

University of Asia Pacific
Department of Electrical and Electronic Engineering
Admission Test: Sample Question

Time: 1.00 Hour

Full Marks: 100

Section A: Mathematics (40)

1. Solve the quadratic equation, $x^2-2x+5=0$. [2.5]
2. How many different ways can the letters of the word 'Calculus' be arranged so that the first and last letter is 'u'? [2.5]
3. Find the result of the matrices of the following, $2A+B$. Where, [2.5]
 $A = \begin{bmatrix} 1 & -2 & 3 \\ 5 & 1 & -4 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 3 & 5 \\ 1 & 4 & -2 \end{bmatrix}$. [2.5]
4. Solve the two equations: [2.5]
 $5x+10y=20$,
 $x-2y=12$.
5. Integrate the following equation, $\int_0^1 \frac{dx}{\sqrt{2x-x^2}}$. [05]
6. Differentiate the following equation, $\frac{d}{dx} [\sin(\ln(x^3))]$. [05]
7. Find out the value: $\lim_{x \rightarrow \infty} \left(\frac{2x^2+1}{6+x-3x^2} \right)$. [05]
8. Prove that the line, $y=2x+a\sqrt{5}$ is tangent to the circle $x^2+y^2=a^2$. [03]
9. Write down the equation of a straight line perpendicular to the line, $y= 5x+2$ and passing through the origin. [03]
10. Find the surface area of a cylinder with a radius of 4cm, and a height of 3cm. [03]
11. Plot graphs for $y = \frac{x}{2} + 3$ and $x = \frac{y^2}{6}$. [03]
12. The line $3x + by - 1 = 0$ touches the circle $x^2 + y^2 - 8x - 2y + 4 = 0$. Find the value of b. [03]

Section B: Physics (30)

13. Find the mass of earth M , if the value of $g=9.8\text{ms}^{-2}$ value of earth $R=6.4\times 10^6\text{m}$ and gravitational constant, $h=6.67\times 10^{-11}\text{Nm}^2\text{kg}^{-2}$. [05]
14. An object of mass 60kg was at rest. It is brought to motion by applying a force of 30N . Calculate its kinetic energy after 10s . [05]
15. If a force of 19.6N applied on a steel wire of 1m length and $5\times 10^{-4}\text{m}$ radius, then it is increased to 1.02m . Determine Young's Modulus of the wire. [05]
16. An object of 250gm is projected horizontally at a velocity of 20ms^{-1} from 19.6m height. Neglecting the obstacle of air and assuming acceleration due to gravity $g=9.8\text{ms}^{-2}$, find the velocity of the object at the time of touching ground. [05]
17. Write the differences between velocity and acceleration. [05]
An electric motor is delivering 1hp power to a pump. The efficiency of the motor is 90% .
18. Find out the input power taken by the motor in kW . [05]

Section C: English(20)

19. Write an essay on, 'Traffic Jam' (100 words). [10]
20. Translate the following paragraph from Bengali to English:

স্বাস্থ্য বাতায়ন ১৬২৬৩ তথ্য অনুসারে, এ বছরের মে মাস থেকে দেশে নতুন করে ডেঙ্গুর প্রকোপ দেখা দেয়া আর ওই সময় থেকে ক্রমে বেড়েছে কল। মে থেকে ২০ আগস্ট পর্যন্ত এক বিশ্লেষণে দেখানো হয়েছে, সবচেয়ে বেশি কল এসেছে ভাইরাল জ্বর নিয়ে। ডেঙ্গুতে আক্রান্ত হওয়ার শঙ্কা থেকে জ্বর নিয়ে কল বেশি এসেছে বলে মনে করছেন স্বাস্থ্য বাতায়নের সঙ্গে সম্পৃক্ত কর্মকর্তারা। ২০১৫ সালের সেপ্টেম্বর মাসে 'স্বাস্থ্য বাতায়ন ১৬২৬৩' চালু হয়। এটি টোল ফ্রি নয়। স্বাস্থ্য অধিদপ্তরের ম্যানেজমেন্ট ইনফরমেশন সিস্টেম (এমআইএস) বিভাগের অধীনে ২৪ ঘণ্টার এই স্বাস্থ্যসেবা পরিচালিত হয়। [05]

21. Read the following passage carefully and tick mark the corresponding circle to choose the correct or the best one from the four answers following each question: [05]

Unlike the eye, the ear has no lid; therefore noise penetrates without protection. Loud noises instinctively signal danger to any organism with a hearing mechanism, including human beings. In response, heartbeat and respiration accelerate. In fact, there is a general increase in functioning brought about by the flow of adrenaline released in response to fear.

Because noise is unavoidable in a complex, industrial society. We are constantly responding in the same ways that we would respond to danger. Recently, researchers have concluded that noise and our response may be much more than an annoyance. It may be a serious threat to physical psychological health and well-being, causing damage not only to the ear and brain but also to the heart and stomach. We have long known that hearing loss is America's number one nonfatal health problem, but now we are learning that some of us with heart disease and ulcers may be victims of noise as well.

- a) What is the author's main point?
 - Noise may pose a serious threat to our physical and psychological health.
 - Loud noises signal danger.
 - Hearing loss is America's number one nonfatal health problem.
 - The ear is not like the eye.

- b) According to the passage, people respond to loud noises in the same way that they respond to-
 - Annoyance
 - Damage
 - Danger
 - Disease

- c) It can be inferred from this passage that the eye-
 - Responds to fear
 - Enjoys greater protection than the ear
 - Increases functions
 - Is damaged by noise

- d) Noise is-
 - Not a serious problem today
 - America's number one problem
 - An unavoidable problem in an industrial society
 - A complex problem

- e) What was the topic of the paragraph that preceded this passage?
 - The eye
 - Heart disease
 - Ulcers
 - Fears

Section D: Aptitude(10)

- 22.** Find out the wrong number in the given sequence of numbers. [02]
396, 462, 572, 427, 671, 264
A. 396 B. 427 C. 671 D. 264
- 23.** A is two years older than B who is twice as old as C. If the total of the ages of A, B and C be 27, then how old is B? [02]
A. 7 B. 8 C. 9 D. 10 E. 11
- 24.** Which one of the following is not a prime number? [02]
A. 31 B. 61 C. 71 D. 91
- 25.** Today is Monday. After 61 days, it will be: [02]
A. Wednesday B. Saturday C. Tuesday D. Thursday
- 26.** Insert the missing number. [02]
16, 33, 65, 131, 261, (...)
A. 523 B. 521 C. 613 D. 721