



**DELHI PUBLIC SCHOOL GAYA**  
**ASSIGNMENT SESSION 2018–19**  
**CLASS – XII**

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*Instruction: – Kindly do your assignment work in assignment copies of the subjects.*

**ENGLISH CORE**

1. Draft Advertisements for the following (2 each):
  - A. Household item for sale
  - B. To-let
  - C. Required/Vacancy
  - D. Matrimony
  - E. Services (Showroom/Gym/Coaching etc.)
2. Write articles on the following topics:
  - A. Language as a means of suppression [ref. : The Last Lesson]
  - B. The greatest challenge is to overcome fear. [ref. : Deep Water]
3. Water is precious and each one of us must stop wastage. Prepare a poster in not more than 50 words urging people to employ various methods of rainwater harvesting in their colonies.
4. The recent rain caused great havoc in the city. Many buildings collapsed and several trees got uprooted blocking traffic at several places. Write a report to be published in a national daily.
5. Recently you went to your native village to visit your grandparents. You saw that some of the children in the age group 5-14 (the age at which they should have been at school) remained at home, were working in the fields or were simply loitering in the streets. Write a letter in 120-150 words to the editor of a national daily analysing the problem and offering solutions to it.
6. Bring out the elements of satire, irony and humour from the chapter 'The Tiger King'.
7. Why is it important to keep one's language alive? What are the reasons behind extinction of many languages?
8. Explain the following statements:
  - A. "Will they make them sing in German too?"
  - B. "The steel canister seemed heavier than the garbage bag."
  - C. "Few airplanes fly over Ferozabad."
9. How is the plight of underprivileged children brought out in the chapter 'Lost Spring'?
10. What was Dr. Sadao's dilemma? Do you agree that his final solution was the best under the circumstances?

**MATHEMATICS**

1. Differentiate  $\sin(x^2)$  w.r.t.  $e^{\sin x}$
2.  $y = x^y$  then find  $\frac{dy}{dx}$ .
3. If  $y = x^x + x^3 + 3^x + 3^3$ , find  $\frac{dy}{dx}$

4. If  $x = a \cos^3 \theta$ ,  $y = a \sin^3 \theta$ , find  $\frac{d^2y}{dx^2}$
5. For what value of constant  $K$ , the following functions are continuous at the indicated points.

$$(i) f(x) = \begin{cases} \frac{e^x - 1}{\log_K(1+2x)} & x \neq 0 \\ \frac{K}{x} & x = 0 \end{cases} \quad \text{at } x = 0$$

$$(ii) f(x) = \begin{cases} \frac{1 - \cos 4x}{x^2} & x < 0 \\ K & x = 0 \\ \frac{\sqrt{x}}{\sqrt{16 + \sqrt{x}} - 4} & x > 0 \end{cases} \quad \text{at } x = 0$$

6. For what values  $a$  and  $b$

$$f(x) = \begin{cases} \frac{x+2}{|x+2|} + a & \text{if } x < -2 \\ a + b & \text{if } x = -2 \\ \frac{x+2}{|x+2|} + 2b & \text{if } x > -2 \end{cases} \quad \text{Is continuous at } x = -2$$

7. Find the values of  $a$ ,  $b$  and  $c$  for which the function

$$f(x) = \begin{cases} \frac{\sin[(a+1)x] + \sin x}{x} & x < 0 \\ c & x = 0 \\ \frac{\sqrt{x+bx^2} - \sqrt{x}}{bx^{3/2}} & x > 0 \end{cases} \quad \text{Is continuous at } x = 0$$

8. Let  $f(x) = \begin{cases} \frac{1 - \sin^3 x}{3 \cos^2 x} & ; x < \frac{\pi}{2} \\ a & ; x = \frac{\pi}{2} \\ \frac{b(1 - \sin x)}{(\pi - 2x)^2} & ; x > \frac{\pi}{2} \end{cases}$  If  $x = \frac{\pi}{2}$ , find  $a$  and  $b$ .

9. If  $f(x) = \begin{cases} x^3 + 3x + a & x \leq 1 \\ bx + 2 & x > 1 \end{cases}$  Is everywhere differentiable, find the value of  $a$  and  $b$ .

10. Differentiate  $\tan^{-1}\left(\frac{\sqrt{1-x^2}}{x}\right)$  w.r.t.  $\cos^{-1}(2x\sqrt{1-x^2})$  where  $x \neq 0$ .

11. Differentiate  $(x \cos x)^x + (x \sin x)^{\frac{1}{x}}$  w.r.t.  $x$ .

12. If  $(x + y)^{m+n} = x^m \cdot y^n$  then prove that  $\frac{dy}{dx} = \frac{y}{x}$ .

13. If  $x = \tan\left(\frac{1}{a} \log y\right)$  then show that  $(1 + x^2) \frac{d^2y}{dx^2} + (2x - a) \frac{dy}{dx} = 0$

14. If  $y = x \log\left(\frac{x}{a+bx}\right)$  prove that  $x^3 \frac{d^2y}{dx^2} = \left(x \frac{dy}{dx} - y\right)^2$ .

15. Differentiate  $\sin^{-1}\left[\frac{2^{x+1} \cdot 3^x}{1+(36)^x}\right]$  w.r.t.  $x$ .

16. If  $\sqrt{1-x^6} + \sqrt{1-y^6} = a(x^3 - y^3)$ , prove that
- $$\frac{dy}{dx} = \frac{x^2}{y^2} \sqrt{\frac{1-y^6}{1-x^6}}, \text{ Where } -1 < x < 1 \text{ and } -1 < y < 1$$
17. If  $f(x) = \sqrt{x^2 + 1}$ ,  $g(x) = \frac{x+1}{x^2+1}$  and  $h(x) = 2x - 3$  find  $f'[h'(g'(x))]$ .
18. If  $x = a \cos^3 \theta$ ,  $y = a \sin^3 \theta$  then find  $\frac{d^2y}{dx^2}$
19. If  $y = \tan^{-1} \left[ \frac{\sqrt{1+\sin x} - \sqrt{1-\sin x}}{\sqrt{1+\sin x} + \sqrt{1-\sin x}} \right]$  where  $0 < x < \frac{\pi}{2}$  find  $\frac{dy}{dx}$
20. If  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ , then show that  $(1-x^2) \frac{d^2y}{dx^2} - x \frac{dy}{dx} - a^2 y = 0$
21. If  $y = [x + \sqrt{x^2 + 1}]^m$ , show that  $(x^2 + 1)y_2 + xy_1 - m^2 y = 0$ .
22. Differentiate  $\sin^{-1} \left[ \frac{3x+4\sqrt{1-x^2}}{5} \right]$  w.r.t.  $x$ .
23. If  $x^y = e^{x-y}$ , prove the  $\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$
24. Find the slope of the normal to the curve  $x = a \cos^3 \theta$  and  $y = a \sin^3 \theta$  at  $\theta = \frac{\pi}{4}$
25. Find the point on the curve  $y = x^3 - 2x + 3$  where the tangent is parallel to x-axis.
26. Find the co-ordinates of the point on the curve  $y^2 = 3 - 4x$ , where tangent is parallel to the line  $2x + y - 2 = 0$
27. The sides of an equilateral triangle are increasing at the rate of 2 cm/s. Find the rate at which the area increases, when side is 10 cm.
28. An inverted cone has a depth of 10 cm and a base of radius 5 cm. Water is poured into it at the rate of  $\frac{3}{2}$  c.c. per minute. Find the rate at which the level of water in the cone is rising when the depth is 4 cm.
29. A water tank has the shape of an inverted right circular cone with its axis vertical and vertex lower most. Its semi-vertical angle is  $\tan^{-1}(0.5)$ , water is poured into it at a constant rate of  $5m^3/h$ . Find the rate at which the level of the water is rising at the instant, when the depth of Water in the tank is 4m.
30. Determine whether the following function is increasing or decreasing in the given interval  $f(x) = \cos \left( 2x + \frac{\pi}{4} \right)$ ,  $\frac{3\pi}{8} \leq x \leq \frac{5\pi}{8}$ .
31. Determine for which values of  $x$ , the function  $y = x^4 - \frac{4x^3}{3}$  is increasing and for which it is decreasing.
32. Find the interval of increasing and decreasing of the function  $f(x) = \sin x - \cos x$ ,  $0 < x < 2\pi$ .
33. Prove that the function  $y = \frac{4 \sin \theta}{2 + \cos \theta} - \theta$  is an increasing function of  $\theta$  in  $\left[ 0, \frac{\pi}{2} \right]$
34. Find the intervals in which the function is decreasing or increasing.

$$f(x) = x^4 - 8x^3 + 22x^2 - 24x + 21$$

35. Find the interval in which the function

$$f(x) = 5x^{\frac{3}{2}} - 3x^{\frac{5}{2}}, x > 0 \text{ is strictly decreasing.}$$

36. Show that the function  $f(x) = \tan^{-1}(\sin x + \cos x)$ , is strictly increasing in the interval  $(0, \frac{\pi}{4})$ .

37. Find the interval in which the function  $f(x) = \cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)$  is increasing or decreasing.

38. Find the interval in which the function given by

$$f(x) = \frac{3x^4}{10} - \frac{4x^3}{5} - 3x^2 + \frac{36x}{5} + 11$$

(i) Strictly increasing

(ii) Strictly decreasing

39. Find the equation of the tangent to the curve  $y = x^2 - 2x + 7$  which is

(i) Parallel to the line  $2x - y + 9 = 0$

(ii) Perpendicular to the line  $5y - 15x = 13$

40. Find the point on the curve  $\sqrt{x} + \sqrt{y} = 4$  at which tangent is equally inclined to the axes.

41. Find the equation of the normal to the curve  $y = e^{2x} + x^2$  at  $x = 0$ . also find the distance from origin to the line.

42. Show that the line  $\frac{x}{a} + \frac{y}{b} = 1$  touches the curve  $y = be^{-x/a}$  at the point, where the curve intersects the  $x$ -axis.

43. At what point on the circle  $x^2 + y^2 - 2x - 4y + 1 = 0$  the tangent is parallel to  $x$ -axis.

44. Show that the equation of the normal at any point ' $\theta$ ' on the curve  $x = 3 \cos \theta - \cos^3 \theta, y = 3 \sin \theta - \sin^3 \theta$  is  $4(y \cos^3 \theta - x \sin^3 \theta) = 3 \sin 4\theta$ .

45. Use differentials to find the approximate value of

(i)  $(3.968)^{3/2}$

(ii)  $(26.57)^{1/3}$

46. Find the approximate value of  $f(2.01)$  where  $f(x) = x^3 - 4x + 7$

47. Find the maximum and minimum values of  $f(x) = \sin x + \frac{1}{2} \cos 2x$  in  $\left[0, \frac{\pi}{2}\right]$ .

48. Find the difference between the greatest and least values of the function  $f(x) = \sin 2x - x$  on  $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ .

49. If the sum of length of hypotenuse and a side of a right angle triangle is given, show that area of triangle is maximum, when the angle between them is  $\frac{\pi}{3}$ .

50. Show that semi-vertical angle of a cone of maximum volume and given slant height is  $\cos^{-1}\left(\frac{1}{\sqrt{3}}\right)$

51. Show that the volume of the largest cone that can be inscribed in a sphere of radius R is  $\frac{8}{27}$  of the volume of the sphere.
52. Show that the cone of the greatest volume which can be inscribed in a given sphere has an altitude equal to  $\frac{2}{3}$  of the diameter of the sphere.
53. Show that the volume of the greatest cylinder which can be inscribed in a cone of height h and semi-vertical angle  $\alpha$  is  $\frac{4}{27}\pi h^3 \tan^2\alpha$ . Also show that height of the cylinder is  $\frac{h}{3}$
54. A wire of length 36 m is to be cut into two pieces. One of the pieces is to be made into a square and the other into a circle. What should be the length of the two pieces, so that the combined area of the square and the circle is minimum?
55. Show that the height of the cylinder of maximum volume that can be inscribed in a sphere of radius r is  $\frac{2r}{\sqrt{3}}$ .
56. Find the area of greatest rectangle that can be inscribed in an ellipse

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1.$$

### **BUSINESS STUDIES**

1. Write concepts, objectives, importance and nature of management.(at least 4 each)
2. Explain principles of management.
3. Explain briefly Fayol's 14 principles of management.
4. Explain any four principle of Taylor's scientific management.
5. With the help of a diagram explain 'functional foremanship' as a technique of scientific management.
6. What are the features of demonetization of 2016?
7. On 28th April, 2016 Indian Stock market crashed by more than 400 points as Bank of Japan dashed out hopes of stimulus. This was in spite of the data showing that the country has fallen back into deflation. Deflation is a general decline in prices, often caused by reduction in the supply of money or credit. It is an opposite of inflation. It has the side effect of increased unemployment, lower level and demand, etc.  
Identify and state the dimension of business environment that has influenced the Indian Stock Market.
8. Explain concept, Importance and limitations of Planning.
9. Saurabh decided to start a chocolates manufacturing business. He set the target of earning 10% profit on sales in the first year. As a good businessman, he was concerned about the future of business, which was uncertain. He gathered information that the demand for chocolates is increasing day by day. He used this information as the base for future planning and shared it with his team. On the basis of the gathered information, he scheduled a meeting in the following week to find innovation ways to achieve the objectives.  
List the first two steps, which has been followed by Saurabh that are related to process of one of the functions of management.
10. Explain concept, Importance and types of Organization.
11. Sate steps in the organization process.
12. Differentiate between formal and informal organization.

13. In a functional designing unit, following are the main functions:  
 A) Manufacturing      B) Marketing      C) Personal Management  
 How will you structure the organization and why? Give any 2 reasons.
14. Aman runs a factory wherein he manufactures leather shoes. The business is doing well and he intends to expand by diversifying into leather bags as well as jackets. His existing business of leather shoes is operating at full capacity. Which type of organizational structure would you recommend for expanded organization and why? Give any 2 reasons.
15. Explain concept, need and Importance of staffing.
16. State steps in the staffing process.
17. What is recruitment? State 4 merits of internal sources of recruitment.
18. A company is manufacturing paper plates and bowls. It produces 1,00,000 paper plates and bowls every day. Due to local festival, it got an urgent order of extra 50,000 paper plates and bowls. Advise how the company will fulfill its order and which method of recruitment would you suggest.
19. Explain concept, Importance and characteristics of Directing.
20. Anjana, a sales manager, achieved her sales target much in advance the scheduled time. Her name was displayed on the achievement board. Name the incentive awarded by the management to Anjana.
21. Explain concept, Importance and characteristics of Controlling.
22. Explain the relationship between controlling and planning functions of management.
23. Mr. Rajeev and Mr. Sanjeev are managers in the same organization heading different units. While discussing about the functions of management, Rajeev says that "Planning is looking ahead whereas controlling is looking back". But Sanjeev says "Planning is looking back whereas controlling is looking ahead".  
 Both are giving reasons in favor of their statements. Explain the possible reason given by both and justify who is correct.
24. What is business finance? Also explain concept, objectives and importance of Financial Management.
25. What are capital budgeting decisions? Explain briefly the factors affecting capital budgeting decisions.
26. How are the shareholders likely to gain with a loan component in the capital employed? Explain with suitable examples.
27. The return on Investment (ROI) of a company ranges between 10-12% for the past 3 years. To finance its future fixed capital need, it has following options for borrowing debts:  
 Option A: Rate of interest 9%  
 Option B: Rate of interest 13%  
 Which source of debt, 'Option A' or 'Option B', is better? Give reason in support of your answer. Also state the concept being used in taking the decision.
28. Explain Financial Market with concept, functions and its types.
29. Explain concept and types of Money Market and Capital Market.
30. Define the term Stock Exchange. Explain its any 4 functions.
31. What are the functions and objectives of SEBI?
32. Due to change in technology, a company is in immediate need of funds to modernize its plant and machinery. The Directors of company wish to approach stock exchange directly to make a public

issue of shares. While the finance manager recommends to approach an Institutional Investor for the new issue of shares.

- (a) Identify the methods recommended by the directors.
- (b) Identify the methods recommended by the Finance Manager.
- (c) Evaluate and suggest which method the company should opt for in the given situation.

## **ACCOUNTANCY**

With the help of your Study Material, you are required to do 40 questions of Company: Issue of share and Balance Sheet.

Please make working notes where ever required and show your working properly.

## **ECONOMICS**

### Introduction

1. What is likely to be the impact of make in India appeal to the foreign investors by the PM of India?
2. Explain the concept of MRT with the help of numerical and schedule.
3. What will be the impact of sarvashikshaabhiyan on the PPC of Indian economy?
4. What is likely to be the impact of efforts towards reducing un-employment in India?
5. Large no. of technical training institutes started by the govt. state its economic value in context of PPC.
6. What will be the impact of recently launched clean India mission on the PPC of economic & why?
7. Production in economy below its potential level is due to which govt. started employment scheme. Explain its effect on PPC.
8. Using a diagram explain what will happen to PPC of Bihar if river Kosi will cause widespread flood?
9. Economist slowdown in some parts of the world had adversely affected India's export. Explain this context on India's PPC.
10. A shift from actual level of output to the potential level of output is not indicated by shift in PPC to right.

### **CONSUMER EQUILIBRIUM**

1. Difference between cardinal and ordinal utility analyses?
2. Explain the concept of consumer equilibrium in two commodity case through utility analysis.

**OR**

Explain the law of Equi-marginal utility.

3. Explain the concept of consumer equilibrium through IC analysis.
4. Explain the various properties of IC curve.
5. Explain the concept of MRS with the help of numerical example.
6. A consumer consumes only two goods X and Y. Prices of these goods 4 and 5 per unit respectively. If the consumer chooses the combination of two goods with marginal utility  $X=5$  &  $Y=4$ . Is the consumer in the equilibrium? Give reasons. What will a rational consumer will do in this situation.

7. A consumer consumes only two goods X and Y. Price of both good is 3 per unit. If a consumer chooses consumption of these two goods.  $MRS=3$ . is the consumer is in equilibrium. Give reason. What will a rational consumer do in this situation?
8. Explain the concept of DMU with assumptions.
9. Explain the relation between TU and MU.

### **DEMAND**

1. Differentiate between change in demand and quantity demanded.
2. Differentiate between increase in demand and extension of demand.
3. Differentiate between decrease in demand and contraction of demand.
4. Explain the effect of increase/decrease in income of the consumer on the demand for a commodity.
5. Explain the effect of increase/decrease in price of related goods on the demand for a given commodity.
6. What are exception to law of demand?
7. Why the demand curve is downward sloping.

**OR**

What are the reasons for the operation of law of demand?

**OR**

Why the demand of commodity increases when price decreases?

Elasticity

1. Explain the various price elasticity of demand.
2. Explain the factor affecting demand.
3. Explain the proportionate method for measuring price elasticity of demand.
4. Explain the relationship between slope and price elasticity of demand.
5. Difference between:
  - (i) Substitute and complimentary goods
  - (ii) Inferior and normal goods
  - (iii) Market demand and individual demand

### **INFORMATICS PRACTICES**

1. Students need to make a project on e-learning/e-business/e-governance by using Java Netbeans and MySQL and the entire work must be filed together along with introduction, acknowledgment, coding, printout and bibliography. (the project needs to be made in a group of two or three pupils).

### **PHYSICAL EDUCATION**

1. Modified AAHPER administration for all items in detail.
2. Labelled diagram of field and equipment of any one game of your choice ant of the following list with their rules, terminologies and skills. – Athletics, Basketball, Football, Hand ball Kho-Kho, Volley ball.
3. Procedure for Asanas, benefits and contraindication of any two Asanas for life style disease.
4. A short note on physical education and sports for differently abled.
5. Write a note on Kinesiology, Biomechanics and sports.

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