DEFENCE SERVICES TECHNOLOGICAL ACADEMY

ENTRANCE EXAMINATION

ENGLISH SAMPLE QUESTION

Date: - -   **Time Allowed: 2 hours**

ANSWER ALL QUESTIONS

I. **Read the passage.**

Stress, itself, is not an illness, but it can certainly **contribute** to illness, some of them serious. When you feel under stress, your body produces more of the hormones, adrenaline and cortisol. As a result, the body needs more oxygen and your heart rate and blood pressure go up. At its most **serious,** this can lead to heart problems, but stress is also related to weight problems, coughs and colds. Scientists have also discovered that stress can lead to the loss of brain cells.

The most **common** cause of stress is over-work, but a **difficult** boss or problems with your colleagues are also common causes. Some jobs are more stressful than others, with teachers and police officers at the top of the scale and beauty therapists at the bottom. From time to time, we hear of celebrities suffering from stress, football managers like Kenny Dalglish or the American actress, Winona Ryder. But stress can affect us all and the figures prove it. 40 million working days are lost in the UK every year because of stress-related illnesses. What is more, people who are suffering from stress do not work as well as usual. The situation is so serious that some companies now offer relaxation and stress management classes.

If you think you, too, are suffering from stress, it's important to know if it is causing your health problems. If it is, see your doctor and talk about it.

(A) **Find the bold-faced words in the passage that are similar in meaning to the following.   (5 marks)**

(1)   hard to manage; uncooperative   a. …………….
(2)   emotional pressure suffered by a human being or other animal   b. …………….
(3)   to give something that is, or becomes part of a larger whole   c. …………….
(4)   important; weighty; not insignificant   d. …………….
(5)   occurring or happening regularly or frequently; usual   e. …………….

(B) **Answer the following questions. Give complete answers.   (10 marks)**

(1)   What and how can stress contribute?
(2)   What happens to your body when you feel under stress?
(3)   What are common causes of stress and what is the most one?
(4)   Describe the most stressful jobs at the top and bottom level.
(5)   What happen to the companies in the UK every year because of stress-related illnesses and what do some of them do?

II. **Complete the sentences with the appropriate words. The initial letters are given.   (30 marks)**

(1)   When he is unkind or cruel to her, she feels **m**……….
(2)   One of the **a**……..of working here is the difficulty of parking near the office.
(3)   The long wait only added to our **e**………
(4)   All men in the world are seeking happiness and life **s**………...
(5)   If you have honesty and integrity, you will have emotional **s**……….
(6)   Her natural **r**…….helps her to overcome the crisis.
(7)   Emotionally healthy people can **c**…………with life's challenges.
(8)   She is still **un**………….   on her feet after the illness.
(9)   He gave a **m**………….answer to the customer in spite of his annoyance.
(10) The ability to keep calm is one of her many **s**………….
(11) To acquire manners, home may be regarded as the **b**………of them.
(12) Children acquire their elders' manners because they **i**……… the manner of them.
(13) Children will grow up to be **c**…………and rude due to crudeness and rudeness of the elders around them.
(14) When the **e**………around children behave gently and politely, they become gentle and polite.
(15) Saying and doing of children depends on hearing and **s**………from the elders around them.

III. **Rewrite the sentences according to the instructions given in brackets.** **(20 marks)**

   (1) He drives so skillfully that the passengers feel safe and secure. (Rewrite the sentence using 'such - that')

   (2) No sooner did she step out of the car than it began to rain. (Rewrite the sentence using 'as soon as')

   (3) Everytime she comes to Yangon, she visits the Shwedagon Pagoda. (Rewrite the sentence using 'whenever')

   (4) That man is my neighbour U Mya. His son is a doctor. (Rewrite, joining the pair of sentences with suitable relative pronouns.)

   (5) The great storm destroyed some parts of our company. It broke out ten years ago. (Rewrite, joining the pair of sentences with suitable relative pronouns.)

   (6) The class teacher punished Mg Mg. He is standing in front of the class. (Rewrite, joining the pair of sentences with suitable relative pronouns.)

   (7) That Journal describes about a girl. She ran from home two weeks ago. (Rewrite, joining the pair of sentences with suitable relative pronouns.)

   (8) Although he is rich, he never lends us any money. (Rewrite the sentence using "no matter how")

   (9) My friend is sympathetic as well as understanding. (Rewrite the sentence using "not only__but also')

   (10) They cannot play outside. It rains heavily. (because of) (Rewrite the sentence using the linking words given in bracket.)

IV. **Complete the dialogue with expressing given in the box. There is an extra.** **(10 marks)**

Don't you have	Have you tried	I have an idea
I don't know what to do	Yes, please do	Maybe I could

   (1) **A:** You look very worried. What's wrong?
   B: -------------------. I've lost everything about my power point presentation for this afternoon.
   (2) **A:** ------------------- it saved on your computer?
   B: No. it was taking up a lot of space, so I saved it in my flash drive.
   (3) **A:** Can I make a suggestion?
   B: -----------------------------.
   (4) **A:** ----------------do a big office search for you? I'm good at finding things.
   B: There are confidential documents in this office - non-staff are not allowed to see them.
   (5) **A:** --------------asking your colleagues if they've seen the memory stick?
   B: I did. They haven't.

V. **Choose a situation given below and write a letter. Do not write more than 300 words.** **(10 marks)**

You are **Mg Kaung Myat.** You live at **No. 10, Main Road, Yangon**. Write to your friend, **Mg Myint Lwin**, telling him you intend to visit Pyin Oo Lwin and Mandalay and invite him to accompany you.

(OR)

You are **Zaw Zaw**. You live at **No. 75, Strand Road, Yangon**. Write a letter to your brother, **Aung Zaw**, who has a good home library, asking him to guide you what books should be read.

VI. **Write an essay on *ONE* of the following. Do not write more than 500 words.** **(15 marks)**

My Aim in Life

(OR)

Why We Should Have Positive Emotions

(OR)

The Importance of English

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DEFENCE SERVICES TECHNOLOGICAL ACADEMY

ENTRANCE EXAMINATION

MATHEMATICS SAMPLE QUESTION

Date: - -   **Time Allowed: 2 hours**

Attempt all questions

1. Choose the correct or the most appropriate answers for each question. Write only the letter of answer.

(20 marks)

(a) If $z_1 = a + 3i$, $z_2 = -2 - 3i$ and $z_1 z_2 = 7 - 9i$, then a is

    A. 1   B. 0   C. 4   D. 2

(b) If $z_1 = 1 - 3i$, $z_2 = -3 - bi$ and $z_1 \bar{z}_2 = 9 + 13i$, then b is

    A. 2   B. 3   C. 4   D. 5

(c) The distance between two points $(3, 2, -2)$ and $(7, 4, 2)$ is

    A. 5   B. 6   C. 7   D. 8

(d) The equation of the plane containing the point $(-5, -8, 22)$ and parallel to xz-plane is

    A. $x = -5$ B. $y = -8$ C. $z = 22$ D. $z = 0$

(e) If $\vec{a} = \begin{pmatrix} -1 \\ 1 \\ 4 \end{pmatrix}$ and $\vec{b} = \begin{pmatrix} 2 \\ 0 \\ -2 \end{pmatrix}$, then $\vec{a} - \dfrac{3}{2}\vec{b}$ is

    A. $\begin{pmatrix} 2 \\ 1 \\ 1 \end{pmatrix}$ B. $\begin{pmatrix} 2 \\ -1 \\ 1 \end{pmatrix}$ C. $\begin{pmatrix} -4 \\ 1 \\ 7 \end{pmatrix}$ D. $\begin{pmatrix} 1 \\ -1 \\ 2 \end{pmatrix}$

(f) If $\overrightarrow{PQ} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$ and P is $(-2, 4, 3)$, then Q is

    A. $(-1, 6, 6)$ B. $(1, -6, -6)$ C. $(1, 6, 6)$ D. $(-1, -6, -6)$

(g) How many 2-digit positive integers are there such that the sum of their two digits is divisible by 4?

    A. 21   B. 22   C. 23   D. 24

(h) The number of ways of selection two numbers from the set $\{1, 2, ..., 12\}$ whose sum is divisible by 3 is

    A. 66   B. 16   C. 6   D. 22

(i) The directrix for the equation $(y - k^2) = -4p(x - h)$ is

    A. $x = h - p$ B. $x = h + p$ C. $y = k - p$ D. $y = k + p$

(j) The end point of latus rectum of the parabola $y^2 - 8x = 0$ are

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

(k) The range of the function $y = 2\sec x + 3$ is

    A. R B. $\{y / -1 \le y \le 5\}$ C. $\{y / y \le 1 \text{ or } y \ge 5\}$ D. $\{y / -5 \le y \le 0\}$

(l) The period of the function $y = 3\cos \pi(x + 1) + 2$ is

    A. 1   B. 3   C. 2   D. π

(m) The graph of $y = \log_{10} x$ is vertical scaling of the graph $y = \log_2 x$ with scale factor

    A. $\dfrac{1}{\log_{\frac{1}{2}} 10}$ B. $\log_2 10$ C. $\dfrac{1}{\log_2 10}$ D. $\log_{\frac{1}{2}} 10$

(n) In exponential function $y = 4^{-x}$, when x becomes large, the value of y close to

    A. 1   B. 0   C. 2   D. none of these

(o) Tangents are drawn to the curve $y = \sec x$ from the origin. Then the point of contact lies on the curve $\dfrac{1}{x^2} - y^2 = \lambda$. The value of λ is equal to

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

(p) How many inflection points are there in the graph of $x^4 - 24x^2 + 12$?

    A. 0   B. 1   C. 2   D. 3

(q) The antiderivative of $2^x \, ln\, 2$ is

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

(r) Evaluate $\displaystyle\int \dfrac{dx}{x\,ln\,x}$

    A. $\ln x$ B. $(\ln x)^2$ C. $\ln\left(\ln x\right)$ D. $\ln x \ln x$

(s) $\displaystyle\int_0^{\frac{\pi}{2}} \cos x\, dx$ is equal to p, then p^2 is

    A. 2   B. $\dfrac{\pi}{4}$ C. $\dfrac{4}{3}$ D. 1

(t) $\displaystyle\int_{-1}^{1} |x|\, dx =$

    A. 2   B. 1   C. 3   D. 5

2. (a) Find the cube root of the following complex number $-1 + i$.   **(5 marks)**

    (b) Express the following complex number in the trigonometric form $\dfrac{(1+i)(1+\sqrt{3}i)}{1-i}$.   **(5 marks)**

3. (a) Find the equation of the sphere with center $(6, -7, -3)$ and touching the plane $(4x - 2y - z = 17)$.

    (5 marks)

    (b) The points A=(3, 1, 2), B=(−1, 1, 5) and C = (7, 2, 3) are vertices of a parallelogram ABCD.

    (5 marks)

        (i) Find the coordinate of D.

        (ii) Calculate the area of the parallelogram.

4. (a) Suppose there are 4 black cars and 7 white cars. If all the cars are distinguishable, in how many ways can 3 cars of the same color be chosen?   **(5 marks)**

    (b) How many different 4-digits codes can be formed using all the digits 0,1,2,3 if   **(5 marks)**

        (i) there is no restriction?

        (ii) repetition is not allowed?

        (iii) repetition is not allowed, and 0 is either the first or the last digit?

5. (a) Find the center and radius of the following circles.   **(5 marks)**

        (i) $x^2 + y^2 - 2x + 10y + 23 = 0$ (ii) $2x^2 + 2y^2 - 24x + 47 = 0$

    (b) Write the given parabola equation $x^2 - 2x + 8y - 23 = 0$ in standard form. Sketch its graph showing the vertex, focus, directrix and end points of latus rectum.   **(5 marks)**

6. Differentiate the following functions with respect to x   **(10 marks)**

    (a) $\cos^2(5x)$ (b) $\tan^3 \sqrt{x}$ (c) $\sin(\cos x)$ (d) $\dfrac{\sin x}{1 + \tan x}$ (e) $\sqrt{\sin x + \cos x}$

7. Two sides of triangle have lengths x and y, and the angle between them is θ. What value of θ will maximize the triangle's area?   **(10 marks)**

8. Find the function $f(x)$ that satisfying the equation $f''(x) = 2x - 1$ with $f(0) = -1$ and $f'(1) = 2$.

    (10 marks)

9. Find the volume of revolution formed when the curve $y = \sin x$ for $\dfrac{\pi}{4} \le x \le \pi$, is rotated through $360°$ about the x axis.   **(10 marks)**

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