

00 JUN 2023

Roll No.

Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (Non Medical) (Sem-3)  
ANALYSIS-I

Subject Code : BSNM-305-18  
M.Code : 76904

Date of Examination : 27-05-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

- Solve :
  - State Cauchy's integral test.
  - Define conditionally convergent series.
  - State first mean value theorem.
  - Give an example of a Riemann integrable function having infinite number of points of discontinuity.
  - Compute  $\Gamma\left(-\frac{3}{2}\right)$ .
  - State relationship between Beta and Gamma function.
  - State Abel's test.
  - Prove symmetry of beta function.
  - Explain conditional convergence of improper integrals of second kind.
  - Prove that  $\sum \frac{n}{n^2 - 2n}$  is divergent.

**SECTION-B**

- Test the convergence of  $\sum \frac{(n!)^2 x^{2n}}{(2n)!}$
- Test the convergence of  $\sum_{n=2}^{\infty} \frac{1}{[\log(\log n)]^n}$
- Prove that every continuous function is integrable.
- Show that the function  $\int_0^{\infty} x^{n-1} e^{-x} dx$  is convergent if and only if  $n > 0$ .
- Prove that  $\int_0^1 x^{m-1} (1-x^2)^{n-1} dx = \frac{1}{2} \beta\left(\frac{1}{2}, m, n\right)$

**SECTION-C**

- If  $f$  is Riemann integrable function on  $[a, b]$ . Show that the function  $F$  defined by  $F(x) = \int_a^x f(t) dt \forall x \in [a, b]$  is differentiable from the right at each  $x_0$  such that  $a < x_0 < b$  for which  $f$  is continuous from the right.
  - Prove that the function  $f$  defined on  $[0, 4]$  by  $f(x) = [x]$ , where  $[x]$  denotes the greatest integer not greater than  $x$ , is integrable on  $[0, 4]$  and  $\int_0^4 f(x) dx = 6$ .
  - Show that  $\int_0^{\infty} \frac{\sin x}{\log x} dx$  conditionally convergent.
  - Prove that  $\Gamma(n) \Gamma\left(n + \frac{1}{2}\right) = \frac{\sqrt{\pi}}{2^{2n-1}} \Gamma(2n)$ ,  $n > 0$ .

B.Sc

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B.Sc. (Non-Medical) (Sem.-6)  
**DRUG ABUSE-II (MANAGEMENT AND PREVENTION)**  
Subject Code : BSNM-609-18  
M.Code. : 79502  
Date of Examination : 16-05-2023

Max. Marks : 50

Time : 3 Hrs.

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

- Write briefly :
  - Explain the concept of drug abuse.
  - What are the physical indications of drug abuse?
  - What is the long-term effect of drugs?
  - How a teacher can be a role model in the prevention of drugs?
  - How drug abuse can be controlled?
  - "Education and awareness can be the reason for prevention from drug abuse". Explain.
  - What is drug addiction?
  - How drug abuse is different from drug addiction?
  - What is the objective of a schooling-based drug prevention program?
  - What is the role of family supervision in drug prevention?

**SECTION-B**

- Short note on time-bound trials?
- Why young children are more prone to drug addiction?
- How the school can be an important agency for the prevention of drug abuse?
- What are the ways of dealing with the withdrawal effects of drugs?
- Write a note on campaigns against drug abuse and enforcement of laws

**SECTION-C**

- Discuss the role of legislation in the prevention of drug abuse.
- Family can play a major role in preventing relapse of drug abuse. Comment.
- Discuss the loopholes in NDPS act?

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B.Sc. (Non-Medical) (Sem.-6)

ENGLISH-VI

Subject Code : BSNM-607-18

M.Code. : 79499

Date of Examination : 18-05-2023

Time : 3 Hrs.

Max. Marks: 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- Whose horoscope is Frank Lubey making at the beginning of the play?
- Quality of good report
- Body language for interviews
- Objectives of oral presentation
- Functions of communication at workplace
- Difference between active and passive voice.

Substitute the following with one word :

- An imaginary ideal society free of poverty and suffering.
- A room or building equipped for gymnastics & other physical exercise .
- A storehouse for threshed grain.
- A piece of enclosed land planted with fruit trees .

**SECTION-B**

2. Write the meanings of following words and make sentences using these words: Considerate, inspiration, overwhelming, outstretched, overcome

3. Fill in the blanks with either past continuous or simple past form of the verbs given in brackets :

- When I \_\_\_\_\_ (enter) the class, the students \_\_\_\_\_ (draw) cartoon of the teacher on the blackboard.
  - When I \_\_\_\_\_ (teach) in the class, some students \_\_\_\_\_ (make) a noise.
  - When my mother \_\_\_\_\_ (cook) food in the kitchen, some boys \_\_\_\_\_ (play) football in the street.
  - When I \_\_\_\_\_ (water) the plants, some birds \_\_\_\_\_ (chirp).
  - He \_\_\_\_\_ (watch) television, when I \_\_\_\_\_ (reach) home.
4. Discuss how a formal presentation can be made most effective?
5. Correct the following sentences :
- The woman which works here is from Japan.
  - Every students like the teacher.
  - Although it was raining, but we had the picnic.
  - I enjoyed from the movie.
  - Where I can find a bank?
  - What does Ann tell George about her leaving the Kellers?

**SECTION-C**

7. Write a report on a survey conducted to analyze the reasons why majority of the students want to go to foreign countries. Invent the necessary details.

8. Explain why Joe Keller upholds wealth in high regard. Do you think that his perspective of money good? Give reasons to justify your answer.

9. Describe all the Do's and Don'ts while appearing for an interview.

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B.Sc (Non Medical) (Sem.-3)  
**THERMAL PHYSICS**

Subject Code : BSNM-304-18

M.Code : 76903

Date of Examination : 18-05-2023

Max. Marks : 50

Time : 3 Hrs.

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- What is the concept of reversible engine?
- Efficiency of Carnot's engine does not depend upon the properties of the working substance. Why?
- Entropy of universe always increases. Why?
- Why only four thermodynamical variables are defined.
- Define critical temperature of a gas.
- What is the probability of drawing a king from a pack of 52 cards?
- What is meant by the term thermodynamic probability of a microstate?
- What are the main points of difference between classical and quantum statistics?
- What are bosons?
- What is adiabatic demagnetization?

**SECTION-B**

- State and prove Carnot's theorem for a reversible heat engine.
- Derive Clausius Clapeyron's latent heat equation using thermodynamic relations.
- Explain the terms Macrostate and Microstate. Illustrate by distributing four particles in two compartments.
- Calculate the number of different arrangements of 8 indistinguishable particles in 10 cells of equal a priori probability considering that one cell contains only one particle.
- Name the three kind of statistics. Explain the distinguishing features of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics.

**SECTION-C**

- What is Joule-Thomson effect? Obtain an expression for change in temperature during Joule-Thomson effect. Give thermodynamical treatment to explain cooling and heating effect.
- Discuss the distribution of 'r' distinguishable particles into 'k' compartments of unequal size each one of which is further subdivided into 'g' cells of equal a priori probability.
- Treating the ideal gas as a system governed by classical statistics derive the Maxwell Boltzmann law of distribution of molecular energies.

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B.Sc. (Non Medical) (Sem.-3)  
ENGLISH-III

Subject Code : BSNM-307-18  
M.Code : 76906

Date of Examination : 20-05-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- a) Note making
- b) Gerunds
- c) Write two types of Participles with examples.
- d) Exchanging greetings
- e) Importance of writing skills
- f) Technical vocabulary
- g) Self introduction
- h) Telephone etiquettes
- i) Formal greeting
- j) Abstract writing.

**SECTION-B**

2. Guidelines to inquire on the phone.
3. Do's and don'ts when introducing people to others.
4. How to introduce oneself in a social setting?
5. What things need to be considered when taking leave?
6. How to deal with a wrong number?

**SECTION-C**

7. Discuss in detail, the summary and analysis of 'The Gift of the Magi'.
8. What is the importance of writing abstracts and summaries? Cite examples.
9. State the message depicted in 'Stay Calm' to the readers.

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B.Sc (Non-Medical) (Sem.-6)  
PHYSICAL CHEMISTRY-IV  
Subject Code : BSNM-602-18  
M.Code : 79494

Date of Examination : 20-05-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- What is black body?
- Explain zero point energy.
- Define Lattice energy.
- What are miller indices?
- Explain the term quantum yield.
- What is chemiluminescence?
- What is an operator?
- What is the significance of a normalized eigen function?
- What is the key feature of wave mechanics?
- What are lasers?

**SECTION-B**

- A 0.005M aqueous solution of a certain substance absorbs 15% of the incident light in a Lambert - Beer law cell of path length 2cm. Calculate the concentration required for 90% absorption of the incident light.
- An electron is confined to a potential well (one dimensional) having width of 0.2nm. Determine the ground state energy for this electron.
- Calculate the angles at which first, second and third order reflections are obtained from planes 500pm apart using X-rays of wavelength 100pm.
- Explain the laws of photochemistry.
- Give the postulates of quantum mechanics.

**SECTION-C**

- Derive the Bragg equation for X-ray crystallography and what is superconductivity?
- Explain the terms photosensitization and quenching. Discuss the mechanism of photosensitization and quenching taking suitable examples.
- Derive Schrodinger equation for hydrogen like atoms and give its importance.

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Total No. of Questions : 09

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B.Sc. (Non-Medical) (Sem.-3)  
ORGANIC CHEMISTRY-II  
Subject Code : BSNM-301-18  
M. Code : 76900

Date of Examination : 22-05-23

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

I. Write briefly :

- Compare the reactivity of chlorobenzene and benzyl chloride.
- Why is the formation of benzyne intermediate necessary during the conversion of chlorobenzene into aniline with sodium amide in liquid ammonia?
- What is the role of  $\sigma$  and  $\pi$  complexes?
- Cyclobutadiene is a cyclic compound and has alternate double and single bonds but it is not included among aromatic compounds. Explain.
- What happens when glycol is treated with  $\text{HIO}_4$ ?
- Discuss any two methods for the synthesis of phenol.
- Why is phenoxide ion more resonance stabilized than phenol?
- How do you synthesize ketone using 1,3-dithiane?
- Draw the mechanism of Wittig reaction.
- $\text{LiAlH}_4$  is more reactive but less selective than  $\text{NaBH}_4$ . Explain with example.

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**SECTION-B**

- Nucleophilic aromatic substitution occurs by two mechanisms namely addition-elimination mechanism and elimination-addition mechanism. Explain with suitable example and mechanisms.
- Discuss the mechanisms of :
  - nitration
  - halogenation of aromatic electrophilic substitution reactions.
- Write a short note on :
  - Claisen rearrangement
  - Pinacol-pinacolone rearrangement.
- Discuss the mechanism of :
  - Perkin reaction
  - Mannich reaction.
- How methyl group is activating the benzene ring? Explain the orientation of methyl group towards the aromatic electrophilic substitution reaction.

**SECTION-C**

- Explain the synthesis and reactions of vicinal glycols.
- Write a short note on halogenation of enolizable ketones.
- Show the mechanism of following reactions :
  - Benzoin condensation
  - Clemmensen reduction
  - Knoevenagel condensation.
- Compare the mechanism of nucleophilic substitution reactions of alkyl halides.
  - How do acetals use as a protecting group? Explain.

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Total No. of Pages : 03

Total No. of Questions : 09

B.Sc. (Non-Medical) (Sem.-4)  
ENGLISH-IV

Subject Code : BSNM407-18

M.Code : 77685

Date of Examination : 24-05-23

Max. Marks : 50

Time : 3 Hrs.

INSTRUCTIONS TO CANDIDATES :

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

- Spoken skills to seek clarification
- Analytical report
- Types of past tense
- Difference between active and passive voice
- Difference between prose and poetry
- Complex sentence
- Difference between affirmative and negative sentence
- Difference between Resume and CV
- Spoken skills while apologizing
- Spoken skills for making request

SECTION-B

2. Write the meanings of following words and make sentences using these words: filthy, disgusting, faint, liar, concealed

3. Change the active voice into passive voice:

- Sakta is singing a song.
  - They have cut all telephone wires.
  - Do cats catch mice?
  - They were making a noise.
  - Had the boys eaten all the cakes?
4. Draft your resume for the post of Assistant Professor in a reputed college. Invent the necessary details.

5. Transform the following sentences:

Change the adverb too:

- He is too honest to accept a bribe.
- The news is too good to be true.

Change the degree of comparison:

- Mumbai is one of the biggest towns in India.
- Lead is heavier than any other metal.

Change into assertive sentence:

- What a fool you are!

6. Discuss the spoken skills required in day-to-day conversation and while working at a professional place.

SECTION-C

7. Write a report on a survey done to analyze the reasons behind the drastic increase in number of students going to foreign countries for higher education. Invent the necessary details.

8. Write any 20 dialogues shared between a photographer and a customer.



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9. Correct the errors in the use of tenses:

- a. The Mughals have won the battle of Panipat.
- b. We had gone to the cinema last night.
- c. I finished my work before he came to see me.
- d. He will reach home before the sun will set.
- e. He told me that she was ill for 6 days.

Change direct speech into indirect speech:

- f. Afzal said, "This is the pen I like".
- g. Bali said, "Here is the stick we have been looking for".
- h. He said to me, "I can easily beat you in the long jump".
- i. Rama said to me, "When will you return"?
- j. He said to me, "Do you play football"?

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B.Sc. (Non Medical) (Sem.-3)  
PHYSICAL CHEMISTRY-II  
Subject Code : BSNM-302-18  
M.Code : 76901

Date of Examination: 25-05-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly:

- a) What are intensive properties?
- b) What is the phase?
- c) Explain the heat capacity at constant volume.
- d) What are state functions?
- e) What is law of mass action?
- f) What is the degree of freedom?
- g) Define the entropy.
- h) What is eutectic point?
- i) Explain the bond dissociation energy.
- j) What is the residual entropy?

**SECTION-B**

2. Define and derive the second law of thermodynamics.
3. Explain the Henry Law's.
4. Explain the Gibbs phase rule.
5. What is the Nernst heat theorem?
6. Explain the relationship between  $K_p$  and  $K_c$ .

**SECTION-C**

7. Derive the relationship between  $C_p$  and  $C_v$ .
8. Derive the Carnot cycle and its efficiency.
9. Explain the phase diagram of water system.

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Roll No.

Total No. of Questions : 09 Total No. of Pages : 02

B.Sc (Non-Medical) (Sem.-6)  
**STATICS AND DYNAMICS**  
Subject Code : BSNM-606-18  
M.Code : 79498  
Date of Examination : 27-05-2023

Time : 3 Hrs. Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

I. Write Briefly :

- Define concurrent forces.
- State parallelogram law of forces.
- What are components Of a force in a given direction?
- State Newton's laws of motion.
- Define acceleration of a particle.
- What is kinetic energy?
- Define power.
- What are conservative forces? Give example.
- What is constrained motion?
- What happens to the motion of a particle under constant acceleration?

**SECTION-B**

- Derive  $\lambda - \mu$  theorem.
- Derive an expression for acceleration of falling bodies.
- Derive an expression for work done against gravity.
- Explain the equilibrium of three forces acting at a point.
- Discuss the composition and resolution of concurrent forces using parallelogram law of forces.

**SECTION-C**

- Derive an expression for resultant of any number of coplanar concurrent forces using triangular law of forces.
- Derive an equation of motion of two particles executing Simple Harmonic motion.
- Discuss projectile motion in detail.

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Total No. of Questions : 09 Total No. of Pages : 02

B.Sc. (Non-Medical) (Sem.-4)  
ORGANIC CHEMISTRY-III  
Subject Code : BSNM402-18  
M.Code : 77680

Date of Examination : 29-05-2023

Time : 3 Hrs.

Max. Marks : 50

INSTRUCTIONS TO CANDIDATES :

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

- Write briefly :
  - What are the esters?
  - What do you mean by autooxidation?
  - What are Phase transfer catalyst?
  - What do you mean by heterocyclic compounds?
  - Write two method of formation of furan.
  - Explain one method of formation of organozinc compounds.
  - Write one reaction of reduction of carboxylic acids.
  - How acid chlorides and acid amides differ in acidity?
  - Write the formula of Grignard reagent.
  - What are organolithium compounds?

SECTION-B

- Why pyrrole classified as aromatic compound?
- Explain the general method of formation of pyrrole.
- Explain the basicity of pyridine, piperidine, and pyrrole.
- Write a note on the thiophene.
- Explain the HVZ reaction.

SECTION-C

- Explain the mechanism of decarboxylation.
- Explain the mechanism of esterification.
- Explain the Ziesel's method.

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Non Medical) (Sem.-2)

**INORGANIC CHEMISTRY-II**

Subject Code : BSNM-201-18

M.Code : 76299

Date of Examination : 30-05-23

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1) Write briefly :

- Give the name of alkali metal which when kept in hand melts.
- Define amalgam.
- What is the electronic configuration of Indium(In)?
- What is freon?
- Which should be the stronger acid, HOCN or HCN?
- What is HOBr called?
- What are paramagnetic substances?
- Why do transition metals form alloy?
- Why can water be both a Bronsted base and a Lewis base?
- Explain the orthoboric acid ionization in water.

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**SECTION-B**

- Why BF<sub>3</sub> is not hydrolysed as compared to BC1<sub>3</sub> and BBr<sub>3</sub>?
- What is diagonal relationship and how does it arise in higher s-block and p-block elements?
- How is beryllium chloride prepared? Draw the structure of beryllium chloride in the solid state and in the vapour state.
- Why are alkali metals less dense and less harder than alkaline earth metals? What are the factors that give the relative strength of Lewis acids and bases?
- How do coordination compounds differ from double salts? Why square planar complexes do not exhibit optical isomerism?

**SECTION-C**

- What is EDTA? How this chelating ligand is capable of complexing with Ca<sup>2+</sup> ion? Draw the structure of complex.
- How is diborane prepared? Discuss the bonding in this unique molecule. How does diborane react with ammonia?
- How does relative strength of an acid vary with the oxidation number of the central atom?

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Roll No.

Total No. of Questions : 09

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Bachelor of Science (Non-Medical) (Sem-4)  
**PUNJAB HISTORY & CULTURE-IV**

Subject Code : BSNM-408-18B  
M.Code : 77995

Date of Examination : 01-06-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

- Answer Briefly :
  - Discuss Pre-Khalsa period.
  - Conquest of Sirhind by Banda Singh Bahadur.
  - Who was Henry Lawrence.
  - Coins of Banda Singh Bahadur.
  - Discuss fighting skills of the Sikhs.
  - Who was Bhag Singh.
  - Examine Religious policy of Ranjit Singh.
  - What do you know about Wood's Act?
  - Foundation of Arya Samaj.
  - Highlight the contribution of Dr. Saifuddin Kitchlu.

**SECTION-B**

- Estimate works and achievements of Banda Singh Bahadur.
- Study the origin and meaning of word Misl. How for the misls organized.
- Discuss nature of administration in Punjab under the Board of Administration.
- Write a note on the achievements of Chief Khalsa Diwan.
- Throw light on the main events of Freedom movement in Punjab from 1919-1947.

**SECTION-C**

- Describe the Military achievements of Banda Singh Bahadur.
- Examine causes of the First Anglo-Sikh War.
- Throw light on Peasant movement in Punjab with special reference to Pagri Sambhal Jatta movement.

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**B.Sc. (Non-Medical) (Sem-6)  
PUNJAB HISTORY & CULTURE-VI**

Subject Code : BSNM-608B-18

M. Code : 79501

Date of Examination : 01-06-2023

Time : 3 Hrs.

Max. Marks : 50

**SECTION-B**

2. Examine the main causes of the partition of Punjab.
3. What are the major problems faced by the agriculture sector in Punjab after Green Revolution?
4. In the light of Constitution law, discuss center-state relations.
5. Throw light on the changing cultural values of Punjab in light of Globalization.
6. Discuss in brief the major problems of Punjabi society in recent times.

**SECTION-C**

7. Discuss in detail the territorial reorganization of Punjab after Partition.
8. Throw light on the emergence of militancy in Punjab. What were its main consequences?
9. Examine various stages of migration of Punjabis to foreign countries.

**SECTION-A**

1. Write briefly :

- a) Who was Evan Jenkins?
- b) Formation of Himachal Pradesh.
- c) Founder of Green Revolution.
- d) Discuss the main reasons for the Agrarian crisis in Punjab.
- e) Examine the politics of Akali Dal after partition.
- f) Throw light on the changes in the demography of Punjab.
- g) How militancy ended in Punjab.
- h) Which country has the most Punjabis?
- i) Which is the major factor for economic growth in Punjab?
- j) Discuss cultural changes in Punjab.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(Non Medical) (Sem-2)  
**ELECTRICITY AND MAGNETISM**

Subject Code : BSNM 204-18

M.Code : 76302

Date of Examination : 02-06-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

- Write briefly :
  - What is conservative field?
  - What do you mean by curl of vector field?
  - Comment on the direction of Poynting vector.
  - What is reciprocity theorem of mutual induction?
  - Two long parallel wires separated by a distance 10 cm, are each carrying a 5 A of current. Calculate force per unit length between them.
  - Define intensity of magnetization.
  - Write Maxwell's equations for isotropic dielectric medium.
  - Differentiate between transverse and longitudinal nature of wave.
  - What is Bohr magneton?
  - Write down the expression for electrostatic energy per unit volume.

**SECTION-B**

- The potential function is given by  $V(x,y,z) = 4x + 3y - z$ . Find the electric field vector.
- Distinguish between para, ferro and diamagnetic substances.
- State Poynting vector and prove Poynting theorem.
- What is dielectric? Derive the relation between  $\vec{D}$ ,  $\vec{E}$  and  $\vec{P}$ .
- Calculate the capacitance of an isolated spherical conductor.

**SECTION-C**

- State and explain Biot Savart's law. Derive an expression for the magnetic field at a point on the axis of a circular coil carrying current. (7)
- Calculate magnetic field at the ends of a 35 cm long solenoid having 500 turns and carrying current of 6 A. (3)
- State the Faraday's laws of electromagnetic induction. Derive the differential and integral form of the Faraday's law.
- Write integral form of Maxwell's equations. Describe the physical significance of each equation.

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

**B.Sc.(Non Medical) (Sem-2)  
ELECTRICITY AND MAGNETISM**

Subject Code : BSNM 204-18

M.Code : 76302

Date of Examination : 02-06-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- What is conservative field?
- What do you mean by curl of vector field?
- Comment on the direction of Poynting vector.
- What is reciprocity theorem of mutual induction?
- Two long parallel wires separated by a distance 10 cm, are each carrying a 5 A of current. Calculate force per unit length between them.
- Define intensity of magnetization.
- Write Maxwell's equations for isotropic dielectric medium.
- Differentiate between transverse and longitudinal nature of wave.
- What is Bohr magneton?
- Write down the expression for electrostatic energy per unit volume.

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**SECTION-B**

- The potential function is given by  $V(x,y,z) = 4x + 3y - z$ . Find the electric field vector.
- Distinguish between para, ferro and diamagnetic substances.
- State Poynting vector and prove Poynting theorem.
- What is dielectric? Derive the relation between  $\vec{D}$ ,  $\vec{E}$  and  $\vec{P}$ .
- Calculate the capacitance of an isolated spherical conductor.

**SECTION-C**

- State and explain Biot Savart's law. Derive an expression for the magnetic field at a point on the axis of a circular coil carrying current. (7)
  - Calculate magnetic field at the ends of a 35 cm long solenoid having 500 turns and carrying current of 6 A. (3)
- State the Faraday's laws of electromagnetic induction. Derive the differential and integral form of the Faraday's law.
- Write integral form of Maxwell's equations. Describe the physical significance of each equation.

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Roll No.

Total No. of Questions : 09

Bachelor of Science (Non-Medical) (Sem-4)  
**PUNJAB HISTORY & CULTURE-IV**

Subject Code : BSNM-408-18B

M.Code : 77995

Date of Examination : 01-06-2023

Time : 3 Hrs.

Max. Marks : 50

**SECTION-B**

2. Estimate works and achievements of Banda Singh Bahadur.
3. Study the origin and meaning of word Misl. How for the misls organized.
4. Discuss nature of administration in Punjab under the Board of Administration.
5. Write a note on the achievements of Chief Khalsa Diwan.
6. Throw light on the main events of Freedom movement in Punjab from 1919-1947.

**SECTION-C**

7. Describe the Military achievements of Banda Singh Bahadur.
8. Examine causes of the First Anglo-Sikh War.
9. Throw light on Peasant movement in Punjab with special reference to Pagri Sambhal Jatta movement.

**SECTION-A**

1. Answer Briefly :

- a) Discuss Pre-Khalsa period.
- b) Conquest of Sirhind by Banda Singh Bahadur.
- c) Who was Henry Lawrence.
- d) Coins of Banda Singh Bahadur.
- e) Discuss fighting skills of the Sikhs.
- f) Who was Bhag Singh.
- g) Examine Religious policy of Ranjit Singh.
- h) What do you know about Wood's Act?
- i) Foundation of Arya Samaj.
- j) Highlight the contribution of Dr. Saifuddin Kitchlu.

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Roll No.

Total No. of Questions : 09 Total No. of Pages : 02

B.Sc. (Non Medical) (Sem.-3)  
**PUNJAB HISTORY & CULTURE-III**  
Subject Code : BSNM-308-18

M.Code : 76908  
Date of Examination : 03-06-23

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Answer briefly :

- How old are Indo-Aryans?
- Economic life during Rig Vedic period.
- Worship in later Vedic period.
- Where was Alexander the Great born?
- Why is emperor Ashoka called the Great?
- Name of main capital of Kushans?
- Who destroyed Gupta dynasty?
- Discuss historical significance of Vardhana dynasty?
- Write about the main cultural features of Punjab in eighth century.
- Significance of ancient Punjab's architecture.

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**SECTION-B**

- What are the main theories about the original home of the Aryans? Which is the most accepted theory?
- The roots of Hindustan go down into the Rig Vedic Age.* Explain it.
- What was the political condition of India at the time of Alexander' invasion?
- Briefly describe the career of Kanishka, discuss his contribution to the art and literature.
- Compare the works of Ashoka and Kanishka as Buddhist missionaries.

**SECTION-C**

- Give an account of the Vedic literature and highlight its importance.
- Describe the administrative system of the Mauryas and estimate its main features.
- Throw light on the traditional forms of art with special references to painting and handicraft.

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Total No. of Questions : 09

**B.Sc. (Non-Medical) (Sem.-6)  
NUCLEAR AND PARTICLE PHYSICS**

Subject Code : BSNM604-18

M.Code : 79496

Date of Examination : 03-06-23

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- What is binding energy?
- What are nuclear magic numbers?
- Define nuclear magnetic moment.
- Write decay mode for positron emission in  $\beta$ —decay.
- What is nuclear Q-value?
- Briefly discuss about compound reactions.
- What is Compton scattering?
- What is Baryon number?
- Briefly explain Thompson scattering.
- What are cosmic rays?

**SECTION-B**

- Discuss in detail the basic properties of a nucleus.
- Explain the liquid drop model of nucleus.
- Describe the theory of  $\beta$ —decay.
- Give a detailed description of working of GM counter.
- Determine how the mass and life time is measured for pions and muons.

**SECTION-C**

- Explain the shell model of nucleus.
- Explain the importance of Geiger Nuttal law.
- Write a detailed note on gamma decay.
- Describe the working of scintillation detector.
- Explain how gamma ray interact with matter
- Discuss the features of quark model.

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B.Sc. (Non Medical) (Sem-3)  
**OPTICS**

Subject Code : BSNM-303-18  
M.Code : 76902

Date of Examination : 06-06-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

I. Write briefly :

- When two sources of light are said to be coherent?
- Define path difference.
- What is thin film?
- Define optic axis.
- Define circularly polarized light.
- What is Rayleigh criterion?
- Write different types of diffraction.
- Define laser.
- What is holography?
- What is an optical resonator?

**SECTION-B**

- Describe Young's double slit experiment.
- How many principal orders are possible with a diffraction grating having 30000 lines an inch and using a source of light of wavelength 600nm? In addition, explain, what will happen if a transparency is made equal to an opacity?
- What is double refraction? What type of material can experience it?
- Discuss Ruby laser with energy level diagram
- Discuss the resolving power of a telescope.

**SECTION-C**

- Discuss possible transitions between two energy levels of an atomic system and deduce the expressions for Einstein Coefficients.
- What is Brewster's law? Prove that every reflecting surface has a unique index.
- With a suitable diagram, explain principal and working of Michelson interferometer. How can we find thickness of film using Michelson interferometer?

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Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Non-Medical) (Sem.-6)  
**ORGANIC CHEMISTRY-IV**  
 Subject Code : BSNM601-18  
 M.Code : 79493

Date of Examination : 06-06-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A****I. Write briefly :**

- What do you mean by chromophore.
- What do you mean by coupling constant?
- What is the principle of IR spectroscopy?
- What do you mean by molar absorptivity?
- What is polymerization?
- What is the Ziegler-Natta catalyst?
- How many PMR peaks are in ethanol?
- What is the monomer of polyester?
- Explain the Lambert Beer's Law.
- What do you mean by monochromatic light?

**SECTION-B**

- Explain the transitions in UV-visible spectroscopy.
- Explain the Hook's Law in IR spectroscopy.
- Explain the applications of IR spectroscopy.
- Explain the polyurethane synthesis.
- Explain the natural rubber.

**SECTION-C**

- Explain the shielding and deshielding in PMR.
- Explain the method of formation of thioethers.
- Explain the applications of UV-Visible spectroscopy.

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Total No. of Questions : 09

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B.Sc. (Non-Medical) (Sem-2)  
PHYSICAL CHEMISTRY-I

Subject Code : BSNM202-18

M.Code : 76300

Date of Examination : 09-06-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- What is collision frequency?
- Explain most probable velocity.
- Define coefficient of viscosity
- What are lyophilic colloids?
- What are ideals solutions??
- What is Van't Hoff factor?
- What are Azeotropes.
- Explain Elastic Gels?
- Explain intrinsic viscosity.
- Explain the law of corresponding states.

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**SECTION-B**

- Calculate the root mean square velocity, average velocity of  $\text{SO}_2$  molecules at  $427^\circ\text{C}$ .
- Explain one kinetic property and one optical property of colloidal state.
- Differentiate between irreversible and reversible sols.
- Latent heat of fusion of water (ice) is  $1436.3\text{cal/mol}$ . Calculate the molal freezing point depression constant of water.
- Describe the principle and apparatus used for the measurement of surface tension.

**SECTION-C**

- Derive the relationship between :  
Depression in freezing point and lowering of vapour pressure.
- State and explain: Boyle's law, Charles law and concept of absolute zero.
- Define vapour pressure, boiling point, Trouton's Rule.

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Total No. of Questions : 09

Total No. of Pages : 02

B.Sc. (Non Medical) (Sem-2)  
ENGLISH-II

Subject Code : BSNM-207-18  
M.Code : 76305

Date of Examination : 10-06-2023  
Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :
  - a. Conjunction
  - b. Adverbs of time
  - c. Example of adjective in a sentence
  - d. Example of preposition in a sentence
  - e. Use of colon
  - f. Difference between active and passive voice
  - g. Complex sentence
  - h. Role of poise in public speaking
  - i. Memorandum
  - j. Example of comparative degree of adjective

**SECTION-B**

2. Who is the ego in Jekyll and Hyde?

3. Combine 2 simple sentences into one compound sentence :

- a. He is mad. He feigns madness.
- b. He is not an idler. He is not a gambler.
- c. He is poor. He is contended.
- d. He is rich. He is unhappy.
- e. Wise men love truth. Fools shun it.

4. Write a letter to the Head of your Institute suggesting him/her ways for the celebration of National Science Day.

5. Punctuate the following paragraph :

i knew that by the time they found me there would be nothing left of me but my hanky i imagined them tapping it to a postcard and mailing it home to my dad when i ran out of tears i started singing oh they built the ship titanic to sail the ocean blue and just then a flashlight found me my patrol leader asked what i was doing out here in the woods and i spit on my palms and said don't worry about me i can take care of myself that night i dreamed of dragons in the pines and i woke up screaming.

6. How does Jekyll and Hyde link to psychology?

**SECTION-C**

7. Write a report on a recent science competition organized by your department. Invent the necessary details.

8. Write the meanings of the following technical words :

Alpha Decay, Atomic Number, Radioactivity, Btu, Reactor, Fusion, Gamma Radiation, Ionize, Neutron, Half-life.

9. What is the main conflict in "The Strange Case of Dr. Jekyll and Mr. Hyde"?

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Non-Medical) (Sem-2)

MECHANICS-II

Subject Code : BSNM-203-18

M.Code : 76301

Date of Examination : 22-06-2023

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- a) Write the principle of GPS.
- b) Define law of Gravitation.
- c) What is an inertial frame of reference?
- d) What are geosynchronous orbits?
- e) What is the difference between Kinetic energy and Potential energy?
- f) Define Quality Factor.
- g) State the two postulates of special theory of relativity.
- h) What do you mean by mass-energy equivalence?
- i) What were the limitations of Michelson Morley experiment?
- j) Define Resonance.

**SECTION-B**

2. Derive an expression for gravitational energy of a uniform sphere.
3. Calculate the components of velocity in cylindrical coordinates.
4. Discuss different types of Damping in Simple Harmonic Oscillator.
5. Explain the working of a satellite in circular orbit. List some applications.
6. Derive Lorentz Transformations. Show that Galilean transformations are limiting case of Lorentz transformations.

**SECTION-C**

7. How two body problem can be reduced to one one body problem under central force? Find its solution.
8. Derive Differential equation for a forced oscillator. Explain transient and steady states.
9. Explain in detail the principle, construction and working of Michelson Morley experiment.

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Roll No.

Total No. of Pages : 01

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B.Voc. (Beauty Therapy and Aesthetics)/ B.A. (JAMC)/ BBA/(SIM)/ B.Com (Honours)/ BCA/ BHMCT (UGC)/ B.Sc. - Honours (Nutrition and Dietetics)/ B.Sc. (AI&ML)/ (Bio Technology)/ (Fashion Design)/ (Graphics & Web Designing)/ (IT)/(Medical Lab Sciences)/ BTTM (Sem-1)

**ENGLISH**

Subject Code : BTHU-103-18

M.Code : 75085

Date of Examination : 22-06-2023

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. All questions are **COMPULSORY**.
2. Q1, Q2 and Q3 carry **TEN** marks each.
3. Q4 and Q5 carry **FIFTEEN** marks each.

1. What is Communication? Explain in detail the types and modes of Communication.
2. How is Verbal communication different from non-verbal Communication? Discuss in detail the importance of non-verbal communication as a leader.
3. In **FOUR** sentences, summarise and paraphrase the following passage in an answer to the following question:

How can smokers quit smoking? What steps can smokers follow to quit smoking?

"No pain No gain". Quitting smoking needs a strong will and a lot of effort. Many smokers want to quit smoking. They know it is bad for their health. But it is difficult for them to do so. Doctors advise heavy smokers to reduce smoking gradually starting to cut down two to three cigarettes a day reaching the ultimate goal. Others find that chewing a gum keeps a smoker busy all day long and consequently, he can reduce the number of cigarettes consumed. Sports can improve the health and give smokers the strength to quit this bad habit. Some people go for group support where all smokers provide support for each other to quit smoking.

4. Write a letter to an applicant for the post of Chief Accountant to present himself for a personal interview.
5. You, as a marketing manager have been given the responsibility of conducting and preparing a market research to know the market potential of a new product which your company is intending to launch in the market in near future. Prepare a draft report.

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Total No. of Questions : 09

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**B.Sc (Non Medical) (Sem.-1)  
PUNJAB HISTORY AND CULTURE**

Subject Code : BSNM-108A-18

M. Code : 75750

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

I. Write briefly :

- a) Write the names of important rivers flowing in the Indus plains.
- b) Name the oldest and the most significant Veda.
- c) Which were the four centres of Indus Valley Civilization?
- d) Write four main crops of Rig Vedic age.
- e) In which language is the Vedic literature written?
- f) What are Jatakas?
- g) Who was the real founder of Jainism?
- h) What was the childhood name of Lord Buddha?
- i) In which language did Lord Buddha propagate his teachings?
- j) Write any two foreign countries where Buddhism spread to a great extent.

**SECTION-B**

2. Why Punjab was called the sword arm of India?
3. Explain the importance of coins as a source of ancient Indian history.
4. Why Indus Valley Civilization is called as Harappan Civilization?
5. Write a brief note on Sabha and Samiti.
6. What was the impact of Jainism in Punjab?

**SECTION-C**

7. Describe the physical features of Punjab and their impact on its history.
8. Discuss the social and religious life of Indus valley people.
9. Explain the main teachings of Mahatma Buddha.

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Total No. of Pages : 03

Total No. of Questions : 09

B.Sc Non Medical (2018 & Onwards) (Sem.-1)  
ENGLISH

Subject Code : BSNM-107-18  
M. Code : 75748

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

I. Follow the directions given above each sub section :

- Who wrote the poem "Fool and Flea"?
  - Name the poet of "I Sit and Look Out",
  - Who wrote the story *Grief*?
  - Who is the author of the short story *Dusk*?
- B) Fill in the blanks with appropriate prepositions :
- Though a playback singer, she is well versed ..... classical music.
  - We pine ..... what is not there.
- C) Choose the correct nouns to make the sentence grammatically correct :
- Have you got all the informations/information?
  - He doesn't know how to give advice/advice.
- D) Fill in the blanks with the appropriate tense of the word given :
- Siddharth ..... (take) coffee after dinner.
  - We ..... (not find) the solution of this problem on the internet.

**SECTION-B**

- Discuss the use of personification by Emily Dickinson in her poem 'Apparently with no Surprise'.
- Discuss the meaning and significance of the following stanza from Sarojini Naidu's poem "The Soul's Prayer".  
1. bending from my sevenfold height,  
Will teach thee of my quickening grace,  
Life is a prism of my light, And Death the shadow of My face.'
- Describe the Doll's house in Katherine Mansfield The Doll's House and discuss its significance.
- Punctuate the following :

That familiarity produces neglect has been long observed the effect of all external objects however great or splendid ceases with their novelty the courtier stands without emotion in the royal presence the rustic tramples under his foot the beauties of the spring with little attention to their colour or their fragrance and the inhabitant of the coast darts his eye upon the immense diffusion of water without awe wonder or terror.

- In about 300 words describe one of the finest days in your life.

**SECTION-C**

- Rabindranath Tagore has poignantly portrayed the relationships of friendship and heartbreak in his story The Kabuliwala. Elaborate the statement.
- Discuss the theme and structure of Browning's Pippa's Song. Why is the poem considered to be Browning's distressing blunder?
- Make a precise of the following paragraphs :

- Among the manifold misfortunes that may befall humanity, the loss of health is one of the severest. All the joys which life can give cannot outweigh the sufferings of the sick. Give the sick man everything and leave him sufferings and he will feel that half the world is lost to him. Lay him on a soft silken couch; he will nevertheless be under the pressure of his suffering while the miserable beggar, blessed with health, sleeps sweetly on the hard ground. Spend his table with dainty meals and choice drinks, and



he will thrust back the hand that proffers them and every the poor man that thoroughly enjoys his dry crush Surround him with the pomp of kings, let his chair be a throne and his crutch a world saving scepter, he will look with contemptuous eye on marble, on gold and on purple and would deem himself happy, could he enjoy, even was it under a thatched roof, health of the meanest of his servants.

b) Several times in the history of the world particular countries and cities or even small groups of people have attained a high degree of civilization. Yet none of these civilizations, important they were, have lasted and one of the reasons why they did not least was that they were confined to a very few people. They were like little oases of civilization on deserts of barbarism. Now it is no good being civilized if everybody round about you is barbarous, or rather it is some good but it is very risky. For the barbarians are always liable to break in on you, and with their greater numbers and rude vigor scatter your civilization to the winds. Over and over again in history comparatively civilized people dwelling in cities have been conquered in this way by barbarians coming down from the hills and burning and killing and destroying whatever they found in the plains.

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Total No. of Questions : 09

B.Sc (Non Medical) (2018 & Onwards) (Sem.-1)

**SOLID GEOMETRY**

Subject Code : BSNM-106-18

M. Code : 75747

Max. Marks : 50

Time : 3 Hrs.

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

- Find the equation of plane passing through the points (2, 3, -4) and (1, -1, 3) and parallel to x-axis.
- Find the equation of the plane through the points (2, 2, 1) and (9, 3, 6) and perpendicular to the plane  $x + 2y + 2z = 5$ .
- Find the equation of the sphere passing through the origin and the points (α, 0, 0), (0, β, 0) and (0, 0, γ).
- Prove that the circles  $x^2 + y^2 + z^2 - 2x + 3y + 4z - 5 = 0$ ,  $5y + 6z + 1 = 0$  and  $x^2 + y^2 + z^2 - 3x - 4y + 5z - 6 = 0$ ,  $x + 2y - 7z = 0$  lie on the same sphere and find its equation.
- Find the limiting point of the coaxial system of spheres determined by  $x^2 + y^2 + z^2 + 4x - 2y + 2z + 6 = 0$  and  $x^2 + y^2 + z^2 + 2x - 4y - 2z + 6 = 0$ .
- Find the equation of the cone whose vertex is the origin and which passes through the curve of intersection of the plane  $lx + my + nz = p$  and the surface  $ax^2 + by^2 + cz^2 = 1$ .
- Find the equation of the right circular cylinder of radius 2 whose axis is the line

$$\frac{x-1}{2} = \frac{y+2}{1} = \frac{z-3}{2}$$

h) Prove that the (1, 1, 1) and (-3, 0, 1) lie on the opposite sides of the plane  $3x + 4y - 12z + 13 = 0$ .

i) Define rectangular cone.

j) Prove that the cones  $ax^2 + by^2 + cz^2 = 0$  and  $\frac{x^2}{a} + \frac{y^2}{b} + \frac{z^2}{c} = 0$  are reciprocal.

**SECTION-B**

- Find the equation the planes which bisect the angles between the two given planes.
- Find the equation of the right circular cylinder described on the circle through the points (1, 0, 0), (0, 1, 0) and (0, 0, 1) as the guiding curve.
- Prove that the plane  $2x - 2y + z + 12 = 0$  touches the sphere  $x^2 + y^2 + z^2 - 2x - 4y + 2z - 3 = 0$ .
- Prove that the polar line  $\frac{x+3}{1} = \frac{y+1}{2} = \frac{z-2}{3}$  with respect to the sphere  $x^2 + y^2 + z^2 = 1$  is the line  $\frac{x}{-1} = \frac{7y+3}{11} = \frac{7z-2}{-5}$ .
- Find the angle between the generating lines in which a plane cuts a cone.

**SECTION-C**

- Find the equation of the plane passing through the line of the intersection of the line of intersection of the plane  $ax + by + cz + d = 0$  and  $ax + by + cz + d' = 0$  and perpendicular to  $xy - plane$ .
- Find the necessary and sufficient condition that the general equation of second degree  $ax^2 + by^2 + cz^2 + 2fyz + 2gzx + 2hxy + 2ux + 2vy + 2wz + d = 0$  represents a cone.
- Find the locus of the tangent lines drawn to the sphere and parallel to a given line.
- If  $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$  represents one of the three mutually perpendicular generator of the cone  $5yz - 8zx - 3xy = 0$ ; find the equation of other two.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**



Roll No.   
Total No. of Questions : 11

Total No. of Pages : 04

B.Com (Hons) / B.Sc.(BT/MLS) / BTM (2018 & Onwards) / B.Sc. (FD) /  
B.A.(JAMC) / BBA / BBA (RD) / BHMCT (2018 Onwards) / B.Sc. (IT) /  
BCA (2019 Batch) / BBA (SIM) (2018 Batch) / BBA (Event Management)  
/ B.Sc. Hons. (Nutrition and Diets) / (Graphic & Web Designing) /  
(Radio therapy Technology) / B.Voc. (Child Caregiver) (Sem.-1,2)

### HUMAN VALUES, DE-ADDICTION & TRAFFIC RULES

Subject Code : HVPE-101-18

M.Code : 75087

Time : 3 Hrs.

Max. Marks : 60

#### INSTRUCTIONS TO CANDIDATES :

1. SECTION-A contains objective type questions.
2. SECTION-B contains short answer type questions.
3. SECTION-C contains descriptive answer type questions.
4. Attempt ALL questions.

#### SECTION-A

1. Fill in the Blanks/True/False :

- a) All the needs of body are quantitative.

शरीर की सभी जरूरतें मात्रात्मक हैं।

सरीर ਦੀਆਂ ਸਾਰੀਆਂ ਲੋੜਾਂ ਗਿਣਤਾਮਕ ਹਨ।

- b) Self organization is harmony in self.

स्व संगठन, स्वयं में सामंजस्य है।

ਸਵੈ ਦਾ ਸੰਗਠਨ, ਸਵੈ ਵਿੱਚ ਇਕਜੁਰਤਾ ਹੈ।

- c) Holistic systems ensure utilization of local resources and expertise.

समग्र प्रणाली के लिए स्थानीय संसाधनों और विशेषज्ञता का उपयोग किया जाता है।

ਸੰਪੂਰਨ ਸਿਸਟਮ ਲਈ ਸਥਾਨਕ ਵਸੀਲੇ ਅਤੇ ਮੁਹਾਰਤ ਦੀ ਉਪਯੋਗਤਾ ਦਾ ਇਸਤੇਮਾਲ ਕੀਤਾ ਜਾਂਦਾ ਹੈ।

- d) There is interconnectedness among all the orders of nature.

प्रकृति के सभी आदेशों के बीच अंतर संयुक्तता है।

ਕੁਦਰਤ ਦੇ ਸਾਰੇ ਆਦੇਸ਼ਾਂ ਦੇ ਵਿੱਚ ਆਪਸੀ ਰਿਸ਼ਤਾ ਹੈ।

[M-75087 ]

(S-17) 1755

- e) Natural acceptance does not change with time.

प्राकृतिक स्वीकृति समय के साथ बदलती नहीं है।

ਸਹਿਜ-ਸਵਿਕਰਿਤੀ ਸਮੇਂ ਦੇ ਨਾਲ ਬਦਲਦੀ ਨਹੀਂ ਹੈ।

- f) We should not operate only on the basis of pre .....  
हमें केवल पूर्व ..... के आधार पर कार्य नहीं करना चाहिए।

ਸਾਨੂੰ ਸਿਰਫ਼ ਪੂਰਵ ..... ਦੇ ਆਧਾਰ 'ਤੇ ਕੰਮ ਨਹੀਂ ਕਰਨਾ ਚਾਹੀਦਾ।

- g) Physical facilities are necessary but ..... for humans.  
भौतिक सुविधाएँ मनुष्य के लिए आवश्यक हैं, लेकिन ..... हैं।

ਭੌਤਿਕ ਸਹੂਲਤਾਂ ਮਨੁੱਖ ਲਈ ਜ਼ਰੂਰੀ ਹਨ, ਲੇਕਿਨ ..... ਹਨ।

- h) Existence is ..... submerged in space.  
अस्तित्व का मतलब है अंतरिक्ष में समाई हुई .....।

ਅਸਤੀਤਵ ਦਾ ਮਤਲਬ ਹੈ ਅੰਤਰਿਕਸ਼ ਮੇਂ ਸਮਾਏਂ ਹੁਏਂ .....।

- i) Right understanding + ..... = Mutual prosperity.  
सही समझ + ..... = পারস্পরিক সমৃদ্ধি।

ਠੀਕ ਸਮਝ + ..... = ਆਪਸੀ ਪੁਸ਼ਹਾਲੀ।

- j) Justice is Harmony in .....  
न्याय ..... में सामंजस्य है।

ਨਿਆਂ ..... ਵਿੱਚ ਤਾਲਮੇਲ ਹੈ।

#### SECTION-B

(5 x 4 = 20)

2. What do you mean by Respect? What are the different patterns of differentiation?

आपका सम्मान से क्या मतलब है? भेदभाव के विभिन्न पैटर्न क्या हैं?

ਤੁਹਾਡਾ ਆਦਰ ਦਾ ਕੀ ਮਤਲਬ ਹੈ? ਫਰਕ ਦੇ ਵੱਖ-ਵੱਖ ਪੈਟਰਨ ਕੀ ਹਨ?

3. Differentiate between intention and competence. How do we come to confuse between the two?

इरादा और क्षमता के बीच क्या अंतर है? कैसे हम गलती करते हैं?

ਇਰਾਦਾ ਅਤੇ ਸਮਰੱਥਾ ਦੇ ਵਿੱਚ ਕੀ ਅੰਤਰ ਹੈ? ਕਿਵੇਂ ਅਸੀਂ ਗਲਤੀ ਕਰਦੇ ਹਾਂ?

4. What do you mean by SVDD, SSDD and SSSS? How is the transformation possible from SSDD to SSSS?

आपका SVDD, SSDD और SSSS से क्या मतलब है? SSDD से SSSS के लिए परिवर्तन कैसे संभव है?

ਤੁਹਾਡਾ SVDD, SSDD ਅਤੇ SSSS ਤੋਂ ਕੀ ਮਤਲਬ ਹੈ? SSDD ਤੋਂ SSSS ਤੱਕ ਦੀ ਤਬਦੀਲੀ ਕਿਸ ਤਰ੍ਹਾਂ ਸੰਭਵ ਹੈ?

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5. Explain Self-Organization and Health.

ਆਪ ਸੰਗਠਨ ਅਤੇ ਸੁਸ਼ਲਾਬ ਦੇ ਭਾਰੇ ਸੋਂ ਭਗਵੇਂ।

ਆਤਮ ਸੰਗਠਨ ਅਤੇ ਸਿਹਤ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

6. What is the need of Value-Education?

ਮੁੱਲ ਸਿੱਖਿਆ ਦੀ ਕੀ ਜ਼ਰੂਰਤ ਹੈ?

ਮੁੱਲ ਸਿੱਖਿਆ ਦੀ ਕੀ ਜ਼ਰੂਰਤ ਹੈ?

SECTION-C

(5 x 6 = 30)

7. Describe in brief the salient values in human relationships.

ਮਾਨਵੀ ਸੰਬੰਧਾਂ ਵਿੱਚ ਮੁੱਖ ਮੁੱਲਾਂ ਦਾ ਵਿਵਰਨ ਕਰੋ।

ਮਾਨਵੀ ਸੰਬੰਧਾਂ ਵਿੱਚ ਮੁੱਖ ਮੁੱਲਾਂ ਦਾ ਵਿਵਰਨ ਕਰੋ।

OR

What is happiness? What is the wrong notion about attaining happiness? What are the problems faced due to the wrong notions about happiness and prosperity?

ਖੁਸ਼ੀ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਨੂੰ ਪ੍ਰਾਪਤ ਕਰਨ ਦੇ ਬਾਰੇ ਵਿੱਚ ਗਲਤ ਧਾਰਨਾ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਅਤੇ ਸਮਾਜਿਕ ਸੁਖ ਦਾ ਸਬੰਧ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਨੂੰ ਪ੍ਰਾਪਤ ਕਰਨ ਦੇ ਬਾਰੇ ਵਿੱਚ ਗਲਤ ਧਾਰਨਾ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਅਤੇ ਸਮਾਜਿਕ ਸੁਖ ਦਾ ਸਬੰਧ ਕੀ ਹੈ?

ਖੁਸ਼ੀ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਨੂੰ ਪ੍ਰਾਪਤ ਕਰਨ ਦੇ ਬਾਰੇ ਵਿੱਚ ਗਲਤ ਧਾਰਨਾ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਅਤੇ ਸਮਾਜਿਕ ਸੁਖ ਦਾ ਸਬੰਧ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਨੂੰ ਪ੍ਰਾਪਤ ਕਰਨ ਦੇ ਬਾਰੇ ਵਿੱਚ ਗਲਤ ਧਾਰਨਾ ਕੀ ਹੈ? ਖੁਸ਼ੀ ਅਤੇ ਸਮਾਜਿਕ ਸੁਖ ਦਾ ਸਬੰਧ ਕੀ ਹੈ?

8. What are the basic guidelines of value education?

ਮੁੱਲ ਸਿੱਖਿਆ ਦੀ ਕੀ ਜ਼ਰੂਰਤ ਹੈ?

ਮੁੱਲ ਸਿੱਖਿਆ ਦੇ ਬੁਨਿਆਦੀ ਵਿਸ਼ੇ-ਨਿਰਦੇਸ਼ ਕੀ ਹਨ?

OR

Explain self-organization and health.

ਆਪ ਸੰਗਠਨ ਅਤੇ ਸੁਸ਼ਲਾਬ ਦੇ ਭਾਰੇ ਸੋਂ ਭਗਵੇਂ।

ਆਤਮ ਸੰਗਠਨ ਅਤੇ ਸਿਹਤ ਦੇ ਬਾਰੇ ਵਿੱਚ ਦੱਸੋ।

9. What do you understand by competence in professional ethics? Elaborate.

ਆਪ ਪੇਸ਼ਾਵਰੀ ਐਥਿਕਸ ਵਿੱਚ ਕੌਸ਼ਲ ਕੀ ਹੈ? ਸਮਝਾਓ।

ਤੁਸੀਂ ਪੇਸ਼ਾਵਰੀ ਐਥਿਕਸ ਵਿੱਚ ਕੌਸ਼ਲ ਕੀ ਹੈ? ਸਮਝਾਓ।

OR

What is the meaning and purpose of Self-Exploration?

स्वयं-अन्वेषण के अर्थ और उद्देश्य क्या है?

आत्म-अन्वेषण के अर्थ और उद्देश्य क्या है?

10. Human being is co-existence of self and body, explain.

इंसान स्वयं और शरीर का सह-अस्तित्व है, समझाओ।

ਇਨਸਾਨ ਸੁੱਚ ਅਤੇ ਸੰਗੀਤ ਦਾ ਸਹਿ-ਅਸਤੀਤਵ ਹੈ, ਸਮਝਾਓ।

OR

Describe basic human aspirations. What are the requirements to fulfill basic human aspirations?

ਬੁਨਿਆਦੀ ਮਾਨਵੀ ਸੰਬੰਧਾਂ ਦਾ ਵਿਵਰਨ ਕਰੋ।

ਬੁਨਿਆਦੀ ਮਾਨਵੀ ਸੰਬੰਧਾਂ ਦਾ ਵਿਵਰਨ ਕਰੋ।

11. What are the salient unethical practices in the profession at present? Analyze the root cause and possible solution.

ਮੌਜੂਦਾ ਸਮੇਂ ਪੇਸ਼ੇ ਦੇ ਮੁੱਖ ਅਨੈਥਿਕ ਤਰੀਕੇ ਕੀ ਹਨ? ਮੂਲ ਕਾਰਨ ਅਤੇ ਸੰਭਵ ਸਮਾਧਾਨ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ।

ਮੌਜੂਦਾ ਸਮੇਂ ਪੇਸ਼ੇ ਦੇ ਮੁੱਖ ਅਨੈਥਿਕ ਤਰੀਕੇ ਕੀ ਹਨ? ਮੂਲ ਕਾਰਨ ਅਤੇ ਸੰਭਵ ਸਮਾਧਾਨ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰੋ।

OR

What are the implications of values based living?

ਮੁੱਲ ਆਧਾਰਿਤ ਜੀਵਨ ਧਾਰਨਾ ਦੇ ਅਢਲੇ ਪਰਿਠਾਸ ਕੀ ਹਨ?

ਕਦਰਾਂ ਕੀਮਤਾਂ ਆਧਾਰਿਤ ਜੀਵਨ ਜੀਉਣ ਦੇ ਚੰਗੇ ਨਤੀਜੇ ਕੀ ਹਨ?

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Roll No.

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc. (Non Medical) (2018 & Onwards) (Sem.-1)

**DIFFERENTIAL CALCULAS**

Subject Code : BSNM-105-18

M.Code : 75746

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

- Answer briefly :
  - Define sequence.
  - Define limit inferior with example.
  - Define Left Hand Limit.
  - Define uniform continuity.
  - Define Right hand derivatives.
- Find  $\frac{\partial(f, g)}{\partial(x, y)}$  if  $f = x^2 - x \sin y$  and  $g = x^2 y^2 + x + y$
- Show that the function  $f(x, y) = |x| + |y|$  is continuous at the origin.
- State Euler's Theorem on homogeneous function.
- Prove that a real polynomial function is continuous everywhere.
- Give an example of a decreasing sequence which diverges to  $-\infty$ .

**SECTION-B**

- State and prove Cauchy's first theorem on limits.
- State and prove Bolzano's Intermediate Value Theorem.
- Prove that the function  $f(x, y) = \sqrt{|xy|}$  is not differentiable at the origin but it is continuous at the origin, both  $f_x, f_y$  exist at the origin & have the value 0.
- Apply Taylor's Theorem with Lagrange's form of remainder to the function  $f(x) = \log x$  in  $[1, x]$ .
- If  $v_1 = x_1 + x_2 + x_3 + x_4$   
 $v_1 v_2 = x_2 + x_3 + x_4$   
 $v_1 v_2 v_3 = x_3 + x_4$

$$v_1 v_2 v_3 v_4 = x_4, \text{ show that } \frac{\partial(x_1, x_2, x_3, x_4)}{\partial(v_1, v_2, v_3, v_4)} = v_1^3 v_2^2 v_3$$

**SECTION-C**

- Show that the alternating series  $\sum_{n=1}^{\infty} (-1)^{n-1} \left( \frac{n+1}{n} \right) + \frac{2}{1} - \frac{3}{2} + \frac{4}{3} - \frac{5}{4} + \dots$  oscillates finitely.
  - Use definition of limit to prove that  $\lim_{x \rightarrow 3} (1 - 3x) = -8$ .
- Show that the function  $f(x) = \frac{1}{\sqrt{x}}$  is differentiable at  $x > 0$ .
  - If  $z = x^2 \tan^{-1} \frac{y}{x} - y^2 \tan^{-1} \frac{x}{y}$ , prove that  $\frac{\partial^2 z}{\partial x \partial y} = \frac{x^2 - y^2}{x^2 + y^2}, x \neq 0, y \neq 0$ .
- Prove that sequence  $\left\{ \frac{n}{n+1} \right\}$  is Cauchy sequence.
  - Prove that if  $f$  is continuous at  $x = a$ , the  $|f|$  is also continuous at  $x = a$ .

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**



Roll No. 

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Total No. of Pages : 02

Total No. of Questions : 09

BBA/BBA RD (2018 Onwards)  
BBA(SIM) (2018 Batch) /BBA(Event Management)  
(Sem-1)

**MANAGERIAL ECONOMICS-I**

Subject Code : BBAGE-101-18

M.Code : 75084

Max. Marks : 60

Time : 3 Hrs.

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B consists of FOUR Sub-sections : Units-I, II, III & IV.
- Each Sub-section contains TWO questions each, carrying TEN marks each.
- Student has to attempt any ONE question from each Sub-section.

**SECTION-A**

1. Write briefly :

- Production possibility curve
- Cross elasticity of demand
- Price line
- Short run production function
- Marginal cost
- Reserve capacity
- Economic Efficiency
- Advertisement cost
- Collective bargaining
- Quasi rent

**SECTION-B**

**UNIT-I**

- Define Managerial Economics. Elaborate its relationship with other disciplines in detail.
- Illustrate process of consumer equilibrium using indifference curve approach of consumer behaviour. Also discuss its limitations.

**UNIT-II**

- How long run production decisions are executed by the managers in recent times? Answer in the context of production theory.
- Discuss in detail the applications of average cost and marginal cost curves in business decisions pertaining to cost management.

**UNIT-III**

- Demonstrate the relationship between average revenue, marginal revenue and elasticity of demand in detail.
- What do you mean by price discrimination? Explain its types and degrees.

**UNIT-IV**

- What do you mean by pricing practices? Give a detailed description of their types along with examples.
- Give a detailed description of derivation of demand and supply curve of a factor.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**







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Roll No. \_\_\_\_\_

Total No. of Questions : 09

(Sem.-1)

B.Sc Non Medical (2018 & Onwards)

MECHANICS-I

Subject Code : BSNM-104-18

M.Code : 75745

Max. Marks : 50

Time : 3 Hrs.

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Write briefly :**

- State Newton's laws of motion.
- State the principle of conservation of momentum.
- Differentiate between stable and unstable equilibrium.
- Show that work done by a conservative force is zero.
- How the momentum and energy conservation laws hold good in case of collision of particles which stick together.
- Derive the relationship between torque and angular momentum.
- Write the expression for angular momentum of a system of particles.
- Write the expressions for moment of inertia and radius of gyration for a system of particles.
- Define Hooke's law of elasticity and explain its validity.
- A load of 2kg produces an extension of 1mm in a wire of 3meters in length and 1mm in diameter. Calculate the Young's modulus of wire.

(S105)-1458

**SECTION-B**

- Discuss rocket propulsion and derive the expression for velocity of rocket at any instant.
- Define a projectile and derive the equation of trajectory for a projectile fired at an angle with the horizontal.
- A body of mass 5kg initially at rest is subjected to a force of 20N. What is the kinetic energy acquired by the body at the end of 10s?
- Prove the law of conservation of energy by using conversion of gravitational potential energy into kinetic energy for freely falling body.
- Differentiate between elastic and inelastic scattering. Derive the expression for cross section of elastic scattering.

**SECTION-C**

- State and prove theorem of parallel axis of moment of inertia
- Derive the expression for moment of inertia of a rectangular bar about an axis passing through the midpoint of one side and perpendicular to its plane.
  - Define Elasticity and discuss all moduli of elasticity.
  - Derive the expression for work done in stretching and twisting a wire.
- Derive the expression for the determination of momentum of inertia and torsional rigidity of an irregular body using Torsion pendulum.

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Bachelor of Science-(Honours) (Nutrition and Dietics) (Sem.-1)

**HUMAN PHYSIOLOGY**

Subject Code : BSND-114-18

M.Code : 77211

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- a) What are axons and dendrites?
- b) What is reflex arc?
- c) How is heart beat originated and conducted in the heart?
- d) What is reticulo-endothelial system?
- e) What are the taste receptors present on the tongue?
- f) What is the function of hemoglobin?
- g) What is autonomic nervous system?
- h) What is the function of urinary bladder?
- i) What is ECG?
- j) Draw the structure of kidney.

**SECTION-B**

2. What are the enzymes released from stomach and small intestine?
3. Write the functions of RBC, WBC and platelets.
4. Classify different epithelial and connective tissues.
5. Write the functions of ribosomes, endoplasmic reticulum and Golgi apparatus.
6. Explain the process of gas exchange in lungs.

**SECTION-C**

7. Explain the process of digestion and absorption of fats.
8. What is blood pressure? What are its different types? How is blood pressure regulated in the body?
9. Draw and explain the structure of human ear.

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B.Sc. (Non Medical) (2018 & Onwards) (Sem.-1)

**MATHEMATICAL PHYSICS**

Subject Code : BSNM-103-18

M.Code : 75744

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE marks each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**I. Write briefly :**

- Find the Wronskian of  $\{x^2, -2x^2, 3x^3\}$
- Solve  $y^3 dx + (xy + x^2) dy = 0$ .
- Find the integrating factor of the equation  $(x^4 e^x - 2mxy^3) dx + 2mx^2 y dy = 0$
- Find the angle between the planes  $x + y + z = 1$  and  $x + 2y + 3z = 0$ .
- Prove that vector product is not associative, in general, i.e.,  $a \times (b \times c) \neq (a \times b) \times c$

f) Prove that  $\oint_C \phi d\vec{r} = \iint_S d\vec{S} \times \nabla \phi$

g) If the vector function  $\vec{f}(t)$  have constant magnitude then prove  $\vec{f} \cdot \frac{d\vec{f}}{dt} = 0$ .

h) Define dirac delta function.

i) Evaluate  $\nabla f$ ; if  $f(r, \theta) = r^2 - b^2 \cos \theta$  where  $b$  is a constant.

j) Show that  $f(r, \theta, \phi) = r \sin \theta \cos \phi$  satisfies Laplace's equation.

**SECTION-B**

- Solve  $(3x + y - z)p + (x + y - z)q = 2(z - y)$ .
- Find the volume of the parallelepiped if the edge vectors are  $[4, 9, -1], [2, 6, 0], [5, -4, 21]$ .
- For the function  $f = \frac{y}{x^2 + y^2}$ , find the value of directional derivative making an angle  $30^\circ$  with the positive x-axis at point  $(0, 1)$ .
- Apply Green's theorem in the plane to evaluate  $\oint_C [(2x^2 - y^2) dx + (x^2 + y^2) dy]$  where C is boundary of the surface enclosed by the x-axis and the semi-circle  $y = \sqrt{1 - x^2}$ .
- Evaluate  $I(\sigma) = (2\pi\sigma^2)^{\frac{1}{2}} \int_{-\infty}^{\frac{\sigma - x_0}{2\sigma}} e^{-\frac{(x-x_0)^2}{2\sigma^2}} \sin x dx$  explicitly and let  $\sigma \rightarrow 0$  to show that  $\lim_{\sigma \rightarrow 0} I(\sigma) = \sin x_0$ .

**SECTION-C**

- Define scalar triple product and their interpretation in terms of volume.
- State and prove Stoke's theorem.
- Use a CAS to evaluate  $\text{div } u$  and  $\text{curl } u$  if  $u(r, \theta, z) = r^2 \cos \theta e_r - rz^2 \sin^2 \theta e_\theta + z^2 e_z$ .

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BBA/BBA(RD)/(Event Management/Service Industry Management)  
(2018 Onwards) (Sem.-I)  
BBA(SIM) (2018 Batch)  
**BASIC ACCOUNTING**  
Subject Code : BBA-102-18  
M. Code : 75083

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B consists of FOUR Sub-sections : Units-I, II, III & IV.
3. Each Sub-section contains TWO questions each, carrying TEN marks each.
4. Student has to attempt any ONE question from each Sub-section.

**SECTION-A**

1. Write briefly :

- a) Explain three merits of double entry system.
- b) What is the difference between expenses and expenditure ?
- c) How sales book differ from cash book ?
- d) Define different types of errors.
- e) Discuss in detail benefits of accounting.
- f) Define Assets and Liabilities.
- g) Define trial balance.
- h) What do you mean by concepts of accounting ?
- i) How do you define conventions ?
- j) Define Computer.

**SECTION-B**

**UNIT-I**

2. What do you mean by accounting standards? Discuss in detail objectives, benefits and brief review of Accounting Standards.
3. What do you mean by accounting? Discuss in detail nature, principles and scope of accounting? Who are users of accounting information? What are the different forms of business organisations.
4. Journalise the following transactions of Oxford for the month of September 2013, post them to ledger.

**UNIT-II**

Date	Particulars	Amount
September 3	Oxford started business with cash	5,00,000
September 4	Paid into bank	2,00,000
September 5	Bought goods for cash	1,00,000
September 6	Drew cash from bank for office	50,000
September 7	Sold goods to Krish on credit	50,000
September 8	Bought goods from Ravi on credit	75,000
September 9	Received cash from Krish	40,000
September 10	Paid cash to Ravi	40,000
September 10	Discount allowed by Ravi	1,000
September 11	Cash sales for month	60,000
September 12	Paid rent	10,000
September 12	Paid salary to Kabir	5,000

5. What do you mean by trial Balance? Discuss in detail various method of preparing trial balance with the help of examples. Which errors can be traced by trial balance?

**UNIT-III**

6. Enter the following transactions in a appropriate Subsidiary Books of Ramesh for the month of January 2009 :

Date	Transactions	Rs.
Jan. 1	Sold goods to Ram	5,000
Jan. 5	Purchased goods from Hari Ram	2,000
Jan. 15	Returned goods to Hari Ram	500
Jan. 25	Ram Returned Goods	800



7. Company A's bank statement dated Dec. 31, 2011 shows a balance of Rs. 24,594.72. The company's cash records on the same date show a balance of Rs. 23,196.79. Following additional information is available :

a). Following cheques issued by the company to its customers are still outstanding :

No. 846 issued on Nov. 29	Rs. 320.00
No. 875 issued on Dec. 26	Rs. 49.21
No. 878 issued on Dec. 29	Rs. 275.00
No. 881 issued on Dec. 31	Rs. 186.50

- b) A deposit of Rs. 400.00 made on Dec. 31 does not appear on bank statement.
- c) An NSF check of Rs. 850 was returned by the bank with the bank statement.
- d) The bank charged Rs. 50 as service free.
- e) Interest income earned on the company's average cash balance at bank was Rs. 1,237.22.
- f) The bank collected a note receivable on behalf of the company. Amount received by the bank on the note was Rs. 550. This includes Rs. 50 interest income. The bank charged a collection fee of Rs. 10.
- g) A deposit of Rs. 430 was incorrectly entered as Rs. 340 in the company's cash records.

Prepare a bank reconciliation statement using the above information.

#### UNIT-IV

8. Define computers. What are the different forms software used in different organizations ? Discuss in detail objectives, advantages and disadvantages and applications of computers in accounting.
9. "Financial accounting is such accounting mechanism which helps in making aggregate presentation of monetary transaction to arrive at the financial results of the business enterprise". Explain.

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B.Sc. (Non Medical) (2018 & Onwards) (Sem.-1)

**INORGANIC CHEMISTRY**

Subject Code : BSNM-102-18

M.Code : 75743

Time : 3 Hrs.

Max. Marks : 50

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying ONE mark each.
- SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**I. Define the following :**

- Why are half filled orbitals are more stable?
- What are the maximum number of hydrogen bonds that a molecule of water can have?
- Out of LiCl and LiF which has more covalent character and why?
- Give the shape and geometry of XeF<sub>4</sub>.
- What is the packing efficiency of NaCl?
- How do we assign angular quantum number if n=4?
- Give the trend of ionisation enthalpy as we go down the group.
- Define ion-dipole forces.
- Discuss the shielding effect in while going down in a group in a periodic table.
- What is the hybridisation of PCl<sub>5</sub>?

**SECTION-B**

**2. Differentiate between the following :**

- Normalised and Orthogonal wave function
- Valence band theory and VSEPR theory

- Define Heisenberg uncertainty principle with its mathematic expression.
  - A cricket ball weighing 100gm is to be located within 0.1 Å. What is the uncertainty and its velocity. ( $h = 6.626 \times 10^{-34}$  JS).
- Differentiate between the following :
  - Frankel defect and Schotky defect
  - Dipole-dipole and induce dipole interaction
- Calculate the effective nuclear charge of following using Slater's rule :
  - 4s e<sup>-</sup> in potassium atom
  - Last electron with configuration 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>2</sup> 3p<sup>5</sup>
  - One of the 3d electron of Vanadium (Atomic No.-23)
- Explain Born Haber cycle and give its applications.
- Explain semiconductors, conductors and insulators on the basis of band theory with diagram.

**SECTION-C**

- Draw the molecular diagram of O<sub>2</sub>, O<sub>2</sub><sup>2-</sup> and O<sub>2</sub><sup>2+</sup>. Compare them on the basis of its bond order and magnetic behaviour. Also calculate its bond length and bond dissociation energy. (10)
- Determine the following for the FCC structure : (6)
  - Packing efficiency
  - Radius ratio
  - Relation between radius and length
- Derive the Born-Landé equation. (4)
- Illustrate the Schrodinger wave equation in one dimensional box. (6)
- Give brief description of following : (4)
  - Hund's Rule
  - Pauli's Exclusive principle
  - Aufbau principle

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B.Com.(Hons.)/B.Sc.(MLS)/(BT)/(BTM) (Sem.-1)  
(2018 & Onwards)/B.Sc.(FD)/BA(JAMC)/BBA/BBA(Business  
Economics)/BBA(RD)/(BHMCT)/(2018 Onwards)/B.Sc.(IT)/  
BCA(2019 Batch)/BBA(SIM)(2018 Batch)/B.Voc.(BeautyTherapy and  
Aesthetics)/BBA(Event Management)/B.Sc.(Nutrition & Dietics)/B.Sc.  
(Graphics & Web Designing)

ENGLISH

Subject Code : BTHU-103-18

M.Code : 75085

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. All questions are COMPULSORY.
2. Q1, Q2 and Q3 carry TEN marks each.
3. Q4 and Q5 carry FIFTEEN marks each

1. Elicit salient features of business communication and explain how can it be made effective?

2. Explain how can barriers to communication be overcome?

3. Read the following passage carefully and answer the questions that follow :

From 'apparel to aerospace', 'steel to software', the pace of technological innovation is quickening. No longer can companies afford to miss generation of technology and expect to remain competitive. Adding to the pressure, innovations are increasingly crossing industry boundaries; a new fiber developed by the textile industry has potential for building materials and medical equipment. Some companies are adept at using a diversity of technologies to create new products that transform markets. But many others are floundering because they rely on a technology strategy that no longer works in such a fast changing environment. The difference between success and failure is not how much a company spends on research and development (R&D), but how it approaches it. There are two possible approaches. Either a company can invest in R&D that an older generation of technology the 'break through' approach-or its focus on combining existing technologies into hybrid technologies - the 'technologies fusion' approach. It blends incremental technical improvements from several previously separate field of technology to create products that revolutionize markets. In a world where the old maxim 'one technology one industry' no longer applies, a singular breakthrough strategy is inadequate; companies need to include both the breakthrough and fusion approaches in their technology strategy. Relying on breakthroughs alone fails because it focuses the R&D efforts to narrowly, ignoring the possibilities of combining technologies. Yet many western companies still rely almost exclusively - on the breakthrough approach. The

reasons are complex: a-distrust of outside innovations and not-invented here engineering and arrogance and aversion to sharing research results.

- a. What, according to the author, is adding to the pressure on the companies?
  - b. What is the immediate effect, according to the passage, if a company does not innovate?
  - c. What according to the author, is the major drawback of the breakthrough approach of technological innovation?
  - d. Why do Western companies avoid the technology fusion approach?
  - e. What is the theme of the passage?
4. Write a letter to your friend discussing the degradation of environment which is leading to global warming and role of common citizens in saving the environment.
5. Write a detailed analysis of any book that you have recently read.

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B.Sc. (IT)/BCA (2019 Batch) (Sem.--1)  
B.Sc. (Graphics & Web Designing)  
**FUNDAMENTALS OF COMPUTER AND IT**  
Subject Code : UGCA1902  
M. Code : 76962

Max. Marks : 60

Time : 3 Hrs.

**INSTRUCTIONS TO CANDIDATES :**

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

**SECTION-A**

- Write briefly :
  - What is the difference between Hardware and Software?
  - What is OCR?
  - Differentiate between RAM and ROM.
  - What is cache memory?
  - List out the applications of IT.
  - Convert the following octal to binary :
    - 253
    - 161
  - What is mail merge in Microsoft word?
  - How freeze pane is performed in Excel?
  - What is cryptocurrency?
  - What is a PowerPoint template?

**SECTION-B**

- Write short note on the following :
  - Mobile Computing
  - Cloud Computing
  - Big Data
  - Internet of Things (IoT)
- Differentiate between the characteristic of primary and secondary memory of computer. Explain in brief
  - Registers
  - System bus
  - SMPS
- What are the advantages of high level language? Compare assembly, high level and machine level language.
- Convert (1100110100)<sub>2</sub> into Decimal, Octal and Hexadecimal. What is the output of :
  - 1110110 - 1010111
  - 1011001 + 111010
- What is Electronic spreadsheet? How the data is sorted, filtered and edited? What is cell and cell referencing?
  - Write a note on :
    - Spell checking
    - Macros
    - Equation editor in MS word

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