

Day : **Thursday**  
Date : **16/11/2017**

**W-2017-1675**

Time : **02.00 PM TO 05.00 PM**  
Max. Marks : 100

**N.B.:**

- 1) Attempt **ANY FOUR** questions from Section – I and **ANY TWO** questions from Section – II.
- 2) Answers to both the sections should be written in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.

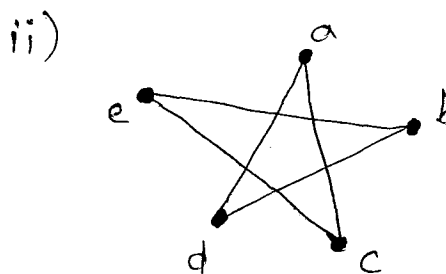
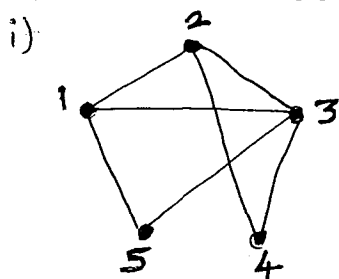
**SECTION – I**

- Q.1** a) Explain pigeonhole principle with two examples [07]  
b) Find the probability of getting 2 king cards and 1 ace card when three cards are drawn from a well shuffled pack of 52 playing cards [08]

- Q.2** a) Find  $E(X)$  and  $Var(X)$  from the following probability distribution : [07]

$x_i$	1	2	3	4	5	6
$p(x_i)$	$\frac{1}{36}$	$\frac{9}{36}$	$\frac{13}{36}$	$\frac{6}{36}$	$\frac{5}{36}$	$\frac{2}{36}$

- b) Represent the following graphs by using adjacency matrix. [08]



- Q 3** a) There are 5 girls and 4 boys who wish to take a photograph. In how many ways can they sit for a photograph in such a way that [07]  
i) all girls always sit together?  
ii) three boys are always together?

- b) Explain sheep cabbage problem in detail. [08]

- Q.4** a) Find the values of : [07]  
i)  ${}^8C_4$     ii)  ${}^9C_3$     iii)  ${}^5P_4$     iv)  ${}^4P_0$ .

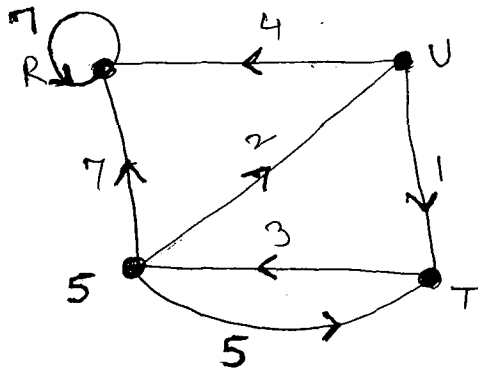
- b) Explain depth first search algorithm. [08]

- Q 5** Write short notes on **ANY THREE** of the following: [15]  
a) Cumulative probability distribution function  
b) Colouring of graphs  
c) Complete and planer graphs  
d) Bridges of Konigsberg problem

P.T.O.

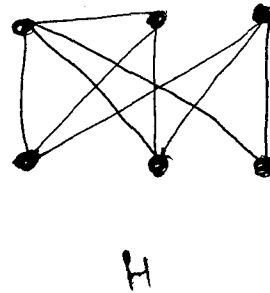
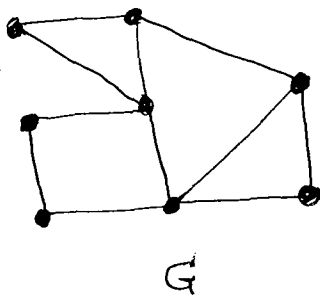
**SECTION – II**

**Q.6** Explain Warshall's algorithm. From the given graph, find the shortest path from each vertex to each other vertex by using Warshall's algorithm. [20]



**Q.7 a)** Find n if: [10]  
 i)  $P(n, 4) = 42 P(n, 2)$ .  
 ii)  $C(n, 12) = C(n, 8)$ .

**b)** Which of the following G and H graphs have: [10]  
 i) Eulerian path?  
 ii) Hamilton circuit?



**Q.8 a)** Find  $E(X)$ ,  $\text{Var}(X)$  and standard deviation from the following distribution: [10]

$x_i$	2	6	8	12	15
$P_i$	0.1	0.4	0.1	0.2	0.2

**b)** State and prove Bayes theorem. [10]

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