NU-FAST

CS & ENGG

PAST PAPERS

Part-1

33. If $y = \ln x^3$, then $\left(\frac{dy}{dx}\right)_{x=1} = ?$

A. 2 B. 1

C. 3 D. 0

34. $\int \frac{\cos x}{\sqrt{\sin x}}\, dx$

A. $2(\sin x)^{1/2} + c$ B. $2\cos x + c$

C. $3\sin x + c$ D. $\sqrt{\sin x} + c$

35. $\tan 105^\circ = ?$

A. $1+\sqrt{3}$ B. $1-\sqrt{3}$

C. $\frac{1+\sqrt{3}}{1-\sqrt{3}}$ D. 0

36. If $A \times (B \cup C) = ?$

A. $(A \times B) \cup (A \times C)$ B. $(A \times B) \cap (A \times C)$

C. $(A - B) \times (A \cap C)$ D. None of these

37. If $2x + 3y = 5$ and $x = 1$, then $y = ?$

A. $\frac{3}{5}$ B. $\frac{3}{5}$

C. $\frac{5}{3}$ D. $\frac{2}{5}$

38. $\int (ax + b)^n\, dx = ?$

A. $\frac{(ax+b)^{n-1}}{n+1}$ B. $\frac{(ax+b)^{n+1}}{n+1}$

C. $(2ax + b)^{n+1}$ D. None of these

39. If $k(m) = 5 - 2m$; $x(m) = 2m - 5$, then $k[x(m)] = ?$

A. $4m - 5$ B. $4m - 15$

C. $15 - 4m$ D. $15 + 4m$

40. $4\frac{1}{2} + 6\frac{3}{4} = ?$

A. $20/3$ B. $40/3$

C. $45/7$ D. $45/4$

13

NU-FAST (CS) #1
ANSWER SHEET

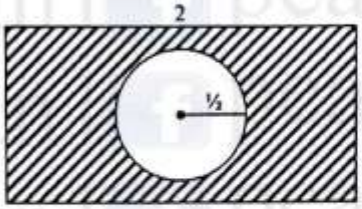
STUDENT'S NAME _____ DATED: _____

ENGLISH		ANALYTICAL SKILLS AND I.Q		BASIC MATH		ADVANCED MATHEMATICS	
1	C	1	B	1	B	1	B
2	B	2	B	2	B	2	B
3	D	3	B	3	D	3	C
4	C	4	A	4	B	4	B
5	C	5	B	5	D	5	D
6	A	6	C	6	A	6	D
7	A	7	B	7	D	7	B
8	C	8	A	8	C	8	D
9	B	9	C	9	B	9	A
10	D	10	D	10	C	10	D
		11	C	11	B	11	D
		12	B	12	D	12	C
		13	C	13	B	13	B
		14	A	14	C	14	D
		15	B	15	C	15	B
		16	C	16	D	16	C
		17	B	17	C	17	A
		18	B	18	D	18	D
		19	C	19	C	19	C
		20	C	20	C	20	D
						21	D
						22	D
						23	D
						24	C
						25	D
						26	C
						27	B
						28	D
						29	D
						30	D
						31	D
						32	D
						33	B
						34	A
						35	C
						36	B
						37	A
						38	B
						39	C
						40	D
						41	A
						42	B
						43	D
						44	A
						45	D
						46	C
						47	B
						48	B
						49	A
						50	B

W		W		W		W	
R		R		R		R	

BASIC MATH

1. Find the area of shaded region.

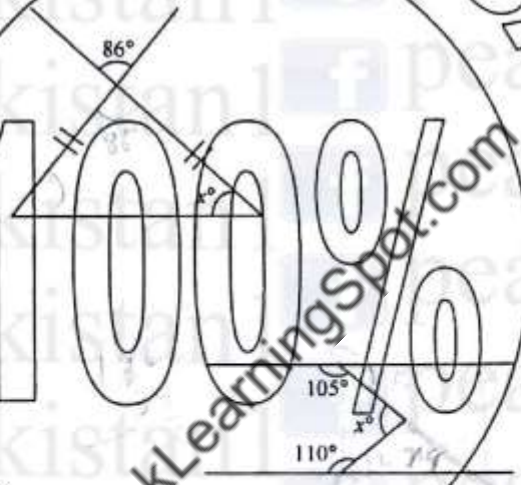


A. 3.35π
B. $3.6 - 0.25\pi$
C. 0.25π
D. $0.36 - 2.5\pi$

2. Find the perimeter of the figure.

A. $14 + \pi$
B. $16 + \pi$
C. $14 + \pi/2$
D. $16 + \pi/2$

3. Find the value of x.



A. 86°
B. 94°
C. 64°
D. 47°

4. $x = ?$

A. 95°
B. 145°
C. 115°
D. 35°

5. Asad sell on article to Wasif at a gain of 20%. Wasif then sells it to Faisal at a loss of 5%. What was the cost for Asad if Faisal paid $57 for it?

A. 45
B. 60
C. 55
D. 50

6. Mr. Jones received a 10% salary increase each of the last two years. If her annual salary this year is $41745, what was her annual salary two years ago?

A. $34,500
B. $33,813
C. $33,396
D. $34,000

7. How many ounces of water must be added to 100 ounces of an 80% solution of boric acid to reduce it to a 50% solution?

A. 30
B. 40
C. 50
D. 60

8. Find the sum of first seven numbers: 6, 12, 24, 48, ...

A. 700
B. 662
C. 762
D. 492

25. Find 'y' if $\text{Sin } x = 2 \text{ Cos}\left(\frac{x+y}{2}\right) . \text{Sin}\left(\frac{x-y}{2}\right)$ where $x \geq 0$ and $y \leq 90$.

A. 60^0 B. 30^0

C. 90^0 D. Zero

26. The sum of 6 consecutive odd numbers exceeds twice the largest number by 22. Then the smallest no is?

A. 5 B. 8

C. 3 D. 2

27. If there are 16 Boys and 12 Girls, then the ratio of girls to the whole student is?

A. 3:4 B. 3:7

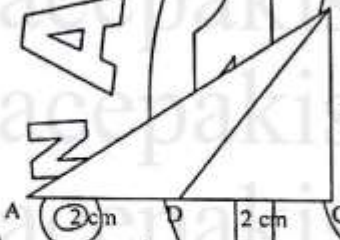
C. 3:2 D. 7:3

28. The sum of the measure of thee angle of a triangle is _____.

A. 90^0 B. 360^0

C. 45^0 D. 180^0

29.



A. $\Delta ABD = \frac{1}{2} \Delta BCD$ B. $\Delta ABD = \frac{1}{3} \Delta BCD$

C. $\Delta ABC = \Delta BCD$ D. $\Delta ABC = 2 \Delta BCD$

30. If $y = \ln x$, then $y'' = ?$

A. $-2/x^2$ B. $3/x^2$

C. $-3/x^3$ D. $2/x^3$

31. If $2 - \text{Sec}^2 2x = \frac{\text{Sec}^2 2x}{2}$, then $x = ?$

A. $\pi/10$ B. π

C. $12/\pi$ D. $\pi/12$

32. If $y = e^{3x} + 2x + 1$, then $\frac{dy}{dx} = ?$

A. $e^{3x} + 2$ B. $e^{3x} + 1$

C. $2e^{3x} - 2$ D. $3e^{3x} + 2$

9. If the radius of circle increased by 6%, then area increased by?

A. 12. 36 % decrease
B. 12. 36 % increase
C. 112 % decrease
D. 112 % increase

10. Ali can do a job in 10 days working alone. If he works together with Babar, he can complete the same job in 6 days. In how many days will Babar do the job alone?

A. 8 days
B. 10 days
C. 15 days
D. 20 days

11. A can do a job in 10 days working alone and B can do it in 20 days working alone. If both of them start the work together and A leaves after 3 days, in how many days will B complete the remaining work?

A. 10
B. 11
C. 12
D. 14

12. Maleeha spends $\frac{2}{5}$ of her time tutoring individuals. Of the remainder, she spends $\frac{1}{2}$ on J.B.A course and $\frac{1}{4}$ on SAT. The balance of the time she spends on GMAT courses. If this time on GMAT is 9 hrs a week, what is the time she spends per week on individual tuitions?

A. 18 hrs
B. 20 hrs
C. 22 hrs
D. 24 hrs

13. If Rs. 450 amounts to Rs. 540 in 4 years at simple interest, then what sum of money will amount to Rs. 637.5 at the same rate of interest?

A. Rs. 500
B. Rs. 510
C. Rs. 520
D. Rs. 550

14. 5 couples go to watch a movie. In how many ways can they be arranged on 10 seats such that each couple gets to sit together?

A. 32
B. 120
C. 3840
D. 14400

15. If the length of segment $\overline{EB}$, base of triangle EBC, is equal to $\frac{1}{4}$ of segment AB ($\overline{AB}$ is length of rectangle of ABCD), and the area of triangle EBC is 12 square units, find the area of the shaded region.

A. 24 square units
B. 96 square units
C. 84 square units
D. 72 square units

17. How many words can be formed from the letter of the word "ASSOCIATION?"

A. 2494800 B. 4294083

C. 5203512 D. 1254032

18. $\text{Tan}^{-1}\left(\text{Tan}\frac{3\pi}{4}\right) = ?$

A. $-\pi/4$ B. $\pi/4$

C. $3\pi/4$ D. A and C both

19. $\lim_{x \to 3} \frac{x^2 - 9}{x + 3}$

A. 3 B. 2

C. Zero D. 1

20. If $y = e^{ax}$, then fourth derivative is?

A. ae^{ax} B. a^2e^{ax}

C. e^{ax} D. a^4e^{ax}

21. If $3 + \sqrt{16x^2 - 30} = 4x$, then x is?

A. 12 B. $15/4$

C. 17 D. $\frac{13}{8}$

22. The reciprocal of $\frac{a}{b} + \frac{b}{a}$ is?

A. $\frac{a+b}{ab}$ B. $\frac{a^2+b^2}{ab}$

C. $\frac{2a+b}{ab}$ D. $\frac{ab}{a^2+b^2}$

23. If $a + b = p$ and $a - b = q$, then $4ab = ?$

A. $p + q$ B. $p^2 + q^2$

C. $p - q$ D. $p^2 - q^2$

24. If $f(x) = 5x^4 + 2x^3 + 4$, then $f'(3) = ?$

A. 495 B. 520

C. 594 D. 420

ADVANCED MATHEMATICS

1. Cos $(-15\pi) = ?$

A. 1 B. -1

C. 0 D. π

2. Which is closest point to the focus of parabola?

A. End pt of L.R B. Vertex

C. Focus D. None of these

3. The equation $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ can be written as?

A. $x = \frac{b}{a}\sqrt{b^2 - y^2}$ B. $x = -\frac{b}{a}\sqrt{b^2 - y^2}$

C. $x = \frac{a}{b}\sqrt{b^2 - y^2}$ D. $x = \frac{a}{b}\sqrt{b^2 + y^2}$

4. The x - intercept of the equation of the tangent to the curve $3x^2 - 4y^2 = 12$ at $(4, 3)$ is?

A. 3 B. 1

C. 0 D. 2

5. The y-intercept of the equation of tangent to the curve $4x^2 + 3y^2 = 12$ at $(3, 2)$ is?

A. 0 B. 3

C. 2 D. 8

6. Find 'k' if $2\begin{bmatrix} 8 & 3 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} 16 & 6 \\ 2 & k \end{bmatrix}$

A. 5 B. 3

C. -3 D. 4

7. The foci of the ellipse which is along x-axis and centre is at origin?

A. $(\pm a, 0)$ B. $(\pm c, 0)$

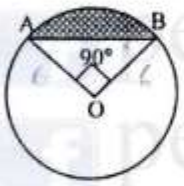
C. $(0, \pm b)$ D. $(0, \pm c)$

8. $\int \text{Sin } x \text{ Cos } x \, dx$

A. $\frac{\text{Sin } 2x}{4} + c$ B. $\frac{\text{Sin}^2 x}{2} + c$

C. $\frac{-\text{Sin } x}{2} + c$ D. $\frac{-\text{Cos } 2x}{4} + c$

16. In the Figure, if $\angle AOB = 90°$ and O is the centre of the circle with radius = 6, then the area of the shaded region is :



A. 6π
B. $6\pi - 2\sqrt{3}$
C. $18 - 9\pi$
D. $9\pi - 18$

17. Asif invests a $45000 at 10% compound interest. After x years, he withdraws the total amount which is equivalent to $59895. What is the value of x?

A. 2
B. 2.5
C. 3
D. 3.5

18. A shopkeeper buys coffee A at $ 40 per kg and coffee B at $ 70 per kg. He mixes them together and the mixture costs him $ 65 per kg. what is the ratio of coffee A to coffee B in the mixture?

A. 1:2
B. 1:6
C. 1:3
D. 1:5

19. 40% of the boys, 70% of the girls in a class attend a picnic and ratio of boys to girls in the class is 3:2 if the no on the picnic was 26. How many are there in the whole class?

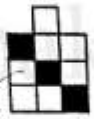
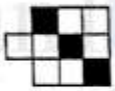
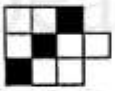
A. 40
B. 45
C. 50
D. 56

20. A man buys a radio for Rs. 70 after receiving a discount of 20%. What was the marked price?

A. 84
B. 90
C. 87.50
D. 65

A. Even B. Odd C. Impossible to say

9.
Which is the odd one out?

A.  B.  C.  D. 

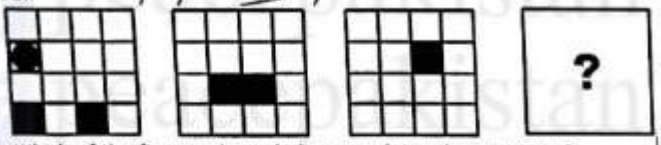
10.
When Jack, James, Jim and Jane stand by age, Jack being the youngest stands first while James brings up the rear. However, when they stand by height, Jim being the shortest stands first while James comes to the third spot. In both lines Jane remains at the second position. Who is immediately younger than James?

A. Jack B. James C. Jim D. Jane

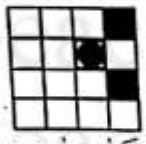
11.
The day after tomorrow is three days before a Monday. What day is it today?

A. Monday B. Tuesday C. Wednesday D. Thursday

12.



Which of the figures shown below completes the sequence?

A.  B.  C.  D. 

13.
Which is the next number is the series? 18, 13, 9, 6, 4, ?

A. 1 B. 2 C. 3 D. 4

14.
Which is the odd one out?

A.  B.  C.  D. 

ANALYTICAL SKILLS & I.Q

1.
Car is to road as train is to

A. Wheels B. Rails C. Surface D. Locomotive

2.
Which is the odd one out?

A. Hockey B. Exercise C. Tennis D. Football

3.
Which city is the odd one out?

A. London B. Frankfurt C. Paris D. Madrid

4.
A forest is to a tree as a tree is to a

A. Leaf B. Orchard C. Jungle D. Plant

5.
A rancher plans to add a post between every two posts of an open-ended (straight) fence. If he currently has 10 posts in the fence, how many does he need to insert?

A. 5 B. 9 C. 10 D. 20

6.

Which of the figures shown below completes the sequence?

A. B. C. D.

7.
Complete the series English, French, Hindi, Arabic

A. Swahili B. Language C. Dialect D. Africa

8.
If you were to add all odd numbers between 1 and 11 (both inclusive), the result would be

9. The 14 term of G.P 4, 8, 16, ... is.

A. 32768 B. 51235

C. 13820 D. 22500

10. If $A = \{1,2,4\}$ & $B = \left\{-2, -\frac{7}{2}, 0\right\}$, then $A \cup B = ?$

A. $\left\{0,2,3,-\frac{7}{2}\right\}$ B. $\left\{0,1,3,-\frac{7}{2}\right\}$

C. $\{1,2,3\}$ D. $\left\{0,1,2,-2,3,-\frac{7}{2}\right\}$

11. The mean and mode of 2, 6, 6, 8, 7, 9.

A. $\frac{19}{3}, 2$ B. $\frac{19}{2}, 2$

C. $\frac{19}{3}, 7$ D. $\frac{19}{3}, 6$

12. Find $a + 2b$ if $a + b = 9$ & $a - b = 6$?

A. $\frac{20}{3}$ B. $\frac{13}{3}$

C. $\frac{21}{2}$ D. $\frac{10}{3}$

13. A, B and C invested Rs.7000; Rs.5000 and Rs.3000. After one year they earned a profit of Rs.9000. Find the share of B?

A. 4200 B. 3000

C. 2400 D. 1800

14. Cost price of 20 articles is equal to the selling price of 16 articles. The gain or loss% is?

A. 15% B. 20%

C. 10% D. 25%

15. $\lim_{x \to \infty} \frac{3x^3 + 4x^2 + 1}{2x + 3}$

A. 3 B. ∞

C. $\frac{3}{2}$ D. Zero

16. The graph of curve $y^2 = 4ax$ is.

A. B.

C. B.

ENGLISH

Direction: - Question 1-2: In each question a word is given. Beneath the word are four lettered words or phrases. Choose the word or phrase that is closest in meaning to the given word

1. Incentive

A. Objective B. Goad C. Stimulation D. Beginning

2. Inconsequential

A. Disorderly B. Insignificant C. Subsequent D. Insufficient

3. Point out the word with incorrect spelling.

A. Iniquitous B. Conspicuous C. Egregious D. Mischievious

4. The one who hates women is called a

A. Misogynist B. Philogynist C. Philistine D. Acrophobe

Directions: In question 5 -6, Each of the following sentences has a blank. From the choices given below choose the phrase or word that best completes the sentence

5. Moby Dick is a mythical account of evil and revenge as shown by Captain Ahab's pursuit of the whale that had wounded _____ earlier in life.

A. He B. His C. Him D. To him

6. Since the earth's crust is much thicker under the continents, equipment have to be capable of drilling through 100,000 feet of rocks to investigate the mantle _____.

A. Beneath them B. Beneath their C. Beneath its D. Beneath they

The basic fiber-optic system is called a fiberscope, which consists of two bundles of fibers. One, the illuminating bundle, carries light to the tissues. It is coupled to a high-intensity light source. Light enters the cores of the high-purity silicon glass and travels along the fibers. A lens at the end of the bundle transmits only a tiny fraction of the total image. The reconstructed image can be viewed through an eyepiece or displayed on a television screen. During the last five years, improved methods of fabricating optical fibers have led to a reduction in fiberscope diameter and an increase in the number of fibers, which in turn has increased resolution.

7. According to the passage, what is the purpose of the illuminating bundle in a fiberscope?

A. To carry light into the body B. To collect and focus light
C. To reconstruct images D. To perform surgery inside the body

8. According to the passage, how do the fiberscope used today differ from those used five years ago?

A. They use brighter lights. B. They are longer.
C. They contain more fibers. D. They are large in diameter.

Fill the blanks with the correct verb.

9. The boy ---------- home after school.

A. Hurry B. Hurries C. Hurriedly D. Is hurry

Write the correct negative sentence

10. He lit the fire at 6.00

A. He does not light the fire at 6.00 B. He do not light the fire at 6.00
C. He does not lit the fire at 6.00 D. He did not light the fire at 6.00

41. $\sin(\alpha+\beta) = ?$

A. $\sin\alpha\cos\beta + \cos\alpha.\sin\beta$ B. $\sin\alpha\cos\beta - \cos\alpha.\sin\beta$

C. $2\sin(\alpha+\beta).\cos(\alpha-\beta)$ D. $\sin\alpha\cos\beta - \cos\alpha\sin\beta$

42. Formula of G.M is

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

C. $\frac{2ab}{a+b}$ D. None of these

43. If $\frac{x}{3}+\frac{x}{7}=21$, then $x=?$

A. 22.1 B. 33.2

C. 11.2 D. 44.1

44. $\sin^2\frac{\pi}{4}+\cos^2\frac{\pi}{6}-\sin^2\frac{\pi}{3}+\cos^2\frac{\pi}{6}=?$

A. 1 B. 0.5

C. $\sqrt{3}$ D. $\frac{\sqrt{3}}{2}$

45. The equation of the line parallel to y-axis at a distance of 5 unit from origin is?

A. $5x=0$ B. $x+5=0$

C. $5x-1=0$ D. $x-5=0$

46. A point which is inside the circle, its distance _____ to the radius of the circle.

A. Greater B. Equal

C. Less then D. Twice

47. If $y=\cos\sqrt{x}$ then $y'=?$

A. $-\sin x$ B. $-\frac{\sin\sqrt{x}}{2\sqrt{x}}$

C. $\frac{\cos\sqrt{x}}{\sqrt{x}}$ D. None of these

48. $(A\cup B)' = ?$

A. $(A\cap B)'$ B. $A'\cap B'$ C. $(B\cup A)'$ D. $A'\cup B$

49. If $(3+\sqrt{2})=(\sqrt{2}+3)$, then is property is called_____.

A. Commutative B. Associative

C. Distributive D. Additive identity

50. If the line is perpendicular to y-axis, then its equation is?

A. $x=0$ B. $y=0$ C. $x=y$ D. $x+y=0$

15.
Ganges is to India as Volga is to

A. Holland B. Russia C. Turkey D. Mongolia

16.

When the figure on the left is folded at the dotted line which shape does it produce?

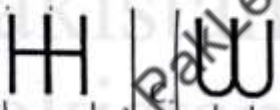
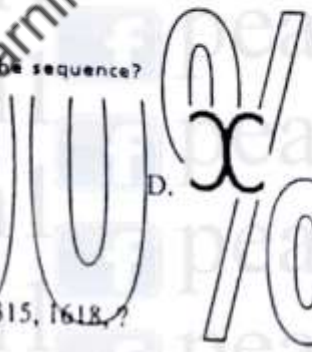
A.  B.  C.  D. 

17.
Steam is to water as liquid is to

A. Ice B. Solid C. Vapour D. Snow

18.

Which of the figures shown below completes the sequence?

A.  B.  C.  D.

19.
Which is the next number in the series? 79, 1012, 1315, 1618, ?

A. 1861 B. 1816 C. 1921 D. 2118

20.
If 3 men can dig 6 trenches in 4 days, how many days would it take for 24 trenches to be dug by 4 men?

A. 6 B. 8 C. 12 D. 16