PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2018
(Second Semester)

Branch SOFTWARE SYSTEMS
(Five year integrated)

MATHEMATICS-11

lime : Ihree Hours Maximum : 75 Marks

Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 15 ; 75)

1 a Write down the truth table for the following compound statements and state which of them are tautologies ;

(i) (qvr) —»(pwlr) (5)

(ii) (p A(p q)-> q (5)

(iii) **(p** q) **<-*** (Ip vq) (5)

OR

b If Hi, H_2, ..TI_n and P => Q. then prove that H_f, H_2,...H_n imply P -> *Q*. . (5)

c Show the following equivalences : (10)

(i) P -> (Q v R) o (P -> Q) v (P -r R)

(ii) (P -> Q) A (R -> Q) co (P v R) -> Q

2 a Obtain the disjunctive normal form and conjunctive normal form of the formula](PvQ)o (P A Q). (10)

b Show that SvR is tautologically implied by (P v Q) A (P —> R) A (Q —» S). (5)

OR

c Show that the following premises are inconsistent. (15)

i) If Jack misses many classes through illness, then he fails high school.
ii) If Jack fails high school, then he is uneducated.
iii) If Jack reads a lot of books, then he is not uneducated.
iv) Jack misses many classes through illness and reads a lot of books.

3 a Find the initial basic feasible solution to the following TP using North-West Corner rule : (5).

3	7	6	4	5
2	4	3	2	2 Availability
4	3	8	5	3 -
3	3	z.J	2	

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b Solve the following assignment problem :

	A	B	C	D
1	15	13	14	17
II	11	12	15	13
III	13	12	10	11
IV	15	17	14	16

OR

c Use least cost method to find the initial basic feasible solution to the following : (5)

1	2	6	7 ■
- 0	4	2	12 Availability

3 Com...

3 d Solve the following assignment problem so as to obtain a maximum profit : (10)

	A	B	C	D	E
1	62	■ 78	50	101	82
I	7i	84	61	73	.59
3	87	92	111	71	81
4	48	64	87	77	80

4 a Explain three utilities problem with its graph. (5)

b Explain the Konigsberg Bridge problem. (5)

c Prove that a given connected graph G is an Euler graph if and only if all vertices of G are even degree. (5)

OR

d Define the terms . (8)
(i) Simple graph (it) Subgraph (iii) Disconnected graph
(iv) Euler graph

e Prove that a graph G is disconnected if and only if its vertex set V can be partitioned into two non empty disjoint subsets V) and V_2 such that there exists no edge in G whose one vertex is in subset V_t and the other in subset V_2. • (7)

5 a Prove that in any tree, there are at least two pendent vertices. (5)

b Define Rank and nullity of a graph. (5)

c Prove that a graph is a tree if and only if it is a minimally connected graph. . / (5)

OR

d Prove that in a tree I. there is only one path between every pair of vertices. (7)

e Define the terms • (8)
(i) Rooted trees (ii) Binary trees (in) Spanning tree
(iv) Internal vertex

z-z-z

END