

**B.C.A. (2010 COURSE SEM- III : SUMMER - 2018**  
**SUBJECT: MATHEMATICS – III (GRAPH THEORY)**

Day : **Tuesday**  
 Date : **08/05/2018**

**S-2018-1732**

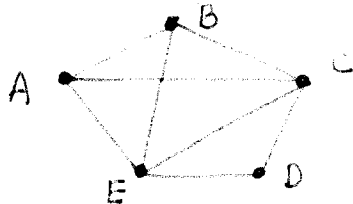
Time **02.00 PM TO 05.00 PM**  
 Max. Marks : 70

**N.B.:**

- 1) Q. No. 1 is **COMPULSORY**.
- 2) Attempt any **FOUR** questions from **Q. No. 2 to Q. No. 7**.
- 3) Figures to the right indicate **FULL** marks.
- 3) Use of non programmable **CALCULATOR** is allowed.

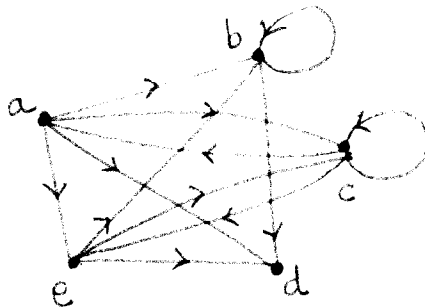
**Q.1** Explain the following: (14)  
 i) Depth first search Algorithm  
 ii) Breadth first search Algorithm

**Q.2** a) Find an Euler circuit, if it exists. (07)



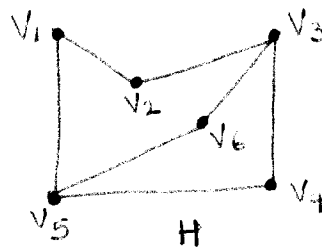
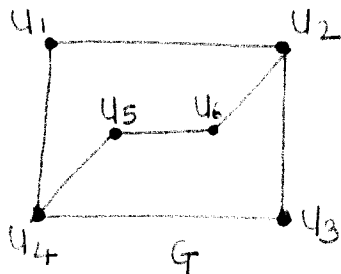
b) Explain the concept of an Eulerian circuit and Planer graphs. (07)

**Q.3** a) Represent the directed graph using Incidence matrix. (07)



b) Draw two 3- regular graphs with nine vertices. (07)

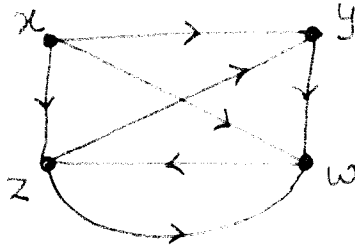
**Q.4** a) Determine whether the graphs G and H are isomorphic. (07)



b) Explain various applications of trees. (07)

**P. T. O.**

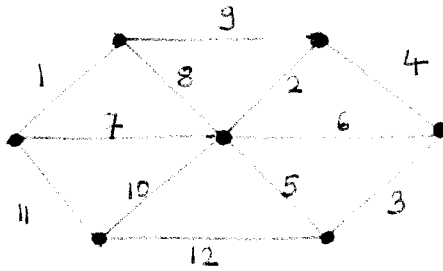
**Q.5 a)** Consider the directed graph G. **(07)**



Find the indegree and outdegree of each vertex of G.

**b)** Explain Kruskal's Algorithm in detail. **(07)**

**Q.6 a)** Find a minimal spanning tree T for the weighted graph G. **(07)**



**b)** Discuss Prim's Algorithm with appropriate examples. **(07)**

**Q.7** Write short notes on any **TWO** of the following: **(14)**

- a) Trees as Models
- b) Haffman's Algorithm
- c) Edge connectivity

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