Subject: English	**B.Sc Part-I**	**Time:**03Hrs.
Paper: Compulsory	**Annual/18**	**Max. Marks:**50

Note: Attempt FIVE questions in all. Section-A is compulsory. Attempt TWO questions from section-B.

SECTION A

Q.1. Read the following passage and answer the question:

The first English attempts to colonize North America were controlled by individuals rather than companies. Sir Humphrey Gilbert was the first Englishman to send colonists to the New World. His initial expedition, which sailed in 1578 with a patent granted by Queen Elizabeth, was defeated by the Spanish. A second attempt ended in disaster in 1583, when Gilbert and his ship were lost in a storm. In the following year, Gilbert's half brother, Sir Water Raleigh, having obtained a renewal of the patent, sponsored an expedition that explored the coast of the region that he named "Virginia." Under Raleigh's direction efforts were then made to establish a colony on Roanoke Island in 1585 an6 1587. The survivors of the first settlement on Roanoke returned to England in 1586, but the second group of colonists disappeared without leaving a trace. The failure of the Gilbert and Raleigh ventures made it clear that the tasks they had undertaken were too big for any one colonizer. Within a short time the trading company had supplanted the individual promoter of colonization.

Questions:

1. The passage states which of the following about the first English people to be involved in establishing colonies in North America? **02**

(A) They were requested to do so by Queen Elizabeth.

B) They were members of large trading companies.

(C) They were immediately successful. (D) They were acting on their own.

2. According to the passage, which of the following statements about Sir Humphrey Gilbert is true?**02**

(A) He never settled in North America.

(B) His trading company was given a patent by the queen.

(C) He fought the Spanish twice. (D) He died in 1587.

3. When did Sir Walter Raleigh's initial expedition set out for North America? 02

(A) 1577 (B) 1579 (C) 1582 (D) 1584

4. Give a title to the passage and make a precise of it. **02+07**

Q.2. Write a survey report to the director general of Children Protection Bureau about the children sexual abuse in your area. **10**

OR

Write a report to the Principal of your college on the college library.

Q.3. Use appropriate preposition in any FIVE of the following sentences. **05**

(i) I shall wait for you _____ 8 p.m.
(ii) Pure milk is selling _____a high price.
(iii) Don not throw water _____him.
(iv) She spoke _____great joy.
(v) Water was flowing _____the bridge.
(vi) Always act _____the limits of the law.

SECTION B **10+10**

Q.4. Man is usually called "the highest animal" on the basis of intelligence. What are the specific traits that make him the "lowest animal"?

Q.5. How does Burgess describe the differences between Bromides and Sulfites in a realistic way?

Q.6. Describe Russell's views on literary and scientific education.

Q.7. What is the difference between the emotional meanings and objective meaning of words? Explain with illustrations from the essay.

Subject: Botany (Diversity of Plants) **B.A/B.Sc Part-I** **Time:**03Hrs.
Paper: I **Annual/18** **Max. Marks:**40

Note: Attempt **Five** question in all, **Section-A** is **compulsory**. Attempt any **Four** questions from **Section-B**. Elaborate you answers with labeled diagram where necessary.

SECTION-A

Q.1. Briefly answer the following questions. **4×2=8**

I- Differentiate between slime layer and bacterial capsule.

II- How plant viruses differs from plants viruses?

III- Differentiates between bryophyte and algae.

IV- How zygospore differs from aplanospore?

SECTION-B

Q.2.	(a).	Discuss Thallus structure/plant body of chlorophyta.	04
	(b).	Discuss sexual reproduction in Charophyta.	04
Q.3.	(a)	Write note on asexual reproduction in Penicillium.	04
	(b).	How fungi is economically important to us?	04
Q.4.	(a).	Discuss sexual reproduction inPythium.	04
	(b).	Write a note on general characters of rust.	04
Q.5.	(a).	What are lichens? Write down details of their structure.	04
	(b).	Draw life cycle of Anthocerose.	04
Q.6.	(a).	Compare angiosperms with gymnosperms.	04
	(b).	Give general account of Ephdra with reference to the structure.	04
Q.7.	(a).	Describe mode of nutrition in fungi.	04
	(b).	Discuss sexual reproduction in Porella.	04
Q.8.	(a).	Describe general structure of bacteria.	04
	(b).	Comprehensively discuss Tobacco Mosaic Virus.	04
Q.9.	(a).	What is double fertilization? Describe the development of dicot embryo.	08

Subject: Botany	**B.A/B.Sc Part-I**	**Time:**03Hrs.
Paper: II	**Annual/18**	**Max. Marks:**40

Note: Attempt **FIVE** questions in all, **Section- A** is compulsory. Attempt any **FOUR** questions from **Section-B**. Elaborate your answer with labelled diagrams, where necessary.

Section-A

Q.1. Discuss the following questions briefly. 4 x 2=08

i. Differentiate between Plant Systematics and Taxonomy
ii. Differentiate between Axileand Basal Placentation
iii. Differentiate between Actinomorphic and Zygomorphic
iv. Differentiate between Permanent and Meristematic tissue

Section –B

Q.2. Discuss Benthum and Hooker system in detail with reference to its merit and Demerits 08

Q.3. Discuss Racemose Inflorescence in detail. 08

Q.4. a) Discuss aims and objective of classification. 04

b) Discussbasic rules of ICBN. 04

Q.5. a) Drawfloral formula and Floral diagram of Family Liliaceae. 04

b). write down Four economic Importance of Family Liliaceae. 04

Q.6. Write down characteristic features of Asteraceae with floral formula and Floral diagram 08

Q.7. Write an easy on physical-chemical nature of Cell membrane. 08

Q.8. Define meristem. Discuss Meristematic tissue in detail. 08

Q.9 a) Write an essay on location, structure and function of Sclerenchyma tissue. 04

b) Describe internal structure of dicot leaf. 04

Subject: Chemistry	**B.A/B.Sc Part-I**	**Time:**03Hrs.
Paper: I	**Annual/18**	**Max. Marks:**40

Note: Attempt FIVE Questions. Section A is Compulsory, and two from Section B and two from C. Each question carries 8 marks.

SECTION A

Q.1. Attempt the following questions

I. Give an example to have an effect of steric hindrance on resonance.
II. Give the structure of smallest cycloalkane
III. Indicate the positions of more electron density in phenol
IV. Give the example of any chiral compound.
V. What is action of Nucleophile as compared to base?
VI. Which is more oxidized; ketone vs aldehyde?
VII. Give the formula of amide
VIII. Why pyrrole is aromatic as it is five membered ring?

SECTION B

Q.2. A) Draw the orbitals, and how they make sigma and pi bond.

B) What is hybridization? Give the bond angles and bond lengths for different hybridized form of C.

Q.3. A) write five functional groups of organic compounds and Give the structure of 3,4-dimethyl-4-isopropyloctane

B) Give the hydroboration of alkene and water based oxidation of alkyne

Q.4. A) Give Gatterman Koch and Ulmann reaction

B) Give the kinds with example to understand stereoisomerism

Q.5. A) What is resonance and inductive effect? Give groups, which have electron with drawing, and donating effect.

B) Give the carbene addition and perkin reaction for synthesis of cycloalkane.

SECTION C

Q.6. A) what is difference between SN1 and SN2 reaction with reference to order, steps and stereo outcomes

B) How chloroform give alpha elimination and 2-chlorbutane beta elimination?

Q.7. A) Give the two reactions for the preparation of alcohols

B) How pri-alcohol upon oxidation gives aldehyde and sec-alcohol gives ketone? Give reactions

Q.8. A) Express Oppenaur oxidation and pinacol pinacolon rearrangement.

B) Give cannizaro reaction in aldol condensation

Q.9. A) Give the derivatives of carboxlic acid and its substitutions reactions

B) Give the basicity of pyrrole and its formylation and alkylation reaction.

Subject: Chemistry	**B.Sc Part-I**	**Time:**03Hrs.
Paper: II	**Annual/18**	**Max. Marks:**40

Note: Attempt **five** questions in all. **Section-A** is compulsory, select **two** questions each from **section B and C**. All questions carry equal marks. Each part in **section B and C** carries 4 marks.

Section A

Q.1. Define any EIGHT parts from the following terms and give example where needed.

i.	Transport number	ii.	Phosphazenes
iii.	Tyndall effect	iv.	Chromophores
v.	Hittorf's rule	vi.	Overtones
vii.	Nuclear reaction	viii.	Thixotrophy
ix.	Vinegar	x.	Emulsions

Section B

Q.2. (a) What is nuclear reactor? Explain its various parts.

(b) Discuss the kinetics of nuclear decay.

Q.3. (a) What are aerosols? Discuss the significance of aerosols.

(b) What are protective colloids? What is meant by gold number? How lyophilic protects a lyophobic colloids.

Q.4. (a) Define Beers and Lamberts law and prove $I = I_o e^{-kx}$

(b) Define Hook's law and explain how it is obeyed by the vibrating bonds?

Q.5. (a) Define the term electrolysis. State and explain Faraday's laws of electrolysis what is the significance of these laws?

(b) Discuss briefly the Arrhenius theory of electrolytic dissociation. What are its limitations?

Section C

Q.6. (a) Name the main ores of Ag. How silver is extracted by using flow sheet diagram?

(b) What is chromatography? Explain descending paper chromatography.

Q.7. (a) What are ceramics? Write in detail what you know about glazing?

(b) What is Portland cement? How is it manufactured?

Q.8. (a) What are fertilizers? Describe various sources of fertilizers.

(b) What are nitrogenous and phosphate fertilizers?

Q.9. (a) What are synthetic dyes? Give their classification.

(b) What are silicon's and silicates? Give the preparation and application of silicones.

Subject: Zoology	**B.A/B.Sc Part-I**	**Time:** 03 Hrs.
Paper: I	**Annual 2018**	**Max. Marks:**40

Note: Attempt any five questions. Section A is compulsory. Attempt any four questions from Section B.

SECTION -A

Q.1. Write very short answers of following Questions. **1x8**

i. What is Cycliophora?

ii. Define Chemoorganotrrophic.

ii. Differentiate between Adhesive Gland and Release Gland.

iv. Define Gemmules.

v. What is Mantle Cavity?

vi. What is Metamerism?

vii. Define Eutely.

viii. Define Pellicle.

SECTION-B

Q.2. (a) Discuss Patterns of Organization? 4

(b) Compare and Contrast Protostome development with Deutrostome development? 4

Q.3. (a) Describe some characteristic of Amoebazoa? 4

(b) Explain life cycle of Plasmodium? 4

Q.4. (a) Describe different Cell types and and Skeleton in Porifera? 4

(b) Describe characteristic of members of Ctenophora? 4

Q.5. Write note on Followings

(a) Metamorphorsis 4

(b) Spidres Silk 4

Q.6. (a) Discuss reproduction in Turbellaria? 4

(b) Describe Structural Features of Nemertea? 4

Q.7. (a) Describe Shell in Mollusks? 4

(b) Write a brief note on Cephalopod Eye? 4

Q.8. (a) Discuss Nutrition in Annelids ? 4

(b) Write a note on Locomotion in leeches? 4

Q.9. (a) Describe Feeding and digestion in Echinoderms? 4

(b) Write a note on Regeneration in Echinoderms? 4

Subject: Zoology	**B.A/B.Sc Part-I**	**Time:**03Hrs.
Paper: II	**Annual/18**	**Max. Marks:**40

Note: Attempt any Five Questions in all. Section A is compulsory, Attempt four Questions from Section B

SECTION –A

Q.1. Do as directed (8)

i. What is receptor mediated endocytosis?
ii. Differentiate between phagocytosis and pinocytosis
iii. What is genetic code?
iv. Define directional selection
v. Differentiate between premating and postmating isolation
vi. Differentiate between cartilage and bone.
vii. Differentiate between hibernation and aestivation.
viii. Differentiate between visual communication and acoustic communication.

SECTION-B

Q.2. (a) Explain four major approaches in animal behavior (4)

(b) Give brief account of cytoskeleton. (4)

Q.3. (a) Differentiate simple diffusion and facilitated diffusion with examples (4)

(b) Explain meosis as genetic base of sexual reproduction (4)

Q.4. (a) Give a detailed account of transcription and translation in eukaryotes. (4)

(b) Explain activation energy of enzymes (4)

Q.5. (a) Elaborate Mendel's law of segregation with monohybrid cross. (4)

(b) What is role of paleontology in evolutionary study? (4)

Q.6. (a) Explain Lamarckisim with examples. (4)

(b) What do you know about Alfred Russel Wallace? Give an overview of his work (4)

Q.7. (a) What are various modes of selection (4)

(b) Explain the process of speciation (4)

Q.8. (a) Elaborate the process of glycolysis . (4)

(b) Explain lock and key model for enzyme activity. (4)

Q.9. (a) Elaborate the role of carbohydrate in energy storage and structural support . (4)

(b) Give a detailed account of Kreb,s cycle. (4)

Subject: Physics	**B.A/B.Sc Part-I**	**Time:**03Hrs.
Paper: I	**Annual/18**	**Max. Marks:**40

Directions: Attempt Five Questions in all, Section A is **Compulsory**, Attempt two questions from section B and two from section C. Use of cell phone as a calculator is not allowed

Section A

Q.1. Attempt any four parts **(2, 2, 2, 2)**

(i) Can two vectors having different magnitude be combined to give zero resultant? Can three vectors?
(ii) At what angle a projectile should be launched to obtain maximum range? Explain.
(iii) A particle has momentum equal to mc, what will its speed.
(iv) Explain how an air bag in automobile may help to protect a passenger from serious injury in case of collision.
(v) Long balancing pole helps a tightrope walker to maintain balance. How?

Section B

Q.2. (a) What are the dynamics of Uniform circular motion and illustrate any one application of Newton's laws to uniform circular motion? **05**

(b) Describe the physical phenomenon "Shooting a Falling Target" **05**

Q.3. (a) Describe the law of conservation of momentum with the help of figures. **05**

(b) Discuss the applications and importance of Laws of Conservations. **02**

(c)Discuss in detail the relationships between linear and angular variables. **03**

Q.4. (a) Discuss The Lorentz Transformation in detail. **05**

(b) Discuss in detail the effects of Einstein postulates on the Relativistic Addition of Velocities. **03**

Section C

Q.5. A body of mass m = 4.5 g is dropped from rest at a height 10.5 m above the Earth surface. Neglecting air resistance, what will be its speed be just before its strikes the ground. **08**

Q.6. Which has greater magnitude the angular momentum of the earth (Relative to its center) associated with its rotation on its axis or the angular momentum of the earth (relative to its center of the orbit) associated with its orbital motion around the earth. **08**

Q.7. What is the momentum of a proton moving at a speed of v = 0.86c? **08**

Q.8. A man of mass 65 Kg is running along a pier at a speed of 4.9 m/s. He jumps from pier in to rowboat of mass 88 Kg that is drifting without friction in the same direction at a speed of 1.2 m/s. When the man seated in the rowboat what is its final velocity? **08**

Subject: Physics	**B.Sc Part-I**	**Time:**03Hrs.
Paper: II	**Annual/18**	**Max. Marks:**40

Directions: Attempt Five Questions in all, Section A is Compulsory, Attempt two questions from section B and two from section C. Use of cell phone as a calculator is not allowed

SECTION - A

Q-1 Attempt any four parts **(2, 2, 2, 2)**

(i) Could we ever construct a true simple pendulum? Explain your answer.

(ii) Explain why the temperature of a gas drops in an adiabatic expansion?

(iii) Discuss the factors that improve acoustics in music halls.

(iv) Under what conditions would an ideal heat engine be 100% efficient?

(v) Why will sound not travel through a vacuum?

SECTION - B

Q-2(a) What is physical pendulum and derive an expression for the center of oscillation for a physical pendulum i.e

$$L=\frac{I}{Md} \qquad \textbf{(4)}$$

(b) Discuss Simple Harmonic Motion in detail and show that the period of motion is

$$T=2\pi\sqrt{\frac{k}{m}}\ . \qquad \textbf{(4)}$$

Q-3.(a) What is Doppler effect and derive an expression for frequency when

(i) Observer is moving and Source is at rest

(ii) Source is moving and Observer is at rest **(4)**

(b) Discuss Power and Intensity of sound waves. **(4)**

Q-4 (a) Discuss heat capacity and specific heat? **(3)**

(b) Define first Law of Thermodynamics and derive an expression for work down in thermal isolation **(5)**

SECTION - C

Q-5 A uniform disk is pivoted at its rim. Find its period for small oscillation and the length of equivalent simple pendulum. If the disk is pivoted at midway between rim and center then what will its period of Oscillation. **(8)**

Q-6 What are the three lowest frequencies for a standing wave on a wire 9.88 m long having a mass of 0.107 Kg, which is stretched under a tension of 236 N? **(8)**

Q-7 The gas in a cloud chamber at a temperature of 292 K under goes a rapid expansion. Assuming that the process is adiabatic, calculate the final temperature if $\gamma = 1.40$ and the volume expansion ratio is 1.28. **(8)**

Q-8 (a) An heat engine has an efficiency of 22%. It operates between heat reservoirs differing in temperature by 75 °C. Find the temperature of the reservoir? **(4)**

(b) An aluminum flag pole is 33 meter high. By how much does its length increase as the temperature increases by 15 °C **(4)**

Subject: Computer (Introduction to InfoTech) **B.A/B.Sc Part-I** **Time:** 03 Hrs.
Paper: I **Annual 2018** **Max. Marks:** 40

Note: Attempt any five questions in all. Section-A is compulsory. Select four questions from Section-B. All questions carry equal marks.

Section-A

Q.1. Answer the following: **8**

1) Name any two commonly used output devices.
2) What is protocol?
3) Which internet tool is used to copy files from one computer to another?
4) The hard disk of a computer has a capacity of 8 Gigabytes; how many bytes does it have?
5) What is a URL?
6) Define response time of an LCD Monitor or screen.
7) What are the two basic types of buses in a computer?
8) How is the speed of a Modem Measured?

Section-B

Q2. Explain CRT and flat-panel monitors. **8**

Q3. Define pipelining. **2**

How do Computers benefit individual's health care? **6**

Q4. What is the decimal equivalent of the hexadecimal number $1A5F_{(16)}$? **4**

Name and differentiate two main types of computer software. **4**

Q5. Explain two types of storage, i.e. magnetic and optical storage. **8**

Q6. Write short notes on:

a. Peer-to-peer networks **4**
b. Multiuser/multitasking operating systems **4**

Q7. Explain the role of Arithmetic Logic Unit and Control Unit in CPU. **6**

Why are mainframe systems usually limited in the number of tasks they perform? **2**

Q8. Explain how bar code reader and OCR (Optical Character Recognition) works. **8**

Subject: Computer	**B.A/B.Sc Part-I**	**Time:** 03 Hrs.
Paper: II	**Annual 2018**	**Max. Marks:**40

Note: Attempt any five questions in all. Section-A is compulsory.Select four Question from Section-B. All question carry equal marks.

Section-A

Q.1. Give short answer to the following:- (8)

a. What is OLE Usedfor?
b. What is the difference between a function and a sub (method)?
c. What is the difference between list-box and combo-box?
d. Name the four locking types in ADO.
e. What is the Object and Class?
f. What are the scope of the class?
g. What are the available technologies for accessing database from Visual Basic 6.0?
h. Differentiate b/w event driven programming and structured programming.

Section-B

Q.2. What is IDE? Discuss the following components of IDE?
Toolbar, project explorer, from Designer (8)

Q.3. Differentiate the following:-Load and Show Method. (8)

Q.4. Discuss the procedure of creating menu in VB? (8)

Q.5. What is control structure difference between IF-THEN- ELSE and CASE structure? (8)

Q.6. What are functions? How it is differ from procedure, explain? (8)

Q.7. What is an event? Narrate the Key Press, Key Up and Key Down event with examples. (8)

Q.8. Write the code segment using IF-THEN-ELSE to assign to status to variableRESULT on the bases of the following condition:

Condition
StatusMARKS grate than or equal to 90
"Excellent"MARKS grate than or equal to 75 and less than 90
"very Good"MARKS grate than or equal to 75 and less than 90
"Pass"MARKS grate than or equal to 50 and less than 75 "Failed"
(8)

Q.9. What is a simple function in VB, call it behind a button and show its result in a textbox.

Q.10. Narrate the following variable types:-Variant type , Object, Data, Boolean (8)

Subject: Statistics | **B.A/B.Sc Part-I** | **Time:** 03 Hrs.
Paper: I | **Annual 2018** | **Max. Marks:**40

Note: Attempt FIVE Questions in all. Section-A is compulsory. Select any FOUR Questions from Section-B. Use of calculator is allowed.

Section-A

Q.1. Attempt any Eight parts. 08

a) Write any two sources of secondary data.
b) Define classification.
c) Under what types of data geometric mean is preferred?
d) Differentiate between time series and index number
e) Differentiate between positive and negative correlation
f) What is secondary data?
g) Define moment's ratios.
h) Why we need to study measures of dispersions?
i) What is histogram?
j) What is difference between Laspayers and Paasche's Index Numbers?
k) Show that sum of deviation taking from mean is always zero.
l) Why we need to study quartiles, deciles and percentiles?

Section-B

Q.2. The tensile strength of silicone rubber is thought to be a function of curing temperature. A study was carried out in which samples of 12 specimens of the rubber were prepared using curing temperatures of 20◦C and 45◦C. The data below show the tensile strength values in megapascals.
20◦C: 2.07,2.14 ,2.22, 2.03 ,2.21 ,2.03 ,2.05 ,2.18 ,2.09, 2.14 ,2.11, 2.02
45◦C: 2.52, 2.15, 2.49,2.03 ,2.37, 2.05, 1.99, 2.42, 2.08, 2.42, 2.29, 2.01.

(a) Show a dot plot of the data with both low and high temperature tensile strength values. 02

(b) Compute sample mean tensile strength for both samples. 02

(c) Does it appear as if curing temperature has an influence on tensile strength, based on the plot? Comment further. 02

(d) Does anything else appear to be influenced by an increase in curing temperature? explain. 02

Q.3. a) What is coefficient of variation? Discuses it significance importance 04

b)The administrator of a hospital conduct a survey of the number of days patient stay in a hospital following an operation

Stay (in days)	1-6	7-12	13-18	19-24	25-30
Patients	10	20	6	4	3

Calculate the value of range and standard deviation and comments on result. 04

Q.4. a) Differentiate between

(i) Simple and composite index number(ii) Fix and chain base index number 04

PTO

b) Calculate base year weighted and current year weighted index numbers from the following data. **04**

Item	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	3	70	4	75
B	5	80	6	90
C	8	40	10	55
D	10	50	12	60

Q.5. a)Define (i) Seasonal Variation (ii) Deasonalization (iii) Secular Trend (iv) Semi Average **04**

b) Compute the seasonal indices for the data using percentage of annual average method. **04**

Years	Quarters			
	I	II	III	IV
2003	72	98	79	106
2004	79	122	101	143
2005	94	141	128	160
2006	125	143	135	187

Q.6. a) Derive the normal equations for first degree equation. **04**

b) Fit the curve $y = ax^b$ from the given data. **04**

x	0.2	0.4	0.5	1.3	2.4
y	3.4	5.2	5.8	6.0	7.3

Q.7. a) Define the terms (i) Standard Error (ii) Coefficient of determination (iii) Regression Coefficient (iv) Intercept **04**

b) Find the regression line yield on temperature from the given data **04**

x	50	53	54	59	62
y	122	118	128	121	125

Q.8. The following calculations are obtained from 15 experiment runs made on three variables

X_1, X_2 and X_3 $r_{12} = 0.559$ $r_{23} = 0 - 0.559$ $r_{31} = 0 - 0.726$

$\overline{X_1} = 11.34$, $\overline{X_2} = 7.03$ $\overline{X_3} = 16.07$ $S_1 = 2.326$ $S_2 = 1.431$ $S_3 = 1.887$

Find (i) Regression line to predict X_3 when X_1=10.3 and X_2=5.8

(ii) All possible partial correlation coefficient

(iii) All possible multiple correlation coefficient **2+3+3**

Subject: Statistics | **B.A/B.Sc Part-I** | **Time:** 03 Hrs.
Paper: II | **Annual 2018** | **Max. Marks:40**

Note: Attempt FIVE Questions in all. Section-A is compulsory. Select any FOUR Questions from Section-B. Use of calculator is allowed.

Section-A

Q.1. Attempt any Eight parts. 08

a) State Non Mutually Exclusive Events.
b) Define the term Random Experiment.
c) What value of 'K' makes the following a density function $f(x) = k\ {}^4C_x \qquad X = 0,1,2,3$
d) If 'x' is a discrete r.v prove that E(aX) = aE(X)
e) Differentiate between combination and permutation
f) Define Uniform distribution?
g) If P = 0.45 and n = 12 find Mean and Standard deviation of Binomial distribution.
h) Under what condition Binomial distribution tends to the Normal distribution
i) Let 'X' be $B(12,0.25)$ find $P(X \leq 4)$.
j) What is statistical independence? k) Show that f(x) is complete p.d.f. $f(x) = \lambda e^{-\lambda x},\ \lambda > 0,\ x > 0$

Section-B

Q.2. a) State and prove addition law of probability. 04

b) A statistics class for engineers consists of 25 industrial, 10 mechanical, 10 electrical, and 8 civil engineering students. If a person is randomly selected by the instructor to answer a question, find the probability that the student chosen is (i) An industrial engineering major (ii) A civil engineering or an electrical engineering major. 04

Q.3. a) If 3 books are picked at random from a shelf containing 5 novels, 3 books of poems, and a dictionary, what is the probability that (a) The dictionary is selected (b) 2 novels and 1 book of poems are selected? 04

b)The probability that a regularly scheduled flight departs on time is 0.83 the probability that it arrives on time is 0.82; and the probability that it departs and arrives on time is 0.78. Find the probability that a plane departed on time, given that it has arrived on time. 04

Q.4. a) Define the terms (i) Conditional probability (ii) Discrete random variable 04

b)Check whether the following is a density function, 'X' is continuous r.v

$f(x) = \frac{x^2}{3}$, $-1 < x < 2$ Also calculate $P(0 < x < 1)$ 04

PTO

Q.5. a)Suppose that joint distribution of 'x' and 'y' is $f(x,y) = x^2 + \frac{xy}{3}$, $0 \le x \le 1$, $0 \le y \le 2$

Compute (i) $P(x < \frac{1}{2})$ (ii) $P(y < \frac{1}{2} | x < \frac{1}{2})$. 04

b) Following are the given value of random variable 'x' find Find $E(X)$ and Var(X) 04

x	-1	0	1
P(x)	0.2	0.5	0.3

Q.6. a) Find variance of binomial distribution. 04

b) The probability that a certain kind of component will survive a shock test is 3/4. Find the probability that exactly 2 of the next 4 components tested survive. 04

Q.7. a) Lots of 40 components each are deemed unacceptable if they contain 3 or more defectives. The procedure for sampling a lot is to select 5 components at random and to reject the lot if a defective is found. What is the probability that exactly 1 defective is found in the sample if there are 3 defectives in the entire lot? 04

b) An inventory study determines that, on average, demands for a particular item at a warehouse are made 5 times per day. What is the probability that on a given day this item is requested more than 5 times? 04

Q.8. a) Write down properties of Normal Distribution. 04

b) An electrical firm manufactures light bulbs that have a life, before burn-out, that is normallydistributed with mean equal to 800 hours and a standard deviation of 40 hours. Find theprobability that a bulb burns between 778 and 834 hours.

(4)

Subject: Mathematics (A-Course) **B.A/B.Sc Part-I** **Time:**03Hrs.
Paper: I **Annual/18** **Max. Marks:**50

Note: Attempt **FIVE** questions in all, select **THREE** questions from section-A and **TWO** questions from section-B. All questions carry equal marks.

SECTION-A

Q.1. (a) Show that $\lim_{x \to 0} \frac{\cos x - 1}{x} = 0$ (b) Find $\lim_{x \to 0} (\cot x)^{\sin 2x}$ **10**

Q.2. (a) Find the velocity and acceleration of a particles $= -t^3 + 96\,t^2 + 195\,t + 10$ att = 30. **10**

(b) Differentiate with respect to x, if $f(x) = x\,a^x \sinh x$

Q.3. (a) If $y = (\arcsin x)^2$, prove that $y^{(n)}(0) = (n-2)^2(n-4)^2 \ldots 2^2 \cdot 2$, when n is even. **10**

(b) If $z = \sin^{-1}\left(\frac{x}{y}\right)$, verify that $\frac{\partial^2 z}{\partial x\,\partial y} = \frac{\partial^2 z}{\partial y\,\partial x}$

Q.4. (a) State and prove The Mean Value Theorem. **10**

(b) Show that$f(x) = x^3 - 3x + 2$is monotonically increasing on every interval.

Q.5. (a) Find the Maclaurin's series of the function $f(x) = \ln(1 + x)$ **10**

(b) $\lim_{x \to 0} \frac{\sqrt{x} - \sqrt{\sin x}}{x^{3/2}}$

SECTION-B

Q.6. Evaluate (a) $\int \frac{dx}{1 + \sqrt{x+1}}$ (b) $\int \frac{x^2}{(x-1)^3(x+1)} dx$ **10**

Q.7. Evaluate (a) $\int x \arcsin x\, dx$ (b) $\int \frac{dx}{(x+2)\sqrt{x+3}}$ **10**

Q.8. Evaluate (a) $\int_0^{\pi/2} \tan x \ln(\sin x)\, dx$ (b) $\int_0^{\infty} e^{-x} \sin x dx$ **10**

Subject: Mathematics (A-Course) **B.A/B.Sc Part-I** **Time:**03Hrs.
Paper: II **Annual/18** **Max. Marks:**50

Note: Attempt**FIVE** questions in all, selecting **TWO** questions from section-A and **THREE** questions from section-B. All questions carry equal marks.

SECTION-A

Q.1. (a) Find the locus of point in the plane satisfying the condition $\mathbf{Re}(i\bar{z}) = 3$ **05**

(b) Find |Z|, where $z = \frac{(3+4i)(-1+2i)}{(-1-i)(3-i)}$ **05**

Q.2. (a) Prove that $\cos 5\theta = 16\cos^5\theta - 20\cos^3\theta + 5\cos\theta$ **05**

(b) Separate $(\alpha + i\beta)^{(p+iq)}$ into real and imaginary parts. **05**

Q.3. (a) Solve the equation $x^5 + 1 = 0$ **05**

(b) Evaluate the sum of the infinite series **05**

$$1 + \frac{1}{2}\cos 2\theta - \frac{1}{2\cdot 4}\cos 4\theta + \frac{1\cdot 3}{2\cdot 4\cdot 6}\cos 6\theta \ldots\ldots$$

SECTION-B

Q.4. (a) For what value of λ will the equation $x^2 - 10xy + 12y^2 + 5x - 16y - 3 = 0$ represents a pair of straight lines. **05**

(b) Show that the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ has asymptotes $y = \frac{b}{a}x$ and $y = \frac{-b}{a}x$. **05**

Q.5. (a) Show that the pedal equation of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is $\frac{1}{p} = \frac{1}{a^2} + \frac{1}{b^2} - \frac{r^2}{a^2b^2}$ **05**

(b) Transform the equation $x^2 + y^2 - 8x + 6y + 7 = 0$ in polar coordinates. **05**

Q.6. (a) Find the parametric equations, direction ratios, direction cosines and measures of the direction angles of the line passing through (-3, 4, 2) and (4, -5, 7). **05**

(b) Find equations of the straight line planes passing through the point (0, -3, 2) and parallel to the straight line joining the points (3, 4, 7) and (2, 7, 5). **05**

Q.7. (a) Find an equation of the plane which is perpendicular bisector of the line segment joining the points (3, 4, -1) and (5, 2, 7). **05**

(b) Prove that the straight lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$ and $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ are coplanar. **05**

Q.8. (a) Find the cylindrical coordinates of the point $(2\sqrt{3}, 2, -2)$. **05**

(b) Write an equation of the right circular cylinder with radius 2 and Centre at (3, 0, 5). **05**

Subject: Mathematics (B-Course) **B.A/B.Sc Part-I** **Time:**03Hrs.
Paper: I **Annual/18** **Max. Marks: 50**

Note: Attempt ***TWO*** questions from Section-A and ***THREE*** questions from Section-B.

Section-A

Q.1. **a.** For any two elements a, b in a group G, the equations $ax = b$ and $xa = b$ have unique solutions.

b. Show that in a group of even order, there is at least one element of order 2.

Q.2. **a.** Let G be a group and H a subgroup of G. Then the set $aHa^{-1} = \{aha^{-1}: h \in H\}$ isa subgroup of G.

b. If H is a subgroup of G. Then the set $H.H = \{h_1h_2:\ h_1, h_2 \in H\} = H$.

Q.3. **a.** Prove that the set of complex valued functions I, f, g and h defined on the set $\mathbb{C}\backslash\{0\}$ by $I(z) = z$, $f(z) = -z, g(z) = \frac{1}{z}, h(z) = \frac{-1}{z}, z \in \mathbb{C}\backslash\{0\}$ forma group under composition of functions.

b. Let H and K be two finite subgroups of G with relatively prime order. Prove that $H \cap K = \{e\}$.

Section-B

Q.4. **a.** Prove that AA^t and A^tA are symmetric for any square matrix A.

b. Show that $\begin{bmatrix} 1 & -3 & -4 \\ -1 & 3 & 4 \\ 1 & -3 & -4 \end{bmatrix}$ is nilpotent. What is its nilpotency index.

Q.5. **a.**For what value of λ the equations

$$(5-\lambda)x_1 + 4x_2 + 2x_3 = 0$$
$$4x_1 + (5-\lambda)4x_2 + 2x_3 = 0$$
$$2x_1 + 2x_2 + (2-\lambda)x_3 = 0$$

Have a nontrivial solution. Find these solutions.

b. Let A and B be matrices of order 6: $det(AB^2) = 72, det(A^2B^2) = 144$. Find $det(2A)$&$det(AB^6)$.

Q.6. **a.**Prove that $\begin{vmatrix} 1 & 1 & 1 \\ \alpha & \beta & \gamma \\ \beta\gamma & \alpha\gamma & \alpha\beta \end{vmatrix} = (\alpha-\beta)(\beta-\gamma)(\gamma-\alpha)$.

b. Find the Rank of the matrix $A = \begin{bmatrix} 5 & 9 & 3 \\ -3 & 5 & 6 \\ -1 & -5 & -3 \end{bmatrix}$.

Q.7. **a.**Let U and W be 2 dimensional subspaces of R^3. Show that $U \cap W \neq \{0\}$.

b. Determine whether or not the set $\{(1,2,-1), (0,3,1), (1,-5,3)\}$is a basis for $\mathbb{R}^3$.

Q.8. **a.**A linear transformation $T: \mathbb{R}^2 \to \mathbb{R}^3$ maps the vector $(1,1)$, into $(0,1,2,)$ and the vector $(-1,1)$, Into $(2,1,0)$.What matrix does T represent with respect to the standard bases for $\mathbb{R}^2$ and $\mathbb{R}^3$.

b. Let $v_1 = (1,1,1), v_2 = (1,1,0), v_3 = (1,0,0)$ be a basis for $\mathbb{R}^3$.

Find a linear transformation $T: \mathbb{R}^3 \to \mathbb{R}^2$:

$T(v_1) = (1,0), T(v_2) = (2,-1), T(v_3) = (4,3)$.

Subject: Mathematics (B-Course) **B.A/B.Sc Part-I** **Time:**03Hrs.
Paper: II **Annual/18** **Max. Marks:**50

Note: Attempt ***TWO*** questions from Section-A and ***THREE*** questions from Section-B

Section-A

Q.1. **a.** Show that if p is prime and$p \mid ab$, where$a, b \in Z$, then either $p \mid a$ or$p \mid b$.

b. Prove that the number of primes is infinites.

Q.2. **a.** Find the solution set of .the linear Diophantine equation $111x + 15y = 21$.

b. If $(d, e) = 1$ and "de" is a perfect square, then both "d" and "e" are perfect squares

$Q.3.$ ***a.*** Show that the arithmetic function $d(n)$ is odd if and only if n is a square.

b. Solve the following system of simultaneous linear congruence$x = 2 (\text{mod } 3), x = 3 (\text{mod } 5)$.

Section-B

Q.4. **a.**If (X, d) is a metric space, then$|d(x, z) - d(y, z)| \leq d(x, y)$.

b. In a metric space an open ball is open.

Q.5. **a.**If (X, d) is a metric space, then$\overline{AUB} = \bar{A}U\bar{B}$.

b. Let $X = \{a, b, c, d, e\}$ and $\Im = \{\varphi, \{b\}, \{a, d\}, \{a, b, d\}, \{a, c, d, e\}, X\}$. Show that $\Im$ is a topology on X.

Q.6. **a.** Show that in a topological space(X, τ), union of finite number of closed sets is closed.

b. Let $X = \{a, b, c, d\}$ and $\Im = P(X)$ be a discrete topology on X. Find the smallest base for $\Im$.

Q.7. **a.**Let $X = \{a, b, c, d\}$ and$\tau = \{\varphi, \{a\}, \{b\}, \{a, b\}, X\}$. Find neighborhoods of all $x \in X$.

b. Show that $S = \{(1,0,1), (0,1,1)(0,0,1)\}$is a basis of$\mathbb{R}^3$. Using the Gram-Schmidt process, transform it into an orthonormal basis.

Q.8. **a.**For what value of $k, < u, v > = u_1v_1 - 3u_1v_2 - 3u_2v_1 + ku_2v_2$ is an inner product on $\mathbb{R}^2$.

b. Find the eigenvalue and corresponding eigenvector vector of the matrix: $\begin{bmatrix} 1 & -3 & 3 \\ 3 & -5 & 3 \\ 6 & -6 & 4 \end{bmatrix}$.

Subject: General Math | **B.A/ B.Sc (Part-I)** | **Time:**03Hrs.
Paper: I | **Annual 2018** | **Max. Marks:**50

Note: Attempt five questions in all, selecting TWO from Section-I and THREE from Section-II.

Section-I

Q.1 (a) Solve the inequalities $|5x + 6| \geq 5$ and then show the solution sets as graphs of intervals or union of intervals. (05)

(b) Let $f : R \to R$ defined by $f(x) = \sqrt{1 - x^2}$. Find domain and range of the function. (05)

Q.2 (a) Express $1 - i\sqrt{3}$ in the polar form. (05)

(b) Prove that $(cos\theta + i\ sin\theta)^n = cosn\theta + isinn\theta$, for all non-negative integers n. (05)

Q.3 (a) Prove that $cos^4\theta + sin^4\theta = \frac{1}{4}(cos4 + 3)$. (05)

(b) Evaluate the sum of the infinite series

$$sin\theta + \frac{1}{2}\ sin3\theta + \frac{1\ .\ 3}{2\ .\ 4}\ sin5\theta + ...$$

(05)

Section-II

Q.4 (a) If matrices A and B are conformable for the sum $A + B$, the show that $(AB)^t = B^tA^t$, where A^t stands for transpose of A and so on. (05)

(b) Define period of matrix. Show that

$$\mathbf{A} = \begin{bmatrix} 1 & -3 & -4 \\ -1 & 3 & 4 \\ 1 & -3 & -4 \end{bmatrix}$$

is nilpotent. (05)

Q.5 (a) What is rank of a matrix? Find the rank of

$$\mathbf{A} = \begin{bmatrix} 3 & 0 & 2 & 2 \\ -6 & 42 & 24 & 54 \\ 21 & -21 & 0 & -15 \end{bmatrix}.$$

(01,04)

(b) For what value of λ the system of linear equations

$$\begin{aligned} (5 - \lambda)x_1 + 4x_2 + 2x_3 &= 0 \\ 4x_1 - (5 - \lambda)x_2 + 2x_3 &= 0 \\ 2x_1 - 2x_2 - (2 - \lambda)x_3 &= 0 \end{aligned}$$

have nontrivial solutions. Find the solutions. (05)

Q.6 (a) Prove that

$$\begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (a - b)(b - c)(c - a).$$

(05)

Continue...

(b) Solve the following equations for x:

$$\begin{vmatrix} 1+x & 1 & 1 & 1 \\ 1 & 1+x & 1 & 1 \\ 1 & 1 & 1+x & 1 \\ 1 & 1 & 1 & 1+x \end{vmatrix} = 0.$$

(05)

Q.7 (a) Analyze and sketch the conic represented by $x^2 - y^2 + 2x + 6y = 12$. (05)

(b) Show that from any point three normals can be drawn to a parabola $y^2 = 4ax$ and the sum of the slopes of the three normals is zero.

Q.8 (a) Show that the pedal equation of the ellipse

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

is

$$\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2} - \frac{r^2}{a^2 b^2}$$

(05)

(b) Show that the curves $r^m = a^m cosm\theta$ and $r^m = a^m sinm\theta$ cut each other orthogonally. (05)

Subject: General Math | **B.A/ B.Sc (Part-I)** | **Time:**03Hrs.
Paper: II | **Annual 2018** | **Max. Marks:**50

Note: Attempt five questions in all, selecting THREE from Section-I and TWO from Section-II.

Section-I

Q.1 (a) Prove that

$$\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^x = e.$$

(05)

(b) What is continuity, discuss the continuity of

$$f(x) = \begin{cases} x-4, & if\ -1 < x \leq 2 \\ x^2-6, & if\ 2 < x < 5 \end{cases}$$

at $x = 2$. (01,04)

Q.2 (a) Find $\frac{dy}{dx}$ if $y = ln(x+\sqrt{x^2-1}\,)$. (05)

(b) Evaluate

$$\lim_{x\to 0}\left(\frac{1}{x} - cotx\right).$$

(05)

Q.3 (a) State and prove Mean Value Theorem. (05)

(b) Use the Mean Value Theorem to show that

$$\left|\frac{cosax - cosbx}{x}\right| \leq |b-a|$$

if $x \neq 0$. (05)

Q.4 (a) Apply Taylor's Theorem to prove that

$$(a+b)^m = a^m + \frac{m}{1!}a^{m-1}b + \frac{m(m-1)}{2!}a^{m-2}\,b^2 + ...$$

for all real m, $a > 0$, $-a < b < a$. (05)

(b) Find the Maclaurin series of $f(x) = cosx$. (05)

Q.5 (a) If $y = (arc\ sinx)^2$ then prove that $(1-x^2)y'' + xy' - 2 = 0.$, also show that $y^{(n)}(0) = (n-2)^2\ (n-4)^2...2^2.2$, when n is even. (05)

(b) If $f(x,y) = e^x\ cosy + e^y\ cosx$, then prove that $\frac{\partial^2 f}{\partial x^2} + \frac{\partial^2 f}{\partial y^2} = 0.$ (05)

Section-II

Q.6 (a) Evaluate $\int \frac{dx}{(1+x^2)arc\ tanx}$. (05)

(b) Using Integration by Parts evaluate $\int x^2\ e^x\ dx$. (05)

Q.7 (a) By definition, evaluate $\int_a^b\ sinx\ dx$. (05)

(b) Evaluate $\int_0^{\pi/4} ln(1+tanx)\ dx$. (05)

Q.8 (a) Calculate $\int_{-\infty}^{\infty} \frac{1}{1+x^2}\ dx$. (05)

(b) Using reduction formula evaluate $\int cot^5x\ csc^4x\ dx$. (05)

Subject: Geography	**B.A/ B.Sc (Part-I)**	**Time: 3 Hours**
Paper: Elective	**Annual 2018**	**Max. Marks: 70**

نوٹ: کل پانچ سوالات کے جوابات دیں۔تمام سوالات کے نمبر مساوی ہیں۔اپنے جوابات خاکہ اور ڈائیگرام کے ساتھ بیان کریں۔

NOTE: Attempt any Five Questions. All questions carry equal marks. Illustrate your answers with sketches and diagrames.

Q.1. what is meant by Precipitation?Describe its forms in detail. (2+12)

سوال نمبر۱۔ریزش سے کیا مراد ہے؟اسکی مختلف اقسام تفصیل سے بیان کریں۔

Q.2. Describe composition and significance of the atmosphere. Also explain the vertical distribution of temperature. (7+7)

سوال نمبر۲۔کرہ ہوا کی ترکیب اور اہمیت بیان کریں۔نیز درجہ حرارت کی عمودی تقسیم بھی بیان کریں۔

Q.3. Describe the Internal structure of the Earth. (14)

سوال نمبر۳۔زمین کی اندرونی ساخت بیان کریں۔

Q.4. Give an account of the currents of the Indian Ocean.Explain their seasnal change. (10+4)

سوال نمبر۴۔بحر ہند کی رَوؤں کا حال بیان کریں۔ان کی موسمی تبدیلی کی وضاحت کریں۔

Q.5. What is the difference between weather and climate? Describe the chacteristics of Monsoon Rainforest (Am) climate. (4+10)

سوال نمبر۵۔موسم اور آب وہوا میں کیا فرق ہے؟مون سونی بارش کے جنگلات کی آب وہوا Am کی خصوصیات بیان کریں۔

Q.6. Describe the landforms made by the erosin of River. (14)

سوال نمبر۶۔دریا کے عمل کٹاؤ سے بننے والے خدوخال بیان کریں۔

Q.7. Give the difference between weathering and denudation.Explain the process of chemical weathering. (4+10)

سوال نمبر۷۔موسم زدگی اور عریاں کاری کے درمیان فرق واضح کریں۔ کیمیائی موسم زدگی کے عمل کو بیان کریں۔

Q.8. What is soil?Describe the major components and texture of the soil. (4+5+5)

سوال نمبر۸۔مٹی کی تعریف کریں۔مٹی کے اہم اجزا اور بناوٹ بیان کریں۔

Q.9. Discuss the possible causes and distribution of Earthquackes in the world. (10+4)

سوال نمبر۹۔زلزلوں کی ممکنہ وجوہات اور دنیا میں انکی تقسیم بیان کریں۔

Q.10. Write short note on any two of the following. (7+7)

سوال نمبر۱۰۔مندرجہ ذیل میں سے کسی دو پر نوٹ تحریر کریں۔

i. Big Bang Theory بگ بینگ نظریہ۔ ii. Metamorphic rocks متغیر چٹانیں۔

iii. Monsoon Winds مون سون ہوائیں۔ iv. Air Masses ایر ماسز (ہوئی ذخیرے)۔

==========

Subject: Economics	**B.A/ B.Sc Part-I**	**Time:**03Hrs.
Paper: Elective	**Annual/ 2018**	**Max. Marks:**100

Part One (Compulsory)

Q.1	Give short answers of the following .	(10 x 2)	مندرجہ ذیل کے مختصر جوابات تحریر کریں۔	سوالنمبر 1
I	According to Robbins "What is economics"?		رابنز کے مطابق "معاشیات سے کیا مراد ہے؟	I
II	What is" consumer's Price Line"?		صارف کے خطِ قیمت سے کیا مراد ہے؟	II
III	What is "Socialism"?		اشتراکیت کیا ہے؟	III
IV	What is "Cross Elasticity of Demand"?		طلب کی متقاطع لچک سے کیا مراد ہے؟	IV
V	What is "Marginal Rate of Technical Substitution"?		شرح مختتم فنی اسبدال سے کیا مراد ہے؟	V
VI	What is meant by "Least Cost Combination"?		عاملین کے کم سے کم لاگتے کے اشتراک سے کیا مراد ہے؟	VI
VII	What is "Income Elasticity"		آمدنی لچک سے کیا مراد ہے؟	VII
VIII	Define "Wealth".		دولت کی تعریف کریں۔	VIII
IX	Define "Giffen Goods"		گفن اشیاء کی تعریف کیجئے۔	IX
X	Define "Monopolistic Competition".		اجارہ دارانہ مقابلہ سے کیا مراد ہے۔	X

Part-Two (any Two)

Q.2 Discuss the importanc, merits and limitations of Microeconomics. Discuss the basic problems of Microeconomics. Define Economics. (5, 5, 5, 5)

سوالنمبر 2 جزوی معاشیات کی اہمیت، خوبیاں اور حدود بیان کریں۔ جزوی معاشیات کے بنیادی مسائل بیان کریں۔

Q.3 Define Indifference curve. Explain the Consumer's equilibrium with the help of Indifference curves approach. (5,15)

سوالنمبر 3 خطِ عدم ترجیح کی تعریف کریں۔ خطوط عدم ترجیح کی مدد سے صارف کے توازن کی تشریح کریں۔

Q.4 Explain the "Law of Variable Proportions ". (20)

سوالنمبر 4 قانون متغیر تناسب کی وضاحت کریں۔

Q.5 Write down the note on any two of the following: (10,10)

a) Equilibrium of the Firm under perfect competition when firm is earning super normal profit.

b) Price Discrimination.

c) Modern theory of Pricing of Factors of Production.

Part-3 (Any one)

سوالنمبر 5 کسی دو پر نوٹ لکھیں۔

ا مکمل مقابلہ کے تحت فرم کا توازن جبکہ فرم نارمل منافع کمارہی ہو۔

ب امتیاز قیمت۔

ج عاملین پیدائش کے معاوضوں کے تعین کا جدید نظریہ۔

Q.6 a) Define the following. (10)

(10)

i) Function ii) Parameter iii) Derivative iv) Limit

b) With the help of following equations find the equilibrium price and equilibrium quantity Prove it with the help of diagram. (10)

$$Qd = 20-5p$$
$$Qs = 4+3p$$

Q.7 Following Cost function is given find the quantity where AC=MC. (20)

$$C = Q^3 - 12Q^2 + 60Q$$

P.T.O

Part-4 (any one)

Q.8 a) Define "Median". (5, 15)

b) Calculate "Mode "and Standard Deviation" from the following data

Group	0-10	10-20	20-30	30-40	40-50	50-60
f	9	16	20	25	18	12

Q.9 Calculate Fisher's Ideal Index number for (20)

i) 1934, taking 1927 as base year.

ii) 1927, taking 1934 as base year.

Commodity	1927		1934	
	Price(Rs)	Quantity(Q)	Price(P)	Quantity(Q)
C1	4.50	90	9.30	100
C2	3.70	10	6.40	11
C3	2.70	03	5.10	05