

Final Term From Feb-2012 to July-2009

Latest Solved MCQ + subjective from Final term Papers

MTH202- Discrete Mathematics
Resource Person Hina

Question No: 1 If a set contains exactly m distinct elements where m denotes some non negative integer then the set is.

- **Finite (Page 40)**
- Infinite
- None of these

Question No: 2 In a directed graph of a Irreflexive relation, there should be

- Loop on a one point
- **No loop at any point (Page 89)**
- No point connected

Question No: 4 How many functions are there from a set with three elements to a set with two elements?

- 6
- **8**
- 12

$$n^m = 2^3 = 8$$

Question No: 5 Let n and d be integers and $d \neq 0$. Then n is divisible by d or d divides n If and only if

- **$n = k.d$ for some integer k (Page 179)**
- $n = d$
- $n.d = 1$

none of these

Question No: 6 Let f and g be the functions defined by

$f(x) = 2x + 3$ & $g(x) = 3x + 2$ then composition of f and g is

- $6x + 6$
- $5x + 5$
- $6x + 7$

$$\begin{aligned} f \circ g &= f(3x + 2) \\ &= 2(3x + 2) + 3 \\ &= 6x + 4 + 3 \\ &= 6x + 7 \end{aligned}$$

Question No: 7 Let f is defined recursively by

$$F(0) = 3$$

$$F(n+1) = 2F(n) + 2$$

Then $f(2) =$

- 8
- 10
- **18**
- 21

$$f(1) = 2f(0) + 2 = 2(3) + 2 = 6 + 2 = 8$$

$$f(2) = 2f(1) + 2 = 2(8) + 2 = 16 + 2 = 18$$

Question No: 9 If a pair of dice is thrown then the probability of getting a total of 5 or 11 is

- $\frac{1}{18}$
- $\frac{1}{9}$
- $\frac{1}{6}$

Outcomes with sum of 5 = (1, 4), (2, 3), (3, 2), (4, 1)

Outcomes with sum of 11 = (5, 6), (6, 5)

Total outcomes for 5 & 11 = 6

Total outcome for 2 dice = $6 \times 6 = 36$

Probability = $\frac{6}{36} = \frac{1}{6}$

$y =$

Question No: 10 If a die is rolled then what is the probability that the number is greater than 4

- $\frac{1}{3}$
- $\frac{4}{3}$
- $\frac{1}{2}$

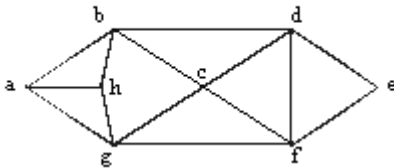
Number greater than 4 = 5, 6

$$\text{Probability} = \frac{2}{6} = \frac{1}{3}$$

Question No: 11 What is the expectation of the number of heads when three fair coins are tossed?

- 1
- 1.34
- 2
- **1.5 (Page 277)**

Question No: 13 The Hamiltonian circuit for the following graph is



- abcdefgh
- abefgha
- **abcdefgha (Page 297)**

Question No: 14 Let n and d be integers and $d \neq 0$. Then n is divisible by d or d divides n if and only if

- **$n = k \cdot d$ for some integer k (Page 179)**
- $n = d$
- $n \cdot d = 1$
- none of these

Question No: 16 The sum of two irrational number must be an irrational number

- **False (Page 197)**
- True

Question No: 17 The square root of every prime number is irrational

- **True**
- False
- Depends on the prime number given

Question No: 18 The greatest common divisor of 27 and 72 is

- 27
- 9
- 1

None of these

Solution:

1. Divide 72 by

27: This gives $72 = 27 \cdot 2 + 18$

2. Divide 27 by 18: This gives $27 = 18 \cdot 1 + 9$

3. Divide 18 by 9: This gives $18 = 9 \cdot 2 + 0$

Hence greatest common divisor $(72, 27) = 9$.

Question No: 19 If T is a full binary tree and has 5 internal vertices then the total vertices of T are

- 11
- 12
- 13

None of these

$$2k + 1 = 2(5) + 1 = 10 + 1 = 11$$

Question No: 20 Suppose that a connected planar simple graph has 30 edges. If a plane drawing of this graph has 20 faces, how many vertices does the graph have?

- 12 (Page 318)
- 13
- 14

Question No: 21 How many different ways can three of the letters of the word BYTES be chosen if the first letter must be B ?

- P(4,2)
- P(2,4)
- C(4,2)

None of these

Question No: 22 The value of $0!$ is

- 0
- **1 (Page 160)**
- Cannot be determined

Question No: 23 An arrangement of objects with the consideration of order is called

- **Permutation (Page 219)**
- Combination
- Selection
- None of these

Question No: 25 Among 200 people, 150 either swim or jog or both. If 85 swim and 60 swim and jog, how many jog?

- **125 (Page 241)**
- 225
- 85
- 25

Question No: 26 If a graph is a tree then

- it has 2 spanning trees
- **it has only 1 spanning tree (Page 329)**
- it has 4 spanning trees
- it has 5 spanning trees

Question No: 27 Euler formula for graphs is

- $f = e - v$
- $f = e + v + 2$
- $f = e - v - 2$
- **$f = e - v + 2$ (Page 317)**

Question No: 28 The given graph is

- **Simple graph**
- Complete graph
- Bipartite graph
- Both (i) and (ii)
- Both (i) and (iii)

Question No: 29 An integer n is odd if and only if $n = 2k + 1$ for some integer k .

- **True (Page 187)**
- False
- Depends on the value of k

Question No: 30 If $P(A \cap B) = P(A)P(B)$ then the events A and B are called

- **Independent (Page 272)**
- Dependent
- Exhaustive

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MTH202- Discrete Mathematics

Question No: 5

The part of definition which can be expressed in terms of smaller versions of itself is called

- Base
- Restriction
- **Recursion (page 159)**
- Conclusion

Question No: 6

$$\left\lceil \frac{N}{6} \right\rceil = 9$$

What is the smallest integer N such that

- 46
- 29
- **49**

$$\begin{aligned} N &= 6 \times (9-1) + 1 \\ &= 6 \times 8 + 1 = \\ &49 \end{aligned}$$

Question No: 8 What is the probability that a hand of five cards contains four cards of one kind?

- 0.0018
- $\frac{1}{2}$
- **0.0024 (page 253)**

Question No: 9 A rule that assigns a numerical value to each outcome in a sample space is called

- One to one function
- Conditional probability
- **Random variable (Page 274)**

Question No: 10

A walk that starts and ends at the same vertex is called

- Simple walk
- Circuit
- **Closed walk (Page 292)**

Question No: 11 The Hamiltonian circuit for the following graph is

- abcdefgh
- abefgha
- **abcdefgha (Page 297)**

Question No: 14

The square root of every prime number is irrational

- **True**
- False
- Depends on the prime number given

Question No: 15 If a and b are any positive integers with $b \neq 0$ and q and r are non negative integers such that $a = b \cdot q + r$ then

- **$\gcd(a,b) = \gcd(b,r)$ (Page 207)**
- $\gcd(a,r) = \gcd(b,r)$
- $\gcd(a,q) = \gcd(q,r)$

Question No: 16 The greatest common divisor of 27 and 72 is

- 27
- **9**
- 1
- None of these

Question No: 24 Any two spanning trees for a graph

- Does not contain same number of edges
- Have the same degree of corresponding edges
- **contain same number of edges (Page 329)**
- May or may not contain same number of edges

Question No: 25 When 3^k is even, then $3^k + 3^k + 3^k$ is an odd.

- True
- **False**

Question No: 26 Quotient–Remainder Theorem states that for any positive integer d , there exist unique integer q and r such that $n = d \cdot q + r$ and _____.

- **$0 \leq r < d$ (Page 201)**
- $0 < r < d$
- $0 \leq d < r$
- None of these

Question No: 27 **The value of**

$\lceil x \rceil$ for $x = -3.01$ is

- 3.01
- 3
- 2
- 1.99

-3.01

-3.01

$$= -4 + 0.99$$

$$= -4 + 0.99$$

$$= -4$$

$$= -4 + 1 = -3$$

Question No: 29 An integer n is prime if and only if $n > 1$ and for all positive integers r and s , if $n = r \cdot s$, then

- $r = 1$ or $s =$
- 2.
- $r = 1$ or $s =$
- 0.
- $r = 2$ or $s =$
- 3.
- **None of these (Page 187)**

Question No: 30 (Marks: 1) - Please choose one

If $P(A \cap B) = P(A)P(B)$ then the events A and B are called

- **Independent (Page 272)**
- Dependent
- Exhaustive

FINAL TERM EXAMINATION
Fall 2009
MTH202- Discrete Mathematics

Question No: 1 (Marks: 1) - Please choose one

Let $A = \{a, b, c\}$ and

$R = \{(a, c), (b, b), (c, a)\}$ be a relation on A . Is R

- Transitive
- Reflexive
- **Symmetric**
- Transitive and Reflexive

Question No: 2

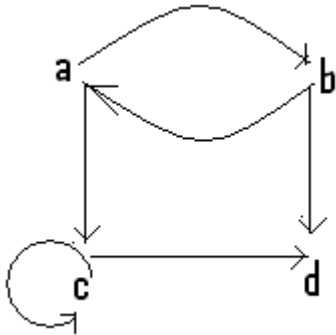
Symmetric and antisymmetric are

- Negative of each other
- Both are same
- **Not negative of each other (Page 90)**

Question No: 3 The statement $p \vee q \wedge \neg q \wedge \neg p$ describes

- **Commutative Law:**
- Implication Laws:
- Exportation Law:
- Equivalence:

Question No: 4 The relation as a set of ordered pairs as shown in figure is



- $\{(a,b),(b,a),(b,d),(c,d)\}$
- $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- **$\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$**
- $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

Question No: 5 The statement $p \vee q \vee (p \vee \neg q) \vee c$ describes

- Commutative Law:
- Implication Laws:
- Exportation Law:
- **Reductio ad absurdum**

Question No: 6 A circuit with one input and one output signal is called.

- **NOT-gate (or inverter) (Page 31)**
- OR- gate
- AND- gate
- None of these

Question No: 7

If $g(x) = x^2 - 1$ then $fg(x) =$
 $f(x) = 2x + 1$,

- $x^2 - 1$
- $2x^2 - 1$
- $2x^3 - 1$

$$fg(x) = f(g(x)) = f(x^2 - 1)$$

$$= 2(x^2 - 1) + 1$$

$$= 2x^2 - 2 + 1$$

$$= 2x^2 - 1$$

Question No: 8 Let g be the functions defined by $g(x) = 3x + 2$ then $gog(x) =$

- $9x^2 + 4$
- $6x + 4$
- **$9x + 8$**

$$gog(x) = g(g(x)) = g(3x + 2)$$

$$= 3(3x + 2) + 2$$

$$= 9x + 6 + 2$$

$$= 9x + 8$$

Question No: 9 How many integers from 1 through 1000 are neither multiple of 3 nor multiple of 5?

- 333
- 467

- 533 (Page 245)
- 497

Question No: 10

$$\left[\frac{N}{6} \right] = 9$$

What is the smallest integer N such that

- 46
- 29
- 49

$$\begin{aligned} N &= 6 \times (9 - 1) + 1 \\ &= 6 \times 8 + 1 = \\ &49 \end{aligned}$$

Question No: 11 What is the probability of getting a number greater than 4 when a die is thrown?

- 1
- 2
- 3
- 2
- $\frac{1}{3}$

Number greater than 4 = 5, 6

$$\text{Probability} = \frac{2}{6} = \frac{1}{3}$$

Question No: 12 If A and B are two disjoint (mutually exclusive) events then $P(A \cup B) =$

- $P(A) + P(B) + P(ANB)$
- $P(A) + P(B) + P(AUB)$
- $P(A) + P(B) - P(ANB)$
- $P(A) + P(B) - P(ANB)$
- $P(A) + P(B)$ Page (240)

Question No: 13

If a die is thrown then the probability that the dots on the top are prime numbers or odd numbers is

- 1
- $\frac{1}{2}$
- 2

$\frac{2}{3}$

Prime number or odd number =1,3,5

Total outcomes =6

Probability = $\frac{3}{6} = \frac{1}{2}$

Question No: 14

The probability of getting 2 heads in two successive tosses of a balanced coin is

$\frac{1}{4}$

$\frac{1}{2}$

$\frac{2}{3}$

Question No: 15 The probability of getting a 5 when a die is thrown?

$\frac{1}{6}$

$\frac{5}{6}$

$\frac{1}{3}$

Question No: 16 If a coin is tossed then what is the probability that the number is 5

$\frac{1}{2}$

0

1

Wrong Question

Question No: 17 If A and B are two sets then The set of all elements that belong to both A and B , is

▶ A N B

▶ A U B (Page 42)

▶ A--B

▶ None of these

Question No: 18 What is the expectation of the number of heads when three fair coins are tossed?

▶ 1

▶ 1.34

▶ 2

▶ 1.5 (Page 277)

Question No: 19 (Marks: 1) - Please choose one

If A, B and C are any three events, then

$P(ANBNC)$ is equal to

- $P(A) + P(B) + P(C)$
- $P(A) + P(B) + P(C) - P(A \cup B) - P(A \cup C) - P(B \cup C) + P(A \cup B \cup C)$ (Page 264)
- $P(A) + P(B) + P(C) - P(ANB) - P(A \cap C) - P(B \cap C)$
- $P(A) + P(B) + P(C) + P(A \cap B \cap C)$

Question No: 20 A rule that assigns a numerical value to each outcome in a sample space is called

- One to one function
- Conditional probability
- **Random variable (Page 274)**

Question No: 21 The power set of a set A is the set of all subsets of A, denoted $P(A)$.

- False
- **True (Page 68)**

Question No: 22 A walk that starts and ends at the same vertex is called

- Simple walk
- Circuit
- **Closed walk (Page 292)**

Question No: 23 If a graph has any vertex of degree 3 then

- It must have Euler circuit
- It must have Hamiltonian circuit
- It does not have Euler circuit

Question No: 24 The square root of every prime number is irrational

- **True**
- False
- Depends on the prime number given

Question No: 25 A predicate is a sentence that contains a finite number of variables and becomes a statement when specific values are substituted for the variables

- **True (Page 202)**
- False
- None of these

Question No: 26 If r is a positive integer then $\gcd(r,0)=$

- **r**
- 0
- 1
- None of these

Question No: 27 Combinatorics is the mathematics of counting and arranging objects

- **True (Page 209)**
- False
- Cannot be determined

Question No: 28 A circuit that consist of a single vertex is called

- **Trivial (Page 322)**
- Tree
- Empty

Question No: 29 In the planar graph, the graph crossing number is

- **0 (Page 314)**
- 1
- 2
- 3

Question No: 30 How many ways are there to select five players from a 10 member tennis team to make a trip to a match to another school?

- **C(10,5)**
- C(5,10)
- P(10,5)
- None of these

Solution: The answer is given by the number of 5-combinations of a set with ten elements. By Theorem 2, the number of such combinations is

$$C(10, 5) = \frac{10!}{5!5!} = 252.$$

Question No: 31 The value of $0!$ Is

- 0
- **1**
- Cannot be determined

Question No: 32 If the transpose of any square matrix and that matrix are same then matrix is called

- Additive Inverse
- Hermition Matrix
- **Symmetric Matrix (Page 299)**

Question No: 34 If A and B are two disjoint sets then which of the following **must be** true

- **$n(A \cup B) = n(A) + n(B)$ (Page 257)**
- $n(A \cap B) = n(A) + n(B) - n(A \cup B)$
- $n(A \cap B) = \emptyset$
- None of these

Question No: 35 Any two spanning trees for a graph

- Does not contain same number of edges
- Have the same degree of corresponding edges
- **contain same number of edges (Page 329)**
- May or may not contain same number of edges

Question No: 36 When $P(k)$ and $P(k+1)$ are true for any positive integer k , then $P(n)$ is not true for all +ve Integers.

- True
- **False (Lecture 23)**

Question No: 37 $> n+3$ for all integers $n \in \mathbb{U}3$.

- True
- False

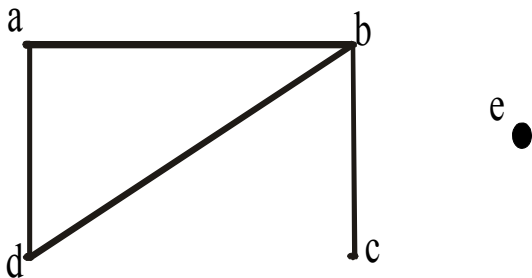
Question No: 38 Quotient –Remainder Theorem states that for any positive integer d , there exist unique integer q and r such that ___ and $0 \leq r < d$.

- **$n = d \cdot q + r$ (Page 201)**
- $n = d \cdot r + q$
- $n = q \cdot r + d$
- None of these

Question No: 39 Euler formula for graphs is

- $f = e - v$
- $f = e + v + 2$
- $f = e - v - 2$
- **$f = e - v + 2$ (Page 317)**

Question No: 40 The degrees of $\{a, b, c, d, e\}$ in the given graph is



- 2, 2, 3, 1, 1
- 2, 3, 1, 0, 1
- 0, 1, 2, 2, 0
- **2,3,1,2,0 Correct answer on Paper 307**

2009
MTH202- Discrete Mathematics (Session
- 2)

Question No: 1 The negation of “Today is Friday” is

- Today is Saturday
- **Today is not Friday**
- Today is Thursday

Question No: 2 An arrangement of rows and columns that specifies the truth value of a compound proposition for all possible truth values of its constituent propositions is called

- **Truth Table (Page 6)**
- Venn diagram
- False Table
- None of these

Question No: 4 Contra positive of given statement “*If it is raining, I will take an umbrella*” is

- **I will not take an umbrella if it is not raining.**
- I will take an umbrella if it is raining.
- It is not raining or I will take an umbrella.
- None of these.

Question No: 5 Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 1), (2, 2), (3, 3), (4, 4)\}$ then

- R is symmetric.
- R is anti symmetric.
- R is transitive.
- R is reflexive.
- **All given options are true**

Question No: 6 A binary relation R is called Partial order relation if

It is Reflexive and transitive

It is symmetric and transitive

It is reflexive, symmetric and transitive

It is reflexive, anti symmetric and transitive

Question No: 7 How many functions are there from a set with three elements to a set with two elements?

Ø 6

Ø **8**

Ø 12

$$n^m = 2^3 = 8$$

Question No: 8 $1, 10, 10^2, 10^3, 10^4, 10^5, 10^6, 10^7, \dots$
is

- Arithmetic series
- Geometric series
- Arithmetic sequence
- **Geometric sequence**

Question No: 9 x
for $x = -2.01$ is

- -2.01
- -3
- **-2 (Page 249)**
- -1.99

Question No: 10 If A and B are two disjoint (mutually exclusive) events then $P(A \cup B) =$

- Ø $P(A) + P(B) + P(A \cap B)$
- Ø $P(A) + P(B) + P(A \cup B)$
- Ø $P(A) + P(B) - P(A \cap B)$
- Ø $P(A) + P(B) - P(A \cup B)$
- Ø **$P(A) + P(B)$**

Question No: 11 If a die is thrown then the probability that the dots on the top are prime numbers or odd numbers is

- Ø 1
- Ø $\frac{1}{2}$
- Ø $\frac{2}{3}$
- Ø $\frac{1}{3}$

Question No: 12 If $P(A \cap B) = P(A)P(B)$ then the events A and B are called

- **Independent (Page 272)**
- Dependent
- Exhaustive

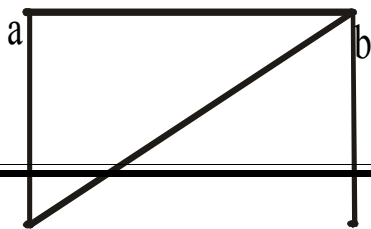
Question No: 13 A rule that assigns a numerical value to each outcome in a sample space is called

- One to one function
- Conditional probability
- **Random variable (Page 274)**

Question No: 14 The expectation of x is equal to

- Ø Sum of all terms
- Ø Sum of all terms divided by number of terms
- Ø $\sum xf(x)$ (Page 277)

Question No: 15 The degree sequence $\{a, b, c, d, e\}$ of the given graph is



e

d

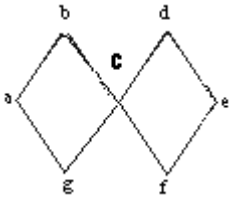
c

- 2, 2, 3, 1, 1
- 2, 3, 1, 0, 1 (Page 307)
- 0, 1, 2, 2, 0
- 2, 3, 1, 2, 0

Question No: 16 Which of the following graph is not possible?

- **Graph with four vertices of degrees 1, 2, 3 and 4. (Page 287)**
- Graph with four vertices of degrees 1, 2, 3 and 5.
- Graph with three vertices of degrees 1, 2 and 3.
- Graph with three vertices of degrees 1, 2 and 5.

Question No: 17 The graph given below



- Has Euler circuit
- Has Hamiltonian circuit
- **Does not have Hamiltonian circuit (Page 297)**

Question No: 18 Let n and d be integers and $d \neq 0$. Then n is divisible by d or d divides n if and only if

- **$n = k \cdot d$ for some integer k (Page 179)**
- $n = d$
- $n \cdot d = 1$
- none of these

Question No: 20 An integer n is prime if, and only if, $n > 1$ and for all positive integers r and s , if $n = r \cdot s$, then

- **$r = 1$ or $s = 1$. (Page 187)**
- $r = 1$ or $s = 0$.
- $r = 2$ or $s = 3$.
- None of these

Question No: 21 The method of loop invariants is used to prove correctness of a loop with respect to certain pre and post-conditions.

- **True (Page 203)**
- False

- None of these

Question No: 22 The greatest common divisor of 27 and 72 is

- 27
- 9
- 1
- None of these

Solution:

1. Divide 72 by 27: This gives $72 = 27 \cdot 2 + 18$

2. Divide 27 by 18: This gives $27 = 18 \cdot 1 + 9$

This gives $18 = 9 \cdot 2 + 0$

3. Divide 18 by 9:

Hence greatest common divisor $(72, 27) = 9$.

Question No: 23 If a tree has 8 vertices then it has

- 6

e
d
g
e
s

- 7

e
d
g
e
s

- 9

e
d
g
e
s

Question No: 24 Complete graph is planar if

- n

=

4

•

n

>

4

- $n \leq 4$ (Page 315)

Question No: 25 The given graph is

- **Simple graph**
- Complete graph
- Bipartite graph
- Both (i) and (ii)

Both (i) and (iii)

Question No: 26 The value of $0!$ is

- 0
- **1 (Page 160)**
- Cannot be determined

Question No: 27 Two matrices are said to conformable for multiplication if

- Both have same order
- **Number of columns of 1st matrix is equal to number of rows in 2nd matrix (Page 300)**
- Number of rows of 1st matrix is equal to number of columns in 2nd matrix

Question No: 28 The value of $(-2)!$ is

- 0
- 1
- **Cannot be determined (Page 217)**

Question No: 30 The number of k -combinations that can be chosen from a set of n elements can be written as

- **${}^n C_k$ (Page 225)**
- ${}^k C_n$
- ${}^n P_k$
- ${}^k P_k$

Question No: 31 If the order does not matter and repetition is allowed then total number of ways for selecting k sample from n . is

- n^k
- **$C(n+k-1, k)$ (Page 229)**
- $P(n, k)$
- $C(n, k)$

Question No: 32 If the order matters and repetition is not allowed then total number of ways for selecting k sample from n . is

- n^k
- $C(n+k-1, k)$
- $P(n, k)$
- **$C(n, k)$ (Page 225)**

Question No: 33 To find the number of unordered partitions, we have to count the ordered partitions and then divide it by suitable number to erase the order in partitions

- **True (Page 233)**
- False
- None of these

Question No: 34 A tree diagram is a useful tool to list all the logical possibilities of a sequence of events where each event can occur in a finite number of ways.

- **True (Page 237)**
- False

Question No: 36 What is the output state of an OR gate if the inputs are 0 and 1?

- 0
- **1**
- 2
- 3

Question No: 39 (Marks: 1) - Please choose one
 $n! > 2^n$ for all integers $n \geq 4$.

- True
- **False**

Question No: 40 $+$, $-$, \times , \div
are

- Geometric expressions
- **Arithmetic expressions**
- Harmonic expressions

**FINALTERM
EXAMINATION Fall
2009
MTH202- Discrete
Mathematics**

Question No: 1 The negation of "Today is Friday" is

- Today is Saturday
- **Today is not Friday**
- Today is Thursday

Question No: 2 In method of proof by contradiction, we suppose the statement to be proved is false.

- **True (Page 193)**
- False

Question No: 3 Whether the relation R on the set of all integers is reflexive, symmetric, anti symmetric, or transitive, where $(x, y) \in R$ if and only if $xy \geq 1$

- Anti symmetric
- Transitive
- Symmetric
- **Both Symmetric and transitive**
http://www.maths.uq.edu.au/courses/MATH1061/wkbooksols/chap10/S10_5_3solution.htm **Question No: 4** The inverse of given relation $R = \{(1,1), (1,2), (1,4), (3,4), (4,1)\}$ is

- $\{(1,1), (2,1), (4,1), (2,3)\}$
- $\{(1,1), (1,2), (4,1), (4,3), (1,4)\}$
- **$\{(1,1), (2,1), (4,1), (4,3), (1,4)\}$**

Question No: 5 A circuit with one input and one output signal is called.

- **NOT-gate (or inverter) (Page 31)**
- OR- gate
- AND- gate
- None of these

Question No: 6 A sequence in which common difference of two consecutive terms is same is called

- geometric mean
- harmonic sequence
- geometric sequence
- **arithmetic progression (Page 146)**

Question No: 8 How many integers from 1 through 100 must you pick in order to be sure of getting one that is divisible by 5?

- 21
- 41
- **81 (Page 241)**
- 56

Question No: 9 What is the probability that a randomly chosen positive two-digit number is a multiple of 6?

- 0.5213
- **0.167 (Page 254)**
- 0.123

Question No: 10 If a pair of dice is thrown then the probability of getting a total of 5 or 11 is

▶ $\frac{1}{18}$

▶ $\frac{1}{9}$

▶ $\frac{1}{6}$

Outcomes with sum of 5 = (1, 4), (2, 3), (3, 2), (4, 1)

Outcomes with sum of 11 = (5, 6), (6, 5)

Total outcomes for 5 & 11 = 6

Total outcome for 2 dice = $6 \times 6 = 36$

Probability = $\frac{6}{36} = \frac{1}{6}$

Question No: 11

If a die is rolled then what is the probability that the number is greater than 4

– ▶ $\frac{1}{3}$

– ▶ $\frac{3}{4}$

– ▶ $\frac{1}{2}$

Number greater than 4 = 5, 6

Probability = $\frac{2}{6} = \frac{1}{3}$

Question No: 12

If a coin is tossed then what is the probability that the number is 5

– ▶ $\frac{1}{2}$

- 0
- 1

Wrong Question

Question No: 13 If A and B are two sets then The set of all elements that belong to both A and B, is

U

- A - B
- **$A \cap B$ (Page 42)**
- $A - B$
- None of these

Question No: 14 If A and B are two sets then The set of all elements that belong to A but not B , is

U

- A - B
- $A \cap B$
- None of these
- **$A - B$**

Question No: 15

U U

If A, B and C are any three events, then $P(A \cup B \cup C)$ is equal to

- $P(A) + P(B) + P(C)$
- **$P(A) + P(B) + P(C) - P(A \cup B) - P(A \cup C) - P(B \cup C) + P(A \cup B \cup C)$ (Page 264)**
- $P(A) + P(B) + P(C) - P(A \cap B) - P(A \cap C) - P(B \cap C)$
- $P(A) + P(B) + P(C) + P(A \cap B \cap C)$

Question No: 16 If a graph has any vertex of degree 3 then

- It must have Euler circuit
- It must have Hamiltonian circuit
- It does not have Euler circuit

Question No: 17 The contradiction proof of a statement pq involves

- Considering p and then try to reach q
- Considering $\sim q$ and then try to reach $\sim p$
- **Considering p and $\sim q$ and try to reach contradiction (Not sure)**
- None of these

Question No: 18 How many ways are there to select a first prize winner a second prize winner, and a third prize winner from 100 different people who have entered in a contest.

- None of these
- **$P(100,3)$**
- $P(100,97)$
- $P(97,3)$

Question No: 19 A vertex of degree 3 is called a

- Terminal vertex
- **Internal vertex (Page 323)**

Question No: 20 Suppose that a connected planar simple graph has 30 edges. If a plane drawing of

this graph has 20 faces, how many vertices does the graph have?

- **12 (Page 318)**
- 13
- 14

Question No: 21 How many different ways can three of the letters of the word BYTES be chosen if the first letter must be B ?

- **P(4,2)**
- P(2,4)
- C(4,2)
- None of these

Question No: 22 For the given pair of graphs whether it is

- **Isomorphic**
- Not isomorphic

Question No: 23 On the set of graphs the graph isomorphism is

- **Isomorphic Invariant (Page 307)**
- Equivalence relation
- Reflexive relation

Question No: 24 A matrix in which number of rows and columns are equal is called

- Rectangular Matrix
- **Square Matrix (Page 289)**
- Scalar Matrix

Question No: 25 If the transpose of any square matrix and that matrix are same then matrix is called

- Additive Inverse
- Hermitian Matrix
- **Symmetric Matrix (Page 299)**

Question No: 26 The number of k-combinations that can be chosen from a set of n elements can be written as

- **nCk (Page 225)**
- kCn
- nPk
- kPk

Question No: 27 The value of $C(n, 0) =$

- **1 (Page 226)**
- 0
- n
- None of these

Question No: 28 If the order does not matter and repetition is not allowed then total number of ways for selecting k sample from n. is

- $P(n,k)$
- $C(n,k)$
- nk
- **$C(n+k-1,k)$ (Page 225)**

Question No: 29 If A and B are two disjoint sets then which of the following must be true

- **$n(A \cup B) = n(A) + n(B)$ (Page 257)**

- $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

- $n(A \cup B) = \emptyset$

- None of these

Question No: 30 Among 200 people, 150 either swim or jog or both. If 85 swim and 60 swim and jog, how many jog?

- **125 (Page 241)**

- 225
- 85
- 25

Question No: 31 If two sets are disjoint, then $P \cap Q$ is

- \emptyset
- U
- P
- Q
- $P \cup Q$
-

Question No: 32 Every connected tree

- does not have spanning tree
- may or may not have spanning tree
- **has a spanning tree (Page 329)**

Question No: 33 When $P(k)$ and $P(k+1)$ are true for any positive integer k , then $P(n)$ is not true for all +ve Integers.

- **True (Lecture 23)**
- False

Question No: 34 When $3k$ is even, then $3k+3k+3k$ is an odd.

- True
- **False**

Question No: 35 $5n - 1$ is divisible by 4 for all positive integer values of n .

- **True**
- False

Question No: 36 Quotient –Remainder Theorem states that for any positive integer d , there exist unique integer q and r such that $n=d.q+ r$ and ____.

- **$0 \leq r < d$ (Page 201)**
- $0 < r < d$
- $0 \leq d < r$
- None of these

Question No: 37 The given graph is

- **Simple graph**
- Complete graph
- Bipartite graph
- Both (i) and (ii)
- Both (i) and (iii)

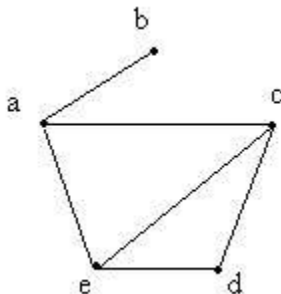
Question No: 38 An integer n is even if and only if $n = 2k$ for some integer k .

- **True (Page 187)**
- False
- Depends on the value of k

Question No: 39 The word "algorithm" refers to a step-by-step method for performing some action.

- **True (Page 201)**
- False
- None of these

Question No: 40 The adjacency matrix for the given graph is



- ▶ 0 1 1 0 0
- 1 0 0 1 0
- ▶ 1 0 0 1 1
- 0 0 1 0 1
- 1 0 0 1 0

- ▶ 0 1 1 0 1
- 1 0 0 0 0
- ▶ 1 0 0 1 1
- 0 0 1 0 1
- 1 0 1 1 0

- ▶ 0 1 0 0 1
- 1 0 0 0 0
- ▶ 1 0 0 1 0
- 0 0 1 0 1
- 0 0 1 1 0
- ▶ None of these

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Question No: 1 When 5^k is even, then $5^k + 5^k + 5^k$ is odd.

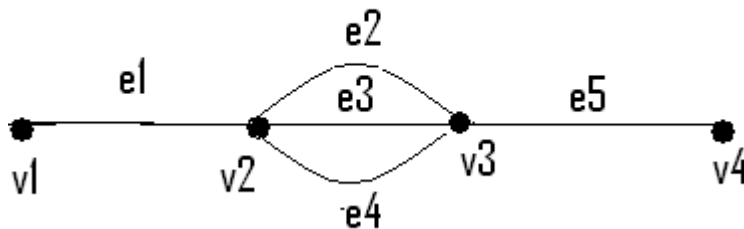
- **True**

- False

Question No: 2 An arrangement of objects without the consideration of order is called

- **Combination**
- Selection
- None of these
- Permutation

Question No: 3 In the following graph



How many simple paths are there from v_1 to v_4

- 2
- **3**
- 4

Question No: 4 Changing rows of matrix into columns is called

- Symmetric Matrix
- **Transpose of Matrix (Page 229)**
- Adjoint of Matrix

Question No: 5 The list of the degrees of the vertices of graph in non increasing order is called

- Isomorphic Invariant
- **Degree Sequence (Page 307)**
- Order of Graph

Question No: 6 A vertex of degree greater than 1 in a tree is called a

- **Branch vertex (Page 323)**
- Terminal vertex
- Ancestor

Question No: 7 The word "algorithm" refers to a step-by-step method for performing some action

- **True (Page 201)**
- False
- None of these

Question No: 8 The sum of two irrational number must be an irrational number

- True
- **False (Page 197)**

Question No: 9 An integer n is prime if, and only if, $n > 1$ and for all positive integers r and s , if $n = r \cdot s$, then

- **$r = 1$ or $s = 1$. (Page 187)**
- $r = 1$ or $s = 0$.
- $r = 2$ or $s = 3$.
- None of these

Question No: 10 An integer n is even if, and only if, $n = 2k$ for some integer k .

- **True (Page 187)**
- False
- Depends on the value of k

Question No: 11 For any two sets A and B , $A - (A - B) =$

- $\emptyset \quad A \cap B \quad \emptyset$
- $A \cap B \quad \emptyset \quad A - B$
- **B**
- \emptyset None of these

Question No: 12 A walk that starts and ends at the same vertex is called

- Simple walk
- Circuit
- **Closed walk (Page 292)**

Question No: 14 Two distinct edges with the same set of end points are called

- Isolated
- Incident
- **Parallel (Page 284)**

Question No: 15

The probability of getting 2 heads in two successive tosses of a balanced coin is

- $\frac{1}{4}$
- **$\frac{1}{2}$**
- $\frac{2}{3}$
- $\frac{1}{3}$

Question No: 16 What is the probability of getting a number greater than 4 when a die is thrown?

- 1
- 2
- 3
- 2
- 1
- 3

Number greater than 4 = 5, 6

$$\text{Probability} = \frac{2}{6} = \frac{1}{3}$$

Question No: 17 If two relations are reflexive then their composition is

- Antisymmetric
- Reflexive
- Irreflexive
- Symmetric

Question No: 19 Select the correct one

- A proof by contradiction is based on the fact that a statement can be true and false at the same time.
- A proof by contraposition is based on the logical equivalence between a statement and its contradiction. (Page 198)
 - The method of loop invariants is used to prove correctness of a loop without any conditions.
 - None of the given choices

Question No: 20 According to Demorgan's law

$$\sim (p \vee q) = ?$$

-
-
-
-

Correct

