Note: Collecting by previous test takers interviews

GHULAM ISHAQ KHAN INSTITUTE OF ENGINEERING SCIENCES AND TECNOLOGY (GIKI)

Engineering Sample Admission Test 05

MATHEMATICS

Directions: *For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER*

ALL ANSWER MUST BE GIVEN ON THE ANSWER SHEET.

YOUR ANSWERS MUST BE INDICATED BY LETTERS (A, B, C, D) AND NOT BY THE WORDS THEMSELVES.

1. The fifth term of the sequence $a_n = 2n - 3$ is_____ .

   A) 13 B) -13

   C) 7 D) -7

2. The harmonic mean between a and b is

   A) $\frac{a+b}{2}$ B) $\pm\sqrt{ab}$

   C) $\frac{a-b}{2}$ D) $\frac{2ab}{a+b}$

3. $\frac{8!}{6!}$ =_____ .

   A) 8 B) $\frac{1}{56}$

   C) 56 D) None of these

4. ${}^{16}C_{11} + {}^{16}C_{10}$ =_____.

A) $^{16}C_{10}$ B) $^{15}C_{11}$

C) $^{17}C_{10}$ D) $^{17}C_{11}$

5. In the expansion of $(a+x)^n$ the sum of exponents of a and x in each term of the expansion is

A) N + 1 B) n-1

C) N D) 2n

6. The number of terms in the expansion of $\left[x^2 - \frac{4}{x^2}\right]^9$ is

A) 8 B) 9

C) 10 D) 11

7. $\text{Cos}^2 \frac{\theta}{2} + \sin^2 \frac{\theta}{2}$ =_____ .

A) 2 B) $\frac{1}{2}$

C) 1 D) None of these

8. The area of a sector of a circular region of radius r and central angle θ radian s is

A) $r^2\theta$ B) $\frac{1}{2}r^2\theta$

C) $r\theta$ D) $\frac{1}{2}r^2\theta$

9. $\text{Cos}\ (2\pi + \theta)$ =_____ .

A) Sin θ B) Cos θ

C) -sin θ D) - cos θ

10 2 sin $a \cos\beta$ =_____ .

A) $\text{Cos}(a+\beta)-\cos(a-\beta)$

B) $\text{Cos}\ (a+\beta)+\cos(a-\beta)$

C) $\text{Sin}\ (a+\beta)-\sin(a-\beta)$

D) $\text{Sin}\ (a+\beta)+\sin(a-\beta)$

11 Period of sin 3x is_____ .

A) $\frac{\pi}{3}$

B) $\frac{2\pi}{3}$

C) π

D) 2π

12 Range of tan x is_____ .

A) R

B) [-1,1]

C) $\left[-\frac{1}{2},\frac{1}{2}\right]$

D) None of these

13 Sin $\frac{a}{2}$ =_____ .

A) $\sqrt{\frac{(s+b)(s+c)}{bc}}$

B) $\sqrt{\frac{(s-b)(s-c)}{bc}}$

C) $\sqrt{\frac{bc}{(s-b)(s-c)}}$

D) $\sqrt{\frac{s(s-a)}{bc}}$

14 In = radius of Δ ABC is

A) R= $\frac{\Delta}{s}$

B) R= $\frac{abc}{4\Delta}$

C) R= $\frac{\Delta}{s-b}$

D) R= $\frac{abc}{4s}$

15 The solution of the equation 3 $\tan^2$ x = 1 is_____.

A) $\left\{\frac{\pi}{6}+n\pi\right\}\cup\left\{\frac{5\pi}{6}+n\pi\right\}, n\in Z$

B) $\left\{\frac{\pi}{3}+2n\pi\right\}\left\{\frac{2\pi}{3}+2n\pi\right\}, n\in Z$

C) $\left\{\frac{\pi}{4}+n\pi\right\}\cup\left\{\frac{5\pi}{4}+n\pi\right\}, n\in Z$

D) None of these

16 If $f(x) = x^3-2x^2 + 4x – 1$ then f(0) is

A) 0

B) 1

C) -1

D) None of these

<

17 F(x) = x is

A) Trigonometric function

B) Exponential function

C) Quadratic function

D) None of these

18 F(x) = tan x is

A) Even function

B) Odd function

C) Linear function

D) None of these

19 If f is a bijective a function then $f(f^{-1}(x))$ is

A) X

B) 0

C) 1

D) -1

20 $\lim_{x\to 0}\frac{\sin ax}{\sin bx}$ =_____ .

A) 1

B) $\frac{b}{a}$

C) $\frac{a}{b}$

D) None of these

21 If $f(x) = \tan^{-1} x$ then f (tan x) =_____ .

A) 0

B) -1

C) 1

D) 2

22 $\frac{d}{dx}\left[\tan^{-1} x\right] =$ _____ .

A) $\frac{1}{x\sqrt{x^2-1}}$

B) Sec^2x

C) $Sin^2 x$

D) Cos^2x

23 $\frac{d}{dx}(\cosh 2x) =$ _____ .

A) 2 cos h 2x

B) -2sin h 2x

C) 2 sin h 2x

D) 2 cot h 2x

24 If f(x) = $\tan^{-1} x$ then f (tan x) = _____ .

A) $\frac{1}{1+x^2}$

B) $Sec^2 x$

C) $Sin^2 x$

D) $Cos^2 x$

25 The function f(x) = $3x^2$ has extreme value at

A) X = 1

B) X = 3

C) X = 6

D) X = 0

26 $\int \frac{2x-1}{x^2-x+1} dx =$ _____ .

A) $\frac{1}{2}(x^2-x+1)^2 + c$

B) In $(x^2 - x+1) + c$

C) $\frac{x^3}{3} - \frac{x^2}{2} + x + c$

D) In (2x – 1) + c

27 $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx =$ _____ .

A) In $\left|e^x - e^{-x}\right| + c$

B) In $\left|e^x + e^{-x}\right| + c$

C) $E^x + e^{-x} + c$

D) $E^x - e^{-x} + c$

28 $\int e^x \left[\tanh^{-1} x + \frac{1}{1-x^2} \right] dx =$ _____ .

A) $e^x \tan h^{-1} x + c$

B) $e^x \cot h^{-1} x + c$

C) $\frac{e^x}{1-x^2} + c$

D) $e^x \operatorname{cosec} h^{-1} x + c$

29 $\int_0^2 x^2 \, dx =$ _____.

A) $\frac{2}{3}$

B) $\frac{4}{3}$

C) $\frac{8}{3}$

D) None of these

30 The mid point of the line segment joining the points A (-B, 3) an B(2, -1) is

A) (-3, 1)

B) (-6, 2)

C) (5, 2)

D) (-5, 2)

31 the centroid of a triangle divides each median in the ratio

A) 2: 1

B) 3:1

C) 3:2

D) 1:1

32 The point P (x_1, y_1) is on the line ax +by +c = 0 if

A) $Ax_1 + by_1 + c = 0$

B) $Ax_1 + by_1 + c < 0$

C) $Ax_1 + by_1 + c > 0$

D) None of these

33 The area of the triangular region with vertices $A(x_1, y_1)$ $B(x_2, y_2)$, $C(x_3, y_3)$ is

A) $\begin{vmatrix} x_1 y_1 1 \\ x_2 y_2 1 \\ x_3 y_3 1 \end{vmatrix}$

B) $\frac{1}{2}\begin{vmatrix} x_1 y_1 1 \\ x_2 y_2 1 \\ x_3 y_3 1 \end{vmatrix}$

C) $2\begin{vmatrix} x_1 y_1 1 \\ x_2 y_2 1 \\ x_3 y_3 1 \end{vmatrix}$

D) $\frac{1}{4}\begin{vmatrix} x_1 y_1 1 \\ x_2 y_2 1 \\ x_3 y_3 1 \end{vmatrix}$

,

34 X= x is in the solution of the inequality

A) X > 0

B) 3x + 4 < 0

C) X + 3 < 0

D) X – 2 < 0

35 The line y = mx + x is tangent to he circle $x^2 + y^2 = a^2$ if

A) C = $\pm a\sqrt{1+m^2}$

B) C = $\pm a\sqrt{1-m^2}$

C) C = $\pm m\sqrt{1+a^2}$

D) C = $\pm m\sqrt{1-a^2}$

36 The foci of the ellipse $\frac{x^2}{b^2}+\frac{y^2}{a^2}$ = 1a. b are

A) $(\pm c,0)$

B) $(0,\pm c)$

C) $(\pm a,0)$

D) $(0,\pm a)$

37 The length of major axis of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}$ = 1, a> b is

A) 2a

B) A

C) 2b

D) B

38 The position vector of the point P (a, b, c) is

A) $\bar{r} = c\hat{i} + b\hat{j} + a\hat{k}$

B) $\bar{r} = a\hat{i} + c\hat{j} + b\hat{k}$

C) $\bar{r} = b\hat{i} + a\hat{j} + c\hat{k}$

D) $\bar{r} = a\hat{i} + b\hat{j} + c\hat{k}$

39 The vectors intersecting at a single point are called

A) Collinear vectors
B) Concurrent vectors
C) Perpendicular
D) None of these

40 A unit vector along $2\hat{i}+\sqrt{5}\hat{j}+4\hat{k}$ is

A) $\frac{2}{5}\hat{i}+\frac{\sqrt{5}}{5}\hat{j}+\frac{4}{5}\hat{k}$
B) $\frac{2}{\sqrt{5}}\hat{i}+\hat{j}+\frac{4}{\sqrt{5}}\hat{k}$
C) $\hat{i}+\hat{j}+\hat{k}$
D) None of these

GENERAL MATH:

Directions: *For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER**ALL ANSWER MUST BE GIVEN ON THE ANSWER SHEET.***

YOUR ANSWERS MUST BE INDICATED BY LETTERS (A, B, C, D) AND NOT BY THE WORDS THEMSELVES.

1. If Mario was 32 years old 8 years ago, how old was he *x* years ago?

A. $x-40$ B. $x-24$ C. $40-x$ D. $24-x$ E. $24+x$

2. Running at the same constant rate, 6 identical machines can produce a total of 270 bottles per minute. At this rate, how many bottles could 10 such machines produce in 4 minutes?

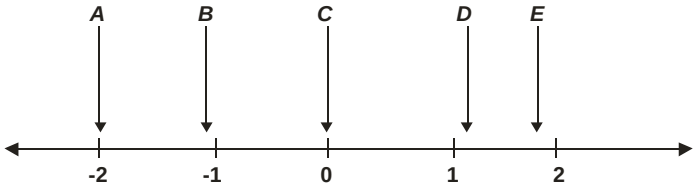
A. 648 B. 1,800 C. 2,700 D. 10,800 E. 64,800

3. Three business partners, *Q, R,* and *S,* agree to divide their total profit for a certain year in the ratios 2 : 5:

8, respectively. If *Q*'s share was $4,000, what was the total profit of the business partners for the year?

A. $26,000 B. $30,000 C. $52,000 D. $60,000 E. $300,000

4.



Of the five coordinates associated with points *A, B, C, D,* and *E* on the number line above, which has

the

greatest absolute value?

A. *A* B. *B* C. *C* D. *D* E. *E*

5. A restaurant meal cost $35.50 and there was no tax. If the tip was more than 10 percent but less than 15

percent of the cost of the meal, then the total amount paid must have beet between

A. $40 and $42 B. $39 and $41 C. $38 and $40 D. $37 and $39 E. $36 and #37

6. Harriet wants to put up fencing around three sides of her rectangular yard and leave a side of 20 feet unfenced. If the yard has an area of 680 square feet, how many feet of fencing does she need?

A. 34 B. 40 C. 68 D. 88 E. 102

7. If $u \clubsuit t, r \clubsuit q, s \clubsuit t, and\ t \clubsuit r,$ which of the following must be true?

I. $u > s$
II. $s \clubsuit q$
III. $u \clubsuit r$

A. I only B. II only C. III only D. I and II only E. II and III only

8. Increasing the original price of an article by 15 percent and then increasing the new price by 15 percent

is equivalent to increasing the original price by

A. 32.25% B. 31.00% C. 30.25% D. 30.00% E. 22.50%

9. If *k* is an integer and 0.0010101 x 10^k is greater than 1,000, what is the least possible value of *k*?

A. 2 B. 3 C. 4 D. 5 E. 6

10. If $(b-x)\left(4+\frac{2}{b}\right)=0 \text{ and } b \neq 3, \text{then } b =$

A. -8 B. -2 C. $-\frac{1}{2}$ D. $\frac{1}{2}$ E. 2

PHYSICS

Directions: *For each question below you are given four choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER*

ALL ANSWER MUST BE GIVEN ON THE ANSWER SHEET.

YOUR ANSWERS MUST BE INDICATED BY LETTERS (A, B, C, D) AND NOT BY THE WORDS THEMSELVES.

1. Physics is the study of

   (a) Matter (b) Energy (c) Relation between matter & energy (d) All of the above

2. The branch of physics which deals with the properties, and interaction of nuclear particles (protons and neutrons) is called

   (a) Molecular physics (b) Plasma physics (c) Nuclear physics (d) Solid state physics

3. When comparing systematic and random errors, the following pairs of properties of errors in an experimental measurement may be contrasted:

   P_1 : error can possibly be eliminated

   P_2 : error cannot possibly be eliminated

   Q_1: error is of constant sign and magnitude

   Q_2 : error is of varying sign and magnitude

   R_1 : error will be reduced by averaging repeated measurements

   R_2 : error will not be reduced by averaging repeated measurements

   Which properties apply to random errors?

   A) P_1, Q_1, R_2 B) P_2, Q_2, R_1 C) P_1, Q_2, R_2 D) P_2, Q_1, R_2

4. In a simple electrical circuit, the current in a resistor is measured as (2.50±0.05) mA. The resistor is marked as having a value of 4.7Ω ±2%. If these values were used to calculate the power dissipated in the resistor, what would be the percentage uncertainty in the values obtained?

A) 2% B) 4% C) 6% D) 8%

5. The dimension of a cube are measured with dernier calipers. The measured length of each side is 30 mm. If the dernier calipers can be read with an uncertainty of ±0.1 mm, what does this give for the approximate uncertainty in the value of its volume?

A) 1/27 % B) 3/10 % C) 1/3 % D) 1%

6. An alternative form of the unit of resistance, the ohm is $V A^{-1}$

Which of the following example shows a similar correct alternative form of unit?

A) coulomb (C) As^{-1} B) farad (F) $V C^{-1}$ C) Pascal (Pa) $N m^{-2}$ D) volt (V) J C

7. Which of the following quantities has a unit that can be expressed in terms of just two different SI base units? (E) resistance

A) area B) charge C) current D) force

8. The base units of the SI system include those of

Mass, kg; length, m; time, s;electric current, A.

Which base units would be needed to express the SI unit of potential difference (the volt)?

A) kg and A only B) kg, m, s, and A C) s and A only D) m, s, and A

9. The unit of luminous intensity in SI system of units is

(a) Ampere (b) Mole (c) Candela (d) Kelvin

10. The fundamental unit of angle in a plane in SI system of units is called

(a) Rotation (b) Degree (c) Radian (d) Cycle

11. What is the unit of power of a lens?

(a) Angstrom (b) Cycle (c) Newton (d) Dioptre

12. Significant figures in 0.0001 are

(a) One (b) Two (c) Three (d) Four

13. The dimensions of frequency are

(a) LT (b) LT^{-1} (c) MT^{-1} (d) T^{-1}

14. What is the number of significant zeros in 0.00112?

(a) Zero (b) One (c) Two (d) Three

15. A scalar is a physical quantity which is completely specified by

(a) Direction only (b) Magnitude only (c) Both magnitude & direction (d) None of these

16. Which of the following is a scalar quantity

(a) Density (b) Displacement (c) Torque (d) Weight

17. Which of the following is the only vector quantity

(a) Temperature (b) Energy (c) Power (d) Momentum

18. Which of the following lists of physical quantities consists only of vectors:

(a) Time, temperature, velocity (b) Force, volume, momentum

(c) Velocity, acceleration, mass (d) Force, acceleration, velocity

19. The rectangular components of a vector have angle between them

(a) 0^0 (b) 60^0 (c) 90^0 (d) 120^0

20. A force of 10N is acting along y-axis. Its component along z-axis is

(a) 10N (b) 20N (c) 100N (d) Zero N

21. Two forces are acting together on an object. The magnitude of their resultant is minimum when the angle between the force is

(a) 0^0 (b) 60^0 (c) 120^0 (d) 180^0

22. Two forces of 10N and 15N are acting simultaneously on an object in the same direction. Their resultant is

(a) Zero (b) 5N (c) 25N (d) 150N

23. If the dot product of two non-zero vectors vanishes, the vectors will be

(a) In the same direction (b) Opposite to each other (c) Perpendicular to each other (d) Zero

24. If two non-zero vector $\vec{A}$ and $\vec{B}$ are parallel to each other, then $\vec{A} \cdot \vec{B}$ is equal to

(a) Zero (b) AB (c) A + B (d) A – B

25. The dot product of two vectors is negative when

(a) They are parallel vectors (b) They are anti-parallel vectors

(c) They are perpendicular vectors (d) None of the above is correct

26. The vector product of two vectors is zero, when

(a) They are parallel to each other (b) They are perpendicular to each other

(c) They are equal vectors (d) They are inclined at angle of 60^0

27. If $(\vec{a} \times \vec{b})$ points along positive z-axis, then the vectors $\vec{a}$ and $\vec{b}$ must lie in

(a) Ax-plane (b) Yx-plane

(c) Xy-plane (d) None of the above

28. The position vector of a point in xz-plane is given by

(a) $\vec{r} = x\hat{i} + y\hat{j}$ (b) $\vec{r} = y\hat{i} + z\hat{k}$ (c) $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ (d) $\vec{r} = x\hat{i} + z\hat{k}$

29. If $\vec{A} = A_1\hat{i} + A_2\hat{j}$ and $\vec{B} = B_1\hat{i} + B_2\hat{j}$ are non-parallel vectors, then the direction of $\vec{A} \times \vec{B}$ is

(a) Along $\vec{B}$ (b) Along x-axis (c) Along y-axis (d) Along z-axis

30. If $\vec{A} \cdot \vec{B} = 0$ and also $\vec{A} \times \vec{B} = 0$, then

(a) $\vec{A}$ and $\vec{B}$ are perpendicular to each other (b) $\vec{A}$ and $\vec{B}$ are parallel to each other

(c) $\vec{A}$ and $\vec{B}$ are anti-parallel to each other (d) Either $\vec{A}$ or $\vec{B}$ is a null vector

ENGLISH

Directions: *For each question below you are given choices. SELECT ANY ONE THAT IS MOST APPROPRIATE ANSWER*

SENTENCE COMPLETION

Directions for Q 1 - 3

Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath in sentence are five lettered words or sets of words. Choose the word or set of words that best fits the meaning of the sentence as a whole.

1. The selection committee for the exhibit was amazed to see such fine work done by a

mere_____ .

A. Connoisseur
B. Artist
C. Amateur
D. Entrepreneur
E. Exhibitionist

2. The teacher suspected cheating as soon as he notice the pupil's____glances at his classmate's paper.

A. Futile
B. Sporadic
C. Furtive
D. Cold
E. Inconsequential

3. Known for his commitment to numerous worthy causes, the philanthropist deserved____for his_____.

A. Recognition….folly
B. Blame….hypocrisy
C. Reward….modesty
D. Admonishment….wastefulness
E. Credit….altruism

ANALOGIES

Direction: Each question below consists of a related pairs of words or phrases, followed by five lettered pairs of words or phrases, Select the lettered pair that best expresses a relationship similar to that expressed in the original pair.

4. FISH : SCALES ::
   (a) plane : wings
   (b) bird : feathers
   (c) cat : claws
   (d) snake : fangs
   (e) song : notes
5. FISH : SCHOOL ::
   (a) book : education
   (b) team : practice
   (c) dog : sled
   (d) bear : lair
   (e) lion : pride
6. CLOCK : TIME ::
   (a) watch : wrist
   (b) odometer : speed
   (c) hourglass : sand
   (d) yardstick : distance
   (e) radio : sound
7. DOCTOR : DISEASE ::
   (a) moron : imbecility
   (b) pediatrician : senility
   (c) psychiatrist : maladjustment
   (d) broker : stocks
   (e) charlatan : truth

ANTONYM

Direction: In each of the following antonym questions, a word printed in capital letters precedes five lettered words or phrases. From these five lettered words or phrases, pick the one most nearly opposite in meaning to the capitalized word.

8. MERRY:
(A) Sad (B) Melancholy (C) Defy (D) Willing

9. MITIGATION:
(A) Obscenity (B) Aggravation (C) Restriction (D) Interregnum

10. NEFARIOUS:
(A) Benign (B) Various (C) Lacking (D) Pompous

11. NOISOME:
(A) Quiet (B) Dismayed (C) Sleepy (D) Fragrant

READING COMPREHENSION

Direction: Please read the passage below and answer the questions on the basis of what is stated or implied.

Passage:

In 1807 Noah Webster began his greatest work, An American Dictionary of the English Language. In preparing the manuscript, he devoted ten years to the study of English and its relationship to other languages, and seven more years to the writing itself. Published in two volumes in 1828. An American Dictionary of the English Language has become the recognized authority for usage in the United States. Webster's purpose in writing it was to demonstrate that the American language was developing distinct meanings, pronunciations, and spellings from those of British English. He is responsible for advancing simplified spelling forms: develop instead of the British form develop; theater and center instead of theatre and centre; color and honor instead of colour and honour.

QUESTIONS

12. When as An American Dictionary of the English Language published?
(A) 1817 (B) 1828 (C) 1807 (D) 1824

13. According to this passage, which one of the following spellings would Webster have approved in his dictionaries?
(A) develope (B) theatre (C) color (D) honour

14. According to the author, Webster's purpose in writing An American Dictionary of the English Language was to
(A) respond to the need for new schoolbooks
(B) demonstrate the distinct development of the English language in America
(C) promote spelling forms based upon British models
(D) influence the pronunciation of the English language

15. In how many volumes was An American Dictionary of the English Language published?

(A) one volume (B) two volumes (C) three volumes (D) four volumes

END OF TEST

For Answer Key: www.entrytest.com/testprep/answers.aspx