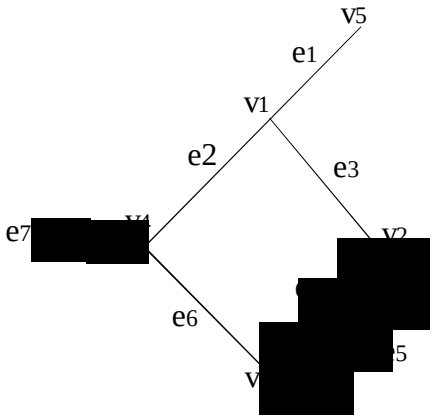
c) Find adjacency and incidence matrix of following graph. 4



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First Year B.C.A (Semester - II) Examination
Paper - 15BCA110
Discrete Mathematical Structure

Time : Three hours] [Full Marks - 60

N.B. :
- *i) Due Credit will be given to neatness and adequate dimensions.*
- *ii) Assume Suitable data wherever necessary.*
- *iii) Illustrate your answer if necessary, with the help of neat sketches.*
- *iv) Use Blue / Black ink only for writing the answers.*

Q.1 Choose correct alternatives. 5

1) A = {x |x is an even number, 6 < x < 14} belongs to ____ method.
   - i) Roaster
   - ii) Set Builder
   - iii) Statement
   - iv) Tabular

2) Range of relation is set of all _____ of ordered pair in R.
   - i) Second Entries
   - ii) First Entries
   - iii) Third Entries
   - iv) None of these

3) OGx = $a_0 + a_1x + a_2x^2 + a_3x^3 +$ _____ This formula belongs to ____
   - i) Exponential Generating Function
   - ii) Both i and iii
   - iii) Ordinary Generating Function
   - iv) None of the above

4) A____ solution is nothing but the solution which satisfies the difference equation with f(r) on the right hand side.
   i) Homogenous ii) Total
   iii) Particular iv) None of the above
5) A graph in which degree of every vertex is equal or same, the graph is called as ____ graph.
   i) Complete ii) Regular
   iii) Bipartite iv) Finite

Q.2 a) Prove that $|A \cup B| = [A] + [B] - |A \cap B|$ and explain operation on sets. 7
b) Find the no. of integers in between 1 to 350 that is not divisible by 2, 3 or 5. 4

OR

Q.3 a) Explain pigeon hole principle and also explain permutation and combination. 6
b) Suppose there is bag of 10 balls out of which there are 6 red balls and 4 black balls. What will be the combination of balls selected ? When we select 3 red balls and 2 black balls. 3
c) How many ways the letters of the word "DISCRETE" can be arranged ? 2

Q.4 a) Explain types of relation in detail. 6
b) Explain types of function in detail. 5

OR

Q.5 a) Explain composition and inverse of function. 5
b) Explain operation on relation. 6

Q.6 a) Find ordinary and Exponential generating function for <1,-1,1,-1,.....> 6

b) Define Probability generating functions & determine the sequence of e^{2x} (EGx) 5

OR

Q.7 a) Find Ferrer's diagram and its conjugate of. 2
i) 9+3+5+2 ii) 8+7+4+3+2+1
b) Find the sequence for $(3+x)^3$ with ordinary and exponential generating function. 6
c) Find the coefficient of x16 in the sereies $(x^2+x^3+x^4+x^5+ .....)^5$. 3

Q.8 a) Find the homogenous solution of recurrence relation $ar + 11a_{r-1} + 30a_{r-2} = 0$ with initial roots $a_0 = 1$ and $a_1 = 2$. 6
b) Find the particular solution of $ar + 4a_{r-1} + 3a_{r-2} = 4r$ 5

OR

Q.9 a) Explain lattice and its properties. 4
b) Find total solution of $ar = 7a_{r-1} - 10a_{r-2} + 8$. 7

Q.10 a) Prove that tree with n-vertices has n-1 edges. Explain types of graph. 7
b) Explain adjacency and incidence matrix. 4

OR

Q.11 a) Define graph, degree of vertex and adjacent nodes. 3
b) Explain rooted tree and binary tree with example. 4