

**PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)  
BBA DEGREE EXAMINATION MAY 2018  
(Third Semester)**

Common to Branches – **BUSINESS ADMINISTRATION /  
BUSINESS ADMINISTRATION (INFORMATION SYSTEM) /  
BUSINESS ADMINISTRATION (RETAIL MANAGEMENT)**

**APPLIED OPERATIONS RESEARCH**

Time : Three Hours

Maximum : 75 Marks

**SECTION-A (20 Marks)**

Answer ALL questions

ALL questions carry EQUAL marks (10 x 2 = 20)

- 1 State any two limitations of O.R.
- 2 What is LPP?
- 3 Define Basic feasible solution.
- 4 What is an assignment problem?
- 5 What are the elements that characteristic a sequencing problem?
- 6 What is 'no passing rule' in a sequencing problem?
- 7 Find the saddle point of the pay-off matrix.

$$\begin{pmatrix} -7 & -4 \\ 7 & -3 \\ 8 & -2 \end{pmatrix}$$

- 8 What is service channel?
- 9 Define Critical path.
- 10 What is Burst event?

**SECTION - B (25 Marks)**

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 5 = 25)

- 11 a State the various scope of O.R in Management.  
OR
- b A Company makes three products X,Y and Z which pass through three departments, Drill, Lathe and Assembly. The hours available in each department, hours required by each product in each department and profit combination of each product are given below:

Product	Time required in hours			Profit/Unit (Rs.)
	Drill	Lathe	Assembly	
X	3	3	8	9
Y	6	5	10	15
Z	7	4	12	20
Hours available	210	240	260	

Formulate the above as an L.P.P.

- 12 a Find the initial basic feasible solution to the following transportation problem using North-West corner rule.

	E	F	G	H	Availability
A	4	8	10	16	100
B	7	2	3	1	200.
C	5	9	11	2	300
Demand	160	240	105	95	

- 13 a Explain the method of Processing 'm' jobs on 3 machines A,B and C in the order ABC.

OR

- b Explain the principal assumptions made while dealing with sequencing problem.
- 14 a Explain Pure and Mixed Strategy.

OR

- b Solve the following game and determine the value of the game.

B

$$A \begin{bmatrix} 1 & 3 \\ 4 & 2 \end{bmatrix}$$

- 15 a Explain the basic steps involved in PERT/CPM techniques.

OR

- b State the various rules for drawing network diagram.

**SECTION - C (30 Marks)**Answer any **THREE** Questions**ALL** Questions Carry **EQUAL** Marks (3 x 10 = 30)

- 16 Use graphical method to solve

$$\text{Min } z = 4x + 5y$$

Subject to constraints

$$x + y \geq 10$$

$$2x + 5y \geq 35$$

$$x, y \geq 0$$

- 17 Solve the following minimal assignment problem by Hurgarian method.

		Worker			
		A	B	C	D
Job	1	41	72	39	52
	2	22	29	49	65
	3	27	39	60	51
	4	45	50	48	52

- 18 A book binder has one printing press; one blinding machine and the manuscripts of a number of different books. The time required to perform the printing and binding operations for each book are shown below. Determine the order in which books should be processed in order to minimize the total time required to turn out all the books.

Book	1	2	3	4	5	6
Printing Time (Hrs)	30	120	50	20	90	110
Binding Time(Hrs)	80	100	90	60	30	10

- 19 In a railway marshalling yard, goods train arrive at a rate of 30 trains per day. Assuming that the inter-arrival time follows an exponential distribution and the service time distribution is also exponential with an average of 36 minutes. Calculate the following:

(i) the mean queue size(line length)

(ii) the probability that the queue size exceeds 10.

- 20 A Project has the following time schedule:

Activity	1-2	1-3	1-4	2-5	3-6	3-7	4-6	5-8	6-9	7-8	8-9
Time in Hours	2	2	1	4	8	5	3	1	5	4	3

Construct PERT network and compute