



ADMISSION TEST

SAMPLE PAPER FOR BS EE, SE AND CS PROGRAMS



Max. Marks: 400

Time Allowed: 2 Hours

INSTRUCTIONS

Each Correct Answer Carries 4 Marks;

DO NOT TURN THIS PAGE UNTILL INSTRUCTED TO DO SO

- Switch off your mobile phone.
- Use the provided blue marker to mark your answer sheet. Do not use a pencil.
- Write your name; roll number and answer booklet number on your answer sheet.
- There are 100 (Physics 40 Questions, Mathematics 40 Questions, and English 20 Questions) questions in this admission test and for each question, four or five possible choices are given.
- Choose the most appropriate answer to the given question by filling the appropriate circle (only ONE circle) on the answer sheet.
- Questions with more than one circles filled, will not be graded.
- **Don't write anything on the booklet. All answers must be given on the answer sheet provided.**
- Anyone found using unfair means will be immediately disqualified from the test

Use of calculator is not allowed

MATHEMATICS SECTION (40 QUESTIONS)

<p>Q 1.</p>	<p>For $y = \sin^3 x$, $\frac{dy}{dx}$ is::</p> <p>A. $\cos^3 x$ B. $3x^2 \cos x$ C. $3 \sin^2 x \cos x$ D. None of the above</p>	<p>C</p>
<p>Q 2.</p>	<p>If $\frac{dy}{dx} = 2x - \cos 4x + 1$, then $\frac{d^2 y}{dx^2}$ at $x = 0$ is given by:</p> <p>A. 2 B. 6 C. 1 D. 7</p>	<p>A</p>
<p>Q 3.</p>	<p>$(x - 2)^2 + (y + 1)^2 = 36$ is equation of:</p> <p>A. Circle with centre $(-2, 1)$ B. Circle with centre $(2, 1)$ C. Circle with centre $(2, 6)$ D. Circle with centre $(2, -1)$</p>	<p>D</p>
<p>Q 4.</p>	<p>$\int \sec^2 x dx = \text{-----}$</p> <p>A. $2 \sec x \tan x + c$ B. $\tan x + c$ C. $\frac{\sec^3 x}{3} + c$ D. None of above</p>	<p>B</p>
<p>Q 5.</p>	<p>$\int \cos 4x dx = \text{-----}$</p> <p>A. $\frac{-1}{4} \sin 4x + c$ B. $\frac{1}{4} \sin 4x + c$ C. $\sin 4x + c$ D. $-\sin 4x + c$</p>	<p>B</p>

PHYSICS SECTION (40 QUESTIONS)

Q 1.	Two independent sources of light don't show interference because they are not A. Coherent B. Mechanical waves C. Obeying the inverse square law D. Having same intensity	A
Q 2.	When beta particle is emitted out of nucleus then its mass number remains constant but its charge number is increased by A. Two B. Three C. One D. None of above	C
Q 3.	If the radius of the Earth were increased by a factor of 3 and its mass remained the same, then the acceleration due to gravity on the Earth would be A. Increase by a factor of 3 B. Increase by a factor of 9 C. Reduce by a factor of 3 D. Reduce by a factor of 9	D
Q 4.	A test charge of 1.0×10^{-5} C is at a point in an electric field where the field strength is 2.0×10^4 N/C. What is the magnitude of the force experienced by the test charge and in what direction is the force compared to the field? A. 0.20 N, opposite direction B. 0.10 N, opposite direction C. 0.10 N, same direction D. 0.20 N, same direction	D
Q 5.	Which of the following pair of vectors is perpendicular to each other? A. $i + j + k, 2i - 3j + k$ B. $i - 2j + 3k, 3i + 4k$ C. $i + j + k, 2i + 3j + 4k$ D. $i + j - 3k, -i - j + k$	A
Q 6.	A ray passing through the optical center: A. Does not change its path. B. Passes through the focus. C. Becomes parallel to the principal axis. D. Diverges from the focus.	A

ENGLISH SECTION (20 QUESTIONS)

Note: Choose the correct preposition

Q 1.	There is no doubt _____ his involvement in this scandal. A. In B. On C. About D. At	C
Q 2.	I wonder what his complaint _____ me and my people is: A. From B. With C. By D. Against	D

Note: Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are five words or sets of words labeled A through D. Choose the word or set of words that, when inserted in the sentence, best fits the meaning of the sentence as a whole.

Q 3.	There is a common belief in society that people who are uneducated and in poverty used slang; however this belief is _____. A. Popular B. Ineffectual C. Erroneous D. Malicious	C
Q 4.	When you make a choice of becoming a monk, you must be willing to _____ luxuries of life. A. Abstain B. Ascertain C. Falsify D. Give up	D

Note: For the following problems, choose the lettered pair of words whose relationship is most like the relationship expressed in the given linked pair in capitals.

Q 5.	WAVERING: DIRECTNESS :: A. Menacing: ambition B. Digressive: conciseness C. Circuitous: rotation D. Straightforward: openness	B
Q 6.	DWELL: INHABITANT :: A. Shun: outcast B. Inherit: heir C. Squander: miser D. Obey: autocrat	B

Note: The passage below is followed by questions based on its content:

Obsessive-compulsive disorder (OCD) is clinically diagnosed as an anxiety disorder and affects up to 4 percent of adults and children. People who suffer from this debilitating disorder have distressing and obsessive thoughts, which usually cause them to perform repetitive behaviors such as counting silently or washing their hands. Though OCD sufferers understand that their obsessions are unrealistic, they find it stressful to put these intrusive thoughts out of their minds. Those who suffer from obsessive-compulsive disorder develop strict behavioral patterns that become extremely time-consuming and begin to interfere with daily routines. Many people with OCD delay seeking treatment because they are ashamed of their own thoughts and behavior.

OCD sufferers experience worries that are both unreasonable and excessive and that act as a constant source of internal stress. Fear of dirt and contamination are very common obsessive thoughts. The obsession with orderliness and symmetry is also common. In other cases, persistent thoughts are centered on doubts, such as whether or not a door is locked or a stove is turned off. Impulses, such as the urge to swear in public or to pull a fire alarm, are other types of OCD symptoms. In order to be diagnosed with OCD, a sufferer must exhibit obsessions and/or compulsions that take up a considerable amount of time (at least one hour per day).

To combat excessive thoughts and impulses, most OCD sufferers perform certain repetitive rituals that they believe will relieve their anxiety. These compulsions can be either mental or behavioral in nature. Common rituals include excessive checking, washing, counting, and praying. Over time, OCD sufferers attach strict rules to their compulsions. For example, a woman who is obsessed with cleanliness might wash her hands three times before having a meal in order to get the thought of the dirty dishes or silverware out of her mind. However, in many cases, the compulsions aren't related to the obsession at all. A man obsessed with the image of dead animals might count silently up to 500 or touch a specific chair over and over in order to block the images. Holding onto objects that would normally be discarded, such as newspapers and empty containers, is another common compulsion.

OCD symptoms generally begin between the age of 10 and 24 and continue indefinitely until a person seeks treatment. A child's upbringing does not seem to be part of the cause of the disorder, though stress can make the symptoms stronger. The underlying causes of OCD have been researched greatly and point to a number of different genetic factors. While studies show that OCD and its related anxiety disorders are often passed down through families, the specific symptoms for each family member are rarely the same. For example, a mother who is obsessed with order may have a son who can't stop thinking about a single word or number.

Research on OCD sufferers has found certain physiological trends. In particular, many studies show an over activity of blood circulation in certain areas of the brain. As a result of this increase in blood flow, the serotonergic system, which regulates emotions, is unable to function effectively. Studies have also shown that OCD sufferers have less serotonin than the average person. This type of abnormality is also observed in Tourette syndrome and Attention Deficit Hyperactive Disorder. People who developed tics as children are found to be more susceptible to OCD as well. Many reports of OCD point to infections that can trigger the disorder, namely streptococcal infections. It is believed that a case of childhood strep throat can elicit a response from the immune system that produces certain neuropsychiatric disorders, such as OCD.

Because OCD sufferers tend to be so secretive about their symptoms, they often put off treatment for many years. The average OCD sufferer waits about 17 years before receiving medical attention. As with many anxiety disorders, early diagnosis and proper medication can lessen many of the symptoms and allow people to live fairly normal lives. Most treatment plans for OCD involve a combination of medication and psychotherapy. Both cognitive and behavioral therapies are used to teach patients about their disorder and work through the anxiety. Serotonin reuptake inhibitors are prescribed to increase the brain's concentration of serotonin. This medication successfully

reduces the symptoms in many OCD sufferers in a short amount of time. For cases when OCD is linked to streptococcal infection, antibiotic therapy is sometimes all that is needed.

Answer the questions below on the basis of what is stated or implied in the passage.

Q 7.	OCD sufferers flee from treatment because: A. They think the feelings are realistic B. They acknowledge their problem are ashamed of talking about their issues C. They fear the medical procedures and pain involved in curing the disease D. They cannot pay the high fee of the doctor	B
Q 8.	Research has shown that OCD is generally related to: A. Excessive stress B. Genetic disorder C. Extreme living conditions D. Phobia of certain images	B
Q 9.	Which of the following cannot be a cause of OCD? A. Failure of serotonergic system B. Children developing tics C. Streptococcal infections D. Childhood upbringing	D