FINALTERM EXAMINATION
Spring 2010
MTH202- Discrete Mathematics (Session - 1)

Time: 90 min
Marks: 60

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

Whether the relation R on the set of all integers is reflexive, symmetric, antisymmetric, or transitive, where $(x, y) \in R$ if and only if $xy \geq 1$

► Antisymmetric
► Transitive
*► Symmetric
► Both Symmetric and transitive

Question No: 2 (Marks: 1) - Please choose one

For a binary relation R defined on a set A , if for all $t \in A, (t,t) \notin R$ then R is

* ► Antisymmetric
► Symmetric
► Irreflexive

Question No: 3 (Marks: 1) - Please choose one

If ($A \cup B$) = A, then ($A \cap B$) = B

► True
* ► False
► Cannot be determined

Question No: 4 (Marks: 1) - Please choose one

$a_0 = 1, a_1 = -2$ *and* $a_2 = 3$

then $\sum_{j=0}^{2} a_j =$

Let

► -6
-*► 2
► 8

Question No: 5 (Marks: 1) - Please choose one

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

► Base
► Restriction
*► Recursion
► Conclusion

Question No: 6 (Marks: 1) - Please choose one

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

What is the smallest integer N such that

* ► 46
► 29
► 49

Question No: 7 (Marks: 1) - Please choose one

In probability distribution random variable f satisfies the conditions

$f(x_i) \leq 0 \quad and \quad \sum_{i=1}^{n} f(x_i) \neq 1$

► $f(x_i) \geq 0 \quad and \quad \sum_{i=1}^{n} f(x_i) = 1$

* ► $f(x_i) \geq 0 \quad and \quad \sum_{i=1}^{n} f(x_i) \neq 1$

► $f(x_i) \prec 0 \quad and \quad \sum_{i=1}^{n} f(x_i) = 1$

►

Question No: 8 (Marks: 1) - Please choose one

What is the probability that a hand of five cards contains four cards of one kind?

► 0.0018

► $\frac{1}{2}$

*► 0.0024

Question No: 9 (Marks: 1) - Please choose one

A rule that assigns a numerical value to each outcome in a sample space is called

► One to one function

► Conditional probability

* ► Random variable

Question No: 10 (Marks: 1) - Please choose one

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

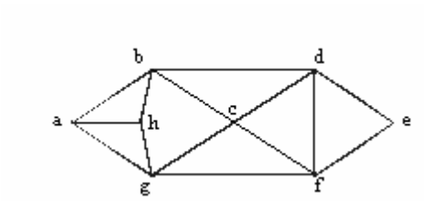
► Simple walk

► Circuit

*► Closed walk

Question No: 11 (Marks: 1) - Please choose one

The Hamiltonian circuit for the following graph is



► abcdefgh

► abefgha

*► abcdefgha

Question No: 12 (Marks: 1) - Please choose one

Distributive law of union over intersection for three sets

► A È (B È C) = (A È B) È C

► A Ç (B Ç C) = (A Ç B) Ç C

*► A È (B Ç C) = (A È B) Ç (A È B)

► None of these

Question No: 13 (Marks: 1) - Please choose one

The indirect proof of a statement pàq involves

► Considering ~q and then try to reach ~p

► Considering p and ~q and try to reach contradiction

*► Both 2 and 3 above

► Considering p and then try to reach q

Question No: 14 (Marks: 1) - Please choose one

The square root of every prime number is irrational

► True

*► False

► Depends on the prime number given

Question No: 15 (Marks: 1) - Please choose one

If a and b are any positive integers with b≠0 and q and r are non negative integers such that a= b.q+r then

*► gcd(a,b)=gcd(b,r)

► gcd(a,r)=gcd(b,r)

► gcd(a,q)=gcd(q,r)

Question No: 16 (Marks: 1) - Please choose one

The greatest common divisor of 27 and 72 is

► 27

► 9

*► 1

► None of these

Question No: 17 (Marks: 1) - Please choose one

In how many ways can a set of five letters be selected from the English Alphabets?

*► C(26,5)

► C(5,26)

► C(12,3)

► None of these

Question No: 18 (Marks: 1) - Please choose one

A vertex of degree greater than 1 in a tree is called a

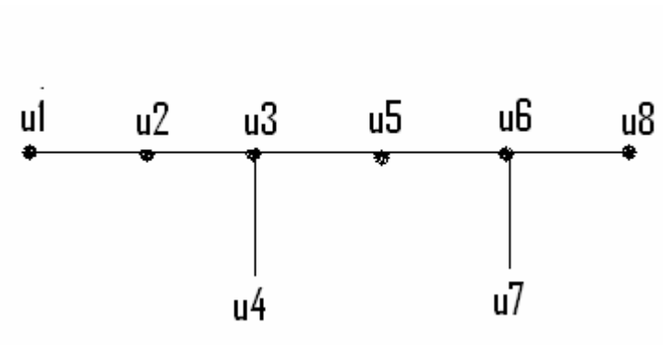
► Branch vertex

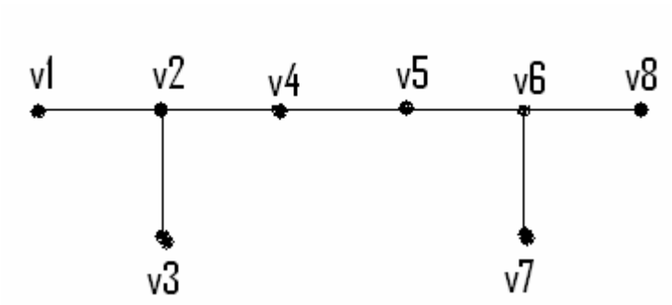
*► Terminal vertex

► Ancestor

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

For the given pair of graphs whether it is





► Isomorphic

*► Not isomorphic

Question No: 20 (Marks: 1) - Please choose one

The value of (-2)! Is

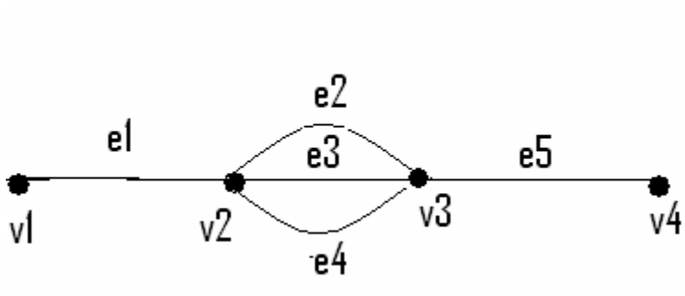
► 0

► 1

* ► Cannot be determined

Question No: 21 (Marks: 1) - Please choose one

In the following graph



How many simple paths are there from v_1 to v_4

► 2

*► 3

► 4

Question No: 22 (Marks: 1) - Please choose one

The value of $\frac{(n+1)!}{(n-1)!}$ is

► 0

*► n(n-1)

► n^2+n

► Cannot be determined

Question No: 23 (Marks: 1) - Please choose one

If A and B are finite (overlapping) sets, then which of the following **must be** true

► n(AÈB) = n(A) + n(B)

* ► n(AÈB) = n(A) + n(B) - n(AÇB)

► n(AÈB)= ø

► None of these

Question No: 24 (Marks: 1) - Please choose one

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

► May or may not contain same number of edges

Question No: 25 (Marks: 1) - Please choose one

When 3^k is even, then $3^k+3^k+3^k$ is an odd.

► True

*► False

Question No: 26 (Marks: 1) - Please choose one

Quotient –Remainder Theorem states that for any positive integer d, there exist unique integer q and r such that n=d.q+ r and _____.

* ► $0 \le r < d$

► $0<r<d$

► $0 \le d < r$

► None of these

Question No: 27 (Marks: 1) - Please choose one

The value of $\lceil x \rceil$ for x = -3.01 is

*► -3.01
► -3
► -2
► -1.99

Question No: 28 (Marks: 1) - Please choose one

If p= A Pentium 4 computer,

q= attached with ups.

Then "no Pentium 4 computer is attached with ups" is denoted by

► ~ (pÙq)

► ~ pÚq

► ~ pÙq

*► None of these

Question No: 29 (Marks: 1) - Please choose one

An integer n is prime if and only if n > 1 and for all positive integers r and s, if n = r·s, then

► r = 1 or s = 2.

► r = 1 or s = 0.

► r = 2 or s = 3.

► None of these

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

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

*► Independent
► Dependent
► Exhaustive

Question No: 31 (Marks: 2)

Let A and B be the events. Rewrite the following event using set notation
"Only A occurs"

Question No: 32 (Marks: 2)

Suppose that a connected planar simple graph has 15 edges. If a plane drawing of this graph has 7 faces, how many vertices does this graph have?

Answer:

Given,
Edges = v =15
Faces = f = 7
Vertices = v =?
According toEuler Formula, we know that,

f= e – v +2

Putting values, we get

7 = 15 – v + 2

7 = 17 – v

Simplifying

v =1 7-7 =10

Question No: 33 (Marks: 2)

How many ordered selections of two elements can be made from the set {0,1,2,3}?

Answer

The order selection of two elements from 4 is as

P(4,2) = 4!/(4-2)!

= (4.3.2.1)/2!

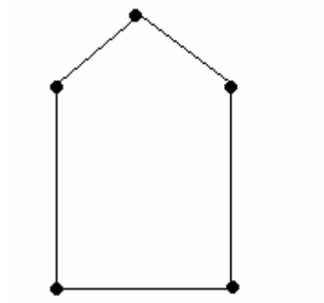
= 12

Question No: 34 (Marks: 3)

Consider the following events for a family with children:
A={children of both sexes}, B={at most one boy}.Show that A and B are dependent events if a family has only two children.

Question No: 35 (Marks: 3)

Determine the chromatic number of the given graph by inspection.



Question No: 36 (Marks: 3)

A cafeteria offers a choice of two soups, five sandwiches, three desserts and three drinks. How many different lunches, each consisting of a soup, a sandwiche, a dessert and a drink are possible?

Question No: 37 (Marks: 5)

A box contains 15 items,4 of which are defective and 11 are good. Two items are selected. What is probability that the first is good and the second defective?

Answer

Question No: 38 (Marks: 5)

Draw a binary tree with height 3 and having seven terminal vertices.

Question No: 39 (Marks: 5)

Find n if

P(n,2) = 72

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