Somali Federal Ministry of Education, Culture & Higher Education

Form Four National Standardized Examinations.

MAY / JUNE 2022

SUBJECT: MATH

TIME 2 HOURS

INSTRUCTION: Answer all questions in the **ANSWER BOOKLET**

Part one: Circle the letter of the correct answer (50 marks)

1. $cosAcosB - sinAsinB$ *is*

   A. $\sin(A+B)$ B. $\cos(A+B)$ C. $\cos(A-B)$ D. $\sin AcosB$

2. The exact value of $cos30°$ **By** using half angle formula is

   A. $\frac{2}{\sqrt{3}}$ B. $\frac{\sqrt{2}}{2}$ C. $\frac{1}{2}$ D. $\frac{\sqrt{3}}{2}$

3. The probability of failing exam is $P(F) = 0.1$, then the probability of passing exam is

   A. 0.8 B. 0.9 C. 0.7 D. 0.6

4. The number of ways that five textbooks can be arranged on a shelf is

   A. 140 B. 120 C. 130 D. 150

5. The imaginary part of the complex number $z_1 = 2 + 3i$ is

   A. $Im(z) = 2$ B. $Im(z) = 3i$ C. $Im(z) = i$ D. $Im(z) = 3$

6. If $z_1 = 2 - 5i$ and $z_2 = 1 + 4i$ then the addition of z_1 *and* z_2 is

   A. $4 - i$ B. $3 + i$ C. $3 - i$ D. $4 + i$

7. The marks of Maryam of six subjects in standard eight class was 24 , 26,35 , 28, 50, 14 The range is

   A. 16 B. 36 C. 18 D. 34

8. If the variance of a data was 49 , then the standard deviation is

   A. 49 B. 48 C. 7 D. 6

9. The exact value of $\lim_{x\to 0} 18$ equals

   A. 0 B. 1 C. 180 D. 18

10. The exact value of this $\lim_{x\to-\infty}\left(2-\frac{1}{x}\right)$ will be:

    A. 1 B. $\frac{1}{2}$ C. 2 D. -2

11. If a givEn function of $y = 6x^2 - 8x + 1$ then $\frac{dy}{dx}$ is

A. $\frac{dy}{dx} = 12x + 8$ B. $\frac{dy}{dx} = 12x - 8$ C. $\frac{dy}{dx} = 12x^2 + 8$ D. $\frac{dy}{dx} = 12x$

12. The derivative of 40

A. $40x$ B. $40x + c$ C. 0 D. -40

13. The integration of $\int 2dx$ is equal

A. $2x$ B. 2 C. $2x + c$ D. $2x^2 + c$

14. The conjugate of $3 + i$ *is*

A. -3 B. $3 - 5i$ C. $-3 + i$ D. $3 - i$

15. The number of 2 letter permutation that can be formed from the letters in the word BURCO.

A. 20 B. 7 C. 8 D. 10

16. The value of $\int_1^2 5x^3 dx$ equals

A. $\frac{4}{65}$ B. $-\frac{73}{4}$ C. $\frac{75}{4}$ D. $\frac{4}{75}$

17. In how many ways can Amarn, Fardowsa and Zeynab arrange themselves in queue?

A. 4 B. 6 C. 5 D. 8

18. The value of $sinx + 2 = 3$ will be:

A. $180°$ B. $270°$ C. $90°$ D. $45°$

19. In the recent presidential election of Somalia, five candidates got the following votes in the first round of election: Hassan sheikh Mohamud 52, Farmajo 59 , Khaire 47, Deni 65

The mean of their votes is

A. 70 B. 50 C. 55.75 D. 45

20. The coordinate of stationary point of the given function $y = x^2 - 4x$ is

A. (2, -2) B. (2,4) C. (-4,2) D. (2, -4)

21. Hafsa has five grades from assessments and quizzes. They are all weighted equally. If her grades are 50, 70, 88, 70, and 88, what is her current average grade?

A. 73.2 B. 61.3 C. 91.5 D. 88.4

22. If an event is impossible , then its probability will be

A. 1 B. 0 C. 0.1 D. 0.5

23. The integration of $\int sinxdx$ is

A. $cosx + c$ B. $-cosx + c$ C. $tanx + c$ D. $cscx + c$

24. Mohamed has the following scores of the subject 60, 70, 80, 50, 80, his mode of score is

A. 70 B. 80 C. 60 D. 59

25. The exact value of $cos40°cos50° - sin40°sin50°$ is

A. -1 B. 0 C. -1 D. ∞

Part two: Match Column A with Column B (10 marks)

Column A	Column B
1. The integraL of $\int \frac{3}{x} dx$ is	(3) 10
2. A box contains 3 math papers, 2 physics, and 4 chemistry papers. The probability of getting math paper is	(4) i
3. The modulus of $8 + 6i$ is	(1) $3lnx + c$
4. The value of $[\cos\frac{\pi}{4} + i\sin\frac{\pi}{4})^2$ is	(6) 2×3
5. The exact value of $\lim_{x\to 0} \frac{sinx}{x}$ equals	(8) 120
6. The order of this matrix $A = \begin{bmatrix} 3 & 2 & 1 \\ 0 & 4 & 5 \end{bmatrix}$ is	(2) $\frac{1}{3}$
7. If a given function of $y = 6x^2 - 8x + 1$ then $\frac{dy}{dx}$ is	(5) 1
8. The number of ways can 5 textbooks arranged on a shelf is	(9) $sinAcosA$
9. $\frac{1}{2}sin(2A)$	(10) $x + c$
10. The value of $\int dx$ is	(7) $\frac{dy}{dx} = 12x - 8$

Part three: Structure Questions (40 Marks)

Question one: Analytic trigonometry

1. Use identities to identify the exact value of $\cos(-105°)$ _____(3 marks)
2. Express $\sin 3x$ in terms of $\sin x$ _____(3 marks)
3. Simplify the expression $\frac{1-\cos 5x}{\sin 5x}$ _____(3 marks)
4. Find the values of $tan2\theta$ if the$\cos\theta = \frac{3}{5}$ and $\sin\theta < 0$. _____(3 marks)

Question two: Statistics

1. The following are marks of mathematic students, describe the range._____(4 marks)
   29, 54, 54, 64, 74.
2. Determine the mean , variance and standard deviation of the temperature reading below
   $15°C$, $16°C$, $17°C$, $18°C$, $19°C$, $20°C$, $22\,°C$, $24°C$ _____(4 marks)

Questions three: Complex Numbers

1. Simplify each of the following _____(4 marks)

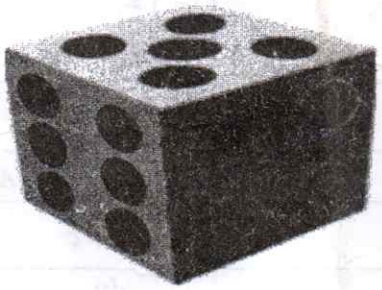
   a) i^3 b) i^7

2. Add the following complex numbers $z_1 = 7 + 5i \; and \; z_2 = -1 + 0i$ _____(3marks)

3. Write $\frac{1+3i}{4-i}$ in terms of $a + bi$ _____(3 marks)

Question four: Probability

1. If you were to roll the die one time what is the probability of it landing on a 2?___(5 marks)



2. In a class, there are 12 boys and 16 girls. One of them is called out using student registration number, what is the probability that the one called is a girl? ___(5 marks)