
f_2	f_2	f_1	f_4	f_3
f_3	f_3	f_4	f_1	f_2
f_4	f_4	f_3	f_2	f_1

Given that from the operation table the set $S = \{f_1, f_2, f_3, f_4\}$ forms a group under $*$, then a subgroup of S is:

A. $\{f_2, f_4\}$

B. $\{f_3, f_4\}$

C. $\{f_2, f_3,\}$

D. $\{f_1, f_4\}$

41. A unit vector in the direction of $6i - 8j$ is:

A. $\frac{6}{10}i - \frac{8}{10}j$

B. $\frac{6}{10}i + \frac{8}{10}j$

C. $\frac{10}{8}i + \frac{10}{6}j$

D. $\frac{10}{6}i - \frac{10}{8}j$

42. A line passes through the point P(1,5) and has direction vector $\begin{pmatrix} 3 \\ 2 \end{pmatrix}$. The parametric equation of the line is:

A. $x = 1 + 3t, y = 5 + 2t, t \in R$

B. $r = i + 5j + t(3i + 2j)$

C. $x + y = 6 + 5t, t \in R$

D. $x + 5y = 5$

43. Given that the vectors $p = 4i - 6j$ and $q = -\lambda i + 8j$ meets at 90^0. The value of λ is:

A. 45^0

B. 12

C. -12

D. 2

44. The angle between two vectors $\vec{a}$ and $\vec{b}$ is given by :

A. $\theta = \sin^{-1}|(\vec{a}.\vec{b})|$

B. $\theta = \cos^{-1}|\vec{a} \times \vec{b}|$

C. $\theta = \sin^{-1}\frac{\vec{a}.\vec{b}}{|\vec{a}||\vec{b}|}$

D. $\theta = \cos^{-1}\frac{\vec{a}.\vec{b}}{|\vec{a}||\vec{b}|}$

45. $\frac{d}{dx}(ax^n) =$

A. ax^{n+1}

B. ax^{n-1}

C. anx^{n+1}

D. anx^{n-1}

46. $\frac{d}{dx}\left(\frac{x^3+5}{x}\right) =$

A. $\frac{3x^2}{x^2}$

B. $3\frac{x^4}{4} + 5x$

C. $2x^2 + \frac{5}{x}$

D. $\frac{2x^3-5}{x^2}$

47. The value of x at which the function $y = 2x^3 + 3x^2 - 12$ has a minimum value is:

A. 0

B. -1

C. 1

D. -6

48. $\int x^n dx =$

A. $nx^{n-1} + k$

B. $nx^{n+1} + k$

C. $\frac{x^{n+1}}{n+1} + k$

D. $\frac{x^{n-1}}{n-1} + k$

(where k is an arbitrary constant of integration)

49. $\int_0^{\pi} 3\cos\theta d\theta =$

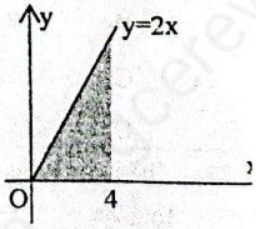
A. 3

B. 0

C. -3

D. -4

50. The area bounded by the curve $y = 2x$ and the ordinates $x = 0$ and $x = 4$ is;



A. 16

B. 8

C. 2

D. 0

END GO BACK AND CHECK YOUR WORK