NIMCET -2024

Original Question Paper with Answer Key

1. How much work does it take to slide a crate for a distance of 25 m along a loading dock by pulling on it with a 180 N force where the dock is at an angle of 45∘ from the horizontal?
   (A) 3.18198×103 J
   (B) 3.18198×102 J
   (C) 3.4341×103 J
   (D) 3.4341×104 J
2. The value of $f(1)$ for $f\left(\frac{1-x}{1+x}\right)=x+2$ is
   (A) 1
   (B) 2
   (C) 3
   (D) 4 Given a set A with median $m1=2$ and set B with median $m2=4$ What can we say about the median of
3. the combined set?
   (A) at most 1
   (B) at most 2
   (C) at least 1
   (D) at least 2
   At how many points the following curves intersect
4. $$\frac{y^2}{9}-\frac{x^2}{16}=1 \text{ and } \frac{x^2}{4}+\frac{(y-4)^2}{16}=1$$
   (A) 0
   (B) 1
   (C) 2
   (D) 4
5. For an invertible matrix A, which of the following is not always true:
   (A) $|\text{adj}(A)|\neq 0$
   (B) $|A|\neq 0$
   (C) $|AA-1|=1$
   (D) $|A(\text{adj}(A))|\neq 1$
6. The system of equations $x+2y+2z=5, x+2y+3z=6, x+2y+\lambda z=\mu$ has infinitely many solutions if
   (A) $\lambda\neq 2$
   (B) $\lambda\neq 2, \mu\neq 5$
   (C) $\lambda=2, \mu=5$
   (D) $\mu\neq 5$
7. Let Z be the set of all integers, and consider the sets $X=\{(x,y): x2+2y2=3, x,y\in Z\}$ and
   $Y=\{(x,y): x>y, x,y\in Z\}$. Then the number of elements in X∩Y is:
   (A) 2 **(B)** 1 (C) 3 (D) 4 Let C denote the set of all tuples (x,y) which satisfy $x2-2y$ where x and y are natural numbers. What is
   the cardinality of C ? (A) 0 (B) 1
8.

(C) 2
(D) 3

9. The number of one-one functions

$$f:\{1,2,3\}\to\{a,b,c,d,e\}$$

is
(A) 125
(B) 60
(C) 243
(D) None of the above

10. If $f(x)=\cos[\pi 2]x+\cos[-\pi 2]x$, where [.] stands for the greatest integer function, then $f(\pi/2)=$
(A) -1
(B) 0
(C) 1
(D) 2

11. Find the cardinality of the set C which is defined as $C=\{x|\sin 4x=$ for $x\in\frac{1}{2}(-9\pi,3\pi)\}$.
(A) 24
(B) 48
(C) 36
(D) 12

12. Let $f:\mathbb{R}\to\mathbb{R}$ be a function such that $f(0)=$ and $\frac{1}{\pi}$

$$f(x)=\begin{matrix} x \\ e\pi x-1 \end{matrix} \text{ for } x\neq 0$$

Then
(A)$f(x)$isnot continuous at $x=0$
(B)$f(x)$iscontinuous but not differentiable at $x=0$
(C) $f(x)$ isdifferentiable at $x=0$ and $f'(0)=-\frac{\pi}{2}$
(D) Noneofthe above

13. If$\sin x=\sin y$ and $\cos x=\cos y$, then the value of $x-y$ is
(A)$\pi/4$
(B)$n\pi/2$
(C)$n\pi$
(D) $2n\pi$

14. Acoinisthrown 8 number of times. What is the probability of getting a head in an odd number of throw?

(A) $1/4$
(B) $3/4$
(C) $1/2$
(D) $1/8$

15. Whichofthefollowing is TRUE?
(A) If f iscontinuous on $[a,b]$, then $\int_a^b xf(x)dx = x\int_a^b f(x)dx$

(B) $\int_0^3 e^{x^2}dx=\int_0^5 e^{x^2}dx+\int_3^5 e^{x^2}dx$

(C)If f iscontinuouson $[a,b]$,then $\frac{d}{dx}(\int_a^b f(x)dx)=f(x)$

(D) Both (a) and (b)

16. Lines $L1,L2,...,L10$ aredistinctamongwhich the lines $L2,L4,L6,L8,L10$ are parallel to each other and the lines $L1,L3,L5,L7,L9$ passthroughagivenpoint *C*. The number of point of intersection of pairs of lines fromthecompleteset $L1,L2,L3,...,L10$is
(A) 24
(B) 25
(C) 26
(D) 27

17. RegionRis defined as region in first quadrant satisfying the condition $x2+y2<4$. Given that a point p=(r,s)lies in R, what is the probability that r>s ?
(A) 1
(B) 0
(C) 1/2
(D) 1/3

18. A speaks truth in 40% and *B* in 50% of the cases. The probability that they contradict each other while narrating some incident is:
(A) 1/2
(B) 2/3
(C) 1/4
(D) 1/3

19. Out of a group of **50** students taking examinations in Mathematics, Physics, and Chemistry, 37 students passed Mathematics, 24 passed Physics, and 43 passed Chemistry.
Additionally, no more than 19 students passed both Mathematics and Physics, no more than 29 passed both Mathematics and Chemistry, and no more than 20 passed both Physics and Chemistry. What is the maximum number of students who could have passed all three examinations?
(A) 10
(B) 12
(C) 14
(D) 9

20. The vector $\vec{A}=(2x+1)\hat{\imath}+(x2-6y)\hat{\jmath}+(xy2+3z)\hat{k}$ is a
(A) sink field
(B) solenoidal field
(C) source field
(D) none of these

21. The points (1,1/2) and (3,−1/2) are

(A) In between the lines $2x+3y=6$ and $2x+3y=-6$

(B) On the same side of the line $2x+3y=-6$

(C) On the opposite side of the line $2x+3y=-6$

(D) On the same side of the line $2x+3y=6$

22. It is given that the mean, median and mode of a data set is $1,3x$ and $9x$ respectively. The possible values of the mode is
(A) 1,4
(B) 1,9

(C) 3,9
(D) 9,8

23. If (4,3)and $(12,5)$ are the two foci of an ellipse passing through the origin, then the eccentricity of the ellipse is
(A) $\frac{\sqrt{13}}{9}$
(B) $\frac{\sqrt{13}}{18}$
(C) $\frac{\sqrt{17}}{18}$
(D) $\frac{\sqrt{17}}{9}$

24. Considerthefunction $f(x)=\begin{cases} -x3+3x2+1, & \text{if } x\leq 2 \\ \cos(x), & \text{if } 2<x\leq 4 \\ e-x, & \text{if } x>4 \end{cases}$
Which ofthefollowing statements about f(x) is true:
(A) $f(x)$hasalocal maximum at $x=1$, which is also the global maximum.
(B) $f(x)$hasalocal maximum at $x=2$, which is not the global maximum.
(C) $f(x)$hasalocal maximum at $x=\pi$, but it is not the global maximum.
(D) $f(x)$hasaglobal maximum at x=0.

25. For whatvaluesof λ does the equation $6x2-xy+\lambda y2=0$ represents two perpendicular lines and two lines inclinedatan angle of $\pi/4$.
(A) -6 and-2
(B) 6 and1
(C) -6 and-35
(D) -6 and1

26. The valueofthelimit $\lim x\to 0\left(\frac{1x+2x+3x+4x}{4}\right)^{\frac{1}{x}}$ is
(A) 1
(B) $3!1/3!$
(C) $3!/4$
(D) $4!/4$

27. The valueof$m$for which volume of the parallelepiped is 4 cubic units whose three edges are represented by $a=mi+j+k,b=j-j+k,c=j+2j-k$ is
(A) 2
(B) −1
(C) 0
(D) 1

28. If for non-zero$x$,$cf(x)+df()=|\log|\frac{1}{x}||+3$, where $c\neq d$, then $\int_1^e f(x)dx=$
(A) $\frac{(c-d)(2e-1)}{c2-d2}$
(B) $\frac{(c-d)(3e-2)}{c2-d2}$
(C) $\frac{(c-d)(3e+2)}{c2-d2}$
(D) $\frac{(c-d)(2e+1)}{c2-d2}$

29. If $|F|=40$ N (Newtons), $|D|=3$ m , and $\theta=60$ °, then the work done by F acting from P to Q is
(A) $60\sqrt{3}$ J
(B) 120 J
(C) $60\sqrt{2}$ J
(D) 60 J

30. There are 9 bottle labelled 1,2,3,…,9 and 9 boxes labelled 1,2,3, ...9. The number of ways one can put these bottles in the boxes so that each box gets one bottle and exactly 5 bottles go in their corresponding numbered boxes is

(A) $9\times{}^{9}C_{5}$
(B) $5\times{}^{9}C_{5}$
(C) $25\times{}^{9}C_{5}$
(D) $4\times{}^{9}C_{5}$

31. A critical orthopedic surgery is performed on 3 patients. The probability of recovering a patient is 0.6 . Then the probability that after surgery, exactly two of them will recover is

(A) 0.321

(B) 0.123

(C) 0.234

(D) 0.432

32. A man starts at the origin O and walks a distance of 3 units in the northeast direction and then walks a distance of 4 units in the north-west direction to reach the point P. then $\overrightarrow{OP}$ is equal to

(A) $\frac{1}{\sqrt{2}}(-\hat{\imath}+\hat{\jmath})$
(B) $\frac{1}{2}(\hat{\imath}+\hat{\jmath})$
(C) $\frac{1}{\sqrt{2}}(\hat{\imath}-7\hat{\jmath})$
(D) $\frac{1}{\sqrt{2}}(-\hat{\imath}+7\hat{\jmath})$

33. Let A and B be two events defined on a sample space Ω. Suppose AC denotes the complement of A relative to the sample space ΩThen the probability $P((A\cap BC)\cup(AC\cap B))$ equals

(A) $P(A)+P(B)+P(A\cap B)$
(B) $P(A)+P(B)-P(A\cap B)$
(C) $P(A)+P(B)+2P(A\cap B)$
(D) $P(A)+P(B)-2P(A\cap B)$

34. Ifthreedistinct numbers are chosen randomly from the first 100 natural numbers, then the probability that allthreeofthem are divisible by both 2 and 3 is

(A) $4/35$

(B) $4/25$

(C) $4/1155$

(D) $4/33$

35. Let $f(x)=\begin{cases} x^2\sin\frac{1}{x}, & x\neq 0 \\ 0, & x=0 \end{cases}$

Then which of the following is true
(A) $f(x)$ is not continuous at $x=0$
(B) $f(x)$ is not differentiable at $x=0$
(C) $f'(x)$ is not continuous at $x=0$
(D) $f'(x)$ is continuous at $x=0$

36. ThevalueofLt $\frac{e^x - e^{-x} - 2x}{1-\cos x}$ is equal to
    (A)2
    (B)1
    (C)0
    (D) -1
37. Thenumberofsolutions of
    $$51+|\sin x|+|\sin x|2+\cdots\cdots\cdots=25$$
    for$x \in (-\pi,\pi)$is
    (A)2
    (B)0
    (C)4
    (D)∞
38. Thevalueoftan(+θ)$\frac{\pi}{4}$tan($\frac{3\pi}{4}+\theta$) is
    (A) -2
    (B)2
    (C)1
    (D) -1
39. Thevalueofseries $\frac{2}{3!}+\frac{4}{5!}+\frac{6}{7!}+\ldots-$, is
    (A)$2e-2$
    (B)$e-2$
    (C) $e-1$
    (D)$2e-1$
40. If oneAM(Arithmetic mean) ' a ' and two GM's (Geometric means) p and q be inserted between any two positivenumbers,the value of $p3+q3$ is
    (A) 2 apq
    (B) pq/a
    (C) 2pq/a
    (D)p+q+a
41. Amongthegivennumbers below, the smallest number which will be divided by 9,10,15 and 20 , leaves theremainders4,5,10, and 15 , respectively

    (A) 535

    (B) 265

    (C) 85

    (D) 355

42. Thetwoparabolas $y^2=4a(x+c)$ and $y2=4bx, a>b>0$ cannot have a common normal unless
    (A) $c>2(a+b)$
    (B) $c>2(a-b)$
    (C) $c<2(a-b)$
    (D) $c < \frac{2}{a-b}$
43. The valueof $\sum_{r=1}^{n} 2^n \frac{{}^nP_r}{r!}$ is:
    (A) 2^n
    (B) $1-2^{-n}$

(C) $2n - 1$
(D) $22n - 1$

44. Considerthefunction$f(x)=x2/3(6-x)1/3$. Which of the following statement is FALSE?
(A)$f$isincreasingintheinterval (0,4)
(B)$f$isdecreasingintheinterval $(6,\infty)$
(C)$f$hasapointofinflection at $x=0$
(D)$f$hasapointofinflection at $x=6$

45. Theequation$3x2+10xy+11y2+14x+12y+5=0$ represents
(A) a circle
(B) an ellipse
(C) a hyperbola
(D) a parabola

46. Acommitteeof5istobechosen from a group of 9 people. The probability that a certain married couple willeitherservetogetheror not at all is

(A) $1/2$

(B) $4/9$

(C) $5/9$

(D) $2/3$

47. If theperpendicularbisector of the line segment joining $p(1,4)$ and $q(k,3)$ has y-intercept -4 , then the possible values of k are

(A) -1 and1

(B) -4 and4

(C) -3 and3

(D) -2 and2

48. If $x=1+\sqrt{2}+\sqrt{4}+\sqrt{8}+\sqrt{16}+\sqrt{32}$, then $\left(1+\frac{1}{x}\right)^{24}$ =
(A) 1
(B) 4
(C) 16
(D) 24

49. If the line $a2x+ay+1=0$, for some real number a, is normal to the curve $xy=1$ then
(A) $a<0$
(B) 0<a<1
(C) $a>0$
(D) $-1<a<1$

50. The number of distinct real values of λ for which the vectors
$\lambda 2\hat{\imath}+\hat{\jmath}+??\hat{}$,$\hat{\imath}+\lambda 2\hat{\jmath}+??\hat{}$ and $\hat{\imath}+\hat{\jmath}+\lambda 2??\hat{}$
are coplanar is
(A) 1 **(B)** 2 (C)
3 (D) 6

1. Which out of the following words will appear last in the dictionary

(A) Compline

(B) Compliment

(C) Complicit

(D) Complete

2. Four friends, Aditi, Bharat, Chandan, and Deepika, went to a restaurant for dinner. Each of them ordered a different dish from the menu: pizza, pasta, burger, and sala(D) Additionally, each friend ordered a different drink: cola, lemonade, orange juice, and water. Based on the following clues, determine the combination of friend, dish, and drink:

Aditi didn't order pizza or col(A)

Bharat ordered salad but not lemonade.

Chandan ordered past(A)

Deepika didn't order burger or orange juice.

Aditi ordered orange juice.

Who ordered the burger, and what drink did they order?

(A) Aditi, orange juice

(B) Chandan, lemonade

(C) Bharat, water

(D) Deepika, cola

3. In the following question, three statements and three conclusions are given.
Statements: 1. All students are intelligent.
2. No intelligent person is lazy.
3. Some lazy people are poor

Conclusions: 1 . No student is lazy.

2. Some poor people are not intelligent.
3. All poor people are lazy.

Find out the most appropriate conclusion(s) from the following options.

(A) Only conclusion 1 follows

(B) Only conclusions 1 and 2 follow

(C) Only conclusion 2 follows

(D) Only conclusions 2 and 3 follow

4. Arrange the words given below in a meaningful sequence.
(1)Software (2) Code (3) Data (4) Analysis (5) Report

(A) 2,1,5,3,4

(B) 5,4,3,1,2

(C) 3,1,2,4,5

(D) 3,1,2,5,4

5. Odometeristomileage as Compass is to

(A) Hiking

(B) Direction

(C) Needle

(D) Speed

6. Inthehalfyearlyexam only 60% of the students were passe(D) Out of these (passed in halfyearly) only 70%studentsarepassed in annual exam, out of remaining students (who fail in half-yearly exam) 80% passedinannualexam. What percent of the students passed the annual exam?

(A) 72%

(B) 74%

(C) 65%

(D) 76%

7. Twocars,CarAand Car B, are traveling on a highway. Car A starts from point X and travels at a constant speedof 60 km/h ,while Car B starts from the same point *X* but travels at a constant speed of 80 km/h. If bothcarstravelfor 1.5 hours, what is the difference in distance covered by Car B compared to Car A?

(A) 35KM

(B) 20KM

(C) 30KM

(D) 25KM

8. Selectthepairofwords, which are related in the same way as the capitalized words are related to each other.
DATA : GRAPH

(A) Milk: Butter

(B) Plant: Leaf

(C) Mother: Father

(D) Water: Glass

9. Inarealityshow,two judges independently provided marks based on the performance of the participants. Ifthemarksprovided by the second judge are given by Y=10.5+2X, where X is the marks provided by

the firstjudge.Ifthe variance of the marks provided by the second judge is 100 , then the variance of the marksprovidedbythe first judge is:

(A) 99

(B) 25

(C) 49.5

(D) 50

10. Thisquestioncontains six statements followed by four sets of combinations of three. Choose the set in whichthecombinations are most logically relate(D)
(A)Allfalconsflyhigh.
(B)Allfalconsareblind
(C)Allfalconsarebirds
(D)Allbirdsareyellow
E.Allbirdsarethirsty
F.Allfalconsareyellow

(A) DEF

(B) BCA

(C) ABC

(D) CDF

11. RamuvisitsDelhion every 15 days and Samu goes to Delhi every **20** days. They met at Delhi 5 days back.Afterhowmany days, from today, they will meet at Delhi next time?

(A) 60

(B) 55

(C) 65

(D) 35

12. Themeanofconsecutive positive integers from 2 to n is

(A) $\frac{n+2}{2}$

(B) $\frac{n(n+1)}{2}$

(C) $\frac{n+1}{2}$

(D) $\frac{n-1}{2}$

13. Atwhat time between 2pm and 3pm, will the hour and minute hands of a clock point in opposite directions (diametrically opposite)?

(A) 2: 45pm

(B) 2: 44pm

(C) $2{:}43\frac{9}{11}$ pm

(D) $2{:}43\frac{7}{11}$ pm

14. Studythefollowing information carefully and answer the given question: Eight friends *A*,*B*,*C*,*D*,*E*,*F*,*G*, and*H*aresitting on a round table facing the centre. A sits second to the left of *D*, who sits third to the left of*E*.*C*sitsthird to the right of *G*, who is not an immediate neighbour of *E*. H sits opposite to the E. B is between*A*and *C*.
Whositsopposite to A?

(A)D

(B)F

(C)G

(D)E

15. Inatournament, many teams participate(D) All teams in the tournament have 5 to 15 players. If a team hasmorethan 10 players, then they have reversible *t*-shirts. Based only on the information above, which ofthefollowing must be true?

(A) Teamsthat have 13 players have reversible t-shirts.

(B)Onlypeople on teams can have reversible t-shirts.

(C)Teamsthat have 12 players do not have reversible *t*-shirts.

(D)Teamswith 8 players do not have reversible t-shirts.

16. If byrearranging the letters of the word NABMODINT, a name of a game is forme(D) What would be the firstandlastletter of the mirror image of the name of the game?

(A) N,B

(B)T,B
(C) B,N

(D) B, T

17. Lookingatthe portrait of a man, Lucky (male) said, "This person is the only child of my paternal grandmother's daughter." Whose portrait was Lucky looking at?

(A) Himself

(B) His brother

(C) His cousin

(D) His uncle

18. Which one of the following is the odd one from the given alternative?

(A) Years of experience

(B) Salary

(C) Highest education

(D) Age

19. Which pairs of bits can be joined together to form two words that have opposite meanings?

ERT	UCE	DES	END	EXP	EAR	AND	SIP	RED	GOS
1	2	3	4	5	6	7	8	9	10

(A) (9,2),(5,7)
(B)(1,3),(8,10)
(C)(1,5),(10,8)
(D)(4,2),(7,8)

20. After allowing 20% cash discount, a trader still earns a profit of 11.11%. How much above the cost price, the tradermarks his goods?

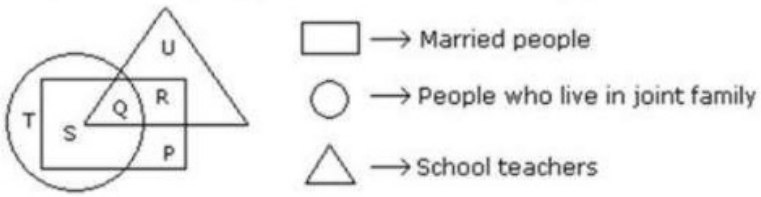
(A) 40%

(B) 28%

(C) 30.33%

(D) 38.88%

21. Study the following diagram and answer the following question.



Bywhich letter, the married teachers who do not live in joint family are represented?
(A)

(B)S

(C)Q

(D)P

22. Rajeshwill not go to the concert if Rakesh goes. Rakesh will go to the concert if his dog barks three times.
Basedonly on the information above, which of the following must be true?

(A) IfRajesh doesn't go to the concert, then Rakesh will go.

(B) IfRakesh's dog does not bark three times, then Rakesh will not go to the concert.

(C) IfRakesh's dog barks three times, then Rajesh will not go to the concert.

(D) Rakesh will not go to the concert unless Rajesh goes.

23. This question contains six statements followed by four sets of combinations of three. Choose the set in which the combinations are most logically relate(D)
(A) Some buildings are not skyscrapers (B) Some skyscrapers are not buildings (C) No structure is a skyscraper (D) All skyscrapers are structures E. Some skyscrapers are buildings F. Some structures are not buildings

(A) ACF

(B) BDF

(C) ACE

(D) FDA

24. From the givenoptions, find the pair which is like the given pair 8:4

(A) 216:32

(B)27:9

(C)45:5

(D)72:24

25. What is thevalueof x^2+y2= ?
Statement I: xy=5
Statement II: $x+y$=10
(A) Choosethisoptionifthequestion can be answered by using one of the statements alone, but cannot be answeredusingtheotherstatement
(B) Choosethisoptionifthequestion can be answered by using both the statements together, but cannot be answeredusingeitherstatement alone.
(C) Choosethisoptionifthequestion can be answered by using either statement alone
(D) Choosethisoptionifthequestion cannot be answered even by using both the statements together

26. In which yearwasArjunborn?
Arjun at presentis**25**yearsyounger to his mother. Arjun's brother,whowasborn in 1964, is 35 years younger to his mother.

(A) 1974

(B) 1944

(C) 1964

(D) 1954

27. Select the one which is different from the other three.

(A) HEM

(B) JGP

(C) NKS

(D) OLT

28. In certain languages, HEART is written as 2018010508 , and LUNGS is written as 1907142112. If BRAIN is written in that language, what will be the last number?

(A) 4

(B) 5

(C) 2

(D) 9

29. In a recent survey of 500 employees in a company, it was found that 60% of the employees prefer coffee over tea, 25% prefer tea over coffee, and the remaining 15% have no preference. If 20% of the employees who prefer coffee are also tea drinkers, how many employees prefer only tea?

(A) 50

(B) 75

(C) 65

(D) 55

30. You are on an island with two tribes. One tribe always tells the truth, and the other tribe always lies. You meet three individuals from the island: A,B, and (C) Each individual belongs to one of the tribes. You ask each of them the same question: "Is B a truth-teller?"
Here are their responses:
A says, "Yes, B is a truth-teller."
B says, "No, I am not a truth-teller."
C says, " *B* is a liar."

Given that each individual is either a truth-teller or a liar, who is telling the truth?

(A) B only

(B) Both B and *C*

(C) C only

(D) A only

31. A cat climbs a 21-meter pole. In the first minute it climbs 3 meter and in the second minute it descends one meter. In how minutes the cat would reach the top of the pole?

(A) 19 minutes

(B) 21 minutes
(C) 20 minutes

(D) 18 minutes

32. If 30th September, 1991 was a Wednesday, then what was the day on 14th March 1992?

(A) Wednesday

(B) Sunday

(C) Monday

(D) Saturday

33. Aryanbought 100 shares of a company at ₹50 per share. He paid a brokerage fee of 2% on the purchase. Later,hesold all the shares at ₹55 per share and paid a brokerage fee of 2% on the sale. What is Aryan's netprofitpercentage on his investment?

(A) 6%
(B) 6.1%
(C) 5.69%
(D)5.5% **Comprehension:**
Direction: A,B,C,Dand E are five different integer. When written in the ascending order of values, the difference betweenany two adjacent integers is 8 . *D* is the greatest and *A* the least. *B* is greater than *E* but less than *C*. Thesum of the integers is equal to *E*. **SubQuestion No : 34**

34. The value of *A* is:

(A) -15

(B) -18

(C) -17

(D) None of these

Comprehension:

Direction: *A*,*B*,*C*,*D*and *E* are five different integer. When written in the ascending order of values, the difference betweenany two adjacent integers is 8 . *D* is the greatest and *A* the least. *B* is greater than *E* but less than *C*. Thesum of the integers is equal to *E*.
SubQuestion No : 35

35. The sum of *A* and *B* is:

(A) None of these

(B) -30

(C) -20

(D) -15

Comprehension:
Direction: A, B, C, Dand E are five different integer. When written in the ascending order of values, the

difference between any two adjacent integers is 8 . D is the greatest and A the least. B is greater than E but less than C. The sum of the integers is equal to E.

SubQuestion No : 36

36. The greatest numberhas the value:

(A) 14

(B) 15 (C) 17 (D) 12

Comprehension:
Direction: A, B, C,DandEare five different integer. When written in the ascending order of values, the difference betweenanytwoadjacent integers is 8 . *D* is the greatest and *A* the least. *B* is greater than *E* but less than *C*. Thesumofthe integers is equal to *E*.
SubQuestion No : 37

37. The sum of the integersis:

(A) -10

(B) None of these

(C) -8

(D) -6

Comprehension:

Directions: *A*,*B*,*C*,*D*,*E*,*F* and *G* are travelling in three different vehicles. There are at least two passengers in eachvehicle-Swift, Creta, Nexon, and only one of them is a male. There are two engineers, two doctors and three teachers among them.
i. C is a lady doctorand she does not travel with the pair of sisters *A* and *F*.
ii. B, a male engineer, travels with only G, a teacher in a Swift.
iii. *D* is a male doctor.
iv. Two persons belonging to the same profession do not travel in the same vehicle.
v. A is not an engineer and travels in a Cret(A)
vi. The pair of sisters *A* and *F* travel in the same vehicle.

SubQuestion No : 38

38. **WhatisF'sprofession?**

(A) Teacher
(B) Engineer

(C) Doctor

(D) Data inadequate

Comprehension:
Directions: A,B,C,D,E,F, and G are travelling in three different vehicles. There are at least two passengers in eachvehicle-Swift, Creta, Nexon, and only one of them is a male. There are two engineers, two doctors and threeteachers among them.
i. C is a lady doctorandshe does not travel with the pair of sisters A and F.
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iii. *D* is a male doctor.
iv. Two persons belonging to the same profession do not travel in the same vehicle.
v. A is not an engineerand travels in a Cret(A)
vi. The pair of sisters *A* and *F* travel in the same vehicle.

SubQuestion No : 39

39. In which vehicle does C travel?

(A) Nexon

(B) Data inadequate
(C) Swift
D. Creta

Comprehension:
Directions: A,B,C,D,E,F, and G are travelling in three different vehicles. There are at least two passengers in eachvehicle-Swift, Creta, Nexon, and only one of them is a male. There are two engineers, two doctors and threeteachers among them.
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v. A is not an engineerand travels in a Cret(A)
vi. The pair of sisters A and F travel in the same vehicle.

SubQuestion No : 40

40. Which of the followingrepresents the three teachers?

(A) GEF

(B) GBF

(C) GEA

(D) Data inadequate

1. Consider an arbitrary number system with independent digits as 0,1 and (A) If we generate first few numbers in sequence as 00,01,0 A,10,11,1 A and if this process is continued to generate the numbers, then the position of 10 A is _____

(A) 10

(B) 12

(C) 9

(D) 15

2. Which of the following components is used to establish a communication link between a CPU and the peripheral devices to transfer data?

(A) Memory data register

(B) Instruction register

(C) Memory address register

(D) Index register

3. Given that numbers *A* and *B* are two 8 bit 2's Complement numbers with *A*=11111111; *B*= 11111111. Then sum *A*+*B* is

(A) 11111100

(B) 00000010

(C) 11111110

(D) 00000000

4. Which of the following is the smallest unit of data in a computer?

(A) Nibble

(B) Byte

(C) Bit

(C) KB

5. Which of the following interfaces perform the transfer of data between the memory and the I/O peripheral without involving the CPU?

(A) Serial Interface

(B) DDA

(C) Branch Interface

(D) DMA

6. The primary purpose of cache memory in a computer system is

(A) to temporarily store frequently accessed data and instructions for faster access by the CPU

(B) to provide additional storage space when the main memory is full

(C) to permanently store data and programs

(D) to manage input and output operations between the CPU and peripherals

7. Consider the program below which uses six temporary variables a, b, c, d, e and f.

a=10
b=20
c=30
d=a+c
e=b+d
f=c+e
b = c + e
e = b + f
d = 5 + e
return d+f

Assuming that all the above operations take their operands from registers, the minimum number of registers needed to execute this program without spilling is _____

(A) 4
(B) 3
(C) 5
(D) 6

8. A CPU generates 32 bits virtual addresses. The page size is 4KB. The processor has a translation look-aside buffer (TLB) which can hold a total of 128-page table entries and is 4way set associate. The minimum size of the TLB tag is

(A) 15 bits

(B) 13 bits

(C) 11 bits

(D) 20 bits

9. Which of the following do not affects CPU performance?

(A) Cache size

(B) Amount of RAM

(C) Number of cores

(D) Clock speed

10. Consider the following 4-bit binary numbers represented in the 2's complement form: 1101 and 0100 . What would be the result when we add them?

(A) 1001 and no overflow

(B) 1001 and an overflow

(C) 0001 and no overflow

(D) 0001 and an overflow

11. Therange of the exponent E inthe IEEE754 double precision (Binary64) format is

(A) $-1022 \leq E \leq 1023$

(B) $-1022 \leq E \leq 1022$

(C) $-1023 \leq E \leq 1022$

(D) $-1023 \leq \mathrm{E} \leq 1023$

12. Anygiven truth tablecanberepresented by

(A) Allof the options

(B)aproduct of sumBooleanexpression

(C)aKarnaugh map

(D)asum of productBooleanexpression

13. Cachememoryfunctionsasanintermediary between

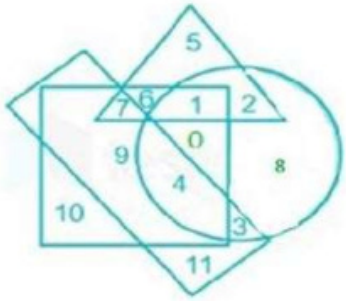
(A) CPU andHardDisk

(B) None ofthese

(C) RAM andROM

(D) CPU andRAM

14. In the figure,thecirclestandsfor employed, the square stands for a social worker, the triangle stands for illiterate, andtherectanglestands for truthful. Study the figure with its regions and find the number of neither truthfulnorilliteratepeople among the employed only.



(A) 11
(B) 4
(C) 1
(D) 8

15. The quotient, if the binary number 11010111 is divided by 101 , is _____
(A) 101101
(B) 101010
(C) 111001
(D) 101011

16. The expression *P*+*QR* is the reduced form of _____

(A) $(P+R)Q$

(B) $PQ+QR$

(C) $(P+Q)R$

(D) $(P+Q)(P+R)$

17. A computer systemhas 16 -bit wide address/data bus that uses RAM chips of 4 K×8-bit capacity. The number of RAM chips are needed to provide a memory capacity of 64 Kbytes memory is _____

(A) 8

(B) 16

(C) 64

(D) 32

18. Let the given numbers 11001,1001 and 111001 be correspond to the 2 's complement representation. Then with which one of the following decimal numbers, the given numbers match?

(A) −25,−9 and -57 , respectively

(B) 25,9 and 57 , respectively

(C) −6,−6, and -6 , respectively

(D) −7,−7, and -7 , respectively

19. The Boolean expression for the followingtruthtableis

x	y	z	f
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

(A) F $=x'yz'+xy'z+x'y'z'$
(B) F= $x'y'z'+xy'z+xyz'$
(C) F= $x'yz'+xy'z+xyz$
(D) None of these

20. Which of the following components is not a part of an instruction format in CPU processing?

(A) Destination operand

(B) Register file

(C) Opcode

(D) Source operand

21. Choose the correct combination of prepositions to complete the sentence: "The cat jumped _____ the table _____ the chair."

(A) off, in

(B) onto, towards

(C) into, beside

(D) on, from

22. Select the correct meaning of 'Peruse':

(A) Examine

(B) Pursue

(C) Continue

(D) Rescue

23. Choose the best option that indicates the change of voice for the sentence given below: Did Alice invite you?

(A) Had you invited Alice?

(B) Were you invited by Alice?

(C) Was Alice invited you?

(D) Did you invited by Alice?

24. Write the antonym for 'Inscrutable':

(A) Comprehensible
(B) Opaque
(C) Mysterious
(D) Obscure

25. Which sentence demonstrates correct preposition usage?

(A) I prefer coffee over te(A)

(B) She arrived to the party at 8PM.

(C) He is interested on learning new languages.

(D) They were surprised of the sudden announcement.

26. What does the idiom "jump on the bandwagon" mean?

(A) To start a business

(B) To join a popular trend or activity

(C) To repair a vehicle

(D) To criticize something unfairly

27. The company's _____ growth in revenue surprised analysts.

(A) exponential

(B) stagnant

(C) erratic

(D) gradual

28. Identify the word that means the same as "ostentatious":

(A) Lavish

(B) Simple

(C) Modest

(D) Unassuming

29. Which of the following is an essential element of a technical report?

(A) Statistical data and analysis

(B) Creative storytelling

(C) Emotional appeals

(D) Anecdotes and personal opinions

30. Select the appropriate synonym for 'coercive':

(A) Corrective (B) Gentle

(C) Forceful (D) Merciful