Question bank 04-SA- English

Short Answer Questions

Question 01

A person deposited Rs. 100,000 in 6-month fixed deposit, renewable automatically in a bank. Bank offers 8% interest per annum on this deposit. Compute the withdrawal value of this deposit at the end of 3 years.

Question 02

It has been noted in a particular exam held in December 2015 percentage of failure had increased by 20% when compared with the exam held in June 2015. In the December 2015 examination, 160 candidates passed that exam out of the 400 candidates sat for that exam. Number of candidates sat for June 2015 exam was 440. Compute the number of candidates passed the June 2015 exam.

Question 03

A bank offers an interest of 12% per annum for 3 month fixed deposits. Compute the effective interest rate of this deposit.

Question 04

A manufacturer sold a particular product to a retailer at a profit margin of 25% and then retailer sold that product to its customer at a mark-up of 20%. If the retailer earned a profit of Rs. 120,000 on the sale of this product, calculate the cost of that product to the manufacturer.

Question 05

It was observed that a frequency distribution of daily sales x (in units) for product P for 25 days to have $(\Sigma\ fx)^2 = 54,289$ and $\Sigma fx^2 = 2,213$. Calculate the mean and standard deviation of daily sales of product P (in units). Here f is the frequency.

Question 06

A loan of Rs. 500,000 obtained on 01.01.2016 is repayable in 5 equal annual installments (with interest) commencing from 31.12.2016. Interest payable on this loan is 15% per annum. Calculate the value of annual installment and interest for the year ended 31.12.2016.

Question 07

If the total cost function is given by TC(x) = 22x + 50,000 and the revenue function is given by R(x) = 32x, Calculate the break-even point. Here x represents no of units produced.

Question 08

Demand for a particular product is 100,000 units per annum. Cost of placing a purchase order is Rs 2,500. Cost of holding one unit for one year is Rs 225.

(a)   Calculate the optimum order size.

(b)   What would be the impact on the order size, if the holding cost increases while all the other factors remain unchanged?

Question 09

Marks obtained by candidates in an examination was normally distributed with a mean mark of 55 and standard deviation of 15 marks. If the pass mark is 50, calculate the proportion of the candidate failed the exam

Question 10

A company's forecast of its profit/ (loss) for next year with related chances as given below:

Profit/ (Loss)	Chance
Profit of Rs. 5 million	0.30
Profit of Rs. 2 million	0.45
Loss of Rs. 3 million	0.25

Calculate the expected Profit/Loss for next year.

Question 11

Quarterly sales of a company is given by the trend line $Y = 6t - 2.5$, where Y is the sales in Rs.'000 and t is the time period with $t = 1$ being the first quarter of 2015. Using the multiplication model, seasonal variation for the last quarter of a year is $+ 4\%$. Estimate the sales for last quarter of 2016.

Question 12

A company manufactures a single product. Following information is given:
Annual fixed cost = Rs. 840,000
Nov 2015- Total production cost of 400,000 units = Rs. 2,270,000
Dec 2015- Total production cost of 420,000 units = Rs. 2,380,000
Selling price of that product is Rs. 7 per unit (constant throughout)

Calculate the break-even quantity.

Question 13

Average prices and consumption per annum of three commodities for two years are given below:

Commodity	Consumption Per annum	Price/unit 2010	Price/unit 2015
A	120 units	Rs. 40	Rs. 42
B	180 units	Rs. 50	Rs. 51
C	250 units	Rs. 100	Rs. 105

Calculate the weighted average of relative index for 2015 taking 2010 as the base year.

Question 14

A person invests Rs. 10,000 each year for 4 consecutive years in a deposit account. If the interest rate is 10% per annum, compute the value of this deposit at the end of 5th year.

Question 15

Calculate the amount you have to invest now for you to receive Rs. 500,000 by the end of 5th year at 10% compound interest.

Question 16

A company, which manufactures a particular product, has a break-even quantity of 20,000 units. The fixed cost is Rs. 300,000 and the variable cost of the above product is Rs. 40 per unit. Calculate the selling price of that product.

Question 17

A company sells its goods on 2- month credit. The sales manager proposes a 2% discount for prompt (immediate) payment. Cost of capital of the company is 12%. State with reason whether the new proposal is cost effective.

Question 18

A person deposited Rs. 100,000 on a deposit scheme. Interest is compounded annually. If he received Rs. 136,050 by the end of the 4th year, what is the applicable interest rate for this deposit?

Question 19

A product costs Rs. 150 per unit to the manufacturer. Maximum retail price of that product is Rs. 198. Manufacturer sells these products to retailers at such a price, which will allow them 10% mark-up. If the manufacturer sells these products directly to the consumers at the market price, what will be the percentage increase in profit to the manufacturer?

Question 20

A 6-month Saving Certificate with a face value of Rs. 100,000 is sold at Rs. 94,340. What is the interest rate on this saving certificate?

Short answers

Question 01

At the end of 3rd year deposit value $= 100,000 (1 + 0.08/2)^6$

$$= 100,000 (1.04)^6$$

$$= \textbf{Rs. 126,531}$$

Question 02

Pass percentage in Dec 2015 exam $= 160/400 * 100 = 40\%$

Failure percentage in Dec 2015 exam $= 100 – 40 = 60\%$

This is a 20% increase compared to June 2015 exam

Therefore, Failure percentage in June 2015 exam $= 60\% * 100/120 = 50\%$

∴ Pass percentage in June 2015 exam $= 50\%$

Number of candidates passed in June 2015 exam $= 440 * 50\% = 220$ **candidates**.

Question 03

A 3-month deposit matures in 3 months. (That means interest is added to capital amount)

Annual interest rate of 12% means a quarterly interest rate of 3%.

Assume a deposit of Rs. 100,000.

At the end of 1 year value of this deposit $=$ Rs. $100,000 (1.03)^4 = 112,550$

∴effective annual interest $= 12,550$

Effective interest rate $= (12,550/100,000) * 100 = \underline{\textbf{12.55\%}}$

Question 04

25% Profit   20% profit

Manufacturer ⟶ Retailer ⟶ Consumer

If the Retailer earns Rs. 120,000 profit his purchase cost $= 120,000 * 100/20 =$ Rs. 600,000

i.e, Manufacturer sold the goods to retailer at a price of Rs. 600,000

, Cost to manufacturer $=$ Rs. $600,000 * 100/125 =$ Rs. **480,000**

Question 05

$(\Sigma fx)^2 = 54,289.$ Therefore $\Sigma fx = (54,289)^{\frac{1}{2}} = 233$

∴ Mean $= \Sigma fx / n = 233 / 25 = 9.32$

Standard deviation $= [(\Sigma fx^2 / n) – (\Sigma fx / n)^2]^{\frac{1}{2}} = [2213 / 25 - 9.32^2]^{\frac{1}{2}} =$

$$= [88.52 – 86.8624]^{1/2} = 1.287$$

Question 06

Assume the annual installment is P.

Then, PV all installment payments = P * Cum. discount factor @ 15% for 5 years

$$= P * 3.352 \quad \text{(Ref: discount table)}$$

This should be equal to the Loan amount of Rs. 500,000.

Therefore,   P =   500,000 / 3.352   = Rs. **149,165**

Interest for the year ended 31/12/2016 (i.e, the first year) = Rs. 500,000 * 15% = Rs**. 75,000**.

Question 07

Total cost function is TC(x) = 22x + 50,000
Revenue function R(x) = 32x
From the above equations, Fixed cost is Rs 50,000 and
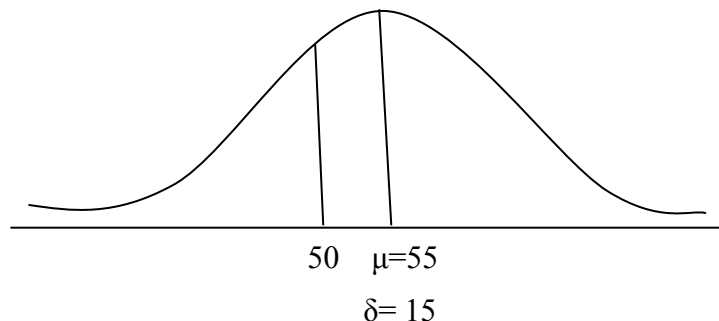Contribution per unit = Selling Price − Variable cost = 32 − 22 = Rs. 10
Break-even point is at Fixed cost / contribution per unit = Rs. 50,000 / Rs 10 = **5,000 units**

Question 08

(a) Economic Order Size (EOQ) = $(2 \, D \, C_o / C_h)^{1/2}$ = $(2* 100,000 * 2,500 / 225)^{1/2}$

$$= 1,491$$

(b) When the denominator, (i.e holding cost) goes up, the value of EOQ will come down.

Question 09

50   μ=55

δ= 15

Z score = (x − μ) / δ   =   (50 − 55) / 15 = 0.3333 = Approx 0.1293

Therefore, proportion failing the exam = 0.5 − 0.1293 = 0.3707 **OR 37.07 %**

Question 10

Outcome	Amount	Probability	Expected value
Profit	Rs. 5 million	0.30	Rs. 1.50 million
Profit	Rs. 2 million	0.45	Rs. 0.90 million
Loss	Rs. 3 million	0.25	(Rs. 0.75 million)
	Expected **Profit**		**Rs. 1.65 million**

Question 11

$$\text{Trend} = 6t - 2.5 \quad \text{Where in last quarter 2016, t = 8}$$

$$\text{Therefore, Trend} = 6*8 - 2.5 = \text{Rs. } 45.5 * 1,000 = \text{Rs. } 45,500$$

$$\text{Forecast for the last quarter of 2016} = \text{Rs. } 45,500 * 1.04 = \text{Rs. } \mathbf{\underline{47,320}}$$

Question 12

Total cost of producing 400,000 units = Rs. 2,270,000
Total cost of producing 420,000 units = Rs. 2,380,000

∴ Increase in cost to produce 20,000 additional units – Rs. 110,000

∴ Variable cost per unit = Rs. 110,000 / 20,000 units = Rs. 5/50

Therefore, Break-even Quantity = Fixed cost / Contribution per unit = 840,000/ (7 – 5.5)

$$= \mathbf{\underline{560,000 \text{ units.}}}$$

Question 13

Commodity	Price relative	Weight	weighted average
A	42/40	120/550	0.2291
B	51/50	180/550	0.3338
C	105/100	250/550	<u>0.4773</u> <u>1.0402</u>

Weighted average relative index $\underline{\mathbf{= 104.02}}$

Question 14

Value of the deposit at the end of 5th year = $(10,000 * 1.1) (1.1^4 - 1) / (1.1 - 1) *1.1$

$$= 11,000 * 0.4641 / 0.1 *1.1$$

$$= \text{Rs. } \mathbf{\underline{56,156}}$$

Question 15

Let the amount you have to invest is a

Then amount receivable at the end of 5th year = $a * (1 + 0.1)^5 = 1.61051$ a

i.e, 1.61051 a = Rs. 500,000

Therefore, a = ***Rs. 310,461***

Question 16

Break-even Quantity = $\dfrac{\text{Fixed cost}}{\text{Contribution per unit}}$

i.e, $20,000 = 300,000 / P - 40$

Therefore P = Rs. 55

Question 17

For a credit sale of Rs. 1,000, financing cost for 2 months = 1,000 * 12% * 2/12

$$= Rs. 20$$

For prompt payment, discount cost = 1,000 * 2% = Rs. 20

New proposal has same cost as the existing 2-month credit. No better than that.

Question 18

If the interest rate is r

Value at the end of 4 year = $100,000 * (1 + r)^4$

Therefore, $136,050 = 100,000 * (1 + r)^4$

$(1 + r)^4 = 1.36050 \Rightarrow 1 + r = 1.08$

Therefore, interest rate 8%

Question 19

	Manufacturer	Retailer	Consumer
Cost to:	Rs.150	(100/110) * 198 = Rs. 180	<= Rs. 198

∴ Profit % to manufacturer if sold to Retailer = [(180 – 150) / 150] * 100 = 20 %

If sold directly to the consumer Profit % = [(198 – 150) / 150] * 100 = 32 %

Percentage increase in profit mark-up = [(32 – 20) / 20] * 100 = 60%

Question 20

Current price = Rs. 94,340

Maturity value in 6 months = Rs. 100,000

If the interest rate is R, then maturity value in 6 months = 94,340 (1 + R/2)

, (1 + R/2) = 100,000 / 94,340 = 1.06

i.e, R/2 = 0.06

R = 2 * 0.06 = 0.12 OR 12%