**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**BBA DEGREE EXAMINATION DECEMBER 2024**
(Fourth Semester)

**Common to Branches – BUSINESS ADMINISTRATION/ BUSINESS ADMINISTRATION (IS)/ BUSINESS ADMINISTRATION (RM)**

# FINANCIAL MANAGEMENT

Time: Three Hours | Maximum: 50 Marks

## SECTION-A (5 Marks)

Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (5 x 1 = 5)

1 _____ is concerned with the acquisition, financing, and management of assets with some overall goal in mind.
(i) Financial management (ii) Profit maximization
(iii) Agency theory (iv) Social responsibility

2 _____ of debt capital is a factor in favor of using more debt capital.
(i) Debt equity norms (ii) Security of assets
(iii) Tax advantage (iv) Leverage effect

3 Financial leverage refers to the rate of change in earnings per share for a given change in earnings_____
(i) Before tax (ii) Before interest
(iii) Before interest and tax (iv) After interest and tax

4 The most important and common form of dividend is_____
(i) Stock dividend (ii) Cash dividend
(iii) Bond dividend (iv) Scrip's dividend

5 _____ refers to the funds, which an organization must possess to finance its day to day operations.
(i) Fixed capital (ii) Working capital
(iii) Retained earnings (iv) Net working capital

## SECTION - B (15 Marks)

Answer **ALL** Questions
**ALL** Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a What are the objectives of Financial management?

OR

b Mr. Harish deposits Rs.10,000 for 3 years at 10 %. What is the compound value of his deposit?

7 a The market price of an equity share of Mugesh Ltd is Rs.80. The dividend expected a year hence is Rs.1.60 per share. The shareholders anticipate a growth of 7% in dividends. Calculate the cost of equity capital.

OR

b A projects costs Rs.1,00,000 and yields an annual cash inflow of Rs. 20,000 for 7 years. Calculate Payback period.

8 a Calculate financial leverage from the following particulars:
Units sold- Rs.5,000, Selling price per unit Rs.30,Variable cost per unit Rs. 20, EBIT Rs. 30,000, 10% public debt Rs. 1,00,000.

OR

b Discover the arbitrage process under MM approach.

**Cont...**

**Cont...**

9 a Explain the different forms of dividend.

OR

b The following data relate to Jasmine Ltd. Earnings per share Rs.4. Retention ratio 25 %, Capitalization rate 15 %, Rate of return 20 %. Determine the market price per share under Gordon's model.

10 a From the following estimates, calculate the average amount of working capital required.

| | **Per annum Rs.** |
|---|---|
| 1. Average amount locked up in stock: | |
| Stock of finished goods and W.I.P | 10,000 |
| Stock of stores, material etc | 8,000 |
| 2. Average credit given: | |
| Local sales 2 weeks credit | 1,04,000 |
| Outside the state 6 weeks credit | 3,12,000 |
| 3. Time available for payments: | |
| For purchases 4 weeks | 78,000 |
| For wages 2 weeks | 2,60,000 |
| Add 10 % contingencies. | |

OR

b Classify the various types of Inventories.

## SECTION -C (30 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 x 6 = 30)

11 a State the functions of financial management.

OR

b Mr. Srikanth deposits Rs.7,000 at the beginning of every year for 5 years. The rate of interest is 8 % per annum. Determine the maturity value at the end of the period.

12 a A company issues 10 % debentures at par for a total value of Rs. 10,00,000. The debentures are redeemable after 10 years at a premium of 10 %. If the tax rate is 40 %, compute the cost of debentures to the company (a) Before tax and (b) After tax

OR

b Initial outlay Rs.50,000
Life of an asset 5 years
Estimated cash flow Rs.12,500
Calculate Internal rate of return.

13 a The following projections have been given respect of company X and Y.

| **Particulars** | **Company X** | **Company Y** |
|---|---|---|
| Volume of output and sales | 80,000 units | 1.00,000 units |
| Variable cost per unit | Rs.4 | Rs.3 |
| Fixed cost | Rs.2,40,000 | Rs.2,50,000 |
| Interest burden on debt | Rs.1,20,000 | Rs.50,000 |
| Selling price per unit | Rs.10 | Rs.8 |

On the basis of above information calculate:

a) Operating leverage
b) Financial leverage
c) Combined leverage

**Cont...**

OR

b Examine the capital structure theories with assumptions.

14 a The following information relates to Vignesh Ltd.

Earnings per share = Rs.9
Internal rate of return = 18 %
Cost of capital = 12 %
Pay-out ratio = 33.33 %

Compute the market price under the Walter's model.

OR

b Normal Ltd. gives you the following information:

Earnings per share (EPS) = Rs.12
Cost of capital = 10 %
Return on investment = 10 %

Find out the market price per share using Gordon's model, if the payout is
a) 25 % b) 50 % c) 75 %

15 a Star Ltd. is engaged in customer retailing. You are required to forecast their working capital requirements from the following information.

Projected annual sales Rs. 6,50,000
% of N.P to cost of sales 25 %
Average credit allowed to debtors 10 weeks
Average credit allowed by creditors 4 weeks
Average stock carrying (in terms of sales requirement) 8 weeks
Add 20 % to allow for contingencies

OR

b Enumerate the various factors influencing the size of receivables.

Z-Z-Z END

TOTAL PAGES : 4

**23MSU207 / 23ISU208 / 23RMU207**

23BLU207R

**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**BBA DEGREE EXAMINATION DECEMBER 2024**
(Second Semester)

Branch – **BUSINESS ADMINISTRATION/ BUSINESS ADMINISTRATION (IS)/ BUSINESS ADMINISTRATION (RM)**

# APPLIED OPERATIONS RESEARCH

Time: Three Hours Maximum: 75 Marks

## SECTION-A (10 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** marks (10 × 1 = 10)

| Module No. | Question No. | Question | K Level | CO |
|---|---|---|---|---|
| 1 | 1 | What is the origin of Operation Research (O.R.)?<br>a. 18th-century military strategies<br>b. Industrial revolution<br>c. World War II military operations<br>d. Ancient Greek mathematicians | K1 | CO1 |
| | 2 | Which property ensures that the optimal solution of a linear programming problem lies at one of the extreme points of the feasible region?<br>a. Convexity<br>b. Linearity<br>c. Duality<br>d. Unboundedness | K2 | CO1 |
| 2 | 3 | What does the assignment problem involve?<br>a. Allocating resources to maximize efficiency<br>b. Scheduling tasks to minimize time<br>c. Matching workers to jobs to minimize cost or maximize profit<br>d. Optimizing transportation routes in a network | K1 | CO1 |
| | 4 | Which method involves starting with the cell with the highest supply-demand ratio and iteratively allocating units until all supplies and demands are met?<br>a. North-West Corner Rule (NWCR)<br>b. Least-Cost Method<br>c. Vogel's Approximation Method (VAM)<br>d. Stepping-Stone Method | K2 | CO1 |
| 3 | 5 | In game theory, what term describes games where the gain of one player equals the loss of the other?<br>a. Cooperative games<br>b. Zero-sum games<br>c. Non-zero-sum games<br>d. Perfect information games | K1 | CO1 |
| | 6 | What term refers to the model where customers arrive at a service point according to a Poisson process and are served according to an exponential service time distribution with a single server and an infinite waiting area?<br>a. M/M/1<br>b. M/D/1<br>c. M/G/1<br>d. M/M/∞ | K2 | CO1 |
| 4 | 7 | What is the primary goal of sequencing in manufacturing processes?<br>a. Maximizing downtime.<br>b. Minimizing costs.<br>c. Increasing complexity.<br>d. Maximizing resource utilization. | K1 | CO1 |

**Cont...**

| | | | | |
|---|---|---|---|---|
| 4 | 8 | In a scenario where the value of money remains constant over time, what kind of replacement policy is suitable?<br>a. Time-based replacement.<br>b. Condition-based replacement.<br>c. Age-based replacement.<br>d. Cost-based replacement. | K2 | CO1 |
| 5 | 9 | What does the critical path represent in a PERT/CPM network?<br>a. The path with the longest duration<br>b. The path with the shortest duration<br>c. The path with the most activities<br>d. The path with the least amount of resources required | K1 | CO1 |
| | 10 | In PERT analysis, what does the variance of an activity's duration represent?<br>a. The likelihood of the activity being completed early<br>b. The likelihood of the activity being completed late<br>c. The uncertainty associated with the activity's duration<br>d. The probability of the activity being skipped | K2 | CO1 |

## SECTION - B (35 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

<table>
<tr><th>Module No.</th><th>Question No.</th><th>Question</th><th>K Level</th><th>CO</th></tr>
<tr><td rowspan="3">1</td><td>11.a.</td><td>Discuss the historical development of Operations Research (O.R.) highlighting its origins and key milestones</td><td rowspan="3">K3</td><td rowspan="3">CO1</td></tr>
<tr><td colspan="2">(OR)</td></tr>
<tr><td>11.b.</td><td>Consider a manufacturing company that produces two types of products, A and B. The company has limited resources for production, including labor hours and raw materials. Each unit of product A requires 2 hours of labor and 3 units of raw material, while each unit of product B requires 3 hours of labor and 2 units of raw material. The company's objective is to maximize its profit. Product A generates a profit of $100 per unit, and product B generates a profit of $80 per unit.<br>a) Formulate the linear programming problem to maximize the company's profit.<br>b) Define the decision variables, objective function, and constraints for the formulated linear programming problem.<br>c) Explain how the formulated problem represents the optimization of the company's production process considering the given constraints and objective.</td></tr>
<tr><td rowspan="3">2</td><td>12.a.</td><td>Describe how a Transportation Problem can be formulated as a Linear Programming (LP) model.</td><td rowspan="3">K4</td><td rowspan="3">CO2</td></tr>
<tr><td colspan="2">(OR)</td></tr>
<tr><td>12.b.</td><td>To find the IBFS using Least Cost Method
<table>
<tr><th rowspan="2">Source</th><th colspan="3">Destination</th><th rowspan="2">Supply</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>1</td><td>2</td><td>7</td><td>4</td><td>5</td></tr>
<tr><td>2</td><td>3</td><td>3</td><td>1</td><td>8</td></tr>
<tr><td>3</td><td>5</td><td>4</td><td>7</td><td>7</td></tr>
<tr><td>4</td><td>1</td><td>6</td><td>2</td><td>14</td></tr>
<tr><td>Demand</td><td>7</td><td>9</td><td>18</td><td>34</td></tr>
</table></td></tr>
</table>

| | | | | |
|---|---|---|---|---|
| 3 | 13.a. | Using dominance property, obtain the optimum strategies for both the players and determine the value of the game.<br>Player B<br>Player A<br>I II III IV V<br>I 2 4 8 3 4<br>II 5 6 7 3 8<br>III 6 7 8 9 7<br>IV 4 2 4 8 3 | K3 | CO4 |
| | | (OR) | | |
| | 13.b. | A bank has a single teller (server) who processes customer transactions. Customers arrive at the bank following a Poisson distribution with an average arrival rate of 10 customers per hour. The teller processes transactions exponentially with an average service time of 6 minutes per customer.<br><br>Assuming an M/M/1 queuing model (Poisson arrivals, exponential service, single server, infinite queue, FIFO service), calculate the following:<br>• Average number of customers in the queue (Lq).<br>• Average waiting time in the queue (Wq).<br>• Server utilization (ρ) | | |
| 4 | 14.a. | Explain how each of these terms contributes to understanding and solving sequencing problems. | K3 | CO3 |
| | | (OR) | | |
| | 14.b. | The data collected in running a machine, the cost of which is Rs. 60,000 are given below<br>Year \| 1 \| 2 \| 3 \| 4 \| 5<br>Resale Value \| 42000 \| 30000 \| 20400 \| 14400 \| 9650<br>Cost of Spares \| 4000 \| 4270 \| 4880 \| 5700 \| 6800<br>Cost of Labour \| 14000 \| 16000 \| 18000 \| 21000 \| 25000<br>Determine the optimum period for the replacement of the machine. | | |
| 5 | 15.a. | How to Conduct a Program Evaluation and Review Technique | K2 | CO5 |
| | | (OR) | | |
| | 15.b. | Draw the network diagram and determine the critical path for the following project:<br>Activity \| 1-2 \| 1-3 \| 1-4 \| 2-5 \| 3-6 \| 3-7 \| 4-7 \| 5-8 \| 6-8 \| 7-9 \| 8-9<br>Time estimate (Weeks) \| 5 \| 6 \| 3 \| 5 \| 7 \| 10 \| 4 \| 2 \| 5 \| 6 \| 4 | | |

## SECTION -C (30 Marks)

Answer **ANY THREE** questions

**ALL** questions carry **EQUAL** Marks (3 × 10 = 30)

<table>
<tr><th>Module No.</th><th>Question No.</th><th>Question</th><th>K Level</th><th>CO</th></tr>
<tr><td>1</td><td>16</td><td>Solve the given linear programming problems graphically:<br>Minimize: Z = 20x + 10y<br>Constraints are,<br>$x + 2y \leq 40$<br>$3x + y \geq 30$<br>$4x + 3y \geq 60$<br>$x \geq 0, y \geq 0$</td><td>K3</td><td>CO1</td></tr>
<tr><td>2</td><td>17</td><td>Solve the following assignment problem shown in Table using Hungarian method. The matrix entries are processing time of each man in hours.<br><table><tr><th></th><th>I</th><th>II</th><th>III</th><th>IV</th><th>V</th></tr><tr><td>1</td><td>20</td><td>15</td><td>18</td><td>20</td><td>25</td></tr><tr><td>2</td><td>18</td><td>20</td><td>12</td><td>14</td><td>15</td></tr><tr><td>3</td><td>21</td><td>23</td><td>25</td><td>27</td><td>25</td></tr><tr><td>4</td><td>17</td><td>18</td><td>21</td><td>23</td><td>20</td></tr><tr><td>5</td><td>18</td><td>18</td><td>16</td><td>19</td><td>20</td></tr></table></td><td>K4</td><td>CO2</td></tr>
<tr><td>3</td><td>18</td><td>Solve by graphical method<br><table><tr><th></th><th>B1</th><th>B2</th></tr><tr><td>A1</td><td>1</td><td>2</td></tr><tr><td>A2</td><td>5</td><td>4</td></tr><tr><td>A3</td><td>-7</td><td>9</td></tr><tr><td>A4</td><td>-4</td><td>-3</td></tr><tr><td>A5</td><td>2</td><td>1</td></tr></table></td><td>K3</td><td>CO4</td></tr>
<tr><td>4</td><td>19</td><td>The following failures have been observed for a certain type of transistors in a digital computer:<br><table><tr><td>End of Week</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>Probability of failure to date</td><td>0.05</td><td>.13</td><td>.25</td><td>.43</td><td>.68</td><td>.88</td><td>.96</td><td>1</td></tr></table>Total number of transistors at the beginning of assembly is 1000 units. The cost of replacing the individual failed transistors is Rs. 1.25/-. The decision is made to replace all these transistors simultaneously at fixed intervals and to replace the individual transistors as they fails in service. If the cost of group replacement is 30 paisa per transistors, what is the best interval between group replacement?</td><td>K3</td><td>CO3</td></tr>
<tr><td>5</td><td>20</td><td>Find out the time, variance and standard deviation of the project with the following time estimates in weeks:<br><table><tr><td>Activity</td><td>1-2</td><td>1-6</td><td>2-3</td><td>2-4</td><td>3-5</td><td>4-5</td><td>6-7</td><td>5-8</td><td>7-8</td></tr><tr><td>Optimistic time estimate (to)</td><td>3</td><td>2</td><td>6</td><td>4</td><td>8</td><td>3</td><td>3</td><td>2</td><td>8</td></tr><tr><td>Most likely time estimate (tm)</td><td>6</td><td>5</td><td>12</td><td>5</td><td>11</td><td>7</td><td>9</td><td>4</td><td>16</td></tr><tr><td>Pessimistic time estimate (tp)</td><td>9</td><td>8</td><td>18</td><td>6</td><td>14</td><td>11</td><td>15</td><td>6</td><td>18</td></tr></table></td><td>K2</td><td>CO5</td></tr>
</table>

Z-Z-Z END

**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**BBA DEGREE EXAMINATION DECEMBER 2024**
(Second Semester)

Branch – **BUSINESS ADMINISTRATION/ BUSINESS ADMINISTRATION (IS)**
**BUSINESS ADMINISTRATION (RM)**

**APPLIED OPERATIONS RESEARCH**

Time: Three Hours Maximum: 50 Marks

**SECTION-A (5 Marks)**
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (5 x 1 = 5)

1 If there is no non-negative replacement ratio in the current solution which is to be improved, then the solution is
(i) Feasible (ii) Infeasible
(iii) Unbounded (iv) Degenerate

2 If we were to use opportunity cost value for non-basic cell to test optimality, it should be
(i) Negative Number (ii) Positive Number
(iii) Equal to zero (iv) Both (i) & (ii)

3 In general, sequencing problem will be solved by using
(i) Hungarian method (ii) Simplex method
(iii) Johnson & Bellman method (iv) Flood's technique

4 When the sum of one player is equal to the sum of losses to another player in a game, this situation is known as
(i) Fair game (ii) Zero sum game
(iii) Biased game (iv) None of the above

5 The activity which can be delayed without affecting the execution of the immediate succeeding activity is determined by
(i) Total float (ii) Free float
(iii) Independent float (iv) Interfering float

**SECTION - B (15 Marks)**
Answer **ALL** Questions
**ALL** Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Explain the scopes of OR.

OR

b Write the standard and canonical form of LPP.

7 a Determine the starting solution in the following transportation problem by using North West Corner Method.

| | D1 | D2 | D3 | D4 | Supply |
|---|---|---|---|---|---|
| S1 | 3 | 7 | 6 | 4 | 5 |
| S2 | 2 | 4 | 3 | 2 | 2 |
| S3 | 4 | 3 | 8 | 5 | 3 |
| Demand | 3 | 3 | 2 | 2 | |

OR

**Cont...**

b Consider the following transportation problem:

| origin | | | | | Availability |
|---|---|---|---|---|---|
| | D1 | D2 | D3 | D4 | |
| O1 | 5 | 8 | 3 | 6 | 30 |
| O2 | 4 | 5 | 7 | 4 | 50 |
| O3 | 6 | 2 | 4 | 6 | 20 |
| Demand | 30 | 40 | 20 | 10 | 100 |

Determine an initial basic feasible solution using Vogel's Approximation method.

8 a A book binder has one printing press, one binding machine, and the manuscripts of a number of different books. The time required to perform the printing and binding operations for each book is 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 | 100 |
| Binding Time (Hrs.) | 80 | 100 | 90 | 60 | 30 | 10 |

OR

b A machine costs Rs. 9000. Annual operating costs are Rs. 200 for the first year, and then increase by Rs. 2000 every year. Determine the best age at which to replace the machine. If the optimum replacement policy is followed. What will be the average yearly cost of owning and operating the machine?

9 a Explain the Maximin and Minimax principle of game theory.

OR

b The rate of arrival of customers at a public telephone booth follows Poisson distribution, with an average time of 10 minutes between one customer and the next. The duration of a phone call is assumed to follow exponential distribution, with mean time of 3 minutes.

(i) What is the probability that a person arriving at the booth will have to wait?

(ii) What is the average length of the non-empty queues that form from time to time?

10 a Draw the network diagram and indicate all the possible paths for the following:

| Activity | 1-2 | 1-3 | 2-3 | 2-4 | 3-4 | 4-5 |
|---|---|---|---|---|---|---|
| Duration (Days) | 20 | 25 | 10 | 12 | 6 | 10 |

OR

b Distinguish between the PERT and CPM.

## SECTION -C (30 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Solve the following LPP by graphical method

Minimize $Z = 5X_1 + 8X_2$

Subject to the constraints

$X_1 \leq 4, X_2 \geq 2, X_1 + X_2 = 5$

And $X_1, X_2 \geq 0$

OR

b Explain the solving procedure of simplex method.

12 a The distribution system has the following constraints and the transportation cost per unit (in rupees) allocated with each route are given:

| | | To | | | Capacity |
|---|---|---|---|---|---|
| | | I | II | III | |
| From | A | 10 | 7 | 8 | 45 |
| | B | 15 | 12 | 9 | 15 |
| | C | 7 | 8 | 12 | 40 |
| Demand | | 25 | 55 | 20 | |

Find the optimal transportation schedule and the minimum total cost of the transportation.

OR

b Explain the solving procedure of an assignment (Hungarian) method.

13 a Determine the optimal sequence of jobs that minimizes the total elapsed time based on the following information processing time on machines is given in hours and passing is not allowed:

| Job | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| Machine $M_1$ | 3 | 8 | 7 | 4 | 9 | 8 | 7 |
| Machine $M_2$ | 4 | 3 | 2 | 5 | 1 | 4 | 3 |
| Machine $M_3$ | 6 | 7 | 5 | 11 | 5 | 6 | 12 |

OR

b Discuss in brief replacement procedure for the item that deteriorate with time.

14 a Solve the game whose pay – off matrix is given below and also identify the value of the game.

| | B1 | B2 | B3 | B4 | B5 |
|---|---|---|---|---|---|
| A1 | 9 | 3 | 1 | 8 | 0 |
| A2 | 6 | 5 | 4 | 6 | 7 |
| A3 | 2 | 4 | 3 | 3 | 8 |
| A4 | 4 | 6 | 2 | 2 | 1 |

OR

b Elucidate the characteristics of a queuing system.

15 a For the given data draw a network and find the critical path.

| Activity | 1-2 | 2-3 | 2-4 | 3-4 | 3-5 | 3-6 | 4-5 | 5-6 |
|---|---|---|---|---|---|---|---|---|
| Duration (Days) | 5 | 6 | 5 | 0 | 7 | 7 | 6 | 6 |

OR

b A project has the following characteristics and time estimates:

| Activity | Estimated duration (days) | | |
|---|---|---|---|
| | Optimistic time | Most likely time | Pessimistic time |
| 1—2 | 12 | 14 | 21 |
| 1—3 | 7 | 10 | 16 |
| 3—5 | 4 | 6 | 10 |
| 3—4 | 36 | 40 | 60 |
| 4—6 | 12 | 15 | 24 |
| 5—6 | 6 | 8 | 12 |
| 6—7 | 9 | 12 | 18 |
| 6—8 | 6 | 10 | 15 |
| 7—8 | 4 | 5 | 7 |
| 8—9 | 8 | 10 | 14 |

Construct the network diagram and the find the critical path. Determine the project completion time and its variance.

Z-Z-Z END