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KATHMANDU

DON BOSCO COLLEGE (10+2)

1st Terminal Exam -2057

Stream	**: Science**	**Time**	**: 3 hrs.**
Class	**: XII**	**F.M.**	**: 100**
Subject	**: English**	**P.M.**	**: 40**

1. Read the following passage and answer the questions given below: 3×5=15

The development of the Space Shuttle has dramatically reduced the cost of sending loads into space. The shuttle takes off from earth like a rocket, and lands again like an aircraft. It can transport not only its own crew, but also passengers, and has a huge cargo-hold, which is capable of carrying large satellites or a space laboratory.

Before the space shuttle was created, it was necessary to plan trips into space several years in advance. However, for the rest of the century it should be possible to make space flights every week or so. Any orbit will simply take the next shuttle flight, stay as long as necessary, and then return at his or her convenience. It is difficult to imagine the immense opportunities created by the shuttle. One of the great advantages of having a reusable space vehicle is that it can take one load after another into orbit. Very large space stations could not be launched in their complete form directly from earth, but they could be built piece by piece in space.

Questions:

a) How is the space shuttle different from earlier space vehicle?
b) What are the three advantages of the space shuttle?
c) Why couldn't a complete space station be launched earlier directly from the earth?
d) The Development of the Space shuttle has dramatically reduced the cost of sending loads into space. How is it possible?
e) Give the central idea of the passage in one sentence.

2. Answer any three questions in short: *3´5=15*

a) What description of the grandmother can be found in the poem 'The Grandmother'. Which senses are they connected to? (The Grandmother)
b) Explain the idea that love is different in every situation. Use examples from the story 'About Love'. (About Love)
c) What does the title of poem mean? Who is travelling through the dark? (Travelling through the Dark)
d) Are there possible solutions to the problems of overpopulation and deforestation? Discuss. (Two Long Term Problems)
e) Discuss what alternative ways do the people of Karnali region follow to make their living. (A Hurried Trip to Avoid a Bad Star)

3. Write as essay on: *10*

a) Life and Art, OR b) Environmental Degradation

4. Put the verbs in the brackets in correct grammatical form: *5*

a) This is the first time I (watch) a movie in the cinema hall.
b) I bought the book which I not (find) for years.
c) I wish they (live) nearer.
d) As soon as the telephone (ring) he answered.
e) This is the first time I (have) my teeth x – rayed

5. Talk about the people below as in the example: *5*

e.g. You see a man lying on the ground in a pool of blood.
Ans: He looks <u>as if</u> he is seriously wounded.

a) You see a girl standing on the seashore, staring into the water.
b) You see a man lying on the floor, laughing.

c) You see a man lying underneath a car.
d) You see someone climbing through a window.
e) You see a women whose clothes are soaked, and she's sneezing.

6. Add a previous event to these remarks as in the example: *5*

e.g. Her husband was horrified when she came back from the hairdresser's.
Ans: They had dyed her hair a kind of purple colour.

a) When I saw him two years later, I could hardly recognise him.
b) They sent both men to prison for 20 years.
c) The fireman received a medal for bravery.
d) I got a very angry letter from my boss last Monday.
e) When my sister came home, she was crying her eyes out.

7. Add an appropriate relative clause to these sentences. *5*

a) At last they managed to repair the telephone, ----------
b) The teacher,----------, turned round suddenly.
c) I eventually found the letter,----------, in my pocket.
d) We were all very grateful to Richard, ---------- .
e) I couldn't wait to get back to Venice, ---------- .

8. Look at the example, and write about the other topics in the same way: *5*

Example: mean people
Ans: The meanest person I've ever met was Jack Davies.

a) frightening experience
b) stupid mistake
c) uncomfortable bed
d) boring job
c) funny film

9. Write a general attitude to each of these remarks beginning with If theirs one thing. ***5***

a) Jim drove into a lamp-post last week.
b) George has forgotten to feed the cat again.
c) Alma kept me waiting for more than an hour last night.
d) 'He's scratching himself again. How irritating.'
e) 'Look how fast he's driving. I'm really impressed.'

10. Fill in the gaps in the sentence below with for, in, until or by. ***5***

a) They got the lunch ready ----------12:30
b) They lived in New castle --------1973
c) I studied French ---------- five years.
d) We did some housework ---------- a couple of hours.
e) He saved up $ 200 --------- Ester.

11. Continue the remarks below with a sentence using (not) used to + ing: ***5***

a) She was quite surprised when I gave her some flowers.
b) I get a bit lonely sometimes, now that she's gone.
c) I don't think she's ever opened a door herself.
d) It's quite hard work doing all my washing and cleaning.
e) You can bring as many friends as you like home to dinner.

12. If you were shipwrecked alone on an island, which five common objects would you want to have with you? Why? Write about in 150 words. 10

13. Read the following passage and answer the questions given. ***5 ´ 2=10***

Bathseba took from her desk a gorgeously illuminate and embossed design in post-octovo, which has been bought in the previous market-day at the chief statio ner's in Casterbridge. In the centre was a small oval enclosure; this was left blank, that the sender might insert tender words more appropriate to the special occasion than any generalities, by a printer could possibly be.

' Here's a place for writing.' Said Bathseba. 'What shall I put?'

' Something of this sort, I should think,' returned Liddy promptly:

'The rose is red
The violet blue,
Carnation's sweet
And so are you.'

'Yes, that shall be it. It just suits itself to a chubby-faced child like him,' said Bathseba. She inserted the words in small though legible handwriting; enclosed the sheet in an envelope, and dipped her pen for the direction.

Questions:

a. What, do you think, Bathseba took from her desk?
b. Describe the object in your own words.
c. Where had Bathseba bought the thing?
d. What was the small oval enclosure for?
e. Do you think Bathseba is a confident woman? Give reasons.

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

1st Terminal Exam -2057

Stream	**: Commerce**	**Time**	**: 3 hrs.**
Class	**: XII**	**F.M.**	**: 100**
Subject	**: English**	**P.M.**	**: 40**

1. Read the following passage and answer the questions given below: 3×5=15

The glass of an aquarium gets covered in algae, and the sand pebbles at the bottom get covered with waste matter such as decayed leaves and fish droppings. You can scrape off the algae quite easily with a razor blade. It is also easy to clean the bottom if you know how to use a siphon.

To make a siphon, take a piece of rubber and hold it under the water in the aquarium until all the air has bubbled out. Keeping one end (end x) under the water, cover the other end (end z) tightly with your thumb and bring it over the edge and down the side of the aquarium. When end Z is below the level of the surface of the water, release your thumb grip and the water will flow out. Unless you let air into the tube or raise end 'Z' above the water level in the aquarium, the water will continue to flow.

By moving end X around over the bottom of the aquarium you can suck up all the pieces of waste matters. It is a good idea to make the sand slope towards the front so that all the dirt collects in one place.

Questions:

a) How does an aquarium get dirty?
b) Who can demonstrate the action of scraping? What do you need for it?
c) How do you drive the air out of the tube?
d) What happens when you let air into tube or raise end Z of siphon above the water level in the aquarium?
e) What is the central idea of the passage?

2. Answer any three questions in short: *3´5=15*

a) How does the poet present the reminiscences of his young life in this poem?
(The Lamentation of the Old Pensioner)

b) Describe about the crises caused by overpopulation according to Nissani.
(Two Long-term Problems: Too Many People, Too Few Trees)

c) What does the poet remember about his grandmother? How do you think he feels about his grandmother? (The Grandmother)

d) In your own words tell the love story of Nikanor and Palageya.
(About Love)

e) What does the poet feel about finding the deer?
(Travelling through the Dark)

3. Answer any one of the following: *10*

a) Write an essay on an outing (actual or imagery) in which you participated.

OR

Write a short essay on "Driving in the Dark".

4. Put the verbs in the brackets in correct grammatical form: *5*

a) This is the first time I (watch) a movie in the cinema hall.
b) I bought the book which I not (find) for years.
c) I wish they (live) nearer.
d) As soon as the telephone (ring) he answered.
e) This is the first time I (have) my teeth x – rayed.

5. Continue the following remarks with look, round, smell, feel, taste, + as if + clause. *5*

a) Are you sure this is tea?

b) I wonder who composed that music.
c) What's that you are cooking?
d) This material is very soft.
e) Surely he's not a manual worker.

6. Add a previous event to these remarks as in the example: *5*

e.g. Her husband was horrified when she came back from the hairdresser's.
Ans: They had dyed her hair a kind of purple colour.
a) When I saw him two years later, I could hardly recognise him.
b) They sent both men to prison for 20 years.
c) The fireman received a medal for bravery.
d) I got a very angry letter from my boss last Monday.
e) When my sister came home, she was crying her eyes out.

7. Incorporate each pair of sentences into one sentence using relative pronouns. *5*

a) Phil was an excellent driver.
Phil's forehead was covered in sweat.
b) Julia hadn't wanted to come in the first place.
The admiral had entrusted the papers to Julia.
c) Alex had closed his eyes.
It had been Alex's idea to come.
The success of the whole mission depended on Alex.
d) Alex had just taken the gun out of his pocket.
Alex never went anywhere without his gun.
e) The dog was sitting facing the back window.
The dog loved travelling in fast cars.

8. Look at the example, and write about the other topics in the same way: *5*

Example: mean people
Ans: The meanest person I've ever met was Jack Davies.
a) frightening experience
b) stupid mistake
c) uncomfortable bed
d) boring job
c) funny film

9. Make sentences showing your attitude using <u>the way</u> as in the example. ***5***

Example: They make the streets so crowded.
Ans: I object to the way they make the streets so crowded.
a) They never bother to learn the local language.
b) They spend so much money.
c) They take an interest in local customs.
d) They take up all the seats on buses.
e) They wear such funny clothes.

10. Fill in the gaps in the sentence below with <u>for</u>, <u>in</u>, <u>until</u> or <u>by</u>. ***5***

a) They got the lunch ready ----------12:30
b) They lived in Newcastle --------1973
c) I studied French ---------- five years.
d) We did some housework ---------- a couple of hors.
e) He saved up $ 200 --------- Ester.

11. Continue the remarks below with a sentence using (not) used to + ing: ***5***

a) She was quite surprised when I gave her some flowers.
b) I get a bit lonely sometimes, now that she's gone.
c) I don't think she's ever opened a door herself.
d) It's quite hard work doing all my washing and cleaning.
e) You can bring as many friends as you like home to dinner.

12. Write a letter to a friend, describing what it's like living, in a new flat you have just shifted to, and what people there are like. 10

13. Read the following application and answer the questions given below: *10*

Dear Sir,

I am an Australian student, and am seeking some interesting form of employment for the summer vacation this year, and I have been advised to write to you to offer my services as a guide to British tourists visiting Europe.

Briefly, my relevant experience and qualifications are as follows. I have studied English for ten years, first at school and since then at Vienna University. I have visited Britain several times, and in 1979 I spent ten weeks in the United States. My experiences of speaking English is therefore quite considerable. I have also travelled extensively within Europe and have a good working knowledge of French and Italian in addition to my native language, German. My study has included the History of European art and Architecture as well as the language I have just mentioned……..…….

Yours' Faithfully,
Anton Mayerhofer

1. What is the main reason that Anton wants the job?
2. Which language does Anton know best?
3. Anton says, "I have a good working knowledge of French and Italian". What does he mean?
4. In the application, Anton has talked basically in present perfect and past simple tense. Why has he done so?
5. How do you think Anton's studies of European art and architecture might be useful in the job?

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

1st Terminal Examination -2057

Stream	**: Science**	**Time**	**: 3 hrs.**
Class	**: XII**	**F.M.**	**: 100**
Subject	**: Physics**	**P.M.**	**: 40**

Group "A"

1. Answer all questions in brief: 7×3=21

a) Oil spreads over the surface of water where as water does not spread over the surface of oil, why?
b) Electric discharge does not take place at very low pressure in gases, why?
c) When strong wind blows, the roof of a house is lifted up, why?
d) Why should the objectives of a compound microscope have small focal length?
e) Define current and voltage sensitivity of a galvanometer?
f) What if Lorentz force. Write its expression.
g) Why can not we experience the existence of matter wave in our daily life?

2. Answer in brief any four questions: ***4´3 = 12***

a) Explain why water is more elastic than rubber?
b) Why the spring is made of steel and not of copper?
c) On what principle is a magnifying glass made?
d) How is the continuous spectrum of x-ray originated?
e) How does the hydrogen bomb differs from atom bomb in principle?
f) Explain the meaning of existence of negative energy of an electron in orbit?

Group "B"

3. a) Discuss the construction and working of modern x-ray tube. 12

OR

State Bohr's Postulate of H-atom calculate expression of energy in nth orbit.

b) Calculate the binding energy per nucleon of the helium nucleus. Mass of helium = 4.002603 amu, mass of a neutron = 1.008665 amu, mass of proton = 1.007825 amu, 1 amu = 1.66×10^{-27}kg.

4. a) State and prove Bernoulli's theorem for the flow of fluids. 12

OR

Discuss the phenomenon of ST and obtain ascent formula of a liquid raised in a capillary tube.

b) Eight air drops, each of radius 1mm falling downward with terminal velocity of 0.05ms^{-1} Coalesce. to form a bigger drop. Find terminal velocity of bigger drop.

5. a) State Biot-Savart law. Use this law to find the magnetic field due to long straight current carrying conductor. 12

OR

State and explain Ampere's Circuital law. Use it to calculate magnetic field cutelsety at the centre of circular current carrying wire.

b) A straight horizontal rod X, of mass 50gm and length 0.5m, is placed in a uniform horizontal magnetic field of 0.2T perpendicular to X, calculate the current is X if the force acting on it just balances its weight (g=10N Kg^{-1})

6. a) With the help of a labelled diagram, explain the construction and working of a compound microscope. Derive an expression for its magnifying power.

OR

Draw ray diagram of astronomical telescope. Deduce magnifying power of this instrument.

b) A compound microscope consists of an objectives lens of focal length 2cm and an eyepiece, of focal length 6.25cm separated by a distance of 15cm. How for from the objective lens should an object be placed in-order to obtain the final image at least distance of distinct vision (25cm)? What is the magnifying power of the microscope.

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

First Term Examination -2057

Stream : Commerce | **Time : 2 hrs.**
Class : XII | **F.M. : 50**
Subject : Computer Science | **P.M. : 20**

Answer all the questions:

1. What is Computer Network?
2. What is Database Management System?
3. What is System development life Cycle?
4. What do you mean by Topology? Name the different topologies.
5. What is Normalization? What are the different Normal forms?

Answer any six of the following questions briefly: [6Q*5 = 30]

1. Explain the types of networks on the basis of scale.
2. Explain the entity-relationship model with the help of an E-R diagram.
3. What are the differences between network and hierarchical models? Give the required diagram of both the models and explain.
4. Explain the major components of a Database Management System?
5. Explain the transmission media known to you?
6. What do you mean by feasibility study? Explain the different types of feasibility.
7. Explain Internet and Intranet? What are the differences between them?

Answer the following long question:

1. What do you mean by System? Explain the different phases of a System Development life Cycle by taking an appropriate example?

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

First Term Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XII | **F.M. : 100**
Subject : Maths | **P.M. : 40**

Short questions [18 ´ 2=36]

1. What do you mean by a sequence and a series?
2. Find the sum of an infinite series with first term 1 and common ratio $\frac{1}{2}$.
3. Write down the expression for the sum of the squares of the first n natural numbers.
4. How many numbers of three different digits can be formed from the integers 3, 4, 5, 6, 7?
5. How many permutations are there of the letters in the word "Mississippi"?
6. Find the limit of the function f (x) = $\sin\left(\frac{1}{x}\right)$ at the point x=0, if it exists.
7. Define the continuity of a function f (x) at a point x=a,
8. When is a function y = f(x) said to be differentiable with respect to x?
9. Write down the derivative of sechx with respect to x.
10. Find the equation of a circle passing through origin and center at (4, -1).
11. Find the center and radius of a circle $4x^2+4y^2+12ax-6ay-a^2=0$.
12. Find the length of tangent drawn from (6, 4) to the circle $x^2+y^2+4x+6y-19=0$.
13. Find the equation of the parabola whose vertex is at (0,0) and focus at (4,0).
14. For what value of a will the straight-line y=2x+3 touch the parabola $y^2=4ax$?
15. Define mean. Calculate the arithmetic mean from the following data:

Marks	0-10	10-30	30-60	60-100
No. of students	5	12	25	8

16. Define median. Find the median height of 10 students with the following heights:
    Height in inches: 51, 53, 58, 50, 54, 52, 56, 55, 55, 57, 49.
17. Compute the standard deviation for the following frequency distribution:

Class interval	0-4	4-8	8-12	12-16
Frequency	4	8	2	1

18. What do you mean by Ogive?

Long questions [16 ´ 4=64]

1. For any two unequal positive numbers a & b, prove that
    a. AM X HM = $(GM)^2$.
    b. AM > GM > HM.
2. Show that if three quantities form any two of the three sequence AS, GS, and HS, then they also form the remaining third sequence.
3. Obtain the expression for the sum of the cubes of the first n natural numbers.
4. Solve for n the equation C (n+2, 4) = 6C (n, 2).
5. Show that the function f (x) defined as

    f(x) = $\frac{\sin^2 ax}{x^2}$ for x ≠ 0
    1 for x = 0
    is discontinuous at x = 0, unless a = 1.

    Or

    Find, from definition, the derivative of $\cos^{-1}x$.

6. Differentiate $(\text{Sinhx})^{\text{Cosh x}}$ with respect to x.

7. Find the points on the curve $y = x^3-3x^2-1$ where the tangents are parallel to the x-axis.

Or

A six feet man walks away from a 10 ft. lamp post at the rate of 5 miles per hour. How fast does the end of his shadow move?

8. Integrate the following:

a) $\int \frac{dx}{a^2 - x^2}$ b) $\int \frac{dx}{\sqrt{a^2 - x^2}}$

or

$$\int \frac{dx}{x^2 - 4x - 12}$$

9. The monthly wages paid by two firms A and B gives the following result

	Firm A	Firm b
No. of wage earners	568	648
Average monthly salary	52.5	47.5
Variance of the distribution	100	121

Find out:

1. The firm which pays out greater amount as monthly wages,
2. The firm, which has greater variability in wage.

10. Calculate Carl Pearson's coefficient of skewness for the following distribution

Age below	10	20	30	40	50	60
No. of person	15	25	40	50	55	60

11. Find out the mean deviation from the median and its coefficient from the following data

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	7	4	8	10

12. Calculate semi-interquartile range (Q.D.) and related coefficient (coefficient of Q.D.) from the following data:

Wages	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of workers	5	3	7	5	10	3	2

13. Prove that the equation to the circle with (x_1, y_1) and (x_2, y_2) as end points of a diameter is $(x-x_1)(x-x_2) + (y-y_1)(y-y_2) = 0$.

14. Find the equations of the tangents to the circle $x^2+y^2 = 5$ which are perpendicular to $x+2y = 0$.

15. What do you mean by conic section? Write down the condition for the conic section to be a parabola, ellipse and hyperbola. Also find the focus, vertex and equation of directrix of parabola $x^2=-12y$.

16. Find the condition that the straight line $y = mx + c$ may be the tangent to the parabola $y^2=4ax$.

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

First Term Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XII | **F.M. : 100**
Subject : Chemistry | **P.M. : 40**

Group "A"

Attempt any 10 questions ***10 ´ 3.5=35***

1. Predict the molecular geometry of BF_3 and CH_4 on the basis of VSEPR theory.

2. What do you mean by sigma (σ) and Pi (π) bond.

3. Identify X and Y in the following reaction.
$CH_3CHO \xrightarrow{I_2/NaOH} \times \xrightarrow[\Delta]{Ag} Y$

4. Give an example (with formula) each from aliphatic and aromatic aldehydes which give aldol condensation reaction.

5. Why is the boiling point of ethanol greater than its isometric methoxymethane.

6. How do methanal and ethanal act upon NH_3?

7. Alcohols are highly soluble in water but alkyl halide are not why?

8. Why is phenol acidic in nature?

9. Write short notes on carbylamine reaction?

10. Calculate the equivalent weight of $KMnO_4$ in acidic, alkaline and neutral medium.

11. Define : a) acidimetry and alkalimetry b) Molality c) Normality factor

12. Prove that $H_2PO_4^-$ is amphoteric ion.

Group "B"

Attempt any five questions: ***5 ´ 7=35***

13. Write short notes on any two
a) Bronsted – Lowry concept for acid and base
b) Arrhenius theory for ionization
c) Primary standard solution

14. 100ml of 0.1M H_2SO_4 acid solution is mixed with 50ml of 0.2M NaOH. Calculate the strength of mixture in terms of normality.

15. Write short notes on:
a) Cannizaro's reaction
b) Kolb's reaction

16. What happens when:

a) Phenol is treated with chloroform in the presence of alkali.
b) Ethyl iodide is treated with sodium ethoxide

17. How can 1^0, 2^0, 3^0 alcohols be distinguished by Victor Mayer's method?

18. How would you extract pure zinc from its sulphide ore?

19. Write short note on any one.
a) Galuanisation b) white Vitriol

Group 'C'

Attempt any two: ***15 ´ 2=30***

20. How is chloroform prepared in the laboratory? What product is formed when chloroform is boiled with aqueous KOH.

21. What are the basic assumptions of valence bond theory? Describe briefly how the valence bond theory explain the shape of H_2O and NH_3 molecules.

22. a) Write short notes on:
i) Gattermann-Koch reaction
ii) Coupling reaction

b) Calculate the weight of anhydrous Na_2CO_3 required to make 250ml of N/10 solution.

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

First Term Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XII | **F.M. : 100**
Subject : Biology | **P.M. : 40**

Zoology

1. Attempt all the questions ***2´8=16***

a) Name the source and deficiency diseases caused by Vitamin A.
b) What do you mean by intercellular digestion?
c) Write important role of insulin.
d) Why is SA node called pacemaker?
e) What do you mean by holoblastic cleavage?
f) List different types of connective tissue found in human body.
g) What types of fibre is found in tendons?
h) Define nutrition.

2. Answer the following questions: ***3´5=15***

a) How blastocoel is formed?
b) What is epithelium? List the different types of epithelium?
c) What do you mean by adipose tissue?
d) Define endocrine gland & name different endocrine glands found in human body.
e) What is cartilage?

3. Describe the physiology of digestion in man (Enzymatic reactions) 9.5

4. Describe the development of frog up to the formation of gastrula.

OR

What is heart beat? Describe the origin & conduction of heart beat? 9.5

Botany

1. Answer the following questions: ***2´8=16***

a) Define the term "Pollination"
b) What is meant by imbibition?
c) How can you determine the age of the plant?
d) What is variation?
e) What do you mean by double fertilization?
f) Define root pressure.
g) What do you mean by central dogma?
h) Write the type of vascular bundle in the root?

2. Answer the following questions: ***3´5=15***

a) "Transpiration is called as necessary evil" justify it.
b) Enumerate the various advantages of vegetative propagation.
c) Give the watson and crick model of DNA.
d) What are the characteristic features of monocot stem?
e) Draw a well labelled diagram of T.S. anther

3. Give the anatomical structure of dicot stem with well labelled diagram. 9.5

OR

Define Ascent of Sap? Give the different theories of Ascent of Sap.

4. What is megasporogenesis? Describe the process of development of female gametophyte in an angiospermic plant. 9.5

"Best of Luck"

KATHMANDU

DON BOSCO COLLEGE (10+2)

First Term Examination -2057

Stream : Science | **Time : 3 hrs.**
Class : XII | **F.M. : 100**
Subject : Mathematics | **P.M. : 40**

General Instructions:
i) All questions are compulsory
ii) Marks for each questions are indicated against it.

1. a) Find the equation of circle whose centre is at (4,−1) and passes through (−1,3). 2

   b) Find the limit of f(x) = $\frac{1}{1+e^{1/x}}$ at x = 0, if it exits. 2

   c) Define median and find the median of the following set of observations 2
   5, 8, 6, 7, 12, 4

2. a) Find the centre and radius of the circle whose equation is $x^2+y^2-12x+4y=1$. 2

   b) Discuss the continuity or discontinuity of the following function at the point specified 3

   f(x) = $\frac{Sin2x}{3x}$ for $x \neq 0$
   1 for x = 0

   c) Define mean. 2
   Given that A.M. is equal to 7.3 find the missing frequency in the following data.

x:	5	6	7	8	9
f:	4	6	12	?	8

3. a) What do you mean by "Dispersion"? Find range and the coefficient of range from the following. 3
   data: 25, 28, 32, 36, 48, 44, 45, 50, 50.

   b) If f(x) = $3+2x$ for $-3/2 \le x \le 0$ 3
   $3-2x$ for $0<x<3/2$
   show that f'(0) does not exist

   c) Find equation of circle whose two diameters are x+y = 6 and x+2y=4 and radius 10. 3

4. a) Determine the equation of the circle. If the ends of a diameter be at (3,0) and (7,−1) . 3

   b) Find the derivative of $\log\left(Sinh\frac{x}{a}\right)$ 3

   c) Find the approximate increase in the volume of a sphere when its radius increase from 2 to 2:1. 2

5. a) Find the slope and the inclination with the x-axis of the tangent of $y = -3x-x^4$ at x = −1. 2

   b) Find Q_1 and Q_3 from the following data. 2

Heights (cm) :	153	155	157	159	161	163
No. of students :	25	21	28	20	18	24

   c) Find dy/dx $y^2-x^2=2x^2y^2$ 2

6. a) Find the equation of the tangent and normal to $x^2 - y^2 = 7$ at the point (4, −3). 4

   b) Find median and mean derivatives from median of the following data. 4

Marks:	0−10	10−20	20−30	30−40	40−50
No. of Students	5	8	15	16	6

7. a) Determine the equations of circle with centre on the line 2x+y=1, radius 5 and through (4,3) 4
b) Find, from first principles, the derivatives of e^{Cosx}. 4

8. a) Water flows into an inverted conical tank at the rate if $27ft^3$/min. When the depth of water is 2ft, how fast is the level rising? Assume that the height of the tank is 4ft and the radius at the top is 1 ft. 4

b) A frequency distribution given the following results. 4
i) C.V. = 5%
ii) S.D = 2
iii) Karl Pearsons coefficient of skewness = 0.5. Find the mean and mode. 4

9. a) Calculates Pearsonian's measure of skewness for the following distribution

Size (and):	30–33	33–36	36–39	39–42	42–45	45–49
No. of obs.	2	4	26	47	15	6

b) Find the points on the curve where the tangents to the curve $y = x^3-3x^2+1$ are parallel to the X-axis. 4

10. a) Find the equation of the circle through the points (1,2) (3,1) and (−3,−1). 4
b) Find, from the first principle the derivatives of Log(Sin2x). 4

11. a) Find the derivatives of $\left(Sinh\frac{x}{a} \right)^{\log x}$ 4

b) find out the arithmetic mean from the following data.

Variables:	5–10	10–15	15–20	20–25	25–30	30–35
Frequency:	2	9	29	54	11	5

12. a) Find the standard deviation from the following data. 4

Income(Rs.):	80–120	120–160	160–200	200–240	240 –280
Frequency:	30	25	20	15	10

b) IF the volume of an expanding cube is increasing at the rate of $4ft^3$/min. How fast is its surface area increasing when the surface area is 24 sq.ft. 4

13. a) A function f(x) is defined as 4

$$f(x) = \begin{cases} 1+\text{Sin}x & \text{for } 0 \le x < \pi/2 \\ 2+(x-\pi/2)^2 & \text{for } \pi/2 \le x < \infty \end{cases}$$

Does $f'(\pi/2)$ exist?

14. a) Following data represent the lives of two models of refrigerators A and B. 4

Line (Years):	0–2	2–4	4–6	6–8	8–10	10–12
Model A:	5	16	13	7	5	4
Model B:	2	7	17	19	9	1

Which model has greater uniformity?

"The End"