[This question paper contains 6 printed pages.]

Sr. No. of Question Paper : 6158 **F-5** **Your Roll No.....**

Unique Paper Code : 1091301

Name of the Paper : Operations Research

Name of the Course : **B.M.S.**

Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **five** questions.
3. Attempt all parts of a question together.
4. Show your workings clearly on the answer sheet itself.
5. Use of Simple Calculator is allowed.

1. Air Force is experimenting with 3 types of bombs P, Q and R in which three kinds of explosives i.e. A, B and C are used. After deliberations, it has been decided to use at most 600 kg of explosive A; at least 480 kg of explosive B and exactly 540 kg of explosive C. Bomb P requires 3, 2 and 2 kg of explosives A, B and C respectively. Bomb Q requires 1, 4 and 3 kg of explosives A, B and C respectively. Bomb R requires 6, 2 and 3 kg of explosives A, B and C respectively. Bomb P has an explosion equivalent to 2- tonnes; Bomb Q has an explosion equivalent to 3-tonnes, while Bomb R has an explosion equivalent to 4-tonnes.

   (i) Formulate the above problem as LPP. (3)

   (ii) Solve the above problem to maximize the intensity of explosion. (10)

   (iii) List the binding and non-binding constraints from the optimum solution. (1)

   (iv) State the shadow prices for explosives A and B. (1)

P.T.O.

2. (a) A firm makes two products X and Y and has a total production capacity of 9 tonnes per day, X and Y requiring the same production capacity. The firm has a permanent contract to supply at least 2 tonnes of X and at least 3 tonnes of Y per day to another company. Each tonne of X requires 20 machine hours of production time and each tonne of Y requires 50 machine hours of production time; the daily maximum possible number of machine hours is 360. Assuming that all the firm's output can be sold and the profit made is Rs. 80 per tonne of X and Rs. 120 per tonne of Y, determine the optimum production schedule and calculate the profit using the Graphical method. (8)

(b) Write the dual to the following LPP:

Maximise: $Z = 20x_1 + 15x_2 + 18x_3 + 10x_4$

Subject to:

$$4x_1 - 3x_2 + 10x_3 + 4x_4 \leq 60$$

$$x_1 + x_2 + x_3 = 27$$

$$-x_2 + 4x_3 + 7x_4 \geq 35$$

$x_1, x_2, x_3 \geq 0$ and x_4 is unrestricted in sign. (7)

3. (a) What is an Integer Programming Problem? How does the optimum solution of an IPP differ from that of an LPP? (3)

(b) In a 3x3 transportation problem, let X_{ij} be the amount shipped from source i to destination j and let C_{ij} be the corresponding transportation cost per unit. The amounts of supplies available at sources 1, 2 and 3 are 15, 30 and 85 units respectively and the demands at destinations A, Band C are 20, 30 and 80 units respectively. Assume that the initial north-west corner solution is optimal and the associated values of the multipliers are given as $u_1 = -2$, $u_2=3$, $u_3=5$, $v_1=2$, $v_2=5$ and $v_3=10$.

(i) Find the associated optimal cost for the northwest-corner solution.

(ii) Determine the smallest value of C_{ij} associated with each non-basic variable that will maintain the optimality of such solution. (2,2)

(c) ABC Transport company ships truckloads of a certain product from a factory to three stores. The supply (in truckloads) and the demand (also in truckloads) together with the unit transportation costs per truckload on the different routes are summarized in the following table. The unit transportation costs, C_{ij} are in hundreds of rupees.

	Stores				
Factories	I	II	III	IV	Supply
A	10	2	20	11	15
B	12	7	9	20	25
C	4	14	16	18	10
Demand	5	15	15	15	

Find the optimum transportation schedule between factories and stores. (8)

4. (a) Differentiate between PERT and CPM in project management. (3)

(b) A small project is composed of 12 activities whose time estimates are listed in the table below. Activities are identified by their beginning (i) and ending (j) node numbers.

Activity (i-j)	Estimated Duration (weeks)		
	Optimistic (t_o)	Most likely (t_m)	Pessimistic (t_p)
1-2	1	1.5	5
2-3	1	2	3
2-4	1	3	5
3-5	3	4	5
4-5	2	3	4
4-6	3	5	7
5-7	4	5	6
6-7	6	7	8
7-8	2	4	6
7-9	5	6	7
8-10	1	2	3
9-10	3	5	7

(i) Draw the project network and find the critical path.

(ii) Find the expected duration and variance of the project.

(iii) What is the probability that the project will be completed 2 weeks earlier than the expected time?

The following table gives area under the standard normal curve from 0 to z for given z values:

Z value	1.21	1.31	1.41	1.51	1.61
Area	0.3869	0.4049	0.4207	0.4345	0.4463

(5,4,3)

5. (a) A city corporation has decided to carry out road repairs on four main arteries of the city. The government has agreed to make a special grant of Rs. 50 lakhs towards the cost with a condition that the repairs are done at the lowest cost and quickest time. If the conditions warrant, a supplementary token grant will also be considered favourably. The corporation has floated tenders and five contractors have sent in their bids. In order to expedite work, one road will be awarded to only one contractor.

On the basis of the cost of repair in the table given below, answer the following:

(i) The best way of assigning the repair work to the contractors and the associated cost.

(ii) If it is necessary to seek supplementary grants, what should be the amount sought?

(iii) Which of the five contractors will be unsuccessful in his bid?

Cost of Repairs (Rs. in lakh)

Contractors	R_1	R_2	R_3	R_4
C_1	9	14	19	15
C_2	7	17	20	19
C_3	9	18	21	18
C_4	10	12	18	19
C_5	10	15	21	16

(8)

(b) A retailer purchases cherries every morning at Rs. 50 a case and sells them for Rs. 80 a case. Any case that remains unsold at the end off the day can be disposed of the next day at a salvage value of Rs. 20 per case (thereafter they have no value). Past sales have ranged from 15 to 18 cases per day. The following is the record of sales for the past 120 days.

Cases Sold:	15	16	17	18
Number of days:	12	24	48	36

Find out how many cases should the retailer purchase per day in order to maximize his profit. (7)

6. (a) In a small town, there are only two stores, ABC and XYZ that handle sundry goods. The total number of customers is equally divided between the two, because the price and the quality of goods sold are equal. Both stores have good reputation in the community, and they render equally good customer service. Assume that a gain of customers by ABC is a loss to XYZ and vice versa. Both stores plan to run annual pre-Diwali sales during the first week of October. Sales are advertised through a local newspaper, radio and television. With the aid of an advertising firm, ABC constructed the game matrix given below. (Figures in the matrix represent a gain or loss of customers for the store ABC).

		Strategy of XYZ	
Strategy of ABC	Newspaper	Radio	Television
Newspaper	30	40	-80
Radio	0	15	-20
Television	90	20	50

Determine the optimal strategies and the worth of such strategies for both ABC and XYZ. (8)

P.T.O.

(b) On January 1 (this year), Bakery A had 40 percent of its local market share, while the other two bakeries B and C had 40 percent and 20 percent respectively, of the market share. Based upon a study by a marketing research firm, the following facts were compiled. Bakery A retains 90 percent of its own customers, while gaining 5 percent of B's customers and 10 percent of C's customers. Bakery B retains 85 percent of its own customers, while gaining 5 percent of A's customers and 7 percent of C's customers. Bakery C retains 83 percent of its own customers and gains 5 percent of A's customers and 10 percent of B's customers. What will each firm's share be on January 1 next year? (7)

[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 6159 **F-5** **Your Roll No.....**

Unique Paper Code : 1091302

Name of the Paper : Human Resource Management

Name of the Course : **Bachelor of Management Studies**

Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **All** Questions (Attempt All Questions) (Question 6 carries internal choice)

1. Case : E-recruitment at ABC Airways

As of 2010, ABC Airways told graduates hoping to join its 'Leaders in Business' management training programme that they could apply via email only. When ABC airways received 4,000 applications instead of the usual 10,000, managers were initially concerned that the move might have been a mistake. But it soon emerged that the online process had actually helped filter out many of the applicants that would probably have been rejected anyway. 'We were dealing with high-quality candidates,' says Amit Kumar ABC 's Head of Recruitment. 'We had no trouble filling our places.' The decision to accept only online applications coincided with the launch of ABC's jobs website. All of its vacancies are posted on these pages now, although most are also advertised in the more traditional media. 'The moment people walk through our door they know that they have to use the web,' Amit says. 'So in the graduate market this is the best way to screen out people who are not conversant with web technology.'

(a) When is e-recruitment a better alternative to traditional recruitment? (5)

(b) What can be the advantages and disadvantages of e recruitment for ABC Airways? (5)

P.T.O.

2. Has HRM become a strategic partner in helping an organization gain competitive advantage? Organizations of today face the challenges of a diverse workforce and are increasingly becoming global. What role can HRM play in addressing these challenges? (3+3+3=9)

3. How is Performance Management System different from Performance appraisal? As a manager you have a number of choices to make in evaluating the performance of the employees. Explain the traditional and modem approaches to Performance appraisal? (2+5+5=12)

4. You are the owner of Tristar Enterprises which is a small company with 30 employees. This year has been particularly good in terms of revenues with excellent teamwork being the key to achieving the designated targets. Unfortunately you had to payoff huge amounts due to your suppliers and creditors. You cannot shell out a very good incentive to your employees because of the payouts. Discuss what incentives for performance would you pay in such a situation explaining the rationale behind giving these incentives. (7)

5. You are the General Manager-Human Resources at the 'Blue lagoon', a five star hotel. You have been assigned responsibility to see that the staff is well equipped and trained to achieve the highest level of performance. The key people at the hotel are the front desk and housekeeping employees. Design a training program for these employees? (12)

6. Write short notes on any **five.**

   (a) Problems of trade unions

   (b) Methods of obtaining job analysis information

   (c) HRIS

   (d) Importance of collective bargaining

   (e) Wage Curve

   (f) Career stages (5×5=25)

(200)

[This question paper contains 2 printed pages.]

Sr. No. of Question Paper : 6160 **F-5** **Your Roll No.....**

Unique Paper Code : 1091303

Name of the Paper : Managerial Economics

Name of the Course : **Bachelor of Management Studies**

Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt All Questions.

1. Answer any **three** of the following: -

   (a) A consumer purchases two goods X and Y with fixed money income. If his demand for X is unit elastic with respect to price of X then his cross elasticity of demand for Y with respect to price of X must be zero. True/False? Why?

   (b) A monopolist practices price discrimination by selling the same product at different prices in two markets. The price charged in market 1 is Rs 10 . The elasticity of demand in market 1 is 2.5. If the elasticity of demand in market 2 is Rs 2. What is the optimal price for market 2?

   (c) Diminishing returns to a variable factor set in at the end of stage II of production. Truel/False? Explain.

   (d) The budget constraint for an individual is given below :-

   $$Qy = 300 - (3/5)\ Qx$$

   What amount of Y is the individual willing to sacrifice for an additional unit of X so that he remains at the highest level of satisfaction? (3×5=15)

2. (a) All Giffen goods are inferior goods but all inferior goods are not Giffen goods. Explain with the help of diagram. (9)

P.T.O.

OR

How does the law of diminishing marginal utility help a consumer to determine the optimum allocation of a given amount of money among different goods? (9)

(b) Maximum economic efficiency cannot be achieved in the presence of externalities. Discuss (6)

3. (a) Explain the relationship between AC, AVC, APC and MC in the short run using diagrams. (8)

(b) Describe the properties of production isoquants. How does a producer choose the optimum output in the long run? Explain with diagram. (7)

OR

At current levels of employment of factors K and L , the marginal product of K is 3 and marginal product of L is 2. The price of K is Rs 5 and the price of L is Rs 4. Since, labour is a less expensive factor of production; the firm can produce the same output at a lower cost by reducing the employment of K and increasing the employment of L. True/False. Explain. (7)

4. (a) Derive the long run SS curve for an industry where additional inputs necessary to produce higher output can be purchased without an increase in per unit price. (8)

(b) Monopolistic competition leads to wastage of resources. Discuss. (7)

OR

In activities involving strategic interdependence that the technique of game theory can be applied to determine the equilibrium outcome. Explain with the help of prisoner's dilemma. (7)

5. Write short notes on any **three** of the following

(a) Economies of scope

(b) Revealed preference theory

(c) Backward bending supply curve of labour

(d) Deadweight loss under monopoly (3×5=15)

(200)

[This question paper contains 6 printed pages.]

Sr. No. of Question Paper : 6161 **F-5** **Your Roll No.....**

Unique Paper Code : 1091304

Name of the Paper : Corporate Finance

Name of the Course : **BMS**

Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question **1** is compulsory and do any **5** of the remaining questions.

1. Skyline Ltd is considering the replacement of one of its production machine. The existing machine is in good operating condition, but is smaller than required if the firm is to expand its operations. It is 4 years old, has a current salvage value of Rs. 1,50,000 and a remaining life of 6 years. The machine was initially purchased for Rs. 10 lakh and is being depreciated at 25% on the WDV basis.

   The new machine will cost Rs 20 lakh and will be subject to the same method as well as the same rate of depreciation. It is expected to have the useful life of 6 years. The management anticipates that with the expanded operation there will be need of an additional net working capital of Rs 50,000. The new machine will allow the firm to expand the current operation and thereby increase annual revenue by Rs. 10,00,000. Variable cost to volume ratio is 30 percent. Fixed cost are likely to remain same (excluding depreciation). The corporate tax rate is 35%. Its cost of capital is 12%. The company has no other machine in the block of 25% depreciation.

   Should the company replace the existing machine if the salvage value of the new machine has zero salvage value at the sixth year end?

P.T.O.

Year	1	2	3	4	5	6
Discount factor at 12%	0.893	0.797	0.712	0.636	0.567	0.507

(15)

2. (a) Calculate the weighted average cost of capital of the company using the (A) market value weights (B) Book value weights. The following information is given below:

Debentures (Rs 100 per debenture)	Rs 12,00,000
Preference shares (Rs 100 per share)	15,00,000
Equity shares (Rs 10 per share)	10,00,000

All the securities are traded in the capital markets, The latest market prices are: Debentures Rs 110 per debenture, preference share Rs 120 per share, and Equity share Rs 22 per share.

Anticipated external financing opportunities are:

(1) Rs. 100 per debenture redeemable at par; 10 year maturity, 11 % coupon rate, 4% flotation cost, sale price Rs. 100.

(2) Rs. 100 preference share redeemable at par, 10 year maturity, 12 % dividend rate, 5% flotation costs, sale price Rs. 100.

(3) Equity share: Rs. 2 per share flotation costs, sale price is Rs 22. The dividend expected on the equity share at the end of the year is Rs. 2 per share; the anticipated growth rate in dividends is Rs. 10 % and firm has the practice of paying all its earnings in the form of dividends. The corporate tax rate is 35%. (9)

(b) What is the difference between implicit and explicit cost? (3)

3. (a) PQR Ltd. provides the following details:

Installed Capacity	1,50,000 units

Actual Production and Sales	1,00,000 units
Selling Price per unit	Rs. 1
Variable Cost per unit	Rs. 0.50
Fixed Costs	Rs. 38,000
Funds Required	Rs. 1,00,000

Proposed Financial Plans

Source	A	B	C
Equity shares of Rs. 100 each to be issued at 25% premium	60%	40%	35%
15% Debt	40%	60%	50%
10% preference shares of Rs. 100 each	--	--	15%

Assume Income Tax rate as 40%.

Calculate:

(i) Degree of operating leverage, financial leverage and combined leverage for each financial plan.

(ii) The indifference point between plan A and B.

(iii) The financial break-even point for each plan. (9)

(b) What are the motives of holding cash? (3)

P.T.O.

4. (a) XYZ Ltd is considering relaxing its present credit policy and is in the process of evaluating two alternative policies. The firm is required to give a return of 25% on the investment in new accounts receivable. The company variable cost is 70 % of the sale. The other relevant information is given as follow:

Particulars	Present Policy	Policy option -1	Policy option -2
Sales revenue	Rs. 50,00,000	Rs. 60,00,000	Rs. 67,50,000
Accounts receivable turnover ratio	4	3	2.4
Bad debt losses	1,50,000	3,00,000	4,50,000

Which policy option is best for the company? (9)

(b) Discuss the emerging role of finance managers in India. (3)

5. (a) A company belongs to a risk class for which the appropriate capitalization rate is 10 percent. It currently has outstanding 25,000 shares selling at Rs 100 each. The firm is contemplating the declaration of a dividend of Rs 5 per share at the end of the current financial year. It expects to have a net income of Rs 2,50,000 and has a proposal for making new investments of Rs 5,00,000. Show that under the MM assumptions, the payment of dividend does not affect the value of the firm? (9)

(b) Discuss the traditional theory of capital structure. (3)

6. (a) Estimate the working capital requirement of Tata Ltd from the following particulars.

Production for the year	1,00,000

units

Finished goods in store	1 month
Raw Material in store	1 month
Work in progress (50% complete with respect of raw materials, wages and overheads)	½ month
Credit allowed by suppliers	1 month
Credit allowed to customers	2 month
Average time lag in payment of wages	½ month
Average time lag in payment of overhead expenses	1½ month
Cash balance required	Rs. 2,00,000
Selling Price per unit	Rs. 200
Raw Material cost per unit	Rs. 84
Direct Wages per unit	Rs. 36
Overheads per unit (includes depreciation of Rs 10)	Rs. 46
Total Cost per unit	Rs. 166

Assume 25% of the output is sold for cash, production is carried out evenly throughout the year and, wages and overheads accrue uniformly. (9)

(b) Discuss various approaches for determining the financing mix for working capital. (3)

7. (a) The two companies X and Y belong to the same risk class. They have everything in common except that firm Y has 10% debentures of Rs. 5,00,000. Following information about the two firms is available to you :

Particulars	X	Y
Net operating income	Rs. 7,50,000	Rs. 7,50,000
Equity Capitalization Rate	0.125	0.14
Overall Capitalization Rate	0.125	0.1363

Explain how under Modigliani-Miller approach an investor who owns 10% equity shares of the overvalued firm will be better off in switching his holding to the other firm. (9)

(b) Investment, Financing and Dividend decisions are interrelated. Comment. (3)