

DEFENCE SERVICES ACADEMY
2022-2023 ENTRANCE EXAMINATION

ENGLISH TEST

Time Allowed: (2) Hours

ANSWER ALL QUESTIONS.

I. Read the passage.

Malaria is a tropical disease caused by protozoal parasites. It is spread by only 60 of the 380 species of the Anopheline mosquito, especially during rainy seasons. Malaria annually affects from 300 to 500 million people worldwide, and causes more than one million deaths. Symptoms may occur in 6-8 days or several months after being bitten and include regularly occurring fevers with chills, nausea, and muscle pain.

Infection results in the enlargement of the spleen and liver, and in fatal cases, capillaries in the brain are blocked. The majority of malaria deaths occur among young children and pregnant women.

Early diagnosis and prompt adequate treatment is essential in curing malaria and preventing death. A limited number of drugs for treating malaria are available. However, in some regions the parasites are resistant to certain antimalarial drugs, particularly chloroquine. People continuously infected gradually develop immunity to the disease.

(A) Write the correct word or words to complete each sentence. (10 Marks)

- (1) Protozoal parasites cause _____, a tropical disease.
- (2) According to the passage, more than one million people _____ of malaria yearly.
- (3) Fevers with chills, nausea, and muscle pain are _____ of malaria.
- (4) Due to infection, the spleen and liver will _____.
- (5) To cure malaria and _____, it is essential to have early diagnosis and prompt adequate treatment.

(B) Answer each question in one sentence. (10 Marks)

- (6) Where and when does malaria occur?
- (7) How many people are affected by malaria yearly?
- (8) What will happen to the capillaries in the brain, particularly in fatal cases?
- (9) What is likely to occur among young and pregnant women if they are affected by malaria?
- (10) What is one of the antimalarial drugs that the writer has mentioned in the passage?

II. Fill in each numbered blank in the following paragraph with a word from the list given.

Write down only the letter of your answer by the number. (10 Marks)

difference	quickly	between	wary	rarely
As	and	a	slower	villages
likely	City	occur	In	these
to	morning	generally	different	of

One major difference ---(1)--- growing up in the city and in the country is the degree ---(2)---friendliness. In large cities, residents often live in huge apartment buildings with hundreds of strangers. These urban apartment dwellers tend to be ---(3)--- of unknown faces and rarely know their neighbors well. The situation in ---(4)--- small town is often just the opposite. Small-town people ---(5)--- grow up together, attend the same schools, and share the same friends. ----(6)---a result, rural people are much more ---(7)--- to treat their neighbors like family ---(8)--- invite them into their homes.

Another ---(9)--- is the pace of life. ---(10)--- the city, life moves very ---(11)---. The streets reflect this hectic pace and are ---(12)--- empty, even late at night. ---(13)--- dwellers appear to be racing to get somewhere important. Life for them tends ---(14)--- be a series of deadlines. In the country, life is much ---(15)---. Even during peak hours, traffic jams ---(16)--- less often than in a city. Stores close in the early evening, and the streets do not come alive until the next ---(17)---. The people in small towns or ---(18)--- seem more relaxed and move in a more leisurely way. The pace of life in ---(19)--- two areas could not be more ---(20)---.

III. (A) Choose the appropriate words to complete the sentences.**(10 Marks)**

- (1) The rich always look down _____ the poor.
A. at B. on C. for
- (2) Suffering from vertigo, my aunt cannot move her head _____.
A. suddenly B. slowly C. upright
- (3) It is said that _____ is better than cure.
A. prevent B. prevention C. preventive
- (4) Though we have completed the computer course, we should keep in touch _____ each other by telephone.
A. for B. against C. with
- (5) My mother usually asks me to take _____ the rubbish.
A. away B. off C. out

(B) Give complete answers to the following questions.**(20 Marks)**

- (1) What is the main idea of the passage “Too Much Knowledge Maketh Fools”?
- (2) Why is the moon completely devoid of water?
- (3) What are two advantages of self-service?
- (4) What could modern robots for factories do if there were any problems?
- (5) What things can we not buy?
- (6) How do dreams have positive effects on our lives?
- (7) To prevent from having bad smell, what should we do?
- (8) How can we prevent ourselves from malaria?
- (9) According to the author, what does “language” mean for Helen?
- (10) What are the neighbouring countries of Myanmar?

IV. Finish each sentence in such a way that it means exactly the same as the sentence that is given.**(20 marks)**

- (1) When Mu Mu saw a big snake on the way home, she screamed out.
Seeing _____.
- (2) Dan left for a distant land as soon as he had received an inheritance from his father.
No sooner _____.
- (3) The University of Tokyo will confer him a degree soon.
He _____.
- (4) Every student in this class has up-to-date dictionary.
There is no _____.
- (5) Nay Lin rented a car and then he went on pilgrimage with his family.
After _____.
- (6) She tore up the letter into pieces. She did not read it .
Without _____.
- (7) Although she wrote the essay well, she did not get high marks.
In spite of _____.
- (8) Mrs Hall received a mysterious visitor. She was the owner of the Coach and Horses Inn.
Mrs Hall, _____.
- (9) Mr Rojas taught us Chemistry.
It was Mr Rojas _____.
- (10) The instructor said to his trainees, “Don’t bring your phones into the hall”.
The instructor told _____.

V. Write an essay of three paragraphs on ONE of the following. Do not write more than 500 words.**(20 Marks)****Your favorite time of the year****(or)****Importance of Discipline****(or)****How we can reduce global warming**

DEFENCE SERVICES ACADEMY
ENTRANCE EXAMINATION
MATHEMATICS

Date: 4 - 9 - 2022

Time Allowed: 2 Hours

ANSWER ALL QUESTIONS

PART (A)

1. Choose the correct or the most appropriate answer for each question.

Write the letter of the correct or the most appropriate answer. **(22 Marks)**

(1) Given that $a \odot b$ means “add 4 to a and multiply the result by b”, then the value of $(2 \odot 1) \odot 3$ is

- A. 55 B. 50 C. 45 D. 40 E. 30

(2) $2x^3 + x^2 - kx + k$ is divided by $(2x + 1)$, the remainder is 6. Then $k =$

- A. -4 B. 4 C. -6 D. 6 E. 9

(3) ${}^nC_r + {}^nC_{n-r} =$

- A. $2 {}^nC_r$ B. $2^n {}^nC_r$ C. ${}^nC_{2n-1}$ D. ${}^nC_{n-2r}$ E. none of these

(4) Given that 7, a, b, c, -5 is an A.P., then the mean of a, b, c is

- A. -2 B. 1 C. $\frac{3}{2}$ D. 3 E. 4

(5) If $k = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$, then $k^{2022} - k^{2021} + k^2$ is

- A. k^5 B. k^4 C. k^3 D. k^2 E. k

(6) A coin is tossed two times. The probability of getting at least one tail is $x - 2$, then x is

- A. $\frac{3}{4}$ B. $\frac{11}{4}$ C. $\frac{15}{4}$ D. $\frac{9}{4}$ E. $\frac{1}{4}$

(7) PAB and PCD are two secant segments to a circle O. If $PA = 2$ cm, $PC = 4$ cm, $CD = 5$ cm and O lies on the segment AB, then the radius of the circle, in cm, is

- A. 6 B. 7 C. 8 D. 9 E. 10

(8) The length of two corresponding angle bisectors of two similar triangles are 16 cm and 20 cm. Then α (the smaller Δ) : α (the larger Δ) =

- A. 4:5 B. 16:20 C. 16:25 D. 20:16 E. 5:4

(9) If $P = (3, 4)$, $R = (8, 2)$ and O is the origin and $\overrightarrow{OP} = \overrightarrow{OT} - \frac{1}{2}\overrightarrow{OR}$, then the coordinates of the point T is

- A. (1, 3) B. (2, 4) C. (7, 5) D. (4, 5) E. (5, 7)

(10) If $\tan \theta = 2$, $\tan \phi = 1$, then $\cot(\theta - \phi) =$

- A. -3 B. 3 C. -2 D. 2 E. 1

(11) Given that $y = \sin 4x + \cos^4 x$, then the value of $\frac{dy}{dx}$ when $x = \frac{\pi}{4}$ is

- A. -5 B. 5 C. -4 D. 4 E. 6

PART (B)

2. (a) The functions f and g are defined by $f(x) = 3x + 1$ and $g(x) = 2x - 3$.
Show that $(f \circ g)^{-1}(x) = (g^{-1} \circ f^{-1})(x)$. **(6 marks)**

- (b) Given that the equation $2x^3 + px^2 + qx - 12 = 0$ has roots $x = 1$ and $x = 4$.
Find the values of p , q and the third root. **(7 marks)**

3. (a) Use the binomial theorem to find the value of
 $\left(x + \sqrt{x^2 - 1}\right)^6 + \left(x - \sqrt{x^2 - 1}\right)^6$. **(6 marks)**

- (b) Find the solution set in \mathbb{R} of the inequation $25x^2 - 5x - 12 \leq 0$ by graphical method and illustrate it on the number line. **(7 marks)**

4. (a) Solve the equation $1 + x + x^2 + \dots + x^9 = x + 5 + \frac{x^{10}}{x - 1}$. **(6 marks)**

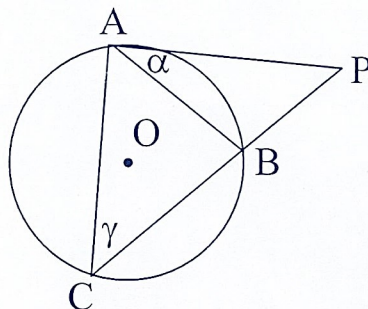
- (b) If $M = \begin{pmatrix} 2 & 5 \\ 1 & 3 \end{pmatrix}$, prove that $M^2(M^{-1})^2 = I$, where I is the unit matrix of order 2. **(7 marks)**

5. (a) Construct the table of outcomes for rolling two dice. What is the probability of scoring 11 when throwing two dice at once? If such experiment is repeated 720 times, what would you expect if the score not being 11? **(6 marks)**

- (b) Two circles intersect at A and B . At A a tangent is drawn to each circle meeting the circles again at P and Q respectively. Prove that $\angle ABP = \angle ABQ$ and $AB^2 = BP \cdot BQ$. **(7 marks)**

6. (a) In a given circle PA is a tangent segment and PBC is a secant segment.

Prove that $\frac{AB^2}{CA^2} = \frac{PB}{PC}$. **(6 marks)**



- (b) Find the matrix which will rotate $\frac{\pi}{6}$ and then reflect in the line OY . What is the map of the point $(-1, 0)$? **(7 marks)**

7. (a) If $x + y + z = \pi$, show that $\tan \frac{x}{2} \tan \frac{y}{2} + \tan \frac{y}{2} \tan \frac{z}{2} + \tan \frac{x}{2} \tan \frac{z}{2} = 1$. **(6 marks)**

- (b) Find the equation of the tangent line to the curve $2x^2 - 3y^2 = 2xy + 1$ at the point $(2, 1)$. **(7 marks)**

DEFENCE SERVICES TECHNOLOGICAL ACADEMY
ENTRANCE EXAMINATION
ENGLISH

Date: 3-9-2022.

Time allowed: 2 Hours.

Attempt all questions

I. Read the passage.

Temperatures on the moon are quite extreme, ranging from 110°C to -173°C . This occurs because there is no atmosphere to filter the sun's rays when it is shining and then to blanket in warm air when the sun goes down. These extremes of temperature are particularly striking during the solar eclipse, when the earth passes directly between the sun and the moon, temporarily blotting out the sun's light. At such times the temperature on the moon dips very rapidly and then rises immediately as the sun emerges from the earth's shadow. The change in temperature may be as much as 200°C in one hour! This sudden change can cause rocks to shatter due to the alternate expanding and contracting. Thus if you visit the moon, deciding what to wear could be a problem.

(A) Write the correct word or words to complete each sentence.

(5 marks)

- (1) The _____ of temperature extend from 110°C to -173°C .
- (2) When the sun sets, any atmosphere _____ warm air on the moon.
- (3) It is _____ that extreme temperature difference takes place.
- (4) There is _____ in temperature during a solar eclipse.
- (5) As the sun is out of the earth's shadow, there is _____ of temperature.

(B) Answer these questions. Give complete answers.

(10 marks)

- (1) How much do temperatures on the moon vary and why?
- (2) What happens as the sun's rays are not filtered on the moon?
- (3) Due to the direct passage of the earth between the sun and the moon, what occurs?
- (4) What do the underlined words "At such times" refer to?
- (5) What happens to rocks alternatively because of the sudden temperature change?

II. Fill in each numbered blank with a word from the list given. Write down only the number of the blank and the word that fills it.

(10 marks)

the	a	and	are	been
self-service	circular	customers	kept	of
herself	operators	perfect	self-service	shelves
and	shops	space	tubed	with

During the last few years, there has ____ (1) ____ an enormous increase in the number of ____ (2) ____, stores and supermarkets which provides facilities for ____ (3) ____ . Their general purpose is to provide goods ____ (4) ____ every description attractively and hygienically and in ____ (5) ____ condition, so that the customer can serve ____ (6) ____, and then pay for the goods with ____ (7) ____ minimum of delay.

The organizers of a ____ (8) ____ store have their difficulties. They must display ____ (9) ____ great number of goods in a minimum ____ (10) ____ without covering up anything. They must deal ____ (11) ____ perishable foodstuffs requiring different ranges of temperature; ____ (12) ____ they must arrange a speedy flow of ____ (13) ____ past the cash registers without overtaxing the ____ (14) ____.

For the purposes of display, many devices ____ (15) ____ used such as long lengths of adjustable ____ (16) ____ to take various sizes of packs, rotating ____ (17) ____ shelves, islands of display stands, racks for ____ (18) ____ foods, and multi-tiered mobile stalls.

Perishable foodstuffs ____ (19) ____ quick frozen fruit, vegetables and meat are ____ (20) ____ in refrigerated self-service cabinets, which keep goods at the required temperatures.

III. Write the appropriate word or words to complete the sentences.

(20 marks)

1. The Egyptian calendar was _____ behind the sun in for years.
2. Adding _____ at the end of each year did not make the Egyptian calendar right.
3. The poor astrologer was _____ out of his wits.
4. The earth and the moon do not shine by their _____.
5. During a solar eclipse, the _____ of temperature are particularly striking.
6. After glass blowing was invented, people started _____ the hourglass.
7. Although Grandfather clocks are expensive, they are very much _____ again nowadays.
8. One of the _____ of self-service is that there is no waiting to be served.
9. In a self-service store, a variety of goods _____, using many devices.
10. Computers do not have any _____.
11. We can spare or save _____ by using robots.
12. In his youth, Jim Bishops dreamt of having _____ who would bring him chocolate bars.
13. All of us _____ of being better educated.
14. Children usually grow out of sleepwalking by the time they become _____.
15. At times, people believe that dreams had _____ or that they could tell the future.
16. We can't buy personal _____ looks.
17. Insects that feed on blood can _____ diseases.
18. The most highly developed insect _____ are the mosquitoes.

19. Laos has a wealth of natural resources which are still _____.
20. Helen was a very merry, _____ little girl.

IV. **Complete the statements with suitable prepositions. Write down only the number of the blank and the word that fills it.** (10 marks)

e.g. 1. The moon is completely devoid ___(a)___ water.

Answer. 1. (a) of

1. Advertisements aimed ___(a)___ men often include the picture ___(b)___ a pretty girl.
2. Symptoms may occur ___(a)___ 6-8 days or several months ___(b)___ being bitten and include regularly occurring fevers ___(c)___ chills, nausea and muscle pain.
3. The most modern electric clocks tell the time ___(a)___ a set of numerals which appear ___(b)___ a little window.
4. Jim Bishop dreamed ___(a)___ having a house ___(b)___ the beach.
5. Since Shelly was brought ___(a)___ ___(b)___ England, she is very fluent ___(c)___ English.
6. Thailand is situated ___(a)___ the gulf ___(b)___ Siam.
7. Michael sat ___(a)___ his friends ___(b)___ the library.
8. When the days were soft and tender, we sat ___(a)___ the beach digging our toes ___(b)___ the hot sand.
9. Sleeping ___(a)___ bed nets treated ___(b)___ insecticides will prevent you from mosquito-borne diseases.

V. **Finish each sentence in such a way that it means exactly the same as the given sentence.** (20 marks)

1. Bagan is a famous ancient capital in Myanmar. It is regarded as one of the archaeological treasure houses in Asia. (Bagan, _____.)
2. The number of wi-fi network is growing rapidly. They are easy and inexpensive to set up. (Being _____.)
3. Aung Aung drives more carefully than Zarni. (Zarni _____.)
4. The earthquake was so strong that it caused a lot of damage near its epicenter. (It was such _____.)
5. Neither Thein Thein nor Min Min knows the answer (Both _____.)
6. The population explosion has pushed people towards towns and cities. (It is the population explosion _____.)
7. Go to the doctor or the cut on your hand will be infected. (Unless _____.)
8. Although it was raining heavily, he went out without an umbrella. (In spite of _____.)
9. The books were returned to the library although they were not red. (Without _____.)
10. I had a cup of coffee before I left for work this morning. (After I _____.)
11. Why did you scold and beat your children last night? (Why were _____.)
12. As soon as she sat down at the table to study, the light went out. (No sooner _____.)
13. All students deserve equal opportunities to learn and succeed in life. (There is no _____.)
14. He apologized to the teacher when he realized his mistake. (Realizing _____.)
15. Mother said to Hlaing Hlaing, "How long have you known that boy?" (Mother asked _____.)
16. Although Nilar was excited, she was able to finish her speech. (In spite of _____.)
17. Who invented the smart watch? (By whom _____.)
18. The policeman asked Ko Ko where he had been the previous night. (The policeman said to Ko Ko, _____.)
19. She is such a skinny girl that her parents are worried about her health. (She is so skinny _____.)
20. As I work more, I spend less time with my family. (The more _____.)

VI. **Write a letter ONE of the following.** (10 marks)

You are Arkar. You live at No. 26, Kan Thar Road, Bago. Write a letter to your uncle, U Myint, who is good at writing English articles and essays, telling him that you find it difficult to write good essays in English. Ask him what to do to be able to write good essays.

(OR)

You are Kyaw Thar. Your address is No. 24, Pagoda Road, Patheingyi. Write a letter to your uncle, who is a doctor, telling him that you are getting very fat and asking him to give you advice on how to control your weight.

VII. **Write an essay of three paragraphs on ONE of the following.** (15 marks)

"Impact of Technology on Youth"

"My Inspiration to Serve My Country and the Tatmadaw"

"The Reason I Want to be an Engineer"

DEFENCE SERVICES TECHNOLOGICAL ACADEMY
ENTRANCE EXAMINATION
MATHEMATICS

Date: 3-9-2022.

Time allowed: 2 Hours.

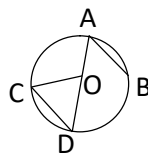
Attempt all questions

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

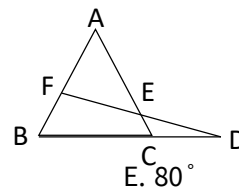
(30 Marks)

- (1) Let a function f be defined by $f(x) = 7 - \frac{5}{x}$, $x \neq 0$, then f^{-1} is undefined at $x =$
 A. 6 B. 7 C. 8 D. 9 E. 5
- (2) An operation Θ on the set of positive real numbers defined by $a \Theta b = \log_2 a + \log_5 b$. Then $16 \Theta (2 \Theta 625) =$
 A. 1 B. 2 C. 3 D. 4 E. 5
- (3) An operation Θ is defined by $a \Theta b = ab - b^2$. Then $(2 \Theta 3) \Theta 2 =$
 A. 2 B. -2 C. 8 D. -8 E. -10
- (4) If n is an integer, then the remainder when $2x^{2n+1} - 4x^{2n} + 5x^{2n-2} + 3$ is divided by $x+1$ is
 A. -8 B. -4 C. 0 D. 4 E. 8
- (5) If a common factor of $x^2 + x - 2$ and $x^2 - 3x + 2$ is $x + a$, then $a =$
 A. 1 B. -1 C. 2 D. -2 E. 3
- (6) In the expansion of $(\frac{1}{2x^2} - x)^9$, the term independence of x is
 A. 4th term B. 5th term C. 6th term D. 7th term E. 8th term
- (7) The constant term in the expansion of $(2x - \frac{1}{x^2})^6$ is
 A. 240 B. 30 C. -240 D. -30 E. 30
- (8) In the expansion of $(1+ax)^{24}$ where $a > 0$, the coefficient of x^2 is 69, then $a =$
 A. 2 B. -2 C. $-\frac{1}{2}$ D. $\frac{1}{2}$ E. 4
- (9) The solution set of the inequation $x^2 + (1 - k)x - k \leq 0$, where $k > -1$, is
 A. \emptyset B. $\{-1\}$ C. $\{x/x \leq -1 \text{ or } x \geq k\}$ D. $\{x/-1 \leq x \leq k\}$ E. none of these
- (10) If $x^2 - 2 > 2$, then
 A. $x > 2$ B. $x < -2$ C. $x > \pm 2$ D. $x < -2$ or $x > 2$ E. $-2 < x < 2$
- (11) In a G.P. each term is positive, the 4th term is 54 and the 6th term is 486, then the common ratio is
 A. 3 or -3 B. -3 only C. 3 only D. 6 only E. 6 or -6
- (12) For a certain A.P. $S_n = \frac{n}{2}(3n-17)$, then $u_n =$
 A. $6n - 20$ B. $3n - 10$ C. $3n + 10$ D. $6n + 20$ E. none of these
- (13) If $P = \begin{pmatrix} 1 & 2x \\ 10 & \end{pmatrix}$ and $Q = \begin{pmatrix} 2 \\ 1-y \end{pmatrix}$ and $P + 2Q = \begin{pmatrix} 3 \\ 2y \end{pmatrix}$, then $\frac{y}{x} =$
 A. 3 B. 2 C. -3 D. -2 E. -4
- (14) $A = \begin{pmatrix} k & -5 \\ 3 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & 5 \\ -3 & -7 \end{pmatrix}$. If $BA = I$, then $k =$
 A. 2 B. -9 C. 7 D. -7 E. 5
- (15) Given that A is a non-singular matrix, then $\det A^{-1} =$
 A. $\det A$ B. $-\det A$ C. 1 D. $1/\det A$ E. none of these
- (16) A letter is chosen from the letters of the word MATRICULATION. The probability that it will not be vowel is
 A. $10/13$ B. $7/13$ C. $6/13$ D. $4/13$ E. $3/13$
- (17) A number is selected at random from the integers 1 to 60 inclusive, the probability of obtaining a multiple of 5 is
 A. $1/4$ B. $1/5$ C. $2/5$ D. $1/60$ E. $11/60$
- (18) The probability of each of the students A, B and C to pass the examination is $\frac{3}{4}$. The probability that only A will pass the examination is
 A. $27/64$ B. $1/64$ C. $3/64$ D. $37/64$ E. $61/64$

- (19) In circle O, $AB \parallel CD$ and $\angle BAD = 40^\circ$, then $\angle COD =$

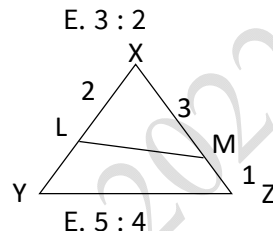


- (20) If BCEF is a cyclic quadrilateral and $\angle AFE = 85^\circ$, $\angle CDE = 30^\circ$, then $\angle AEF =$



- (21) In $\triangle ABC$, P and Q are two points on the sides AB and AC respectively. If $PQ \parallel BC$ and $\text{Area}(\triangle ABC) : \text{Area}(BCQP) = 9 : 16$, then AP : PB is

- (22) In the figure, $\angle XYZ \cong \angle XML$. Then $\text{Area}(\triangle XYZ) : \text{Area}(\triangle XML) =$



- (23) The vector of magnitude of 65 which is parallel to the $5\hat{i} - 12\hat{j}$ is
 A. $5(5\hat{i} - 12\hat{j})$ B. $7(5\hat{i} - 12\hat{j})$ C. $13(5\hat{i} - 12\hat{j})$ D. $12\hat{i} - 5\hat{j}$ E. $6(5\hat{i} - 12\hat{j})$
- (24) Given that $\vec{p} = 2\vec{a} + 3\vec{b}$, $\vec{q} = 4\vec{a} - \vec{b}$ and $\vec{r} = h\vec{a} + (3h+k)\vec{b}$, where \vec{a} and \vec{b} are non-parallel and non-zero vectors, such that $2\vec{p}$ Type equation here. $= 3\vec{q} - 4\vec{r}$. Then $h =$
 A. 1 B. 2 C. 3 D. 4 E. 5
- (25) $\cos(\alpha + \beta) - \cos(\alpha - \beta) =$
 A. $2 \sin \alpha \cos \beta$ B. $2 \sin \beta \cos \alpha$ C. $2 \cos \alpha \cos \beta$ D. $-2 \sin \alpha \sin \beta$ E. $-2 \cos \alpha \cos \beta$
- (26) If $A + B = 45^\circ$, then $\tan A + \tan B + \tan A \tan B =$
 A. 1 B. 2 C. 3 D. -2 E. none of these
- (27) The value of $\sec(-150^\circ)$ is
 A. $-\frac{2}{\sqrt{3}}$ B. $\frac{\sqrt{3}}{2}$ C. $\frac{2}{\sqrt{3}}$ D. $-\frac{\sqrt{3}}{2}$ E. none of these
- (28) $\lim_{x \rightarrow 0} \left[\left(x + \frac{1}{x}\right)^2 - \left(x - \frac{1}{x}\right)^2 \right] =$
 A. 0 B. 4 C. 2 D. 6 E. 1
- (29) The gradient of the curve $y = x e^{x-3}$ at the point (3, 3) is
 A. 6 B. 5 C. 4 D. 3 E. 2
- (30) The curve $y = \sin x$, $0 < x < 2\pi$ has the maximum turning point at
 A. $(\frac{\pi}{2}, 0)$ B. $(-\frac{\pi}{2}, 0)$ C. $(\frac{\pi}{2}, 1)$ D. $(\pi, 0)$ E. $(\frac{3\pi}{2}, -1)$

2. A function f is defined by $f(x) = 4x + 5$. Find the formulae of $f \circ f$, f^{-1} and $f^{-1} \circ f^{-1}$ giving your answer in simplified form. (10 Marks)
3. The expression $2x^3 + bx^2 - cx + d$ leaves, the same remainder when divided by $x - 1$ or $x + 2$ or $2x - 1$. Evaluate b and c . Given also that the expression is exactly divisible by $x - 2$, evaluate d . (10 Marks)
4. Let S_5 be the sum of the first five terms of an A.P. and S^* be the sum of the next five terms. If $S^* - S_5 = 75$, then find the common difference. (10 Marks)
5. Show that $A = \begin{pmatrix} \cos \alpha & \sin \alpha \\ -\sin \alpha & \cos \alpha \end{pmatrix}$ satisfies $A^2 + I = 2A \cos \alpha$ where I is the unit matrix of order 2. (10 Marks)
6. X and Y are two independent events. The probability that the event X will occur is twice the probability the event Y will occur and that the event Y will not occur is three times the probability that X will not occur. Then find probability that both X and Y will occur. (10 Marks)
7. Given that $\sin \alpha = \frac{15}{17}$, $\cos \beta = -\frac{3}{5}$ and that α and β are in the same quadrant, find without using tables the values of $\tan 2\alpha$ and $\tan(2\alpha + \beta)$. (10 Marks)
8. Differentiate $y = \frac{1}{\sqrt{x}}$ with respect to x at $x = 2$ from the first principles. (10 Marks)



DEFENCE SERVICES MEDICAL ACADEMY
ENTRANCE EXAMINATION
ENGLISH

ATTEMPT ALL QUESTIONS.

2-9-2022

(Write down the answers on the answer book)

Time allowed: 2 hours

I. Read the passage. (15 marks)

It is natural if your appearance concerns you a great deal. After all, the way you look now may still be very new to you. Between the ages of 10 and 14 most boys and girls begin to notice changes taking place to their bodies. Your body alters in shape and size, and your face changes too. Slight little girls are transformed into tall young women with well developed figures. The girl who used to be tallest in her class may stop growing at fifteen and find herself less than average in height. Snub noses lengthen; eyes that previously looked large may appear smaller because they have remained the same size while the other features have grown. Not only that, but the texture of your skin probably is different, and you are likely to suffer from spots.

I. (A) Write the correct word or words to complete each sentence.

1. Naturally, everyone worries about his.....
2. Not only our body but also changes from about 11.
3. have remained the same size while the other figures have grown.
4. Slight little girls turned into tall young women withfigures.
5. When skin texture changes, you may have.....on your faces.

I. (B) Answer each question in complete sentence.

6. Why may the way you look be new to you?
7. What do slight little girls turn into?
8. Why may your eyes appear smaller?
9. What may happen to your face when the skin texture changes?
10. What are some physical changes that take place in a girl as she grows up?

II. Fill in each numbered blank with a word from the list given. (10 marks)

at	very	face	people's	threw
out	Annie's	peace	the	door
tried	for	a	she	her
I'm	But	and	told	that
threw	tell	he	asked	this

Annie Sullivan was excited by the idea of helping a deaf-blind child. She agreed to travel to Tuscumbia (1) become Helen's teacher. When she arrived (2) the Kellers' house, she found a (3) messy, spoilt little girl. Helen grabbed (4) suitcase and immediately began pulling everything (5) of it.

Annie took a present (6) Helen from her suitcase. It was (7) doll. Then, using a special alphabet (8) spelt into Helen's hand, "D-O-L-L, Doll. (9) going to teach you language, the (10) to the world for you," she (11) Helen.

Helen grabbed the doll and (12) it violently onto the floor. Annie (13) to make her pick it up. (14) instead, Helen kicked Annie in the (15) and knocked out a tooth.

At (16) dining table that evening, Annie found (17) Helen was allowed to eat with (18) hands and take food from other (19) plates. Captain Keller explained, "We can't have any (20) and quiet unless we give her what she wants". Annie said, "That's exactly the point. This child is spoilt."

III.(A) Choose the appropriate word to complete the sentences. (5 marks)

- Your salary will be reviewed
(A) traditionally (B) delicately (C) annually
- This shampoo will give you hair.
(A) slender (B) adequate (C) lustrous

3. The person is a lot better off than they were 40 years ago.
(A) average (B) biological (C) terrifying
4. He has always been driven by his
(A) emotions (B) measures (C) features
5. They are money prizes to the first three runners.
(A) fascinating (B) offering (C) overlooking

III.(B) Write the appropriate words or groups of words to complete the sentences and lines of verse. (10 marks)

1. A sundial did not work on days.
2. Many devices are used goods.
3. Dreams have on our lives.
4. Dengue fever is a viral disease by the Aedes mosquitos.
5. Many cultural still exist in Hanoi.
6. A great steel bridge,
With towers
7. I a song into the air,
It fell to earth, I knew not where;
8. To a cloud frog
That unsuspecting lay.
9. Sound sleep by night; study and ease
Together mix'd; sweet
10. It changed into an elephant
Of most

IV. Give complete answers to these questions. (20 marks)

1. What are the things that can particularly worry young boys?
2. What is the general purpose of a self-service store?

Say something about these lines (from your prescribed text).

3. What is the title of the unit from which the sentence is taken? What does the underlined word refer to?
Cranes and mechanical diggers can pick up things and move them around.

4. Who said these words and to whom were they said? What do they mean?

“..... help me with this. I’m so clumsy.”

5. What do these lines mean?

March wind ranges;

April changes;

V. Finish each sentence in such a way that it means exactly the same as the sentence that is given. (15 marks)

1. I will never tell the truth about you and I will not lie for you.

I will neither.....

2. Daw Saw Mone Nyin will give a talk tomorrow. She is a well-known writer.

Daw Saw Mone Nyin ,.....

3. Thida said, “Did Wutyi receive the message?”

Thida wanted to know

4. Stop borrowing money or you will be in trouble.

Unless

5. They discovered an explosive device in a warehouse last night.

An explosive device

6. The day was so wet and cold that we stayed indoors.

It was such a

7. When he sat at the table to study, he felt sleepy.

No sooner

8. No student in our class is as talented as Soe Aung.

Soe Aung is.....

9. The babies have already been fed by the nurse every two hours.

The nurse

10. The thief ran so fast that we couldn’t catch him.

The thief ran too.....

11. Jobs nowadays are much more insecure than they were fifty years ago.

Jobs fifty years ago

12. Win Soc is one of the most intelligent persons I have come across.

Very few

13. The music was very loud. He could hardly make himself hear well.

The music was so

14. Special discounts will be offered to our customers.

We

15. Although the weather was very hot, he went out to play football with his friends.

In spite of

VI. Write an essay of three paragraphs on the following topic.

(Minimum word limit 250) (25 marks)

"The greatest gift we can give our parents"

**DEFENCE SERVICES MEDICAL ACADEMY****ENTRANCE EXAMINATION****BIOLOGY****ATTEMPT ALL QUESTIONS****2-9-2022****(Write down the answers on the answer book.)****Time allowed: (2) hours****SECTION (A) ZOOLOGY****1. State TRUE or FALSE to the following statements. Do not copy the statements.****(10 marks)**

- i. Carnassials are large teeth in carnivores adapted for shearing and chewing food.
- ii. Animals can use light energy to manufacture their own food.
- iii. Diaphragm is concave towards the thorax when at rest.
- iv. Alveoli of the kidney are fully stretched at the end of inspiration.
- v. Monocytes are formed in the spleen and red bone marrow.
- vi. Lymphatics have thin walls with valves.
- vii. Urethra in the male reproductive system leads the sperms to the inside through the penis.
- viii. The egg is about 400 times bigger than the sperm.
- ix. Gestation period takes about nine months in man.
- x. Parasitism benefits the parasite but harms the host.

2. Complete the following statements with appropriate words. Do not copy the statements.**(10 marks)**

- i. Each spinal nerve consists of sensory and _____ nerve fibres.
- ii. The teeth cut the food into small _____ during the process of chewing.
- iii. Constipation is the result of insufficient _____ in the diet.
- iv. Digestion is the process that changes the food into a form that is _____ and diffusible into the body cells.

- v. Contraction of the muscles of the ----- also aid in driving the air out of the lungs.
 - vi. Plasma calcium is bound to serum ----- .
 - vii. Vagina is also a ----- canal for the baby in the female reproductive system.
 - viii. Animals can reproduce asexually by binary and ----- fission.
 - ix. Testis of the male reproductive system is located in the ----- .
 - x. Symbiotic relationships are close relationships between two ----- species.
3. (a) State the roles of vitamins and minerals that are required in a balanced diet. (3 marks)
- (b) State the relationship between parasites and population size of the host. (3 marks)
4. (a) State how the respiratory movements are controlled during gaseous exchange. (4 marks)
- (b) Describe the structure and function of granulocytes with an illustration. (4 marks)
5. (a) With a labelled diagram, explain the nature of the respiratory system as found in the rabbit. (8 marks)
- (b) Explain the group of muscles and mention the nature of limb muscles and their respective functions. (8 marks)

SECTION (B) BOTANY

6. State TRUE or FALSE to the following statements. Do not copy the statements.

(10 marks)

- i. The leaf is usually green due to the presence of the pigment, chlorophyll.
- ii. Cross-pollination can only occur in bisexual flowers.
- iii. Maize grain sown in moist soil absorbs water and becomes soft.
- iv. Photosynthesis is the process by which green plants use light energy to manufacture glucose.
- v. The glucose formed during photosynthesis is stored temporarily as starch in leaves.
- vi. The process of aerobic respiration is rapid systematic oxidation.
- vii. Loss of water from the phloem vessels produces a tension.
- viii. Plants respond to light, gravity, touch and water.
- ix. DNA is normally a stable molecule with the capacity for self-replication.
- x. The atmosphere contains 78% hydrogen.

7. Complete the following statements with appropriate words. Do not copy the statements.

(10 marks)

- i. The underground root system consists of the main root and the ----- roots.
- ii. The pollen grains of ----- flowers are easily carried by wind.
- iii. In the first stage, a bean seed is sown in ----- soil.
- iv. Below the point of the attachment to the cotyledon is the -----.
- v. Lower epidermis of the leaf is covered by -----.
- vi. ADP is bonded to a ----- group and absorbs a large amount of energy.

- vii. Osmosis can be regarded as a special type of -----.
- viii. Lateral roots grow at right angle to -----.
- ix. Normal ----- are chromosomally XY.
- x. Many animals and plants spend their lives in lightless -----.
8. (a) Generally state the nature of roots as found in most plants. (3 marks)
- (b) Give an equation to summarize the process of photosynthesis. (3 marks)
9. (a) How do you understand cytokinin. (3 marks)
- (b) List and state the functions of the leaves. (5 marks)
10. (a) Distinguish and state the nature of plants according to the length of life. (8 marks)
- (b) State the process of vegetative propagation and commercial importance of asexual reproduction in plants. (8 marks)