# MARKING GUIDE ADD MATHS 0575

## PAPER 1 AND 2

**PAPER 2**

**SECTION A**

1)i) $2^{2x} - 5(2^x) + 4 = 0$

Let $y = 2^x$

$y^2 - 5y + 4 = 0$

$x = 2,\ x = 0$ **M1A1M1A1**

ii)a) $\alpha + \beta = \frac{7}{3},\ \alpha\beta = \frac{1}{3}$ A1

b) Equation: $3x^2 + 5x - 1 = 0$ **M1M1A1**

2) i) MATHEMATICS

No of ways $= \frac{11!}{2!2!2!}$

$= 4989600ways$ **M1M1A1**

ii)a) $f(x) = (1 + 3x)^{-1}$

$= 1 - 3x + 9x^2$ **M1M1A1**

b) Expansion valid for

$\frac{-1}{3} < x < \frac{1}{3}$ **M1A1**

3)i)a) $T_{12} = 15000 + 11d$

$15000 + 11d = 235000$

$d = 20000$ **M1M1A1**

b) Total amount, $S_{12} = 1500000FCFA$

M1A1

ii) $\frac{2-\sqrt{2}}{2+2\sqrt{2}} = \frac{(2-\sqrt{2})(2-2\sqrt{2})}{(2+2\sqrt{2})(2-2\sqrt{2})}$

$= -2 + \frac{3}{2}\sqrt{2}$ **M1M1A1**

4)i)a) Table **3marks divisible.**

b) $e = 1$ **A1**

ii)a) $M^{-1} = \frac{1}{-7}\begin{pmatrix}-1 & -2\\ -3 & 1\end{pmatrix}$ **M1A1**

b) Point$=\frac{1}{-7}\begin{pmatrix}-1 & -2\\ -3 & 1\end{pmatrix}\begin{pmatrix}7\\ 7\end{pmatrix}$

point = (3, 2) **M1A1**

5) a) $2y \geq x,\ 3y \leq x$

$5x + 2y \leq 20,\ x + y \geq 6$ **M1A1,1**

b) Graph, **3 mks divisible**

c) Max value

$h = 40x + 20y$

$h = 40(3) + 20(5)$

$h = 220$ M1A1

6) i) $sin(2x - 3^0) = \frac{1}{2}$

PV = $30^0$

G.S:

$2x - 30^\circ = (-1)^n 30^\circ + 180^\circ n$

$x \in \{30^\circ, 90^\circ\}$ **M1M1A1**

ii) a) Table; **3mks divisible**

b) Graph: (scale, plot and shape) **3mks divisible**

c) Max. value = 2.2 **A1**

7) a) Point of intersection

$r_1 = r_2,\ \alpha = -1,\ \beta = \frac{1}{3}$

$\overrightarrow{OP} = 4i - 2j$

M1A1M1A1

b) $cos\theta = \frac{d_1 \cdot d_2}{|d_1||d_2|}$

$\theta = 153.4^0$ **M1M1M1A1**

8) i)a) $\frac{dy}{dx} = (2x + 5)^{-\frac{1}{2}}$

M1A1

b) $\frac{dy}{dx} = 9x^8 + 7x^6 - 4x$ **M1M1A1**

C) $\int_1^2 (3x^2 + 2)dx$

$= x^3 + 2x]_1^2 = 9$ **M1A1M1A1**

**SECTION B**

9)i) a) $r = [(4t + 4t^2)i + 3t^2 j]$m

$Vel = \frac{dr}{dt}$

$= [(4 + 8t)i + 6tj]ms^{-1}$

$Acc = \frac{dv}{dt} = (8i + 6j)ms^{-2}$

$|Acc| = \sqrt{8^2 + 6^2} = 10ms^{-2}$ **M1M1M1A1**

b) $F = ma = 2(10) = 20N$ **M1A1**

$cos\theta = \frac{v \cdot A}{|v||A|}$

$\theta = 16.3^0$ **M1M1M1A1**

ii) a) $60 - T = 6a$ ….(1)

$T - 20 = 2a$ . . . (2)

$a = 5\ ms^{-2}$ **M1M1A1**

b) $T = 30N$ **M1A1**

c) $R = 2T = 2(30)$

$= 60N$ **M1A1**

10) i)a) $v - t\ graph$ **3mks divisible**

b) $Acc = Area\ of\ triangle$

$= \frac{1}{6}ms^{-2}$ **M1A1**

c) Total disc $= Area\ under\ graph = 9000m^2$ **M1M1A1**

ii) a) mom before = mom after

$2(30) + 4(10) = 2(10) + 4v$

$v = 20ms^{-1}$

b) lost in k.e $= k.e_{Bf} - k.e_{Af}$

$= 1100J - 900J = 200J$ **M1M1A1**

iii) $\frac{dh}{dt} = \frac{dh}{dv} \cdot \frac{dv}{dt}$

$= \frac{1}{\pi r^2} \times 0.9\pi = 10ms^{-1}$ **M1M1A1**

11) i) a) Diagram **M1A1**

b) moment about A

$4R_w sin30^\circ = 50(2)cos30^\circ$

$R_w = 43.3N$ **M1M1M1A1**

c) $R_w = \mu R_g$

$\mu = \frac{\sqrt{3}}{2} = 0.87$ **M1M1A1**

ii) a) $F - R = ma$

At max. speed, $a = 0$

$F = R = \frac{p}{v}$

$R = \frac{200000}{40} = 5000N$

b) $F = 10000sin\theta$

$\frac{p}{v} = 10000(\frac{1}{4})$

$v = 80\ ms^{-1}$ **M1M1M1A1**

**SECTION C**

12) a) Histogram **M1M1A1**

Mode = 34 **M1M1A1**

b) Graph : **M1M1A1**

median = 35 **A1**

c) S. I. R $= \frac{Q_3 - Q_1}{2} = \frac{43 - 27}{2} = 8$

M1M1M1A1

d) $mean = \frac{2120}{60} = 35$ **M1M1A1**

13) i)a)Table: **2mks divisible**

b) $\sum P(X = x) = 1$

$k = \frac{1}{36}$ **M1A1**

c) $E(X) = \sum xP(X = x)$

$117(\frac{1}{36}) = \frac{13}{4}$ **M1A1**

$Var(X) = E(X^2) - ((E(X))^2$

$147(\frac{1}{36}) - (\frac{13}{4})^2 = \frac{121}{48}$ **M1A1**

d) $P(X < 4) = 1 - P(X \geq 4)$

OR $P(1) + P(2) + P(3) = \frac{7}{12}$ **M1A1**

ii)a) $E(X) = np$

$4 = 0.2p$

$p = 20$ M1A1

b) $Var(X) = npq$

$= 10(0.2)(0.8) = 3.2$ M1M1A1

14) i)a) $P(A \cap B) = P(A) + P(B) - P(A \cup B)$

$= \frac{1}{4} + \frac{1}{3} - \frac{1}{2}$

$P(A \cap B) = \frac{1}{12}$ M1M1A1

b) $P(A' \cap B) = P(B) - P(A \cap B$

$= \frac{1}{3} - \frac{1}{12} = \frac{1}{4}$ M1M1A1

$P(B/A) = \frac{P(A \cap B)}{P(A)}$

$= \frac{1}{12} \div \frac{1}{4} = \frac{1}{3}$

M1A1

ii) a) Diagram: 3mks divisible

b) P(Red ball from A)= $\frac{75}{100} + \frac{50}{100} = \frac{3}{8}$ M1M1A1

c) P(Green)= $P(A \cap G) + P(B \cap G) = \frac{75}{100} + \frac{50}{100} + \frac{25}{100} + \frac{50}{100} = \frac{19}{40}$ M1M1A1

**PAPER 1, MCQS**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **B** | 11 | **C** | 21 | **C** | 31 | **B** | 41 | **C** |
| 2 | **C** | 12 | **B** | 22 | **C** | 32 | **C** | 42 | **B** |
| 3 | **D** | 13 | **A** | 23 | **C** | 33 | **A** | 43 | **D** |
| 4 | **A** | 14 | **A** | 24 | **B** | 34 | **C** | 44 | **C** |
| 5 | **D** | 15 | **D** | 25 | **B** | 35 | **A** | 45 | **B** |
| 6 | **B** | 16 | **C** | 26 | **D** | 36 | **A** | 46 | **B** |
| 7 | **C** | 17 | **A** | 27 | **C** | 37 | **D** | 47 | **B** |
| 8 | **D** | 18 | **D** | 28 | **A** | 38 | **C** | 48 | **C** |
| 9 | **B** | 19 | **D** | 29 | **C** | 39 | **C** | 49 | **C** |
| 10 | **A** | 20 | **B** | 30 | **D** | 40 | **A** | 50 | **A** |

**END**

**GRADE BOUNDARIES**

| U | E | D | C | B | A |
|---|---|---|---|---|---|
| $\leq 34.9$ | $\leq 44.9$ | $\leq 49.9$ | $\leq 59.9$ | $\leq 74.9$ | $\geq 75$ |